

WEB DESIGNING AND DEVELOPMENT

Learning Guide

National Vocational
Certificate Level 3

Version 1 - July 2013

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Author

Ahmad Mustafa, Chief Instructor, Govt. Staff Training College, Murree
Muhammad Touseef, Instructor, Govt. Institute of Information Technology, Rawalpindi

Responsible

Director General Skills Standard and Curricula, National Vocational and Technical Training Commission
National Deputy Head, TVET Reform Support Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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National Vocational & Technical Training Commission

5th Floor, Evacuee Trust Complex

Sector F-5/1, Islamabad

Tel: +92 51 904404

Fax: +92 51 904404

Email: info@navttc.org

Authors:

Ahmad Mustafa, Chief Instructor, Govt. Staff Training College, Murree

Muhammad Touseef, Instructor, Govt. Institute of Information Technology, Rawalpindi

Reviewed by:

Mr. Khalid Hussain Bugti, Sr. Instructor, Govt. Vocational Training Institute (Boys), Larkana

Qaiser Zahoor, Instructor Web Design and Development, Vocational Training Institute, Lahore

Muhammad Shahid, Instructor, Staff Training Institute, Quetta

Asif Ghaffar, Instructor (IT), Govt. Technical Training Centre, Tounsa Sharif, D.G Khan

Layout and Design by:

Sajid Yameen

Printed by:

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Foreword

The National Vocational & Technical Training Commission (NAVTTTC) developed a National Skills Strategy (NSS) after extensive research and consultation with experts and stakeholders including policy makers and representatives from Industry, Academia and the Provincial Government departments dealing with technical and vocational training. The strategy aims at establishing a regime that facilitates competency-based and demand-driven training and assessment.

NAVTTTC has developed competency-based training programs with the technical support of TVET Reform Support Programme (TVET-RSP), which is funded by the European Union, the Kingdom of the Netherlands, the Federal Republic of Germany and the Royal Norwegian Embassy. The Programme has been commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and is being implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close collaboration with NAVTTTC. These vocational training programs have been approved by the National Curriculum Review Committee (having representation from all over the country from TEVTAs and industry) for implementation in Public and Private Training institutions.

The purpose of developing competency-based training programs is to equip the learners with modern skills and knowledge for each of the trades to meet the requirements of local as well as international markets. These training programs include competency standards, qualification, curriculum, assessment material and teaching & learning material that will aid in implementation of competency-based and demand driven training in the country.

This Teaching and Learning Material is part of the competency based training program exclusively developed to support the implementation of CBT curricula. This Material is intended for the use of learners undertaking training in *National Vocational Certificate Level-3 in Information Technology (Web Designing and Development)* under the guidance of experts and appropriate trainers. This Teaching and Learning Material has been designed in consultation with industry, academia and researchers to ensure that the material is relevant and current.

On behalf of the Federal Government/NAVTTTC, I wish to express my sincere appreciation and gratitude to all subject matter experts, industry representatives and TVET-RSP experts who have diligently contributed in producing this valuable Teaching and Learning Material.

Executive Director
National Vocational & Technical Training Commission
(NAVTTTC)

Introduction

A website is an effective and efficient tool for promoting, selling and buying a product or service. For many organizations, it is the only point of contact with customer through which a customer buys and product or service and also gives feedback. The role of a Web Designer is crucial because it is his responsibility to develop a website and update its sections on routine basis to make it productive and user friendly for the users.

The National Vocational & Technical Training Commission (NAVTTTC) has developed a national qualification entitled, “National Vocational Certificate Level-3 in Information Technology (Web Designing and Development)”. Relevant industry and employers were consulted in the design and validation processes in order to come up with a national qualification that fulfills the requirements of the sector in general and the occupation in particular.

This Teaching and Learning Material (TLM) is developed based on competency standards and curriculum of the Web Designing and Development national qualification. It carries a learning volume of 80 credits and includes nine learning modules which are as under:

- Module 1: Explain Internet Working
- Module 2: Elaborate World Wide Web
- Module 3: Design a Website
- Module 4: Plan Website and Explain Software Development Life Cycle for Web Applications
- Module 5: Use Databases in Web Development
- Module 6: Develop Website using Client Side Scripting Languages
- Module 7: Develop Website using Server Side Scripting Languages
- Module 8: Design and Present Final Project
- Module 9: Perform Duties and Exhibit rights at the Workplace

This TLM provides support for more effective training and productive learning. Each of the learning modules contains learning outcomes and information regarding learning elements in the form of knowledge, skills and attitudes. At the end of every learning module are Frequently Asked Questions (FAQs) and Test Yourself which will help learners in self-assessment before proceeding to modular or final assessment.

Table of Contents

Module	Learning Unit	Title	Page
1	Explain Internet Working		1
	1	Discuss the History Evolution of Internet	3
	2	Define and Differentiate Software and Hardware	6
	3	Elaborate the Working of different Computer Networks	22
	4	Differentiate different types of Networks	31
		Summary of Module	34
		Frequently Asked Questions (FAQs)	35
		Test Yourself	37
		Answer Key	40
2	Elaborate World Wide Web		41
	1	Discuss different Eras of Web	43
	2	Compare Static Websites with Dynamic Websites	49
	3	Web Browsers	52
	4	Types of Websites	63
	5	Web Threats and Their Security Measures	65
	6	Process of Domain Registration and Web Hosting	77
	7	Discuss Shopping Carts and E-commerce	83
		Summary of Module	86
		Frequently Asked Questions (FAQs)	87
		Test Yourself	89
		Answer Key	92
3	Design a Website		93
	1	Basics of Web Designing	95
	2	Analyze different software to design website	101
	3	Application of Templates in Website	170
		Summary of Module	172
		Frequently Asked Questions (FAQs)	173
		Test Yourself	174
		Answer Key	177
4	Plan Website and Explain Software Development Life-cycle for Web Applications		179
	1	Devise Website Project Plan	181
	2	Utilize the Software Development Life Cycle in a Web Project	192
		Summary of Module	195
		Frequently Asked Questions (FAQs)	196
		Test Yourself	197
		Answer Key	198
5	Use Databases in Web Development		199
	1	Basic Perspectives of Databases	201
	2	Database Management Systems (DBMS)	216
	3	Database Designing of a Website in a Database Management System	233
		Summary of Module	238

		Frequently Asked Questions (FAQs)	239
		Test Yourself	241
		Answer Key	244
6	Develop Website using Client Side Scripting Language		245
	1	Client Side Scripting Language	247
	2	Implement Style Sheets (CSS) in a Website	291
	3	Use JavaScript in a Website	317
		Summary of Module	338
		Frequently Asked Questions (FAQs)	339
		Test Yourself	341
		Answer Key	343
7	Develop Website using Server Side Scripting Language		345
	1	Develop a website using ASP.Net	347
	2	Develop a Website using PHP	395
		Summary of Module	474
		Frequently Asked Questions (FAQs)	475
		Test Yourself	478
		Answer Key	481
8	Design and Present Final Project		483
	1	Develop a dynamic website in ASP.Net / PHP	485
	2	Prepare a project document	501
		Summary of Module	511
		Frequently Asked Questions (FAQs)	512
		Test Yourself	513
		Answer Key	515
9	Perform Duties and Exhibit Rights at the Work Place		517
	1	Demonstrate Ethics and Professional Conduct	519
	2	Plan Business-Process Activities	528
	3	Develop awareness of rights	532
		Summary of Module	538
		Frequently Asked Questions (FAQs)	539
		Test Yourself	541
		Answer Key	542

Module 1: Explain Internet Working

Learning Outcomes

- After completion of this learning module, you will be able to:
- Explain the history evolution of internet
- Define and differentiate hardware and software
- Elaborate the working of different computer networks
- Differentiate different type of computer networks

Learning Unit 1: Discuss the History Evolution of Internet

Overview

In this learning unit, you will be introduced to basic concept of internet and computer networking. After the completion of this unit, you will be able to understand definition of internet, comprehend working of internet, history and evolution of internet.

1. Definition of Internet

Internet is Worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals. The Internet, sometimes called simply "The Net,"

The Internet is a global network connecting millions of computers across the world to exchange information, news and opinions.

Do you know!

Internet Assigned Numbers Authority (IANA), delegates the actual administration of most functions to other bodies for managing Internet Protocol address or domain names.

Do you know!

Internet stands for International network



Internet Overview

2. Comprehend Working of Internet

How the Internet works:

The Internet works because open standards allow networks all over the world to interconnect.

How to connect?

Two ways to connect with internet

1-Slow-speed Technology

Modem in your computer uses a standard telephone line to connect to the Internet. Connection must be established each time you log on.

2- High-speed Connection

DSL, cable modem, FTTP, fixed wireless, wireless modem, Wi-Fi, and satellite modems. Connection is always on whenever the computer is running.

What are ways to access the Internet?

ISP (Internet service provider)

An Internet Service Provider (ISP) is a company that gives you access to the Internet and charge fee against it.

Do you know!

An IP address is a number that uniquely identifies each computer or device connected to the internet.

Do you know!

The DNS server translates the domain name into its associated IP address.



Data Travelling over Internet

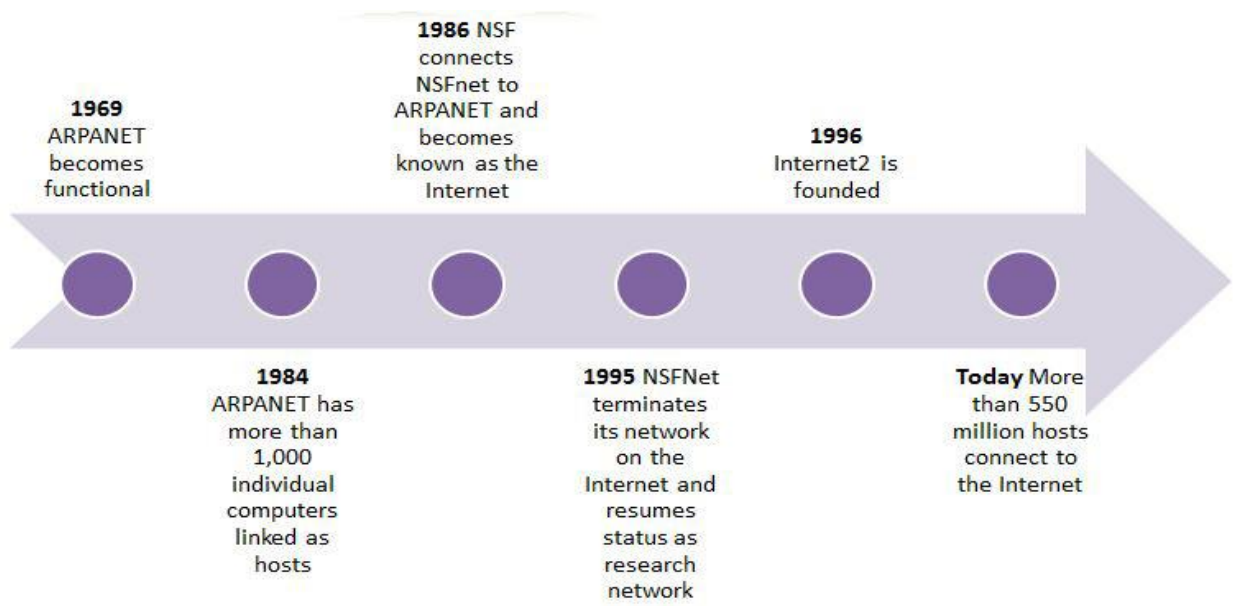


IP address & Domain name

3. History and Evolution of Internet

The Internet originated as ARPANET in September 1969 and had two main goals:

- Allow scientists at different physical locations to share information and work together.
- Function even if part of the network were disabled or destroyed by a disaster.



Evolution of Internet

Learning Unit 2: Define and Differentiate Software and Hardware

Overview

Do you know!

Software has two major types: System software and application software.

In this learning unit you will be introduced to hardware and software. After completion of this unit, you will be able to understand about: Definition of software, History of software, Definition of hardware, History of hardware, Identify types of hardware, Role of hardware in computer system, Identify Different hardware components in a computer, Examine hardware of a network, Compare software and hardware.

1. Definition of Software

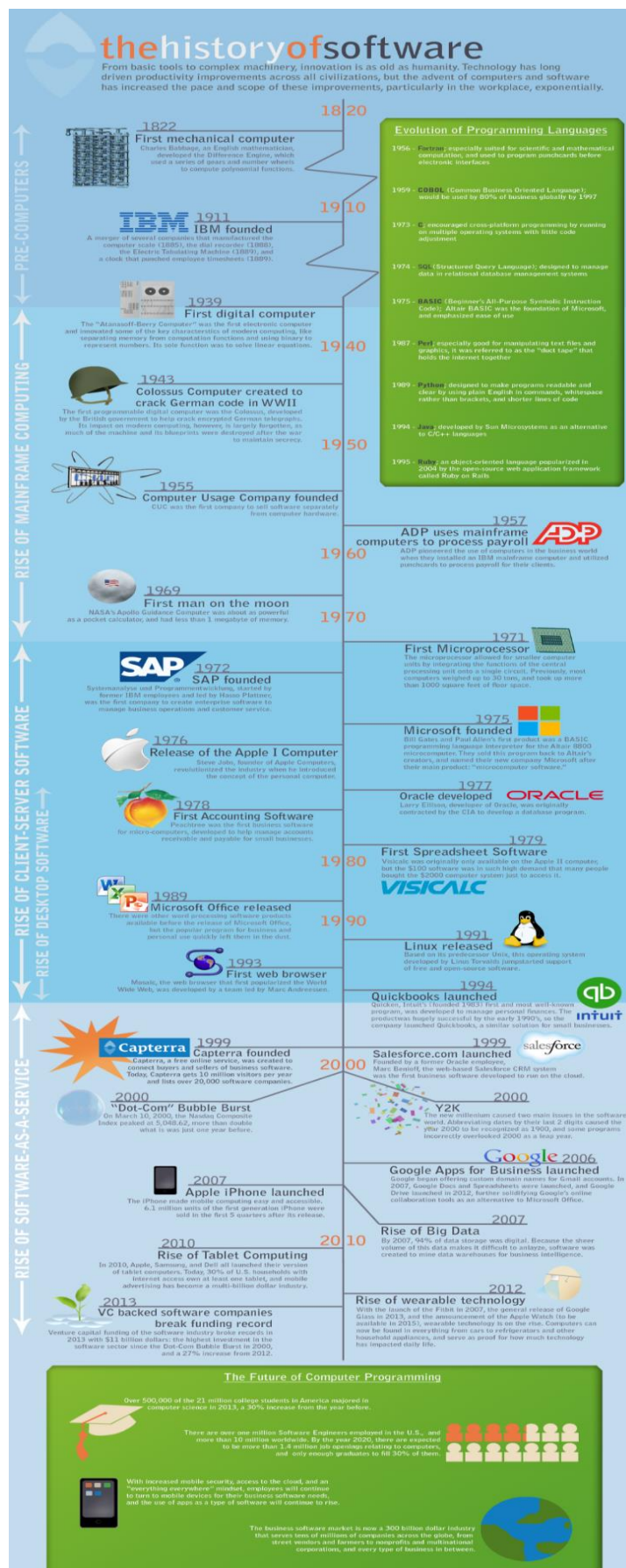
Software is a set of instructions that tells the computer what to do and how to do it.

2. History of Software

Remember

Operating system is sub-category of system software. A Domain name is the text version of an IP address.

The term “software” was introduced in the late 1950s and was soon adopted throughout the industry. Coined by statistician John Tukey, the term became a catchall, user-friendly term for the work of computer programmers who were using terminology ranging from “computer program” to “code.”



Application Software

Application software help users to complete complex task such as creating documents, spreadsheets, databases, and publications, doing online research, sending email, and designing graphics etc.

3. Definition of Computer Hardware

Physical parts of computer are called hardware.

4. History of Computer Hardware

Do you know!

The first computer like machine Mark-1 developed by IBM at Harvard University.

Since civilizations began, many of the advances made by science and technology have depended upon the ability to process large amounts of data and perform complex mathematical calculations. For thousands of years, mathematicians, scientists and businessmen have searched for computing machines that could perform calculations and analyze data quickly and efficiently. One such device was the abacus.

The abacus was an important counting machine in ancient Babylon, China, and throughout Europe where it was used until the late middle ages. It was followed by a series of improvements in mechanical counting machines that led up to the development of accurate mechanical adding machines in the 1930's. These machines used a complicated assortment of gears and levers to perform the calculations but they were far too slow to be of much use to scientists. Also, a machine capable of making simple decisions such as which number is larger was needed. A machine capable of making decisions is called a computer.

The first computer like machine was the Mark I developed by a team from IBM and Harvard University. It used mechanical telephone relays to store information and it processed data entered on punch cards. This machine was not a true computer since it could not make decisions.

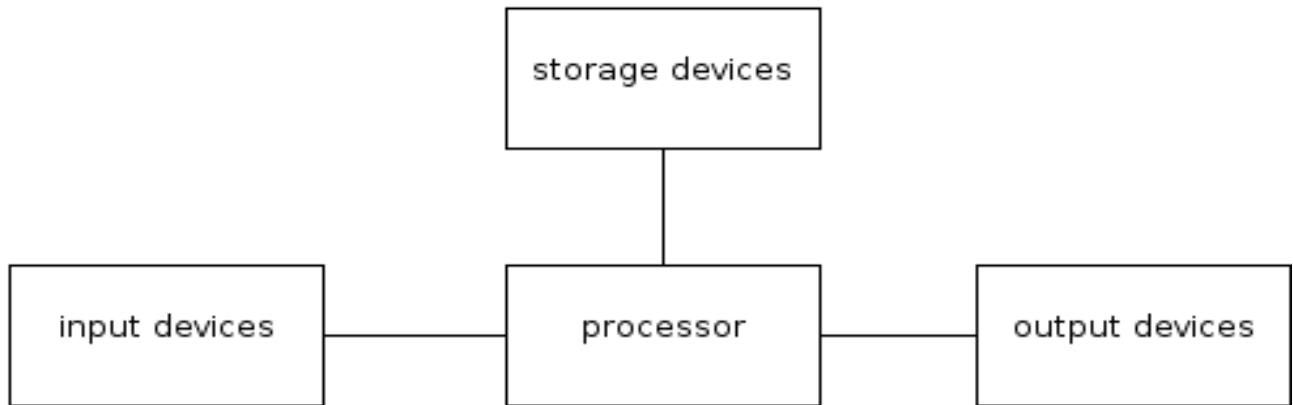
In June 1943, work began on the world's first electronic computer. It was built at the University of Pennsylvania as a secret military project during World War II and was to be used to calculate the trajectory of artillery shells. It covered 1500 square feet and weighed 30 tons. The project was not completed until 1946 but the effort was not wasted. In one of its first demonstrations, the computer solved a problem in 20 seconds that took a team of mathematicians three days. This machine was a vast improvement over the mechanical calculating machines of the past because it used vacuum tubes instead of relay switches. It contained over 17,000 of these tubes, which were the same type tubes used in radios at that time.

The invention of the transistor made smaller and less expensive computers possible. Although computers shrank in size, they were still huge by today's standards. Another innovation to computers in the 60's was storing data on tape instead of punch cards. This gave computers the ability to store and retrieve data quickly and reliably.

5. Identify Types of Hardware

A generic term used to describe any component of a computer system with a physical presence and which can, therefore, be seen and touched.

Hardware components are often categorized as being input, output, storage or processing components. Devices which are not an integral part of the CPU are referred to as being peripherals. Peripherals are usually used for input, storage or output (such as a hard disk, keyboard or printer). A device does not necessarily have to be outside the same physical box as the CPU. The best example of this is the hard disk, which is a peripheral even though it is not usually housed within the main case.



The Main Hardware Components of a Computer System

Input devices are hardware devices which take information from the user of the computer system, convert it into electrical signals and transmit it to the processor. The primary function of input devices is to allow humans to interact with the computer system. For instance a mouse allows the user to control the movement of the pointer (a common element in user interface design).

Output devices take data from the computer system and convert it to a form that can be interpreted by humans. For instance a monitor creates a visual electronic display to output information created by the processor to the user.

Processing devices are the components responsible for the processing of information within the computer system. This includes devices such as the CPU, memory and motherboard.

Storage devices are components which allow data to be stored within a computer system. This includes devices such as hard disk drives and compact disk drives.

6. Role of Hardware in Computer System

Computer hardware plays a vital role in computer system.

Hardware refers to the physical elements of a computer. Also referred to as the machinery or the equipment of the computer. Examples of hardware in a computer are the keyboard, the monitor, the mouse and the processing unit. However, most of a computer's hardware cannot be seen; It's inside the computer case.

I/O lets the computer talk with the world around it. Sometimes it's necessary to add functionality to a computer to keep it up to date, or make it better. The amount of I/O a computer has can be changed, by adding expansion cards that support I/O. A graphics card can be added to a computer to let it talk with a display, or a Wi-Fi card can be added, which will let a computer talk to other computers without a connecting wire. Sometimes functionality can be added through a universal port, a port that supports multiple kinds of I/O. USB, FireWire, and Thunderbolt (Types of I/O) support multiple data types. Your keyboard, mouse, and monitor all connect to a computer's I/O.

RAM

RAM consists of microchips that allow for the temporary storage of data. RAM functions as the work place for the CPU. It is common for a computer to have 512 MB to 4 GB of RAM.

CPUs or processors perform computations. They do the math for your calculator application, they compare the size of numbers; people have likened the CPU to the "brain" of a computer.

Memory is what allows a computer to remember things. Similar to human memory, there's long term memory (a hard disc or optical media (like a CD)) and short term memory (RAM). When a computer is turned off, it forgets everything in the RAM, so the computer saves everything it knows it will need later on in the long term memory. The short term memory is easier to use because it can do I/O faster, so when a data is needed by the CPU, it's sent from the hard disk drive (HDD) to the RAM. The short term memory lives on RAM, while the long term

memory is in the hard disk drive (HDD). Optical disks let you change certain parts of the memory, it's kind of like having a book or notebook that you might read and get information from.

Motherboard is a piece of hardware that makes connections in the right places between all of the other components in a computer. It tells data where it should go. When the CPU finishes processing some data, it might say to the CPU, OK, put this in the HDD, and the motherboard will figure out where the HDD is and send the data there.

7. Hardware Components in a Computer

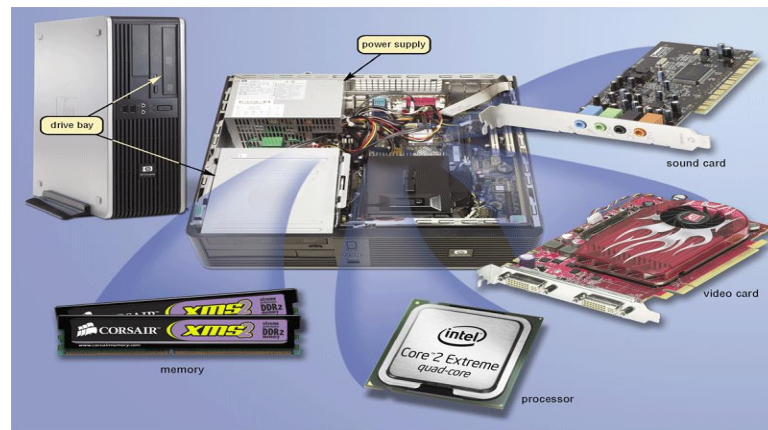
System unit

Case that contains electronic components of the computer used to process data.



Common Components Inside the System Unit

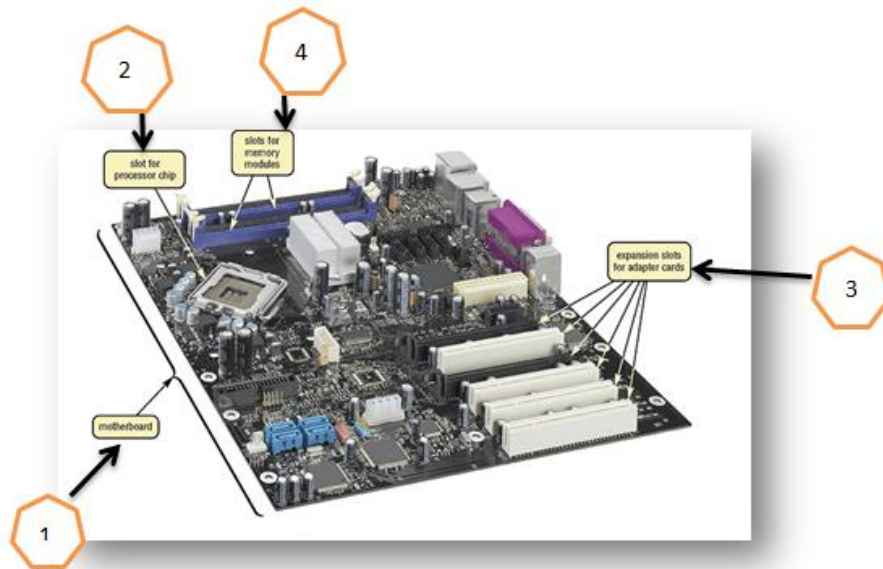
- Mother Board
- Processor
- Memory
- Adapter cards
 - Sound card
 - Video card
- Drive bays
- Power supply



Component inside of system unit

1. Motherboard

Motherboard/system board is main circuit board of the system unit. It Contains expansion slots, processor chips, memory slots and system Bus.



Mother Board

2. Slot for Processor:

This slot is used to add CPU.

3. Expansion Slots:

Expansion slots are used to add graphic cards, modems and networks cards.

4. Memory Slots:

Memory slot is used to add memory (RAM) in the computer.

What is memory?

Electronic components that store instructions, data, and result .Consists of one or more chips on motherboard or other circuit board Each byte stored in unique location called an address, similar to seats in a concert hall.

How is memory measured?

1 Byte	2^3 or 8 bits
1 Kilo Byte (KB)	2^{10} or 1024 Bytes
1 Million (Mega) Byte (MB)	2^{20} or 1024 Kilo Bytes
1 Billion (Giga) Bytes (GB)	2^{30} or 1024 Mega Bytes
1 Trillion (Tera) Bytes (TB)	2^{40} or 1024 Giga Bytes

8. Compare Software and Hardware

There are several differences between computer hardware and software.

Comparison Chart

Particulars	Hardware	Software
Definition	Devices that are required to store and execute (or run) the software.	Collection of instructions that enables a user to interact with the computer. Software is a program that enables a computer to perform a specific task, as opposed to the physical components of the system (hardware).
Types	Input, storage, processing, control, and output devices.	System software, Programming software, and Application software.
Examples	CD-ROM, monitor, printer, video card, scanners, label makers, routers, and modems.	Quick books, Adobe Acrobat, Winoms-Cs, Internet Explorer , Microsoft Word , Microsoft Excel
Function	Hardware serves as the delivery system for software solutions. The hardware of a computer is infrequently changed, in comparison with software and data, which are “soft” in the sense that they are readily created, modified, or erased on the computer	To perform the specific task you need to complete. Software is generally not needed to for the hardware to perform its basic level tasks such as turning on and responding to input.
Inter dependency	Hardware starts functioning once software is loaded.	To deliver its set of instructions, Software is installed on hardware.
Failure	Hardware failure is random. Hardware does have increasing failure at the last stage.	Software failure is systematic. Software does not have an increasing failure rate.

Durability	Hardware wears out over time.	Software does not wear out over time. However, bugs are discovered in software as time passes.
Nature	Hardware is physical in nature.	Software is logical in nature.

9. Procedure to Install Window 7

Following are the steps for the Installation of window 7

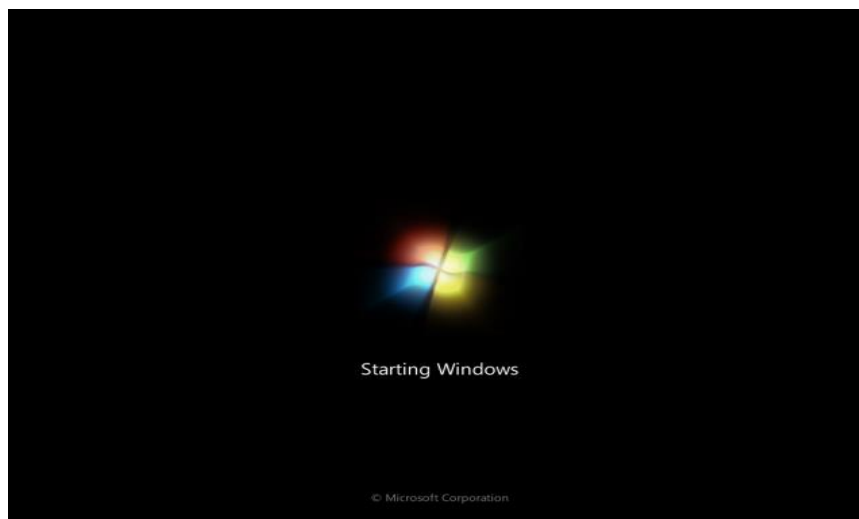
STEP 1: Boot from Windows 7 DVD. The first step is to place your Windows 7 DVD into the DVD tray and boot the machine. Your computer needs to be configured to boot from DVD. This is done via BIOS. On most computers, the BIOS menu can be accessed by pressing either the F2 or Del keys while the machine is booting.



Do you know!

BIOS stand for basic in-put out-put system.

STEP 2: Once you have completed this stage, Windows 7 will start loading. If you see the below image, you're doing well so far.



Remember

Windows 7 Minimum System Requirement is:
Processor: 1 GHz
RAM: 1 GB
Hard disk: 16 GB

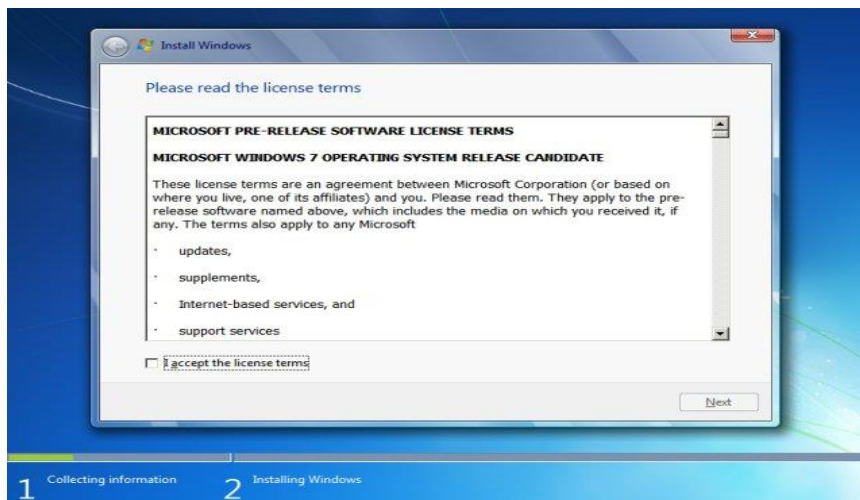
STEP 3: After a few moments, you will reach the installation menu. Now you have to choose the language and the keyboard.



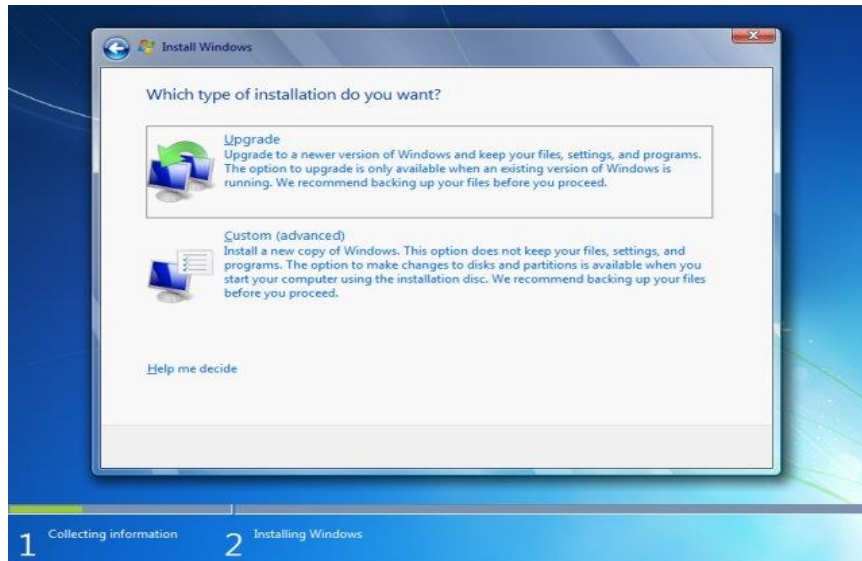
STEP 4: Now you will be taken to the Install now menu. We have already prepared for the installation, so you can click Install now and proceed.



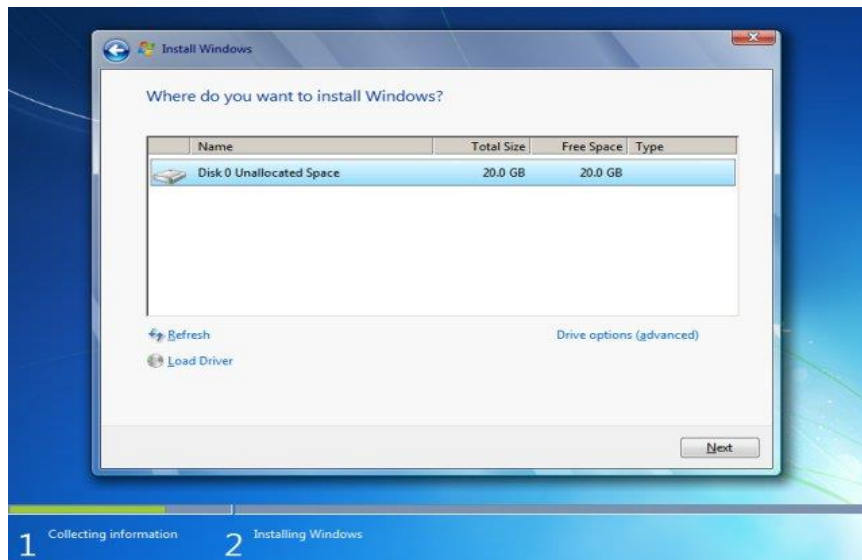
STEP 5: The next step is to accept the license agreement.



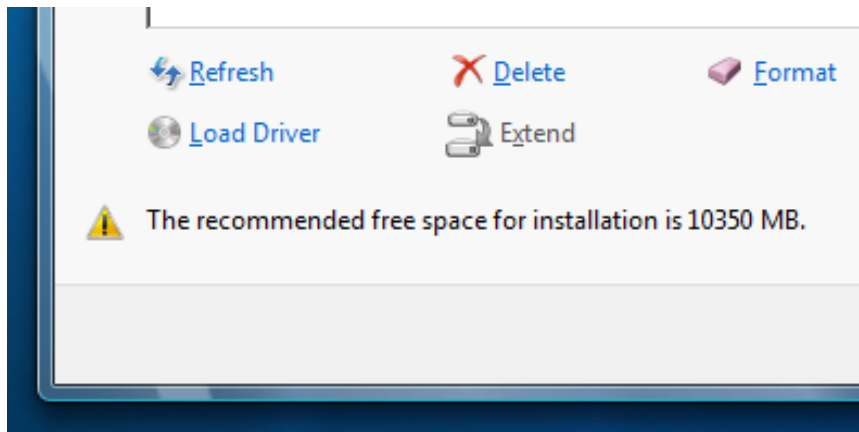
STEP 6: After this, you will have to decide whether you want to Upgrade an existing installation or perform a Custom (advanced) installation, which is basically creating a new copy of Windows. Recommended you are to install a new copy. Fresh installations are always better. Your machine starts in a pristine state and does not rely on old leftovers.



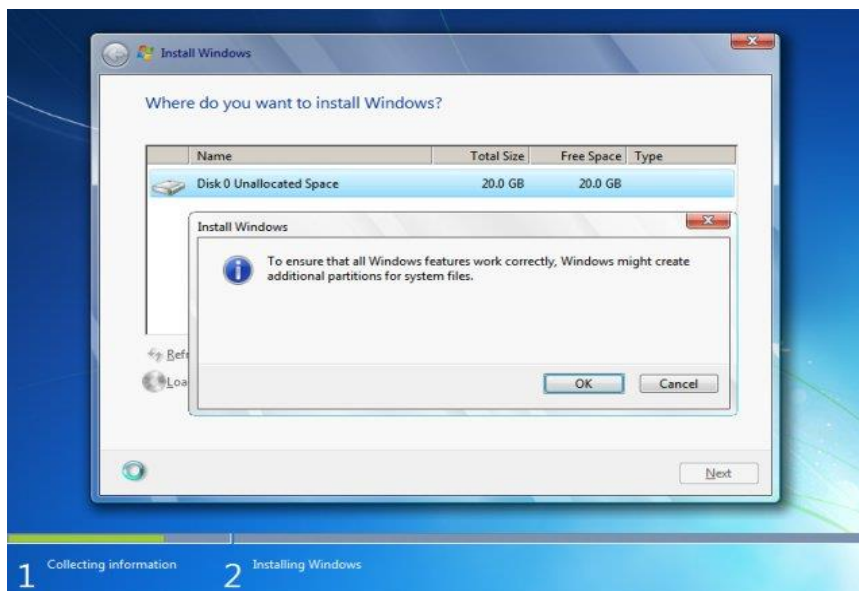
STEP 7 Partitioning: The next step is to choose where you want to install Windows 7. This is probably the most important part of the entire installation, so you need to be very careful here and make the right choices.



STEP 8: We will create a new partition. According to official system requirements, Windows 7 needs 16 GB of free space. However, you can do with less. The minimum recommended space for a partition where you want to place Windows 7 is 10350MB. Eventually, the installation itself will take approx. 7GB.

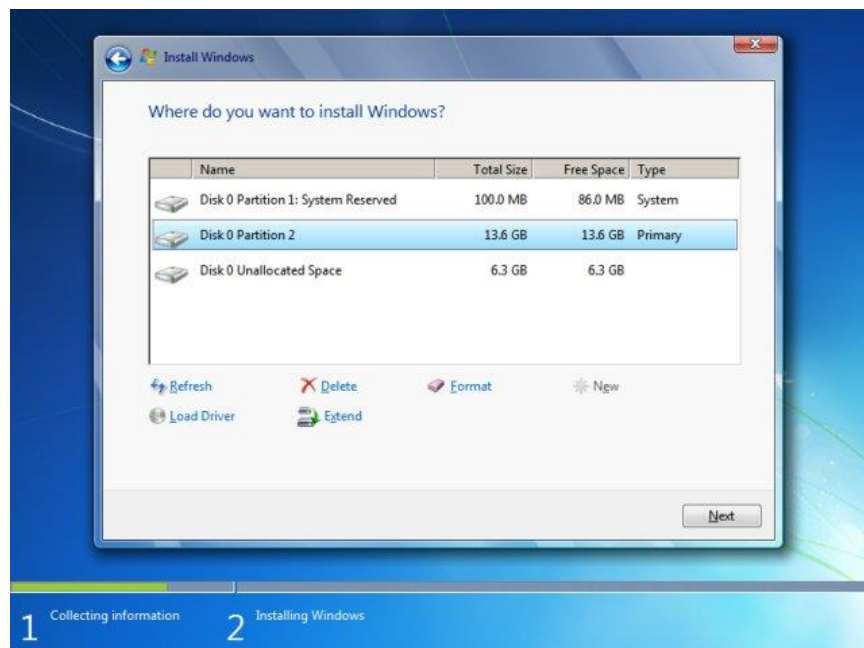


STEP 9: Windows 7 installer will now tell you that it will have to create an additional partition for the core system files. This will be a small primary partition ahead of your newly created one.



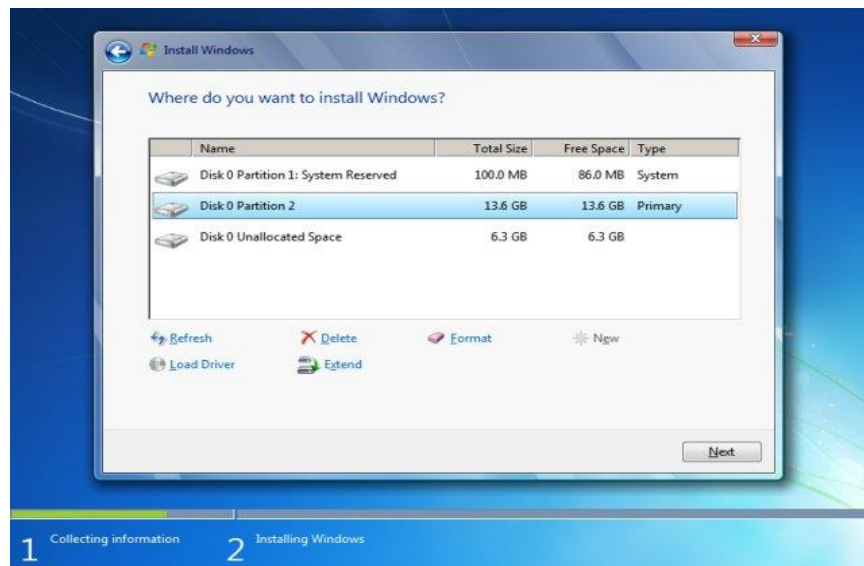
STEP 10: We now have a system partition and a primary partition, plus some free space. In purely technical terms, there is no such thing as a partition of the type system. There are only two types of partitions: primary and logical. The above-mentioned partition is a primary partition.

In total, there can only be up to four primary partitions on any physical disk. Windows 7, by itself, creates and uses at least two primary partitions. If we created another partition in the free space, it would too, become a primary partition.

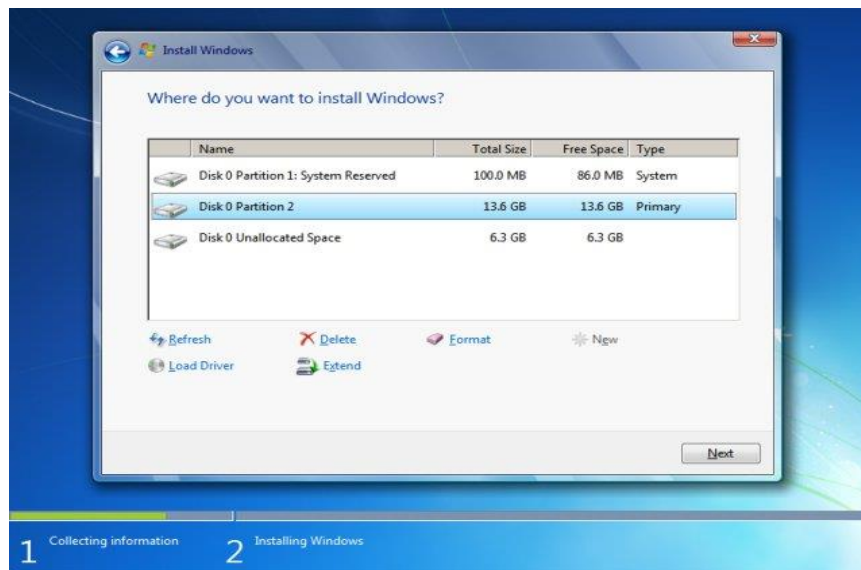


STEP 11: Recommendation Use a third-party partitioning tool to create a partition layout beforehand. This will allow you to place Windows 7 files on a logical partition, saving yourself the precious commodity of wasting primary partitions on what is essentially non-system data.

If you're using ONLY Windows 7 to create a partition layout on your system, then you should just create a partition with a sufficient size to hold the Windows 7 data files and nothing else.

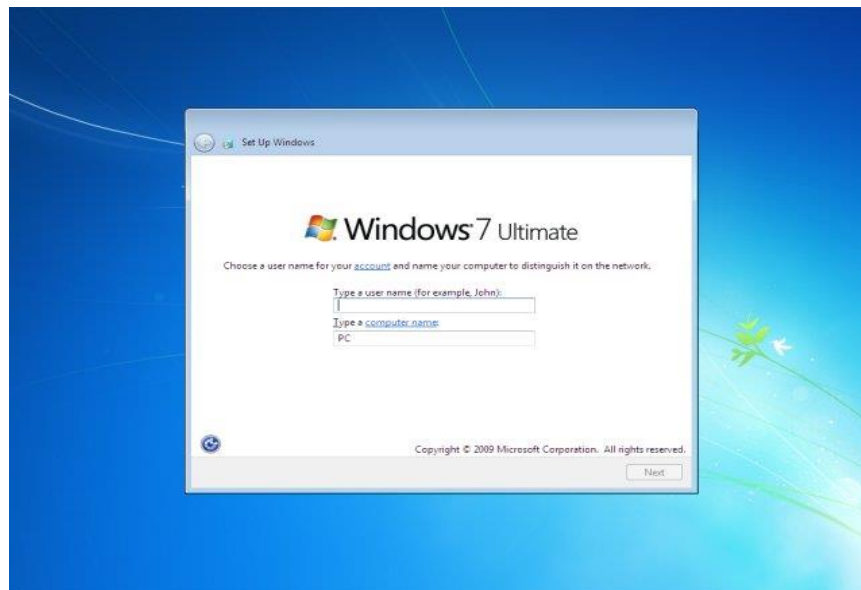


STEP 12: Begin installation if you're comfortable with your setup, highlight the created partition and click Next. Windows 7 will be installed on this partition. Depending on your hardware, this can take some time. My testing shows approx. 30-40 minutes.

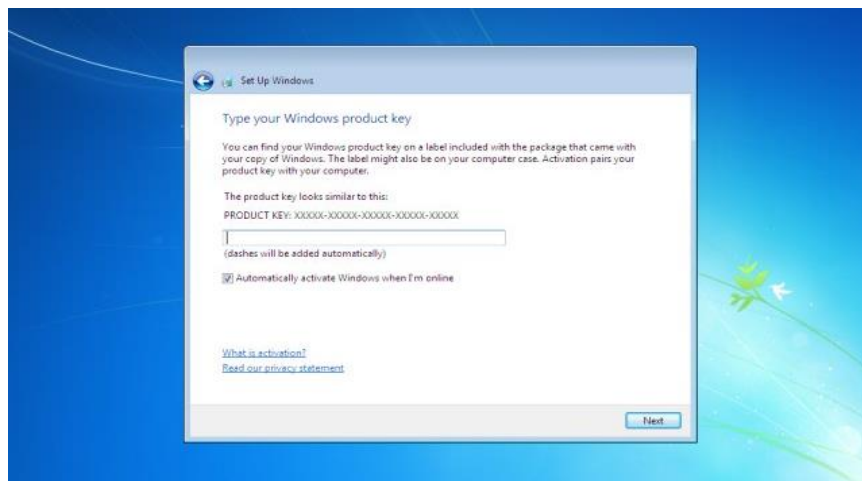


STEP 13: During the installation, your computer may restart several times. Let it be.

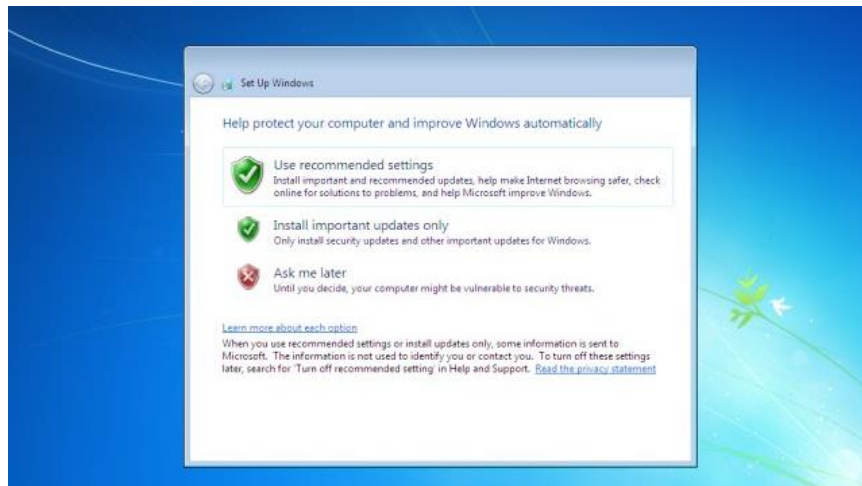
User settings eventually, you will be asked to provide your username and a computer name. You will also have to password-protect your account. This is most advisable. You should opt for a strong password.



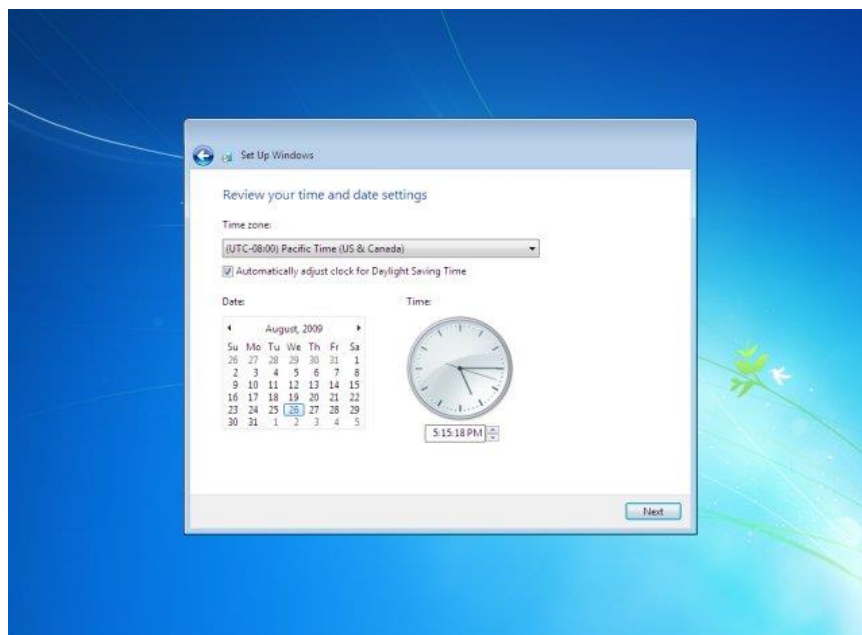
STEP 14 Activation: The next step is to activate your Windows. Grab your key and type it here.



STEP 15 Updates: You will be asked to configure your updates. You can choose either setting you like. However, I recommend you configure this choice later, after Windows 7 is installed and running properly.



STEP 16 Time zone: Configure your time zone:



STEP 17 Network Location: Your location will determine the firewall settings for your newly installed Windows 7. You have three choices: home, work or public network. Home and work networks are supposed to be trusted, so you should not experience any problems adding other machines to your group or sharing data with them.

However, the public network is meant to be untrusted. So if you have installed Windows 7 in, let's say, Internet cafe, then you should choose the third option.

Window 7 has been installed.



10. Procedure to Install Software on Computer

After the installation of Operating system, user can install the application software on computer as per their requirements. Software generally refers to any type of executable code that can be launched in a computer system. It is designed to implement and complete specific functions that are required by the user in his activities. Software .exe will save on DVD disk or in computer memory or saved on other computer hard disk we may transfer with the help of USB.

Step 1

The first most important step in software installation is to verify that the target system meets the general hardware requirements of the application. Beginning the installation in a computer machine which does not possess the minimum requirements can lead to either an unsuccessful installation or failure of the program to run after installing it.

Step 2

Since programs in general are written to be Operating System dependent, make sure that the version of the application you are installing corresponds to the Operating System platform running on your machine.

Step 3

Aside from the general hardware requirements, some computer programs also have software requirements prior to installation. Double check if you need to update or upgrade your Operating System or if there is a need to download other tools or utilities.

Step 4

Once all the initial requirements have been met, make sure that there are no unnecessary programs running before beginning the installation procedure. In some instances, applications may require that the antivirus programs be disabled. Make sure that you are installing a legitimate application before disabling your protection software.

Step 5

Software installation can be done either from the Internet (skip to step 8) or from an installation disc provided by the software manufacturer. To install from the disc, simply open the CD or DVD drive and insert the installer.

Step 6

A setup wizard window should be launched. In case there is none, open the Explorer and navigate to the optical drive. Double click on either the Autorun or Setup file.

Step 7

Once the wizard is running, simply follow the prompts until the installation process is completed. For novice users, accept the default values to minimize potential problems during the procedure. Jump to step 10.

Step 8

For installation from the Web, launch your browser application and download the setup file to your hard drive.

Step 9

After completion of the downloading process, run the setup program to execute the setup wizard that will handle the automatic installation of the software. Do step 7.

Step 10

After the installation procedure has been completed and the setup wizard has terminated, reboot your machine before launching the newly installed software.

Learning Unit 3: Elaborate the Working of Different Computer Networks

Overview

In this learning unit you will be introduced about basic concept of computer network. These are building blocks to connect different system and deploy web server.

In this unit, you will introduced about basic of a computer network, History of Network, Network topologies like Bus, Ring, Star, Mesh Topology and Basic component of network.

After learning this unit you will be able to define what is computer network and its topologies.

1. What is Network

“A network is a set of devices (often referred to as nodes) connected by communication links. A node can be a computer, printer, or any other device capable of sending and / or receiving data generated by other nodes on the network”

2. History of Network

The history of computer networking in chronological order is mentioned below:

- In the late 1950s early networks of communicating computers included the military radar system Semi-Automatic Ground Environment (SAGE).
- In 1959 Anatolii Ivanovich Kitov proposed to the Central Committee of the Communist Party of the Soviet Union a detailed plan for the re-organization of the control of the Soviet armed forces and of the Soviet economy on the basis of a network of computing centers.
- In 1960 the commercial airline reservation system semi-automatic business research environment (SABRE) went online with two connected mainframes.
- Throughout the 1960s, Leonard Kleinrock, Paul Baran, and Donald Davies independently developed network systems that used packets to transfer information between computers over a network.
- In 1962 J.C.R. Licklider developed a working group he called the "Intergalactic Computer Network", a precursor to the ARPANET, at the Advanced Research Projects Agency (ARPA).
- In 1964 researchers at Dartmouth College developed the Dartmouth Time Sharing System for distributed users of large computer systems. The same year, at Massachusetts Institute of Technology, a research group supported by General Electric and Bell Labs used a computer to route and manage telephone connections.

Remember

The Internet Protocol (IP) is the method or protocol by which data is sent from one computer to another on the internet.

- In 1965, Thomas Marill and Lawrence G. Roberts created the first wide area network (WAN). This was an immediate precursor to the ARPANET, of which Roberts became program manager.
- Also in 1965, Western Electric introduced the first widely used telephone switch that implemented true computer control.
- In 1969 the University of California at Los Angeles, the Stanford Research Institute, the University of California at Santa Barbara, and the University of Utah became connected as the beginning of the ARPANET network using 50 kbit/s circuits.

- In 1972 commercial services using X.25 were deployed, and later used as an underlying infrastructure for expanding TCP/IP networks.
- In 1973, Robert Metcalfe wrote a formal memo at Xerox PARC describing Ethernet, a networking system that was based on the Aloha network, developed in the 1960s by Norman Abramson and colleagues at the University of Hawaii. In July 1976, Robert Metcalfe and David Boggs published their paper "Ethernet: Distributed Packet Switching for Local Computer Networks" and collaborated on several patents received in 1977 and 1978. In 1979 Robert Metcalfe pursued making Ethernet an open standard.
- In 1976 John Murphy of Data point Corporation created ARCNET, a token-passing network first used to share storage devices.
- In 1995 the transmission speed capacity for Ethernet increased from 10 Mbit/s to 100 Mbit/s. By 1998, Ethernet supported transmission speeds of a Gigabit. The ability of Ethernet to scale easily (such as quickly adapting to support new fiber optic cable speeds) is a contributing factor to its continued use as of 2015.

Remember

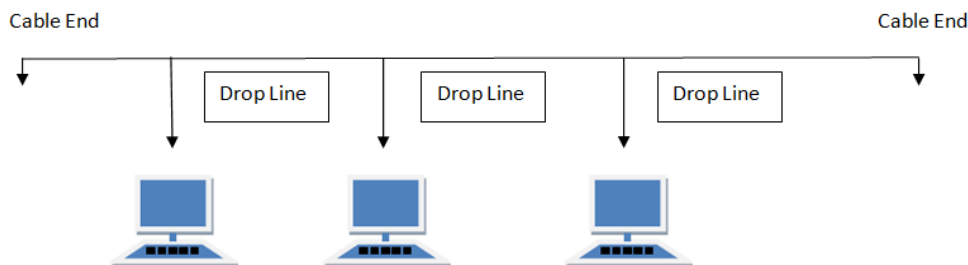
Network Topology is physical arrangement of nodes in the network.

3. Network Topologies

Network Topology is the schematic description of a network arrangement, connecting various nodes (sender and receiver) through lines of connection.

BUS Topology

Bus topology is a network type in which every computer and network device is connected to single cable.

**Remember**

IPv4 address is a 32 bit numeric address written as four numbers separated by period's e.g. 192.168.1.2

Features of Bus Topology

1. It transmits data only in one direction.
2. Every device is connected to a single cable

Advantages of Bus Topology

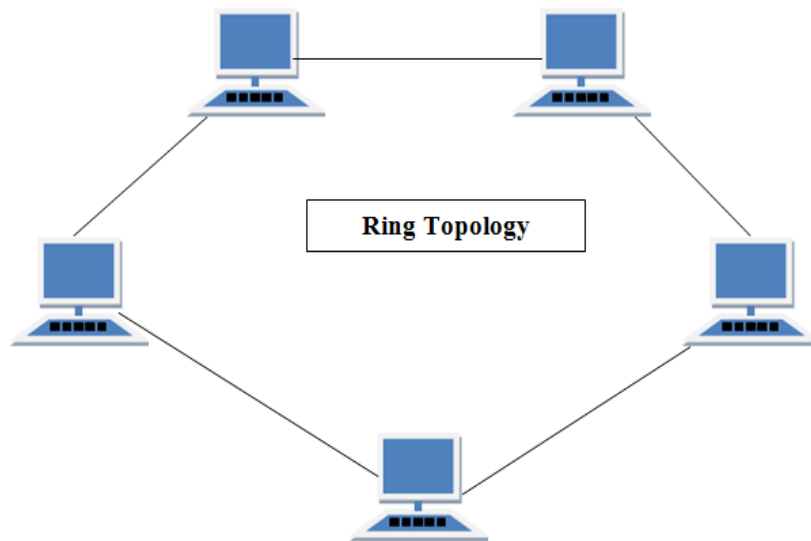
1. It is cost effective.
2. Cable required is least as compared to other network topology.
3. It works well for small networks.
4. It is easy to understand.
5. Easy to expand joining two cables together.

Disadvantages of Bus Topology

1. Entire network shuts down if there is a break in the main cable.
2. It is slow when more devices are added into the network.
3. It is slower than the ring topology.
4. Difficult to identify the problem if the entire network shuts down.

RING Topology

It is called ring topology because it forms a ring where each node is connected to exactly two nodes. Data travels from node to node, with each node along the way handling every packet.



Features of Ring Topology

1. A number of repeaters are used and the transmission is Unidirectional.
2. Data is transferred in a sequential manner that is bit by bit.

Advantages of Ring Topology

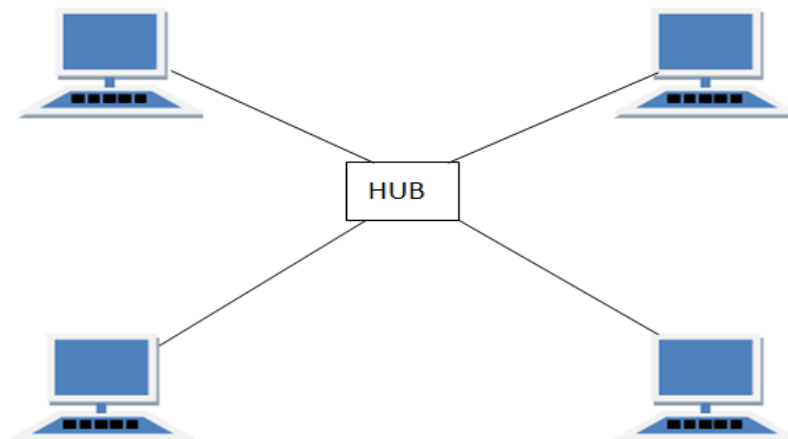
1. No need for network server to control the connectivity between work stations.
2. Additional components do not affect the performance of network.
3. Each computer has equal access to resources.

Disadvantages of Ring Topology

1. Troubleshooting is difficult in ring topology.
2. Adding or deleting the computers disturbs the network activity.
3. Communication delay is directly proportional to the numbers of nodes in the network.
4. Network is highly dependent on the wire which connects different nodes.

STAR Topology

In this type of topology all the computers are connected to a single hub through a cable. This hub is the central node and all other nodes are connected to the central node.



Features of Star Topology

1. Every node has its own dedicated connection to the hub.
2. Hub/switch acts as a repeater for data flow.
3. STP/UTP Ethernet cable is used to connect nodes to the central point.

Advantages of Star Topology

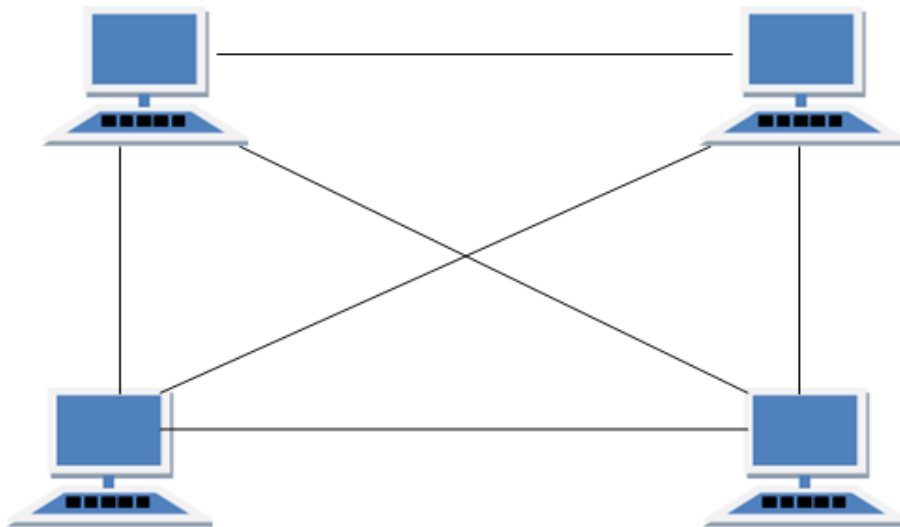
1. Fast performance with few nodes and low network traffic.
2. Hub can be upgraded easily.
3. Easy to detect the failure and troubleshoot.
4. Easy to setup and modify.
5. If single node is destroyed then the rest will work smoothly.

Disadvantages of Star Topology

1. Cost of installation is high.
2. Expensive to use.
3. If the hub is affected then the whole network is stopped because all the nodes depend on the hub.
4. Performance is based on the hub that is it depends on its capacity

MESH Topology

It is a point-to-point connection to other nodes or devices. Traffic is carried only between two devices or nodes to which it is connected. Mesh has $n(n-2)/2$ physical channels to link n devices.

**Types of Mesh Topology**

1. **Partial Mesh Topology:** In this topology some of the systems are connected in the same fashion as mesh topology but some devices are only connected to two or three devices.
2. **Full Mesh Topology:** Each and every nodes or devices are connected to each other.

Features of Mesh Topology

1. Fully connected.
2. Robust.
3. Not flexible.

Advantages of Mesh Topology

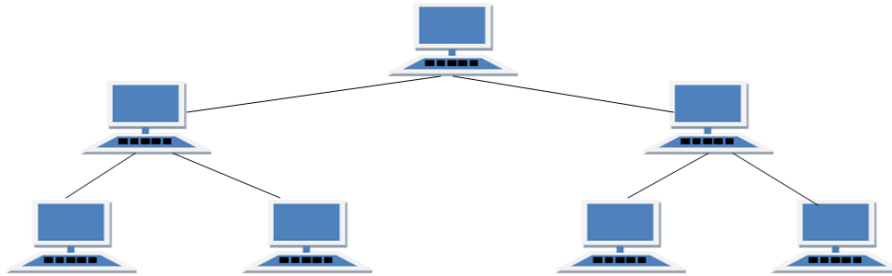
1. Each connection can carry its own data load.
2. It is robust.
3. Fault is diagnosed easily.
4. Provides security and privacy.

Disadvantages of Mesh Topology

1. Installation and configuration is difficult.
2. Cabling cost is more.
3. Bulk wiring is required.

TREE Topology

It has a root node and all other nodes are connected to it forming a hierarchy. It is also called hierarchical topology. It should at least have three levels to the hierarchy.



Features of Tree Topology

1. Ideal if workstations are located in groups.
2. Used in Wide Area Network.

Advantages of Tree Topology

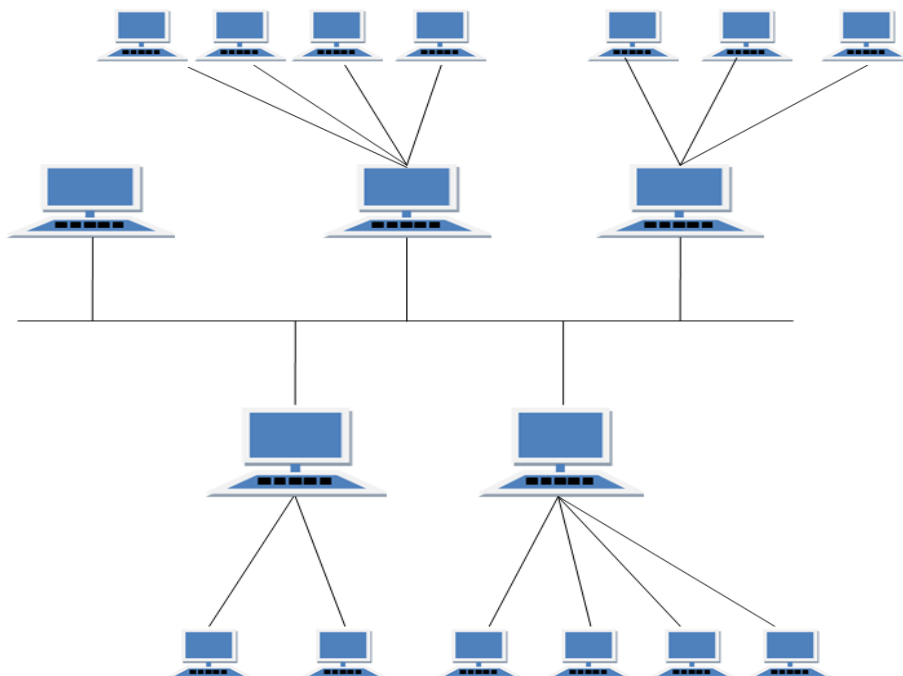
1. Extension of bus and star topologies.
2. Expansion of nodes is possible and easy.
3. Easily managed and maintained.
4. Error detection is easily done.

Disadvantages of Tree Topology

1. Heavily cabled.
2. Costly.
3. If more nodes are added maintenance is difficult.
4. Central hub fails, network fails.

HYBRID Topology

It is two different types of topologies which is a mixture of two or more topologies. For example if in an office in one department ring topology is used and in another star topology is used, connecting these topologies will result in Hybrid Topology (ring topology and star topology).



Features of Hybrid Topology

1. It is a combination of two or topologies
2. Inherits the advantages and disadvantages of the topologies included

Advantages of Hybrid Topology

1. Reliable as Error detecting and troubleshooting is easy.
2. Effective.
3. Scalable as size can be increased easily.
4. Flexible.

Disadvantages of Hybrid Topology

1. Complex in design.
2. Costly.

4. Components of Computer Network

Computer network requires the following devices (some of them are optional):-

- Network Interface Card (NIC)
- Hub
- Switches
- Cables and connectors
- Router
- Modem

Remember

The Network Card can be wired or wireless.

1. Network Interface Card

Network adapter is a device that enables a computer to talk with other computer/network. Using unique **hardware addresses (MAC address)** encoded on the card chip, the data-link protocol employs these addresses to discover other systems on the network so that it can transfer data to the right destination.



There are **two types of network cards: wired and wireless**. The wired NIC uses cables and connectors as a medium to transfer data, whereas in the wireless card, the connection is made using antenna that employs radio wave technology. All modern laptop computers incorporated wireless NIC in addition to the wired adapter.

Network Card Speed

Network Interface card, one of the main computer network components, comes with different speeds, 10Mbps, 100Mbps, and 1000Mbps, so on. Recent standard **network cards built with Gigabit** (1000Mbps) connection speed. It also supports to connect slower speeds such as 10Mbps and 100Mbps. However, the speed of the card depends on your LAN speed.

For example, if you have a switch that supports up to 100Mbps, your NIC will also transfer a data with this same speed even though your computer NIC has still the capability to transfer data at 1000Mbps (1Gbps). In modern computers, network adapter is integrated with a computer motherboard. However if you want advanced and fast Ethernet card, you may buy and install on your computer using the **PCI slot** found on the motherboard (desktop) and **Express Card slots** on laptop .

2. Hub

Hub is a device that splits a network connection into multiple computers. It is like a distribution center. When a computer request information from a network or a specific computer, it sends the request to the hub through a cable. The hub will receive the request and transmit it to the entire network. Each computer in the network should then figure out whether the broadcast data is for them or not.

Currently Hubs are becoming obsolete and replaced by more advanced communication devices such as **Switches and Routers**.



Hub

3. Switch

Switch is a telecommunication device grouped as one of computer network components. Switch is like a Hub but built in with advanced features. It uses **physical device addresses** in each incoming messages so that it can deliver the message to the right destination or port.

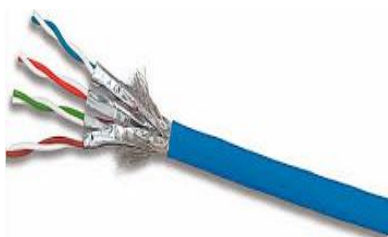


Switch

Like Hub, switch don't broadcast the received message to entire network, rather before sending it checks to which system or port should the message be sent. In other words switch connects the source and destination directly which increases the speed of the network. Both switch and hub have common features: Multiple RJ-45 ports, power supply and connection lights.

4. Cables and connectors

Cable is one way of transmission media which can transmit communication signals. The wired network typology uses special type of cable to connect computers on a network.



Twisted Pair Cable



Cable Connector

There are a number of solid transmission Media types, which are listed below. -

Twisted pair wire

It is classified as Category 1, 2, 3, 4, 5, 5E, 6 and 7. Category 5E, 6 and 7 are high-speed cables that can transmit 1Gbps or more. -

Coaxial cable

Coaxial cable more resembles like TV installation cable. It is more expensive than twisted-pair cable but provide high data transmission speed.



Coaxial Cable

Do you know!

Optical fibre was invented in 1966 by two British scientists called Charles Kao and George Hockham working for the British company Standard Telecommunication Laboratories

Fiber-optic cable

It is a high-speed cable which transmits data using light beams through a glass bound fibers. Fiber-optic cable is high data transmission cable comparing to the other cable types. But the cost of fiber optics is very expensive which can only be purchased and installed on governmental level.



Fiber-Optic Cable

Remember

The Router is used to connect two different networks.

5. Router

When we talk about computer network components, the other device that used to **connect a LAN with an internet connection is called Router**. When you have **two distinct networks** (LANs) or want to share a single internet connection to multiple computers, we use a Router.



Router

In most cases, recent routers also include a switch which in other words can be used as a switch. You don't need to buy both switch and router, particularly if you are installing small business and home networks.

There are two types of Router: **wired and wireless**. The choice depends on your physical office/home setting, **speed** and **cost**.

6. Modems

A modem enables you to connect your computer to the available internet connection over **the existing telephone line**. Like NIC, **Modem is not integrated with a computer motherboard**. It comes as separate part which can be installed on the PCI slots found on motherboard.

A modem is not necessary for LAN, but required for internet connection such as dial-up and DSL.

There are some types of modems, which differs in **speed and transmission rate**. Standard PC modem or Dial-up modems (56Kb data transmission speed), Cellular modem (used in a laptop that enables to connect while on the go), **cable modem (500 times faster than standard modem)** and DSL Modems are the most popular.



Modem

Learning Unit 4: Differentiate Different Types of Networks

Overview

In this learning unit you will be introduced about different types of networks. This unit is building block to understand different type of networks. After the completion of this learning unit you will be able to understand about personal Area Network, Local Area Network, and Wide Area Network, Metropolitan area network, campus area network, wide area network, virtual private network and difference among network.

Remember

The RJ-45 is an eight-wire connector used commonly to connect computers onto a local-area network (LAN), especially Ethernets.

1. Personal Area Network

A personal area network (PAN) refers to the interconnection of information technology devices or gadgets within the environment of an individual user typically within 10 meters or 33 feet's).

These interconnected devices might include laptop computers, PDAs, cellphones, printers, PCs or other wearable computer devices. Wireless personal network (WPAN), a network covering a very small area, usually a small room. The best known wireless PAN network technology is Bluetooth, and the most popular wired PAN is USB. You might not think of your wireless headset, your printer or your smartphones as components in a network, but they are definitely talking with each other. Many peripheral devices are actually computers in their own right. Wi-Fi also serves as a PAN technology, since Wi-Fi is also used over a small area.

Information

Twisted-pair cable is a type of cabling that is used for telephone communications and most modern Ethernet networks.

2. Local Area Network

A **local area network**, or **LAN**, consists of a computer network at a single site, typically an individual office building. A LAN is very useful for sharing resources, such as data storage and printers. LANs can be built with relatively inexpensive hardware, such as hubs, network adapters and Ethernet cables.

The smallest LAN may only use two computers, while larger LANs can accommodate thousands of computers. A LAN typically relies mostly on wired connections for increased speed and security, but wireless connections can also be part of a LAN. High speed and relatively low cost are the defining characteristics of LANs.

LANs are typically used for single sites where people need to share resources among themselves but not with the rest of the outside world. Think of an office building where everybody should be able to access files on a central server or be able to print a document to one or more central printers. Those tasks should be easy for everybody working in the same office, but you would not want somebody just walking outside to be able to send a document to the printer from their cell phone! If a local area network, or LAN, is entirely wireless, it is referred to as a wireless local area network, or WLAN.

Do you know!

Dynamic Host Configuration Protocol (DHCP) is a client/server protocol that automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

3. Wide Area Network

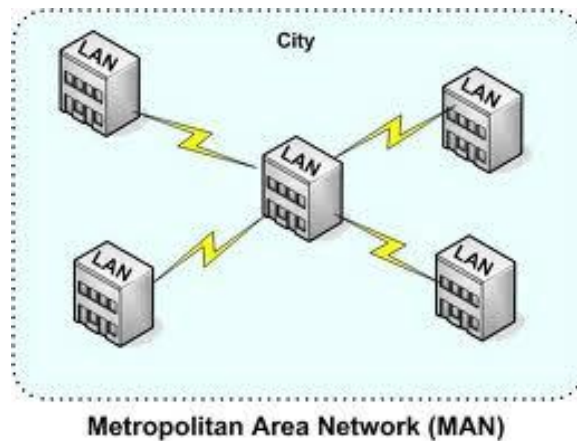
Wide Area Networks are used to connect server machines and computers across continents and countries for constant information updates. Wide Area Networks, are used across the globe, many networks connect with one another across continents to create one giant Wide Area Network. Wide Area Networks use optic fiber as their communication medium. The largest example of a Wide Area Network is the internet itself, which connects all users to the information and data that is available on the internet.



Wide Area Networks

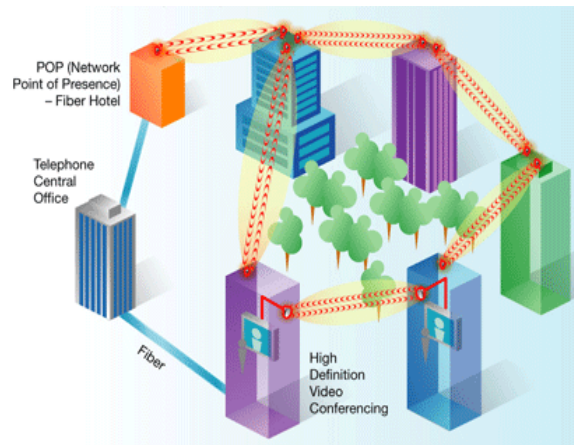
4. Metropolitan Area Network

Metropolitan Area Networks are not commonly used these days; they are used to create communication between systems in an entire city. Hence a Metropolitan Area Network area falls between the sizes Local Area Networks, and Wide Area Networks. Metropolitan Area Networks are used by city specific businesses such as Network of TEVTA institutes in the Lahore city.



5. Campus Area Network

Campus Area Networks are usually a connection of many small LAN networks which are often used on university campuses and office buildings. Campus Area Networks allow for easy file sharing between different departments as all the files are usually shared on the server machines of each LAN network. This type of network offers a lot of simplicity in the transfer and downloading of files.

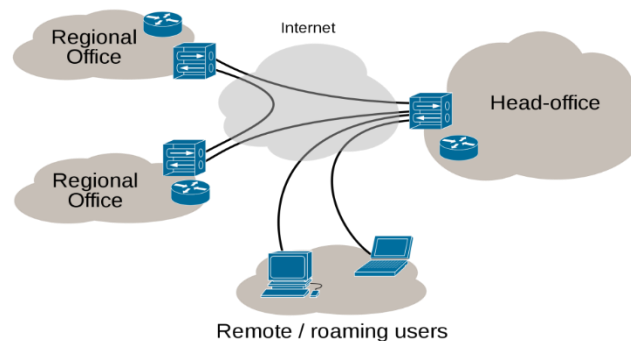


Campus Area Networks

6. Virtual Private Network

A **virtual private network (VPN)** is a method for the extension of a private network across a public network, such as the Internet. It enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network, and thus are benefiting from the functionality, security and management policies of the private network. A VPN is created by establishing a virtual point-to-point connection through the use of dedicated connections, virtual tunneling protocols, or traffic encryption.

Internet VPN



7. Difference among Network Types

1. **LAN (Local Area Network):** In LAN, two or more computers and peripheral devices are connected within the small area, as is a room, office building or a campus. The number of computers in a LAN varies from 2 to 1000 computers. The data transmission speed is slow as compare to WAN. A few data errors occur. In LAN computer terminals are physically connected with wires.
2. **WAN (Wide Area Network):** This kind of networks can connect two or more computers present at distant places. In WAN computer terminals are not connected with wires. They are linked by the communication services like satellite signals, telecommunications. The usage of WAN network system is limited to very large organizations and government agencies. The main example of WAN network system in our daily life is telecom system.
3. **MAN (Metropolitan Area Network):** MAN network system is larger than LAN network system. This system is spread across a city. The main and common example of MAN is in our daily life is Cable Television.

Summary of Module

- In a relatively short period of time, the Internet has had an amazing impact on almost every facet of our lives. With it, we are able access to new ideas, more information, unlimited possibilities, and a whole new world of communities. It has grown and evolved to influence how we interact, how we conduct business, how we learn, and how we proceed day to day. And as much as it has changed our lives, in the process, the Internet itself has changed too.
- Hardware refers to the physical elements of a computer. This is also sometime called the machinery or the equipment of the computer. Software, commonly known as programs, consists of all the electronic instructions that tell the hardware how to perform a task.
- Computer networking or data communication is a most important part of the information technology. Today every business in the world needs a computer network for smooth operations, flexibly, instant communication and data access.

Just imagine if there is no network communication in the university campuses, hospitals, multinational organizations and educational institutes then how difficult are to communicate with each other.

- There are several different types of computer networks. Computer networks can be characterized by their size as well as their purpose.

The size of a network can be expressed by the geographic area they occupy and the number of computers that are part of the network. Networks can cover anything from a handful of devices within a single room to millions of devices spread across the entire globe.

Frequently Asked Questions (FAQs)

FAQ 1: What is the Internet?

Answer A vast global network of computers connected by wires (phone lines, cable lines, DSL - digital subscriber lines, etc.)

When people talk about the Web, that is not *the* Internet, just a piece of it. E-mail, chat rooms, newsgroups, FTP (File Transfer Protocol) - all of these things make up the Internet.

FAQ 2: What is an IP address?

Answer An IP address is used to uniquely identify any computer on the network. i.e. 172.16.0.100.

FAQ 3: What is ARPANET?

Answer Arpanet - The original name of the Internet, created by the U.S. Dept. of Defense 'Defense Advanced Research Projects Agency Internet Program'.

FAQ 4: ICANN stands for?

Answer Internet Corporation for Assigned Names and Numbers - This group administers policies for the Internet name and address system

FAQ 5: Who runs the Internet?

Answer The Internet is a cooperative endeavor much like the worldwide telephone network. No single organization is responsible for all aspects of the Internet. The US Federal government, through ARPA and NSF, continues to support the Inter NIC and IETF. Equipment vendors support the Internet through their product development and participation in the Frame Relay Forum, the ATM Forum and the IETF. Internet Service Providers cooperate with each other, the NSF and ARPA and equipment vendors to provide ubiquitous connectivity.

The sum of these cooperative efforts is the worldwide Internet, which appears to each user as a seamless universal access network to global Internet resources.

FAQ 6: What's the difference Between an Intranet and the Internet?

Answer There's one major distinction between an intranet and the Internet: The Internet is an open, public space, while an intranet is designed to be a private space. An intranet may be accessible from the Internet, but as a rule it's protected by a password and accessible only to employees or other authorized users.

From within a company, an intranet server may respond much more quickly than a typical Web site. This is because the public Internet is at the mercy of traffic spikes, server breakdowns and other problems that may slow the network. Within a company, however, users have much more bandwidth and network hardware may be more reliable. This makes it easier to serve high-bandwidth content, such as audio and video, over an intranet.

FAQ 7: Differentiate between hub and switch

Answer

- Hub is a layer 1 device while Switch is layer 2 device.
- Hub works on single collision and single broadcast domain while switch works on per port collision and single broadcast domain.

FAQ 8: Define Bandwidth and Latency?

Answer Bandwidth/ Throughput – It means the number of bits which can be transmitted over the network in a specified time.

- Latency – It is the time taken by a message to travel from one side to another.

FAQ 9: What is VoIP and do I need it?

Answer VoIP stands for Voice over Internet Protocol. This technology allows businesses to use their data network to carry voice traffic as well as data. This allows a company to stop having to maintain two separate networks: one for voice, and one for data, maintaining which adds up to huge cost savings in very short order.

FAQ 10: What is the difference between a patch cable and a cross-over cable?

Answer A patch cable is basically your common everyday cable. It is used to connect your NICs or other devices to your hub/switch or what have you. With a patch cable the signal goes straight through.

A cross over cable is a specialized cable. It basically has three roles: 1) It is used if you wish to connect two computers together without using a hub. 2) It can be used to uplink one hub to another in situations where an uplink port isn't available. 3) It is can be used to daisy chain on a network device like a Cable modem in some situation.

Test Yourself!

Please mark the correct one from the given options. You can check your answer with the Answer Key at the end of this module.

1. **The Internet has its roots in _____, a network that became functional in 1969, linking scientific and academic researchers across the United States.**
 - a. ARPANET
 - b. NSFnet
 - c. LISTSERV
 - d. MPEG
2. **_____ oversees research and sets standards and guidelines for many areas of the Internet.**
 - a. ARPANET
 - b. NSFnet
 - c. LISTSERV
 - d. World Wide Web Consortium (W3C)
3. **_____ is collection of networks that connects millions of businesses, government agencies, educational institutions and individuals.**
 - a. Networks
 - b. Node
 - c. Internet
 - d. WLAN
4. **The major carriers of network traffic on the Internet are known collectively as the _____.**
 - a. NERVENet
 - b. DARPA
 - c. Internet backbone
 - d. Internet artery
5. **A (n) _____ address is a number that uniquely identifies each computer or device connected to the Internet.**
 - a. IP
 - b. e-mail
 - c. POP
 - d. DSL
6. **The group that assigns and controls top-level domains is the _____.**
 - a. NSF
 - b. ICANN
 - c. Network Solutions Group
 - d. ARPANET
7. **In 1986, the National Science Foundation (NSF) connected its huge network of five supercomputer centers, called NSFnet, to _____.**
 - a. the Web
 - b. ARPANET
 - c. the IPnet
 - d. DNS
8. **All of the following are widely used input devices except the _____.**
 - a. keyboard and mouse
 - b. microphone and scanner
 - c. digital camera and PC video camera
 - d. printer and monitor

9. A _____ is an input device that converts printed material to a form the computer can use.
- a. mouse
 - b. keyboard
 - c. microphone
 - d. scanner
10. Each of the following is a commonly used output device *except* _____.
- a. a printer
 - b. a monitor
 - c. a scanner
 - d. speakers
11. Two categories of software are _____.
- a. operating system and system software
 - b. system software and utility programs
 - c. utility programs and operating systems
 - d. system software and application software
12. A widely used type of application software related to communications is _____, which allows users with an Internet connection to access Web pages.
- a. a Web browser
 - b. word processing software
 - c. database software
 - d. spreadsheet software
13. A computer contains many electric, electronic, and mechanical components known as _____.
- a. software
 - b. input devices
 - c. output
 - d. hardware
14. The _____ unit is a case that contains electronic components of the computer that are used to process data.
- a. Control
 - b. System
 - c. arithmetic
 - d. base
15. The _____ is the electronic component that interprets and carries out the basic instructions that operate the computer.
- a. Motherboard
 - b. control unit
 - c. processor
 - d. arithmetic unit
16. _____ consists of electronic components that store instructions waiting to be executed and data needed by those instructions.
- a. The processor
 - b. The CPU
 - c. The control unit
 - d. Memory
17. _____ Software consists of the programs that control or maintain the operations of the computer and its devices.
- a. System
 - b. Application
 - c. Utility
 - d. Operating

- 18. One type of system software is a (n) ____ system, which is a set of programs that coordinates all the activities among computer hardware devices.**
- a. utility
 - b. hardware
 - c. operating
 - d. software
- 19. One type of system software is a (n) ____ program, which allows a user to perform maintenance-type tasks usually related to managing a computer.**
- a. management
 - b. maintenance
 - c. utility
 - d. operating
- 20. ____ Software consists of programs designed to make users more productive and/or assist them with personal tasks, and include Web browser, word processing software, and spreadsheet software.**
- a. Management
 - b. Utility
 - c. Application
 - d. System
- 21. A ____ is a device that forwards packets between networks by processing the routing information included in the packet.**
- a. Bridge
 - b. Firewall
 - c. Router
 - d. All of them

Answers Key

MCQ Number	Correct Answer	MCQ Number	Correct Answer
1	a	13	d
2	d	14	d
3	c	15	c
4	c	16	d
5	a	17	a
6	b	18	c
7	b	19	c
8	d	20	c
9	d	21	c
10	c		
11	d		
12	a		

Module 2: Elaborate World Wide Web

Learning Outcomes

After completion of this learning module, you will be able to:

- Elaborate different eras of web.
- Compare static websites with dynamic websites.
- Elaborate and differentiate different web browsers
- Compare different types of websites.
- Identify different web threats and security measures.
- Elaborate the process of domain registration and web hosting.
- Elaborate about shopping carts and e-commerce.

Learning Unit 1: Different Eras of Web

Overview

In this learning unit, you will learn different eras of web. After the completion of this learning unit, you will be able to understand the definition of World wide web, website and webpage, history of web, web 1.0, web 2.0, web 3.0 and comparison of web 1.0, 2.0, 3.0.

Do you know!

Markup Language is used to create web pages.

1. World Wide Web

The world wide web (commonly shortened to the web) is a system of interlinked hypertext documents accessed via the internet. With web browser, user views web pages that may contain text, images, videos and other multimedia and navigates between them, using hyperlinks.



This is what's displayed through your web browser.

URL

URL is an acronym for Uniform Resource Locator and is a reference (an address) to a resource on the Internet. e.g URL <http://example.com>

Web Browser

Web browser, is a software program created as a simplified means to present and explore content on the World Wide Web.

2. Website and Webpage

Web Page

A webpage is a document commonly written in Hyper Text Markup Language (HTML) that is accessible through the Internet or other network using a browser. A web page is accessed by entering a URL address and may contain text, graphics, and hyperlinks to other web pages and files.

Website

A Web site is a collection of related Webpages and associated items, such as documents and pictures, multimedia stored on a Web server.

Web Server

Web server is a computer that delivers requested Web pages to computer.

3. History of Web

Do you know!

The first website at CERN - and in the world was dedicated to the World Wide Web project itself and was hosted on Berners-Lee's NeXT computer. Hyper Text Markup Language is used to create web pages.

Tim Berners-Lee, a British scientist at CERN (European Organization for Nuclear Research), invented the World Wide Web (WWW) in 1989. The web was originally conceived and developed to meet the demand for automatic information-sharing between scientists in universities and institutes around the world.

The website described the basic features of the web; how to access other people's documents and how to set up the own server.

Web 1.0

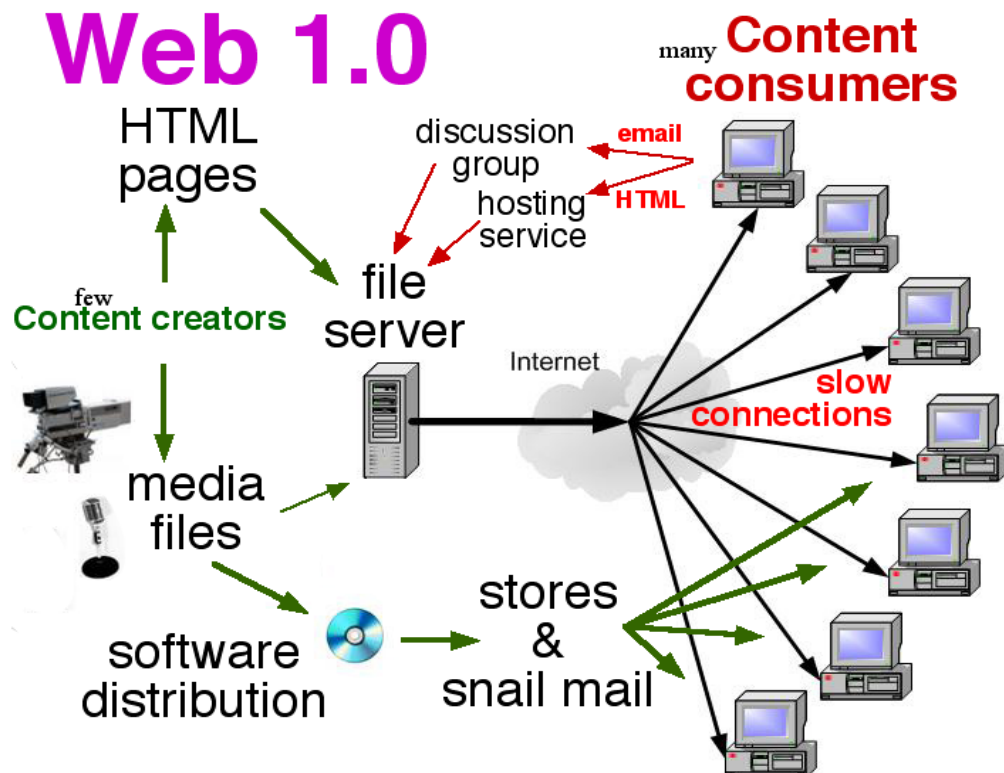
Do you know!

CERN as part of the In 2013 CERN reinstated the world's first website to its original address.

Web 1.0 refers to the first stage in the World Wide Web, which was entirely made up of web pages connected by hyperlinks. Although the exact definition of Web 1.0 is a source of debate, it is generally believed to refer to the web when it was a set of static websites that were not yet providing interactive content.

Remember

In Web 1.0, applications were proprietary. Where Web 1.0 ends and Web 2.0 begins cannot be determined as this a change that happened gradually over time as the Internet became more interactive



- **Web 1.0 sites are static.** They contain information that might be useful, but there's no reason for a visitor to return to the site later. An example might be a personal Web page that gives information about the site's owner, but never changes.
- **Web 1.0 sites aren't interactive.** Visitors can only visit these sites; they can't impact or contribute to the sites. Most organizations have profile pages that visitors can look at but not impact or alter, whereas a wiki allows anyone to visit and make changes.
- **Web 1.0 applications are proprietary.** Under the Web 1.0 philosophy, companies develop software applications that users can download, but they can't see how the application works or change it.

Do you know!

Web 2.0
Technologies such as weblogs, social bookmarking, wikis, podcasts, RSS feeds, social software, web APIs, eBay & Gmail provide enhancements over read-only websites

Web 2.0

Web 2.0 is the name used to describe the second generation of the World Wide Web, where it moved static HTML pages to a more interactive and dynamic web experience.

Web 2.0 is focused on the ability for people to collaborate and share information online via social media, blogging and web based communities.

Web 2.0 Website Types

Audio	Blog-Pod	Blogging	Bookmarking	Calendars
Chats	Collaboration	Communication	Community	CRM
E-commerce	E-learning	E-mail	File-sharing	Forums
Games	Images	Knowledge Base	Lists	Mapping
Mashups	Multi-media	Portals	RSS	Wiki

Examples of Web 2.0 based websites

Flickr - A photo sharing website which allows users to upload their photographs and share it with anyone and everyone.

Orkut-Social networking site which allows the users to send messages and communicate with other members.

YouTube - It allows the users to upload their videos and share it with everyone.

Blogs - Maintained by individuals or groups, they can be used to convey anything.

Google AD sense - Allows users to earn money through posting Google ads on their websites.

Wikipedia - Online encyclopedia wherein the users contribute by writing the articles, definitions, etc. It is completely edited and maintained by the users.

Scribd - Users can upload any documents on the website where other users can either download or view those documents online.

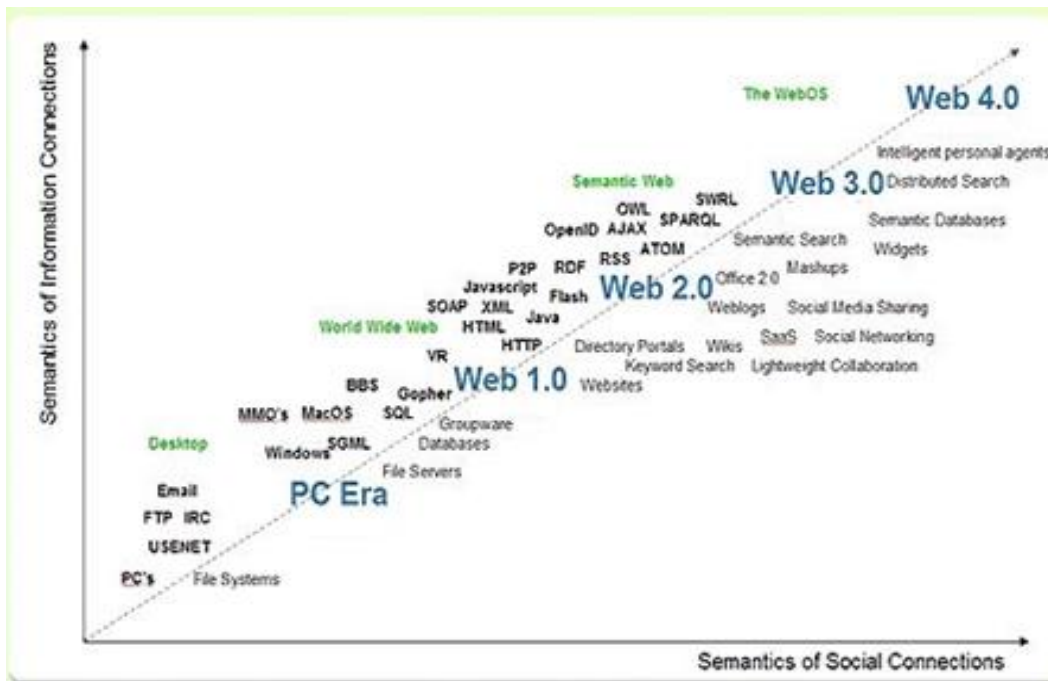
Web 3.0

Do you know!

Web 4.0 is often characterized as the WebOS - the entire web being a single operating system where information flows from any one point to any other

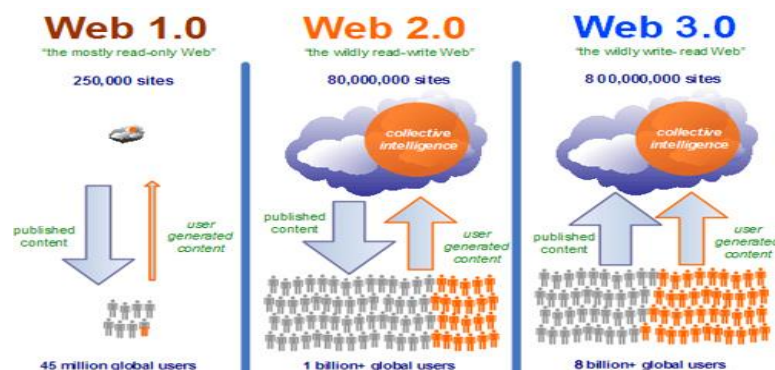
Web 3.0 refers to a third generation of Internet-based services that collectively comprise what might be called 'the intelligent Web' such as those using semantic web, micro-formats, natural language search, data-mining, machine learning, recommendation agents, and artificial intelligence technologies which emphasize machine-facilitated understanding of information in order to provide a more productive and intuitive user experience.

Web 2.0 Design vs. Web 3.0 Design



Web 3.0, designers will continue to focus on making things simpler. The truth is, the designer has the absolute power to persuade viewers on where to look first and second and so forth and so on.

Comparison of web 1.0 web 2.0 and web 3.0



S.No	Web 1.0	Web 2.0	Web 3.0
1.	1990	2000	2009
2.	The Web	The Social Web	The Semantic Web
3.	Tim Berners Lee	Tim O'Reilly	Sir Tim Berners Lee
4.	Read only web	Read and write web	Read, write and execute web
5.	Information sharing	Interaction	Immersion.
6.	Millions of users	Billions of users	Trillion of users
7.	Ecosystem	Participation	Understanding itself
8.	Connect information	Connect people	Connect knowledge
9.	Brain and Eyes (= Information)	Brain, Eyes, Ears, Voice and Heart (= Passion)	Brain, Eyes, Ears, Voice, Heart, Arms and Legs (= Freedom)
10.	The Hypertext/CGI Web. (the basics)	The Community Web (for people: apps/sites connecting them).	The Semantic Web (for machines).
11.	Pushed web, text/graphics based flash	Two way web pages, Wikis, video, pod casts, shading, Personal publishing, 2D portals	3D portals, avatar, Interoperable profits, multi-user virtual environment, Integrated games, education and business, all media flows in and out of virtual Web worlds
12.	Companies publish content that people consume (e.g. CNN)	People publish content that other people can consume, companies build platforms that let people publish content for other people (e.g. Flickr, YouTube, AdSense, Wikipedia, Blogger, MySpace, RSS, Digg)	People build applications that people can interact with, companies build platforms that let people publish services by leveraging the associations between people or special content (e. g. Facebook, Google Maps, My Yahoo!)
13.	In Web 1.0 search engines retrieve macro contents. Search is very fast but many times results are inaccurate or more than users can chew.	In Web 2.0 search engines retrieve tags with micro contents (Furl even retrieves tags with macro contents). The process of tagging is manual, tedious and covers negligible percent of the WWW. Web 2.0 tags everything: pictures, links, events, news, Blogs, audio, video, and so on. Google Base even retrieves micro content texts.	In Web 3.0 search engines will hopefully retrieve micro content texts which were tagged automatically. This implies translating billions of Web 1.0 macro contents into micro contents. The result could be more precise search because tagging can solve part of the ambiguity that homonyms and synonyms introduce into the process of search.
14.	Web 1.0 was all about static content, one way publishing of content without any real interaction between readers or publishers or each other.	Web 2.0 is more about 2 way communication through social networking, blogging, wikis, tagging, user generated content and video.	Web 3.0 is curiously undefined. And the web learning what it want and delivering a personalized web experience.
15.	The web in the beginning when it was first developing web 1.0	New advances that allow a much more sophisticated user interaction with web pages - citizen journalism, social networks and Wikis are all products of Web 2.0	Thought to be the future - where the web is more interactive with users, leading to a kind of artificial intelligence web 3.0

16.	Personal web sites	Blogs	Semantic Blogs: Semi-Blog, Haystack, Structured Blogging
17.	Content Management system	Wikis, Wikipedia	Semantic Wikis: Semantic MediaWiki, SemperWiki, Platypus, dbpedia, Rhizome
18.	AltaVista, Google	Google personalized, DumpFind, Hakia	Semantic Search: SWSE, Swoogle, Intelli-dimension
19.	Citeseer, Project Gutenberg	Google scholar, Book search	Semantic Digital Libraries: JeromDI, BRICKS, Longwell
20.	Message boards	Community portals	Semantic Forums and community portals: SIOC, OpenLinkDataSpaces
21.	Buddy Lists, Address book	Online social networks	Semantic Social Networks: FOAF, PeopleAggregator
22.			Semantic Social Information Spaces: Nepomuk, Gnowsis

Learning Unit 2: Compare Static Websites with Dynamic Websites

Overview

In this learning unit, you will learn the detail of static and dynamic websites. These concepts are building blocks to design and deploy a web application. After the completion of this learning unit, you will be able to understand the difference of static & dynamic website, architectural design of static and dynamic web sites.

Remember

Web Server Software is required to run and test the dynamic web sites

1. Static Website

Static website is collection of web pages stored on the server in the format that is sent to a **client web browser**. It is primarily coded in Hypertext Markup Language (HTML). Pages typically contain text, hyperlinks, photos, graphics and multimedia.

Static websites contain fixed number of pages and format of web page is fixed which delivers information to the client. This kind of web sites created from HTML and CSS coding on simple text editor like notepad. Example an organization site, institute site etc.

Advantages

- Quick and easy to put together, even by someone who doesn't have much experience.
- Ideal for demonstrating how a site will look.
- Cache friendly, one copy can be shown to many people.

Disadvantages

- Difficult to maintain when a site gets large.
- Difficult to keep consistent and up to date.
- Offers little visitor personalization (all would have to be client side).
- The basic disadvantage of static web sites is the web pages are developed at the time of constructing the site. As such, all static website owners have to be abjectly dependent on Web professionals whenever any changes become necessary. Though the initial cost of setting up a static Website may not be costly, its long term maintenance will be expensive – more so, if the site owner wishes to effect changes at regular intervals.

HTML

HTML, is the standard markup language used to create web pages.

Cascade Style Sheet (CSS)

Cascade style sheet is a web page derived from multiple sources with a defined order of precedence where the definitions of any style element conflict.

Server Side Scripting

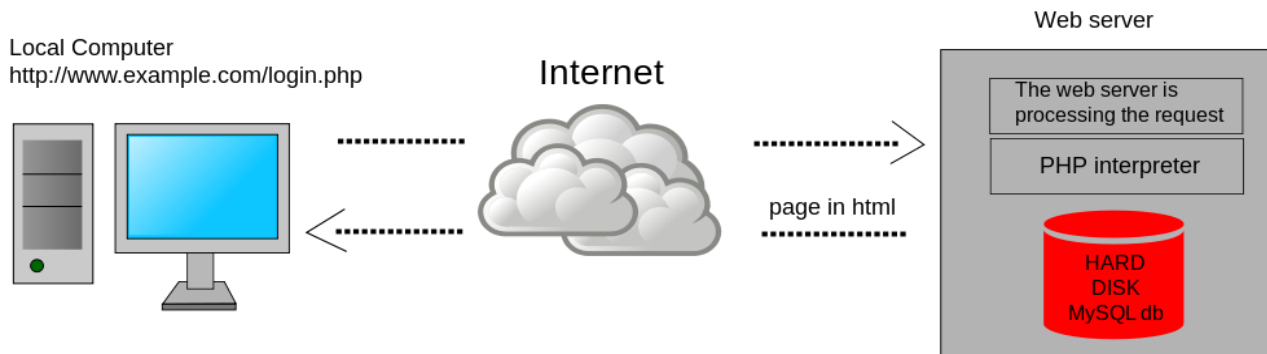
Server-side scripting is a technique used in web development which involves employing scripts on a web server which produce a response customized for each user's (client's) request to the website

2. Dynamic Website

Dynamic Websites one that changes or customizes content automatically and/or frequently based on certain criteria. The page composition is usually data-driven and collates information each time a page is requested. It is primarily coded using server scripting such as PHP, ASP.NET and SQL and so on.

It can be **dynamic** in one of two ways:

- ✓ The first is that the web page code is constructed dynamically.
- ✓ The second is that the web page content display varies based on certain criteria. The criteria may be pre-defined rules or may be based on variable user input.
- ✓ End User?
- ✓ Application User?



client server architecture

3. Difference between Static and Dynamic Websites

Difference between static and dynamic website is mentioned below:

Static Websites	Dynamic Websites
Static websites contain fixed number of pages.	Dynamic websites can create webpage dynamically.
Theme of website and content of webpage are fixed.	Webpage design and content may change on run time.
Static websites load quickly on client browser because it has only some markup contents.	Dynamic sites take some time to load on client browser because it processes the request server side and create contents dynamically.
Static sites never use database connectivity.	Dynamic sites deal with database and generate the contents dynamically using database queries.
Static websites is highly secure than dynamic sites because it behaves as a half-duplex approach so only one way communication is possible i.e. server to client.	Dynamic sites are less secure because it behaves as full duplex approach so both side communications is possible so user can change the server data.
Static site use for provide some information to the clients like an organization or institute website.	Dynamic website use where content changes frequently on run time. Like a E-commerce site, online examination, etc.
Static website directly run on browser and does not require other server application language. Static website can be created from HTML and CSS.	Dynamic website run the application on server and the output will display on webpage. So this is require server application language like PHP , Asp.NET, JSP etc.
Static sites are easy to develop and a bit experienced people can develop it.	Dynamic websites not easy to develop because require qualify developers to create it, manage it, test it and maintain security of application and database.
In static website if we want to change the page content then we have to upload that page on server many times.	Dynamic sites provide the facilities that it possible to change the page content using server application. And need not to upload the page on server.

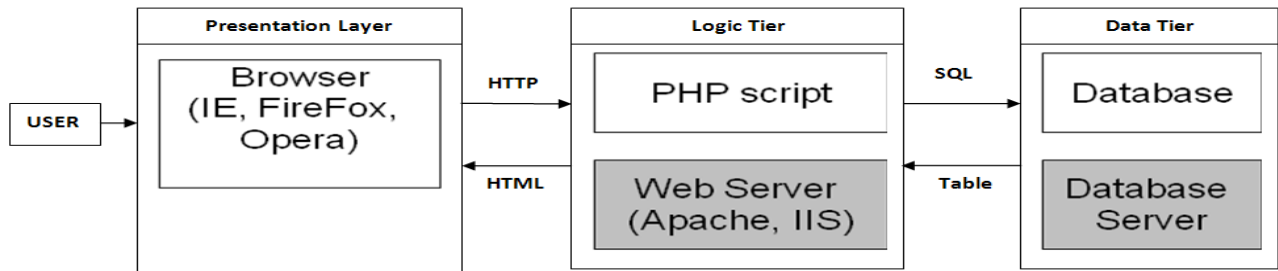
4. Design Architecture of a Static Website

In case of static website, all pages are saved in server computer. Client system is sending requests to server to get specific page. At request of client server will return specific page.



5. Design Architecture of a Static Website

Dynamic web pages architecture based on 3 tier architecture



Dynamic website architecture is consists of three distinct tiers or layers:

- Presentation
- Logic (Application)
- Data.

Logically, the presentation tier consists of client computers and web services that provide the user interface. The logic or application tier contains the business logic, the rules for information processing and the data access components. The data tier contains the data and data storage.

Advantages

- **Scalable Design** – The addition of new servers and load balancing can grow an environment to accommodate large numbers of client connections.
- **Parallel Development** – Developers and DBAs can work simultaneously and independently on the different layers (tiers).
- **Superior Performance** – Separation of CPU-intensive, memory-intensive and I/O-intensive operations increases and extends performance of all components.
- **Increased Security** – Physical and logical separation of components can increase security.
- **Improved Availability** – Redundant server members decrease the severity of outages.

Disadvantages

- **Design Complexity** – Multi-tier architecture is more difficult to implement than single tier.
- **Increased Maintenance** – Designated systems (Web, Application and Database) often have their own maintenance schedules and windows that might prove cumbersome to production.

Learning Unit 3: Web Browsers

Overview

Do you know!

The first commonly available web browser with a graphical user interface was Netscape.

In this learning unit, you will be introduced different web browsers. After the completion of this learning unit, you will be able to understand working & installation of web browser (Mozilla, Google Chrome & Internet Explorer)

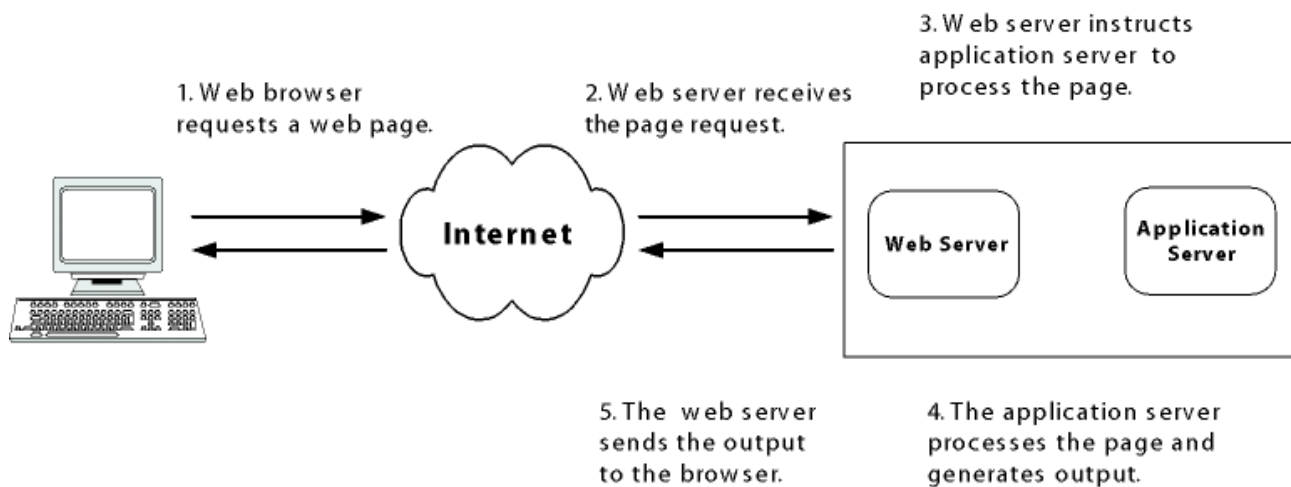
1. Web Browser

A **browser**, also referred to as a **web browser**, is a software program created as a simplified means to present and explore content on the World Wide Web.

These pieces of content, including pictures, videos, and web pages, are connected using hyperlinks and classified with Uniform Resource Identifiers (URLs). Most popular browser software are Mozilla Firefox, Google chrome , Internet Explorer, Opera and safari

2. Working of Web Browser

Browser is a application software that act as user agent for web server detailed working of browser with help of diagram is mentioned below:

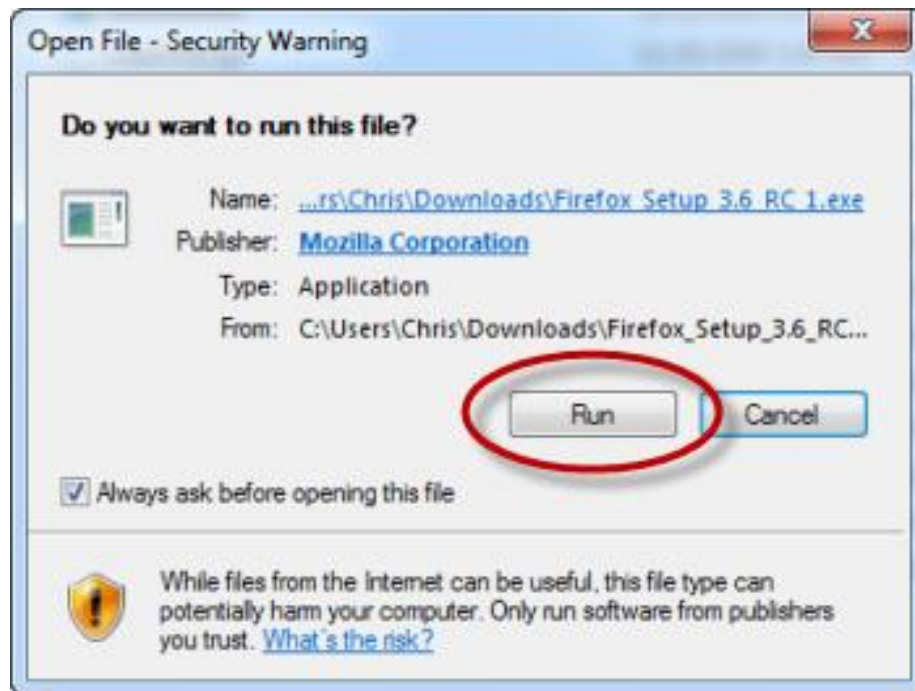


3. Installation of Mozilla Firefox

1. Visit the Firefox download page (<http://www.getfirefox.com/>) in any browser (e.g. Microsoft Internet Explorer). The page will automatically recommend the best version of Firefox.



2. Click on the green download button to download the Firefox installer. Depending on the connection speed, the download may take up to a few minutes.
3. Start the process by clicking RUN.



4. Then, just Click Install



Congratulations, installing Firefox!

1. Double-click on the Firefox icon.

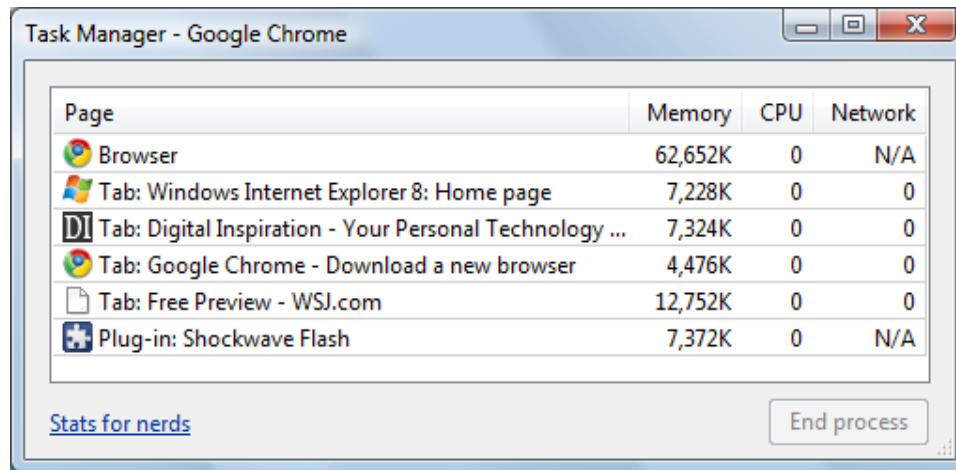


4. Features / Options of different Web Browsers

Google Chrome

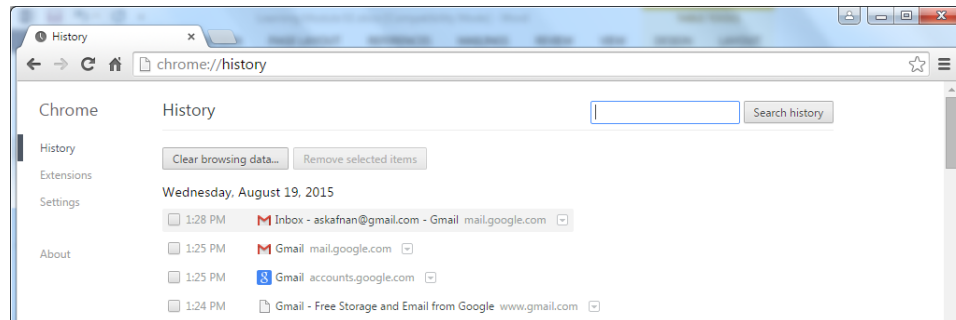
1. Task Manager for Websites

Inside Google Chrome, press **Shift+Esc** and it will open up a 'task manager' with a list of all websites currently open inside Chrome.



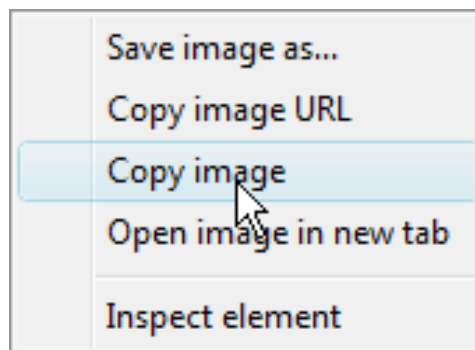
2. Visual Browser History

This is a feature Chrome borrowed from Google Desktop / Google Web History. Type **Ctrl+H** to open the browser history and search for a term.



3. Super Save Images

Right click on any picture/image and get only five relevant options to deal with that link.



4. Favorite Websites from the Address Bar

Chrome browser add favorites under address bar



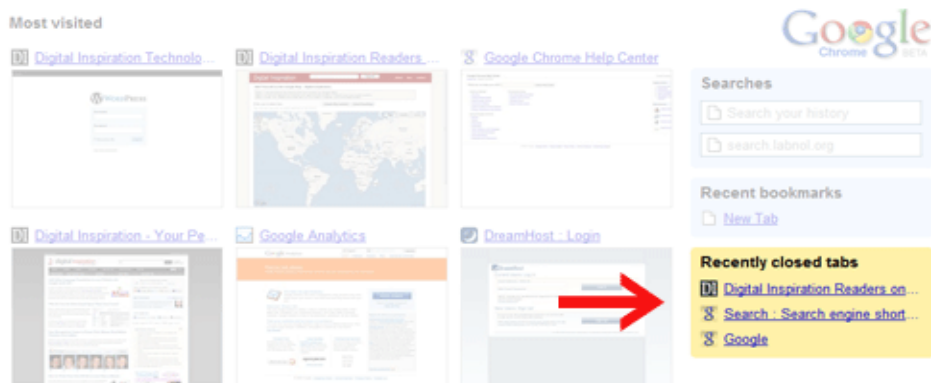
5. See Memory Used by Different Browsers

Open a new tab inside Chrome browser and type "about:memory" (without quotes) – somewhere at the top, a list of browser processes that are currently running on the system and the amount of memory they are using.

About memory <small>Measuring memory usage in a multi-process browser</small>			
Browser	Memory <small>?</small> Private	Shared	Total
Chrome 0.2.149.27	108,388 k	10,228 k	118,616 k
IE 8.00.6001.18241	83,736 k	32,292 k	116,028 k
Firefox 3.0.1	373,348 k	25,984 k	399,332 k

6. Reopen Website tabs that closed by mistake

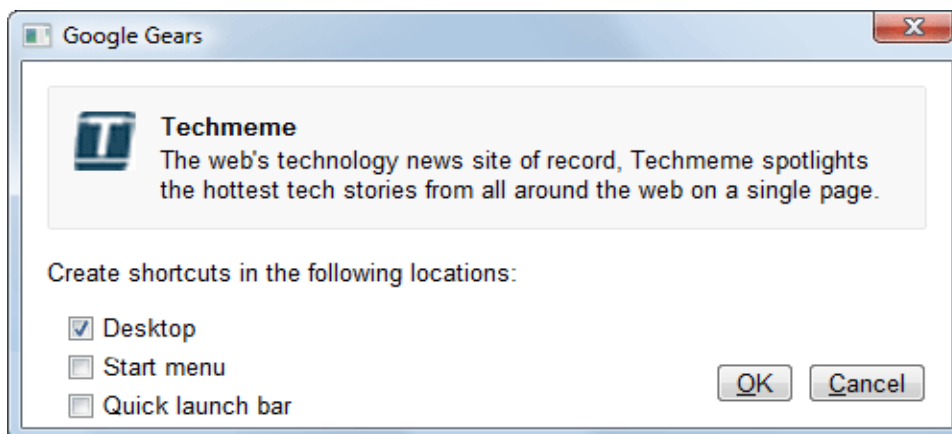
Firefox 3 has this "Undo Closed Tab" option in the menu, in Opera web browser press the Ctrl+Z shortcut.



To re-open a closed tab in Google Chrome, just hit Ctrl+T and an option that says "Recently closed tabs" – click.

7. Launch Websites from the Start Menu / Quick Launch Bar

Desktop shortcuts for web pages are possible with other browsers as well but Google Chrome makes the whole flow very easy. Open any site and choose "Create application shortcut" from the File menu.



This will essentially create a desktop shortcut that looks something like this:

C:\Users\labno\AppData\Local\Google\Chrome\Application\chrome.exe

--app=http://www.labnol.org/

Clicking the shortcut will launch that web page in a new instance of Chrome that may not contain have any more new tabs.

Chrome offers to move tabs around different windows, In Firefox tags can be drag onto the desktop and turn them into web shortcuts.

Mozilla Firefox

Largely developed by the Mozilla Foundation, Firefox is an open source Web browser available on Windows, Mac and Linux. It is the second most popular Web browser on the Internet as of 2013. The browser has a number of unique features designed to enhance the browsing experience.

1.Open Source

Firefox is the only open source Web browser among the most used browsers on the Web as of March 2013. The open source nature of Firefox enables developers from all over the world to contribute code to the browser and extend the functionality of Firefox with add-ons and themes

2.Add-ons and Personas

Firefox is one of the most easily customized browsers thanks to its extensive library of add-ons and personas. From blocking advertisements and Flash content, to integrating social networks and email, to assisting Web developers debug and review live code, add-ons offer the ability to configure Firefox exactly as one like it

3.Tab Management

Tab Groups is a built-in feature that offers a simple way to cluster tabs into different categories. This is particularly useful if one have a large number of tabs open.

4.Security

Firefox features a number of tools designed to prevent malicious websites from causing harm. In particular, Firefox features a pop-up blocker, anti-phishing and anti-malware warnings that are updated 48 times per day to prevent from accessing fraudulent websites and thorough website identity information that is easily accessible from the address bar, making it easy to validate a website before enter private information.

5.The New User Interface



Add-Ons

Add-ons are small bits of code that can extend the functionality of Firefox in an almost infinite number of ways.

The first thing users will notice is the drastic changes to the user interface. For starters, the traditional File Menu is gone, replaced by a single “Firefox” button located at the top left corner of the window. Not liking the all-in-one button? Users can easily change back to the old file menu by clicking the Firefox button, hovering over Options and clicking Menu Bar.

6. Better Add-on Manager



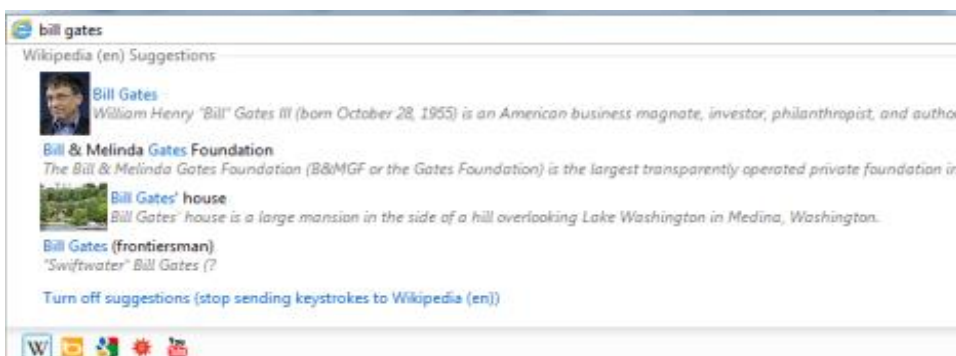
The bread and butter of Firefox have always been its extensions and themes. The new add-on manager cleans up the experience making it easier for users to find different add-ons as well as organizing existing ones. The new organization tool opens a new tab, giving users a full window view instead of a small popup. With a separate dedicated tab for the add-ons manager Mozilla makes it easy to keep everything in a single window, however, it would have been great if this translated to the options section as well. Earlier this year Google released Chrome 10 which opens the options menu in a separate tab, hopefully Mozilla will be able to add this feature soon.

Internet Explorer

Even though not many websites cover Internet Explorer extensively and write interesting articles and tutorials about it, this browser still manages to hold the title of the most used browser. One of the reasons for it is that it provides some interesting functionality that other browsers don't have or have not fully adopted. Here is a list of 5 great features Internet Explorer has and other browser do not, which I would love to see being adopted by everybody.

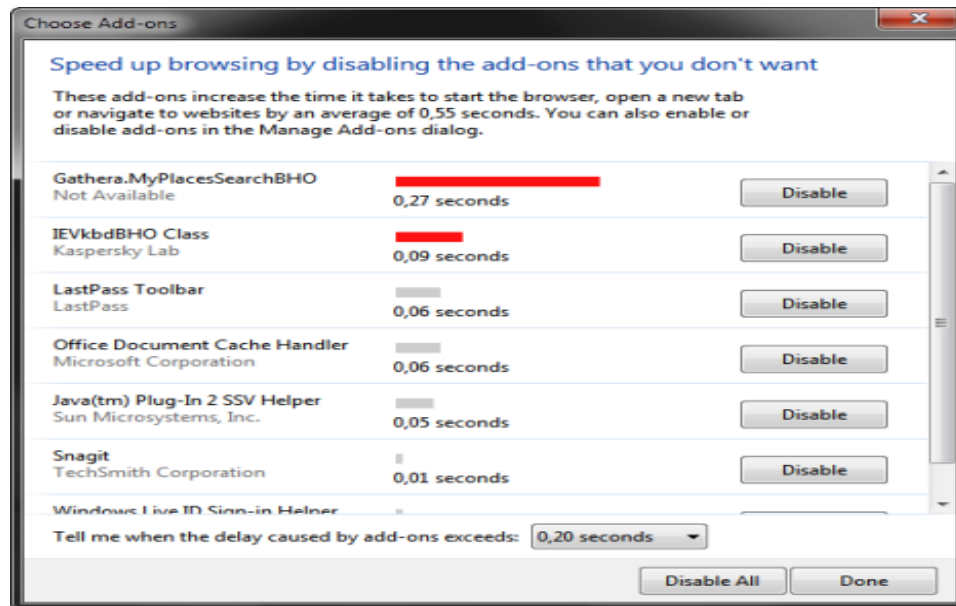
1. Visual Search Providers

Internet Explorer have the ability to install and use visual search providers. It allows not only to see suggestions for searches but it also accompanied by a visual preview that includes a picture and some text description.



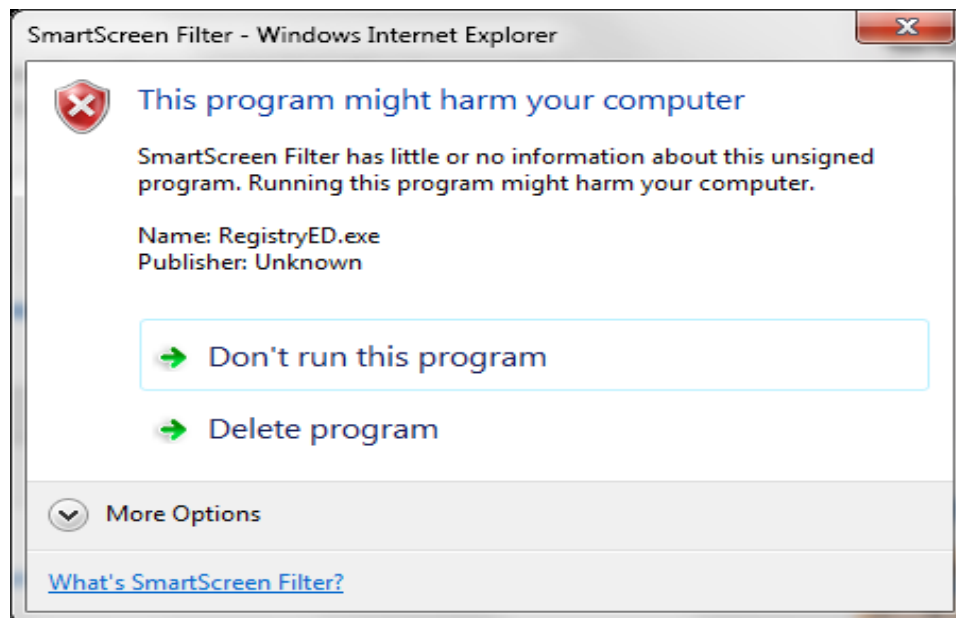
2. Stats about the Performance Impact of Add-ons

As highlighted in the article Internet Explorer 9 - How to Improve the Load & Navigation Speed, the browser monitors the performance impact of all add-ons and encourages users to disable those that slow things down.



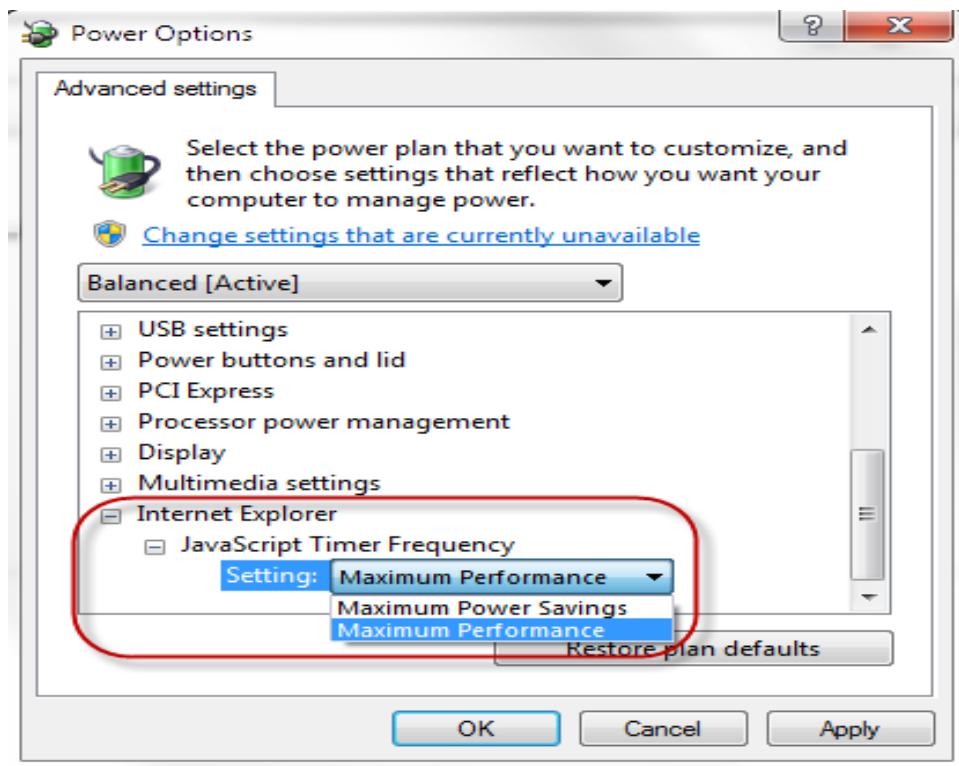
3. Improved Security

Internet Explorer provides better identification and reporting of malicious websites and downloads, when compared to other browsers and even some security suites. Another great feature is that Internet Explorer allows users to easily report malicious websites, directly from the main interface of the browser, thus helping increase security for all users.



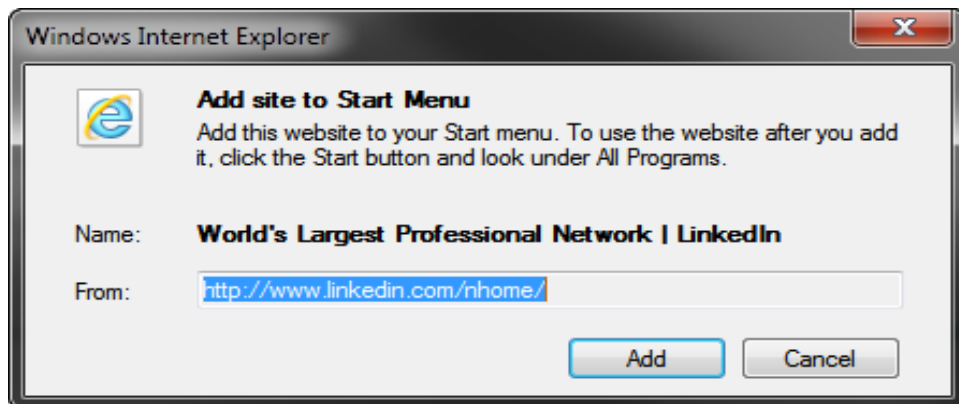
4. Power Saving Features

Internet Explorer allows to squeeze a bit more juice from the battery, when running unplugged. It gets less hardware acceleration while browsing, without making things terribly slow and a bit more battery time.



5. Pinning Websites to the Windows Taskbar or the Start Menu

This feature is not new and it has been adopted by some browsers, such as Google Chrome. It is useful and all browsers should offer such capabilities to their users.



5. Comparisons of Different Web Browsers

Performance:	Firefox	Chrome	IE
Fast startup and shutdown	Yes	Yes	Yes
Fast JavaScript engine for better performance	Yes	Yes	Yes
Popular websites load quickly	Yes	Yes	Yes
Full hardware acceleration for text, graphics, and video provided by default			Yes
Notification when add-ons slow browser performance			Yes
Ease of Use:			

Simple browsing controls for a better browsing experience	Yes	Yes	Yes
Change and add search providers within the search box	Yes	Yes	Yes
Search provider suggestions as type in the search box	Yes	Yes	Yes
New Tab page includes quick access to common tasks and websites		Yes	Yes
Websites can be pinned to the taskbar in Windows 7		Yes	Yes
Tear-off tabs with Windows 7? Aero Snap		Yes	Yes
Reopen accidentally closed tabs		Yes	Yes
Combined search and Address bar		Yes	Yes
Visual search suggestions shown as type			Yes
Jump Lists and thumbnail preview controls for pinned sites			Yes
Accelerators for quick access to web services without leaving the page			Yes
Security:			
Protection from malicious cross-site scripting attacks	Yes	Yes	Yes
Best protection against phishing attacks	Yes		Yes
Domain name highlighting in the Address bar		Yes	Yes
Most protection against socially engineered malware			Yes
Reliability:			
Crashed tabs stay isolated from all other tabs	Yes	Yes	Yes
Automatic recovery of crashed tabs	Yes	Yes	Yes
Tab recovery with messaging and prompting when websites time out			Yes
Privacy:			
Prevent others from seeing what sites have visited on PC	Yes	Yes	Yes
Control whether certain third parties can track browsing activity	Yes	Yes	Yes
Web Standards and Compatibility:			
Supports common and future standards including HTML5	Yes	Yes	Yes
WebM-encoded HTML5 video supported when a VP8 codec is installed	Yes	Yes	Yes
H.264-encoded HTML5 video support			Yes
Compatibility mode to view websites designed for older browsers			Yes
Developer Tools:			
Tool set (HTML, CSS, JavaScript editing, profiling, network inspection)	Yes	Yes	Yes
Developer tools built-in to the browser		Yes	Yes
Tools that show pages in different rendering engines			Yes

6. Cross Browser Compatibility of Websites

When a software program is developed for multiple computer platforms, it is called a cross platform program. Similarly, when a website is developed for multiple browsers, it is called a cross-browser website. Cross-browser compatibility is an issue faced by designers/developers when creating websites.

How should fix compatibility issue?

The first step in fixing a browser compatibility problem is to check the code to see if it passes "validation". Code validation will show where website has incorrectly coded HTML tags, missing tags, non W3c compliant tags, and more. It can validate the website for free at the W3c site. See the following links on this.

HTML Validator

<http://validator.w3.org/>

CSS Validator

<http://jigsaw.w3.org/css-validator/>

Once it validate the HTML and have no errors on the website, it should see the browser look more uniform. If it need to continue looking through the website code and fixing code problems until all browsers look the same. This process will require being able to check the website in each browser.

How can test for browser compatibility?

There are different ways to test the website for cross browser compatibility. It can install all the known browsers on the computer and then view the website in each browser as develop it. The downfall to this is not be able to see what the older versions of a browser looks like.

Browser Shots

<http://browsershots.org/>

IE Tester

<http://www.my-debugbar.com/wiki/IETester/HomePage>

Adobe Browser Lab

<https://browserlab.adobe.com/en-us/index.html>

Quirks Mode

<http://www.quirksmode.org/compatibility.html>

Learning Unit 4: Types of Websites

Overview

In this learning unit, you will learn different types of website. After completion of this learning unit, you will be able to understand the different type of web sites e.g. personal, social, Blog, forums, wiki, news, e-commerce, and government.

1. Different Types of Websites with Examples

Personal Websites

Personal websites are owned by individuals, with their personal profile featured on it, and the things that they are interested in. These websites have a limited scope, and it doesn't take too much capital to put one of them on the Internet like www.draqkhan.com.pk

Social Networking Websites

Social networking websites are the top visited ones, as they are created purely for socializing and catching up with friends, etc. Few of these websites include networking for both business and personal use. For example, Facebook, LinkedIn, etc.

Blogs

Blog is a short form for web logs. Blogging is very popular as it provides an individual direct communication with the readers, their feedback, thought sharing, etc. Blogging has become one of the marketing strategies for many companies, and many sportspersons, businessmen, and actors are using it to connect with their audiences. Some of the best blogging websites are huffingtonpost, tmz, etc.

Forums

A Web forum is a website or section of a website that allows visitors to communicate with each other by posting messages. Most forums allow anonymous visitors to view forum postings, but require to create an account in order to post messages in the forum. When posting in a forum, creating new topics (or "threads") or post replies within existing threads.

Web forums are available for all kinds of topics. Examples include software support, help for webmasters, and programming discussions. While lots of Web forums focus on IT topics, they are not limited to information technology. There are forums related to health, fitness, cars, houses, teaching, parenting, and thousands of other topics. Some forums are general, like a fitness forum etc.

Wiki Websites

A wiki is a Web site that allows users to add and update content on the site using their own Web browser. This is made possible by Wiki software that runs on the Web server. Wikis end up being created mainly by a collaborative effort of the site visitors. A great example of a large wiki is the Wikipedia, a free encyclopedia in many languages that anyone can edit. Thousands of users adding content to wiki web site on a regular basis, the site could grow "super-fast."

Do you know!

The term "wiki" comes from the Hawaiian phrase, "wiki wiki," which means "super-fast."

News Websites

Nowadays, every newspaper, magazine and TV channel has its own online edition. These websites allow users from all over the world to have access to the latest news and they are also providing e-newspapers online. Now

users can also view newspaper online instead of purchasing newspaper in hard form. Some of the examples are, din news, jang News (e.jang.com.pk).

E-commerce Websites

They are mainly transactional ones, which allow to shop from home. For many consumers, they are like an online store, and for businessmen, they are a great way of conducting business without the need of an expensive outlet. Some of the websites that make money from E-commerce are Amazon, eBay, etc.

Government Websites

All the government department of almost every country in the world has their own websites so that information can be given to the public on a regular basis. They have a suffix .gov at the end; for instance, the website department punjab.gov.pk

Learning Unit 5: Web Threats and Their Security Measures

Overview

In this learning unit, you will learn different type of web threats and their security measures. After the completion of this learning unit, you will be able understand different web threats like worms, Trojans, Malware, SQL injection, cross-site scripting, phishing, and denial of service attack, Security measures for different web threats and installation of antivirus.

Remember

Brain, a malicious code created in Pakistan which infected boot sectors of disks so that their contents could not be accessed.

1. Different Web Threats

Computer Virus

A computer virus is a program or piece of code that is loaded onto the computer without the knowledge, & permission and runs against the wishes and harmful for computer. Almost all viruses can replicate themselves. All computer viruses are man-made.

A simple virus that can make a copy of it over and over again is relatively easy to produce. Even such a simple virus is dangerous because it will quickly use all available memory and bring the system to a halt. An even more dangerous type of virus is one capable of transmitting itself across networks and bypassing security systems.

Do you know!

The term "computer virus" was formally defined by Fred Cohen in 1983

Computer worms

A computer worm is a self-replicating computer program that penetrates an operating system with the intent of spreading malicious code. Worms utilize networks to send copies of the original code to other computers, causing harm by consuming bandwidth or possibly deleting files or sending documents via email. Worms can also install backdoors on computers.

Worms are often confused with computer viruses; the difference lies in how they spread. Computer worms self-replicate and spread across networks, exploiting vulnerabilities, automatically; that is, they don't need a cybercriminal's guidance, nor do they need to latch onto another computer program.

As such, computer worms pose a significant threat due to the sheer potential of damage they might cause. A particularly notorious incident occurred in 1988. A computer worm since named the Morris worm caused hundreds of thousands, if not millions, of dollars in damage, and its creator was convicted under the Computer Fraud and Abuse Act.

Trojans Horse

A **Trojan horse** is a program or utility that appears to be something useful or safe, but in reality is performing background tasks such as giving access to the computer or sending personal information to other computers. Trojan horses are one of the most common methods a criminal uses to infect the computer and collect personal information from the computer. Below are some basic examples of how the computer could become infected with a Trojan horse.

A Website offers a free download to a program or game that normally costs money. Downloading the pirated version of a program or game allows illegally using or playing it, however, during the install it also installed a Trojan horse onto the computer.

A friend's Facebook account is hacked and has sent out personalized messages telling all their friends to see this exciting new video. Opening the video requests a download that has a hidden Trojan horse that infects the computer.

A popular screen saver website has become infected or uploaded infected screen savers. Downloading the screen saver to the computer also installs a Trojan horse onto the computer.

Receiving an e-mail that appears to be from a friend asking to view this fantastic new program or look at a file. Opening the file infects the computer with a Trojan horse.

Malware

Key Logger

Key logger is small programs or hardware devices that monitor each keystroke typed on a specific computer's keyboard, including typos, backspacing and retyping.

Malware is an abbreviated term meaning "malicious software." This is software that is specifically designed to gain access or damage a computer without the knowledge of the owner. There are various types of malware including spyware, keyloggers, true viruses, worms, or any type of malicious code that infiltrates a computer. Generally, software is considered malware based on the intent of the creator rather than its actual features.

SQL Injection

SQL Injection is one of the many web attack mechanisms used by hackers to steal data from organizations. It is perhaps one of the most common application layer attack techniques used today. It is the type of attack that takes advantage of improper coding

of the web applications that allows a hacker to inject SQL commands into say a login form to allow them to gain access to the data held within the database.

In essence, SQL Injection arises because the fields available for user input allow SQL statements to pass through and query the database directly.

Cross-site Scripting (XSS)

Hackers are constantly experimenting with a wide range of hacking techniques to compromise websites and web applications and make off with a treasure trove of sensitive data including credit card numbers, social security numbers and even medical records.

Cross-site Scripting (also known as XSS or CSS) is generally believed to be one of the most common application layer hacking techniques.

Email Spam

Spam email is a form of **commercial advertising** which is economically viable because email is a very cost-effective medium for the sender. If just a fraction of the recipients of a spam message purchase the advertised product, the spammers are making money and the spam problem is perpetuated.

Spammers **harvest recipient addresses** from publicly accessible sources, use programs to collect addresses on the web, and simply use dictionaries to make automated guesses at common usernames at a given domain.

Spamming is politically debated in several countries, and has been **legislated** some places with varying results. Spammers often conceal or forge the origin of their messages to circumvent laws, service provider regulations, and anti-spammer lists used by anti-spam software.

At the present more than **95% of email messages** sent worldwide is believed to be spam, making spam fighting tools increasingly important to all users of email.

Hijacking of real users' addresses or email accounts is also common. Typically these messages will have the From field showing something like "Lisa W Harold" <info@runbox.com>. Please note that such messages have no actual connection to Run box (to see what a real Run box header looks like, look at this example). Run box does not in any way distribute our customers' email addresses, and is not a source of spam — directly or indirectly.

Phishing

An increasingly common phenomenon is "phishing", where messages appearing to be sent from e.g. legitimate financial institutions attempt to trick recipients into "verifying" sensitive data (such as credit card information) on **fraudulent web sites**.

Legitimate services will rarely (if ever) send messages requesting to click a link and provide personal or sensitive information. Be sure to **verify the source** of the message before complying with such a request.

If receiving messages claiming to originate with payment services such as PayPal, eBay, financial institutions, or even Run box, please **verify** that the message is indeed sent from the service in question:

- Look at the links in the message in plain text (not HTML) view. Verify that the **actual link** contains the domain name (e.g. runbox.com or paypal.com), and not another domain name or IP address, by hovering the mouse pointer over the link while looking at the status bar of the browser. Remember that links in an HTML message may be "disguised" and link to a different server than it appears to do.
- Check the **message headers**. Look at the IP address of the sending server and verify that it resolves to the correct domain and country by using a service such as DNS stuff.
- Falsified messages will rarely address by **name** or provide any personal information about to except the email address, because the senders do not have access to such information.

Denial of Service Attack

Denial of Service (DoS) attacks against web sites occur when an attacker attempts to make the web server, or servers, unavailable to serve up the web sites they host to legitimate visitors. For some time, it was thought that these types of attacks were generally used against large corporations, government sites, and activist sites as a form of protest to disrupt their web presence.

Examples of Denial of Service attacks launched against web applications include:

- Attempts to "flood" web applications, thereby preventing legitimate user traffic
- Attempts to disrupt service to a specific system or person, e.g., blocking user access by repeated invalid login attempts resulting in the account's suspension
- Jamming the application-database connection by crafting CPU-intensive SQL queries

2. Security Measures for Different Web Threats

General Rules to avoid from Virus:

- Never download files from any suspicious websites.
- Use the best available Anti- virus tool and scan hard drive regularly.
- Deactivate the Auto run function for external drives.
- Always scan any documents from the external drive before open or save them.
- Keep the operating system updated from time to time.

In order to avoid worms attack:

- Configure a proper firewall to restrict the network traffic.
- Set the firewall to cloak the computer from the network.
- Never open Emails before scanning them with updated anti-virus software.
- Scan the computer regularly and keep the anti-virus updated

Follow the rules to avoid any internet scams:

- Do not respond believe in any unrealistic mails
- Also do not respond to such mails or advertisement letters.
- Always do some research about the company mentioned in the mail before reply to it
- Never respond to mails which has any banks or government agencies name in the sender details.

To avoid Phishing attacks:

- Do not respond to mails that requests for the personal information.
- Never click on any links which are emailed.
- Do not open mail attachment with .scr, .exe & .com file extensions.
- Avoid giving the username and password to any illegitimate source.
- Ensuring updated anti-virus software and the operating system of the computer.

Preventing from Trojan Horse

Trojans is executed by users, they may be easier to avoid than other types of malware. Never download files and never click on links outside of trusted websites, it can significantly reduce the chances of coming into contact with Trojans.

- 1- Never open unsolicited emails from unknown senders. Emails from people, the one don't know may contain links, attachments or other traps that can get him to inadvertently install Trojans.

- 2- Avoid downloading and installing programs unless, fully trust the publisher. Some websites attempt to trick users into downloading programs that they claim will perform useful tasks, when in reality installation will only infect the computer.
- 3- Use firewall software. Firewalls are programs that can block unsolicited connections, which may help prevent Trojans. On using Windows XP Service Pack 2 or later, Vista or Windows 7, it will have access to Windows Firewall. Make sure it is running properly by clicking "Start," "Control Panel," "Security," "Windows Firewall" and "Change Settings." Click "On" and "Apply" if it is not already on.
- 4- Use a fully updated antivirus program whenever using the Internet. Antivirus software can help scan links for malicious data and prevent and remove malware, like Trojans. Popular antivirus programs include Norton, McAfee, Kaspersky, AVG Free, Avira Antivirus and Avast.

Preventing Denial of Service Attacks

With web application firewall (like dotDefender) it can be avoid DoS attacks because dotDefender inspects HTTP traffic and checks their packets against rules such as to allow or deny protocols, ports, or IP addresses to stop web applications from being exploited.

Architected as plug & play software, dotDefender provides optimal out-of-the-box protection against DoS threats, cross-site scripting, SQL Injection attacks, path traversal and many other web attack techniques.

The reasons dotDefender offers such a comprehensive solution to the web application security needs are:

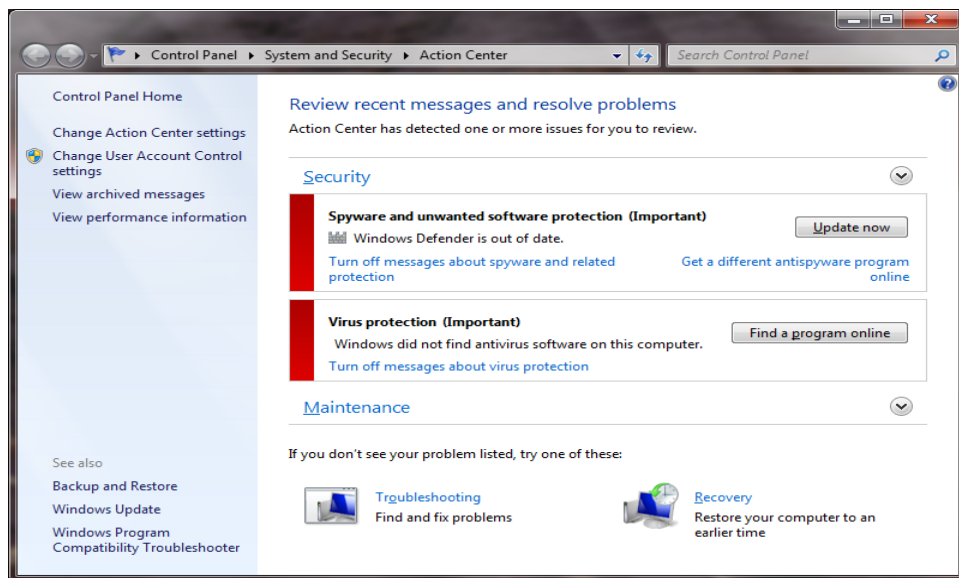
- Easy installation on Apache and IIS servers
- Strong security against known and emerging hacking attacks
- Best-of-breed predefined security rules for instant protection
- Interface and API for managing multiple servers with ease
- Requires no additional hardware, and easily scales with the business.

3. Installation of Antivirus

All popular antivirus software's like Norton, McAfee, Kaspersky, AVG Free, Avira antivirus and Avast are paid software ,they only provide on month free trial after that it should be bought its license as per antivirus provider company plan minimum duration of license is 01 year.

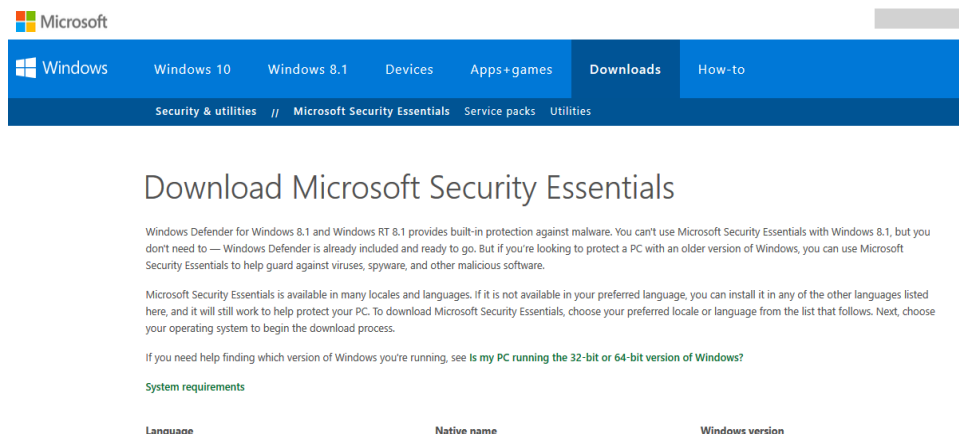
Microsoft window provide free antivirus for window 7 and window vista user **Microsoft Security Essentials**. For Windows 8, Windows RT, Windows 8.1, Windows RT 8.1 user **Microsoft Windows Defender**.

If the computer has no antivirus software, it will get some dire warnings in the Security Action Center. To navigate the Security Action Center through the Control Panel.



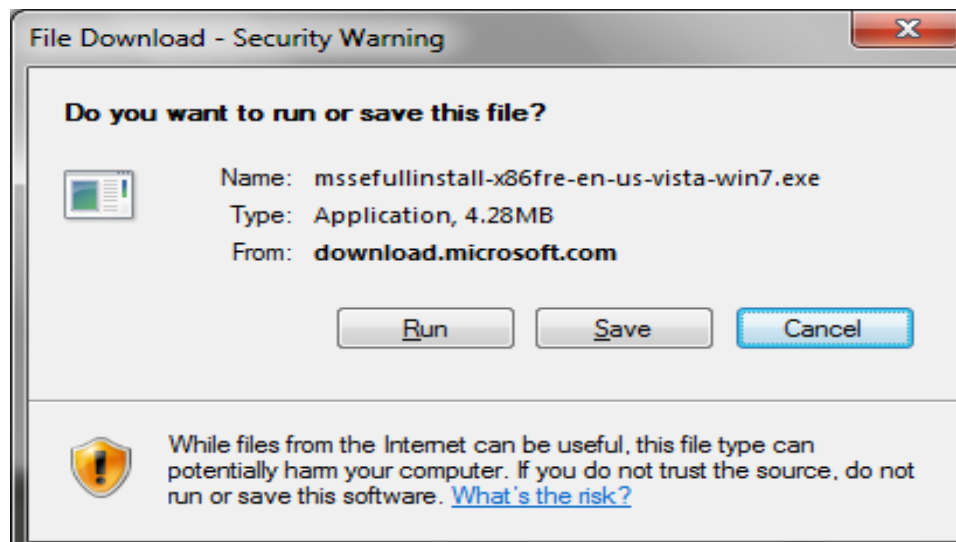
Heed dire warnings in the Security Action Center.

Fixing these problems in one action, by downloading and installing Microsoft Security Essentials. The first thing to do is go to the Web site and start the download, it should also uninstall any previously installed antivirus software to avoid conflicts.



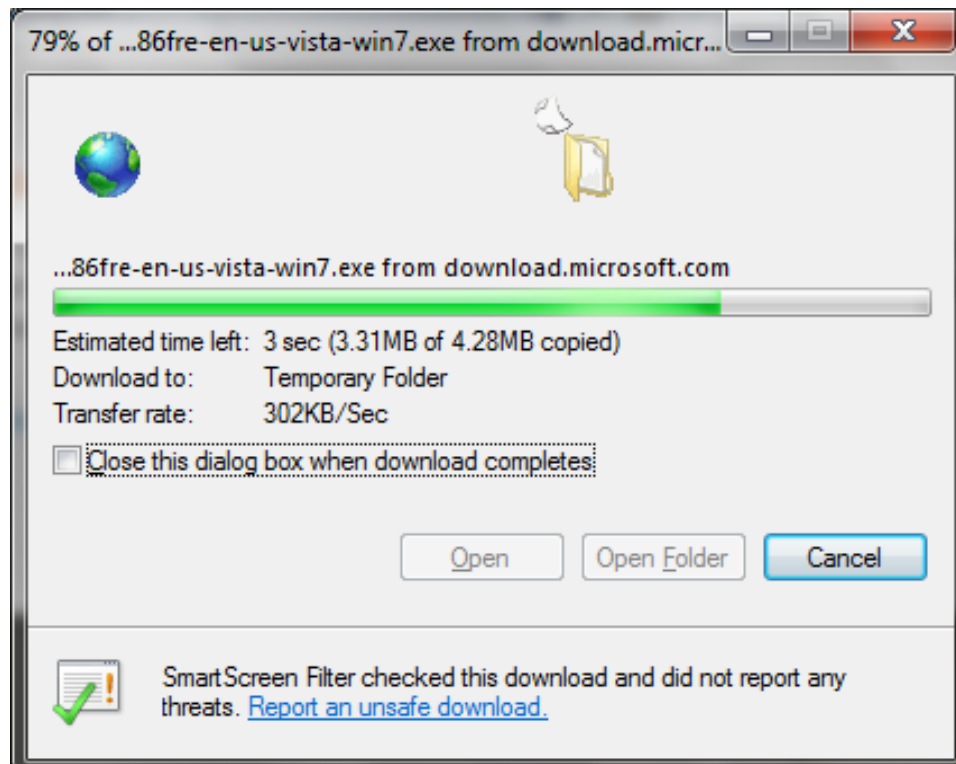
Download the client.

When the Microsoft Security Essentials download starts, click the Run button,



Click Run.

The download and install is very quick.



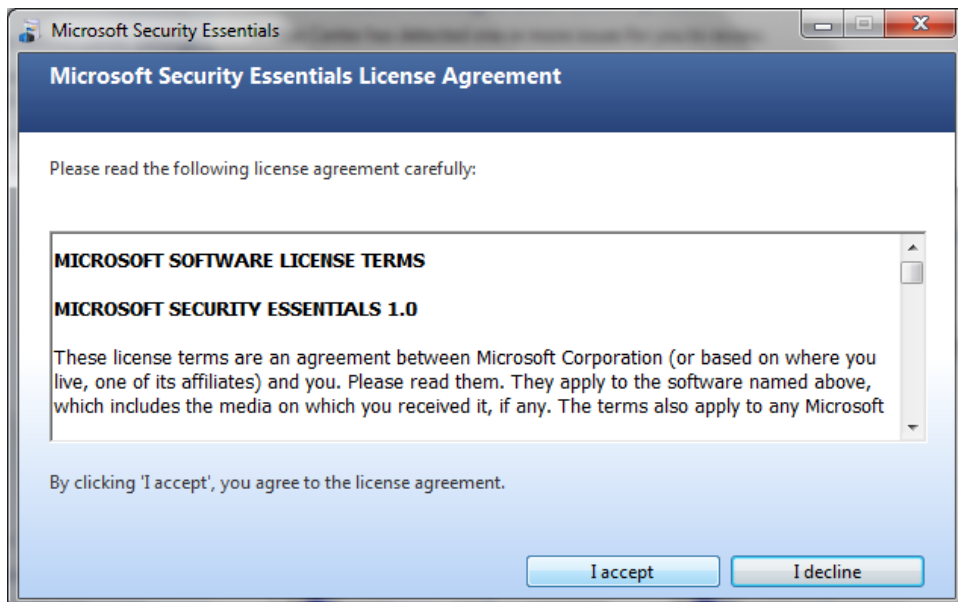
The download happens in no time at all.

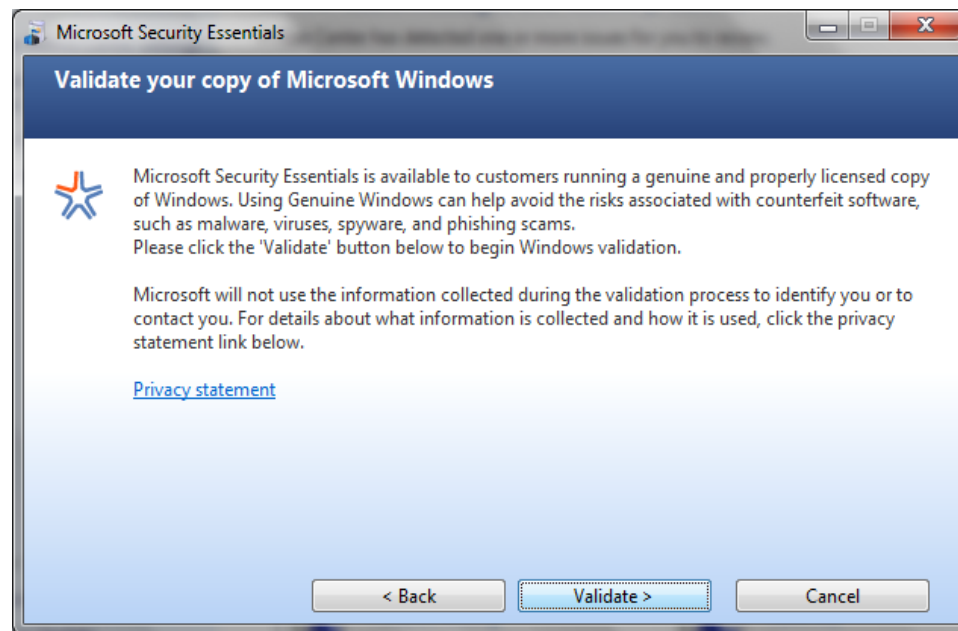
Microsoft Security Essentials ready to install and explain what it is designed to do.



Microsoft Security Essentials is now ready to install.

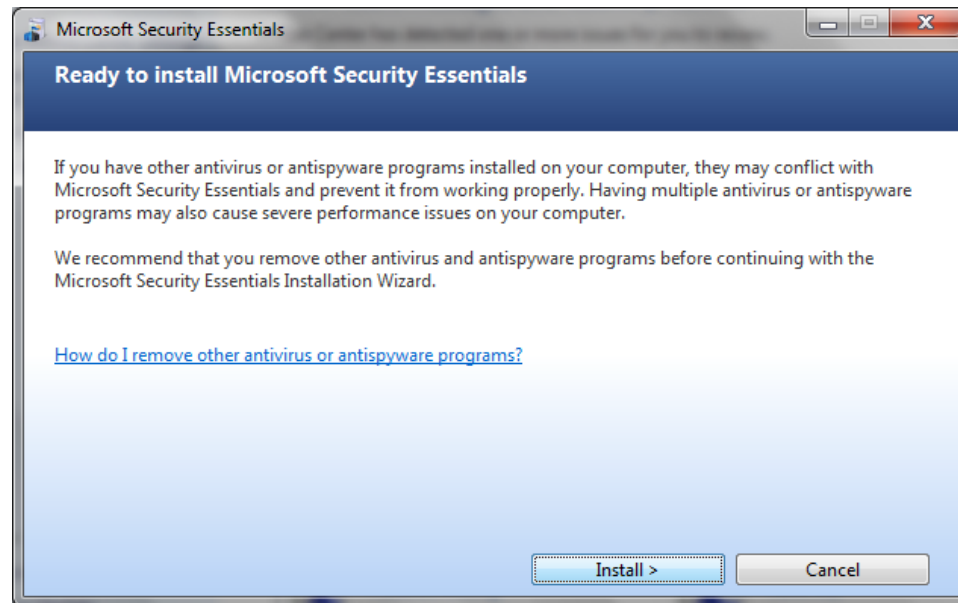
Accept the licensing agreement and validate the copy of the Windows operating system is genuine Accept the license.





Validate Windows.

The ready-to-install screen reminds to uninstall previously installed antivirus applications.

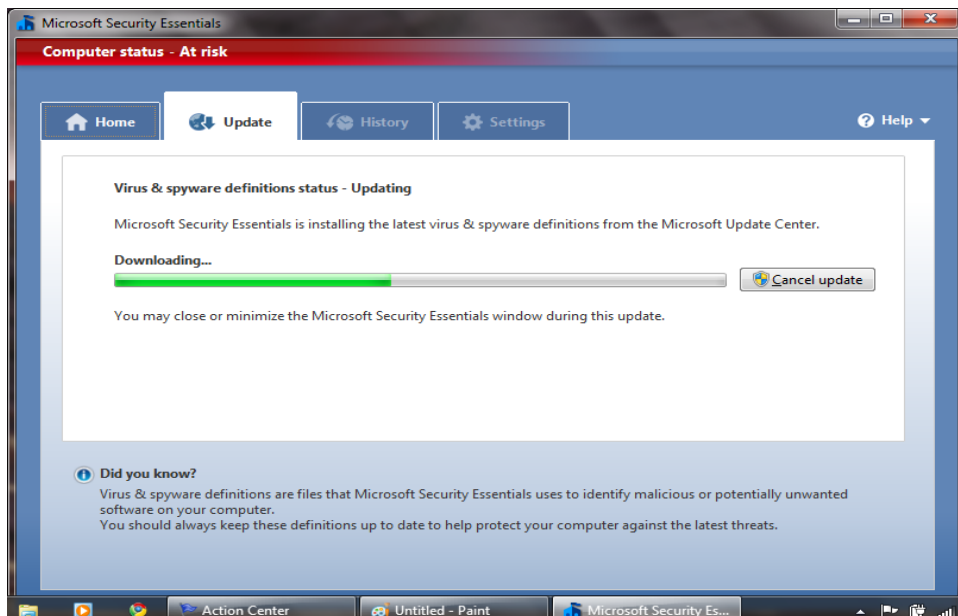


Finally, it ready to install.

Once Microsoft Security Essentials is installed, it will immediately update itself with the latest antivirus definitions. This is an important step, as new variations of viruses and malware are released into the wild on a daily basis. No matter which antivirus software choose to use, always keep it up to date.

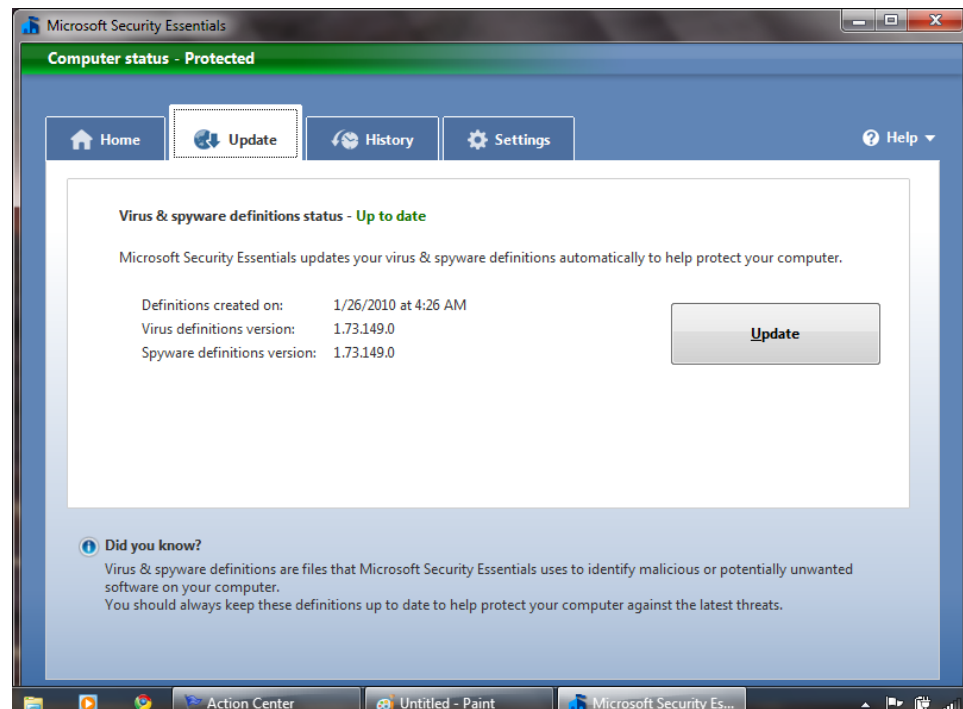


Microsoft Security Essentials is now installed.

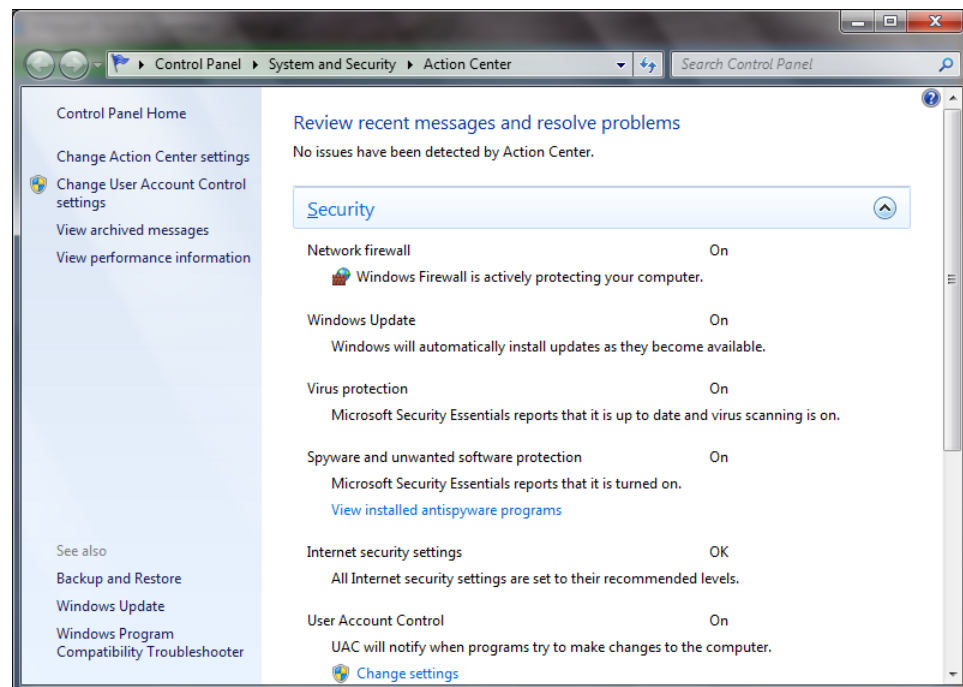


Update definitions.

Once the updates are in place, test PC goes from a red warning that the computer is at risk to a green declaration that the PC is protected



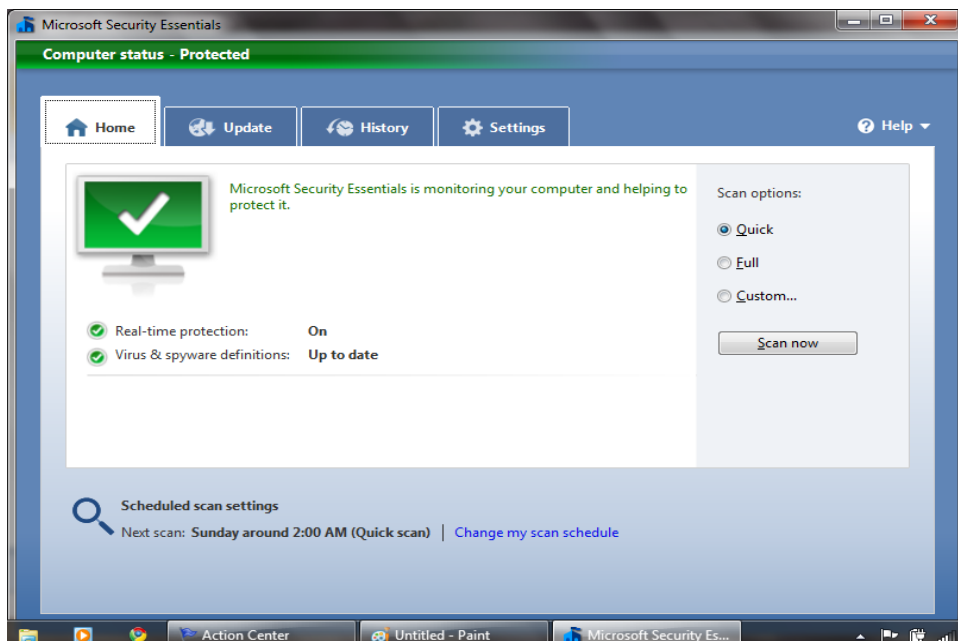
PC is now protected.



Security is back.

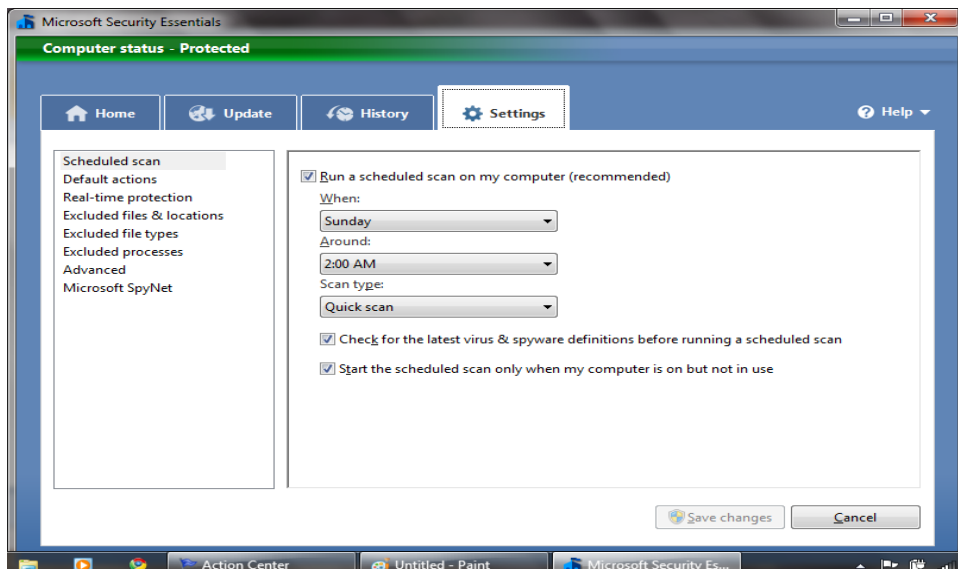
Configure

From the main page of the Microsoft Security Essentials client application, see the status of the computer's antivirus security and perform a manual scan. From the other tabs on this screen, it can manually ask for virus definition updates and check the history of antivirus activity performed by the application.



Configure the computer's antivirus security on the main page.

On the last tab, set a scheduled time to perform a Microsoft Security Essentials scan. The default is once a week, but it has flexibility to set the schedule as required.



Set a scanning schedule.

Bottom Line

Whether, an individual computer user or the manager of an entire department of Internet-connected computers, the need for antivirus applications is very real. While Microsoft Security Essentials may be merely basic protection, it is an important first line of defense that can work for almost anyone or any organization. With the benefit of a clean install and tight integration with the Windows operating system, it is worth a look no matter how many computers are involved.

Learning Unit 6: Process of Domain Registration and Web Hosting

Overview

In this learning unit, you will learn process of domain registration and web hosting. After the completion of this learning unit, you will be able to understand about Web hosting, types of web hosting, domain registration and how to upload website on web server.

1. Web Hosting

What is web hosting?

Web hosting is a place where individuals or organizations place their websites.

When talk about a web hosting, it means a company that provides space on a computer (server) to *host* the files of the website, as well as providing Internet connectivity so that other computers can access to these files on the website.

2. Domain Registration

Before hosting a website, there will be needed a domain name.

Domain Name

A domain is the name of the website. A domain name is not something physical that can touch or see; it is merely a string of characters that give the website an identity (yes, a name, like human and businesses).

Now, here are some quick examples: Google.com is a domain name; so are Alexa.com, Linux.org, WebRevenue.co, eLearningEuropa.info, as well as Yahoo.co.uk.

To have own domain names, it will need to register the domain with a domain registrar.

Where Register a Domain?

Here is a list of domain registrars where domain name can be registered.

			
<u>GoDaddy</u>	<u>Domain.com</u>	<u>NameCheap</u>	<u>Network Solutions</u>

The Difference between Web Hosting and Domain Name

It is very common for new individual in the field of web designer and developer to get confused between a domain names with a web hosting. However, it is very important to be clear on the differences between the two before move on to the first website.

To simplify: A domain name is like the address of home; web hosting on the other hand, is the space of house where place the furniture.

Instead of street name and area code, set of words or/and numbers are used for the website's naming'. The same goes with hosting, computer hard disk and computer memory are used instead of wood and steel for storing and processing data files. The idea is presented clearer with the diagram below.



Conceptual diagram to understand Hosting and domain name

Registering A Domain Name – How It Works?

According to the body's standards, all customers registering a domain name must be prepared to furnish contact information for themselves, their organization, their business, and even their employer in some cases. For those customers who are seeking to register a country-specific domain name option (like ".pk" or ".gov.pk"), a good portion of the registration process will be dedicated to determining whether or not the customer is a resident of that country and therefore legally permitted to purchase one of its country-specific top level domains.

3. Uploading a Website to the Web Server

FileZilla

It is powerful and free software for transferring files over the Internet. FileZilla is a very popular FTP client and is used by webmasters from all over the world.

When domain name is purchased Service provider, provide ftp user name and password to upload webpages on domain.

1. Procedure to Install FileZilla

Getting FileZilla

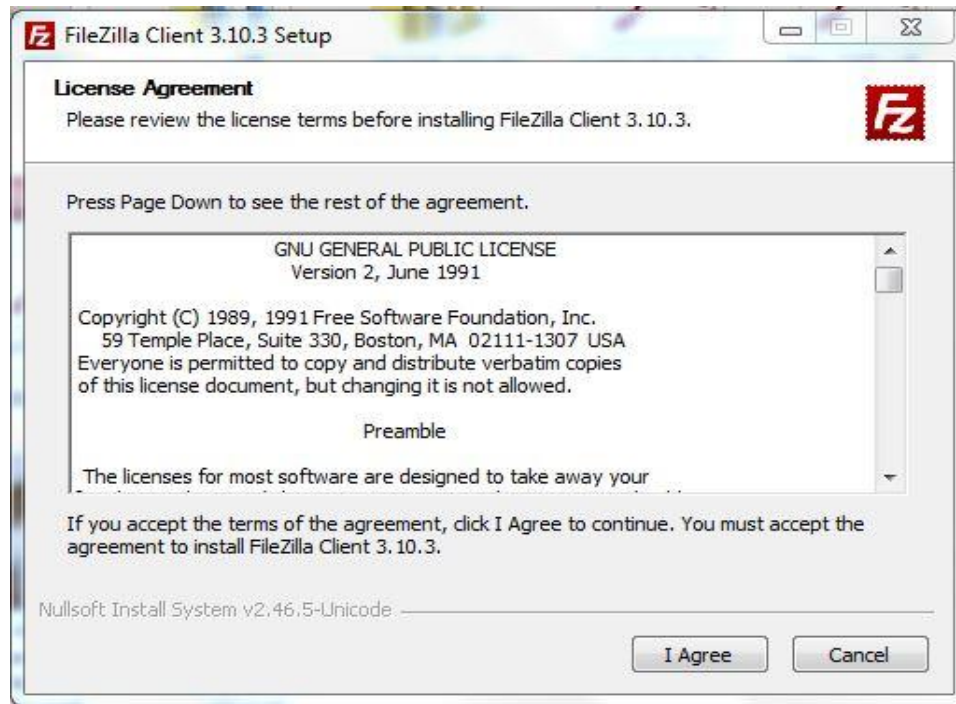
FileZilla is open source software that can download for free at <http://filezilla.sourceforge.net/>. Select the download link on the left side of the page.

1-From the list of packages on the download page, select the latest package that ends in "setup.exe." For example, "Download FileZilla_x_x_x_setup.exe."

2-Download FileZilla to the Desktop.

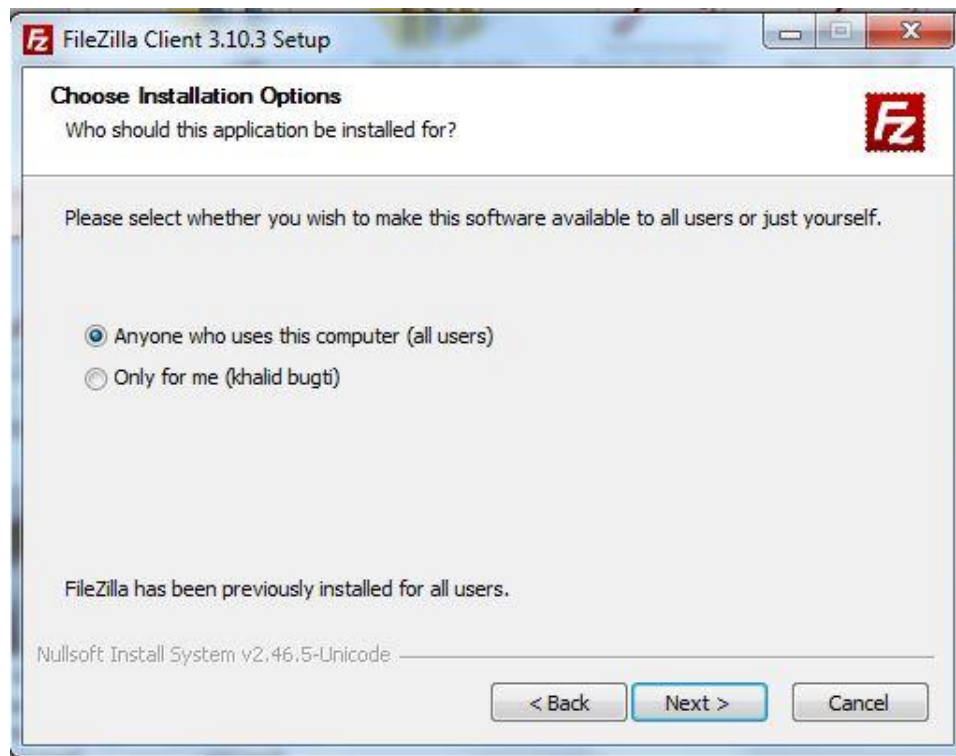
2. FileZilla Installation:

The License Agreement screen will appear.



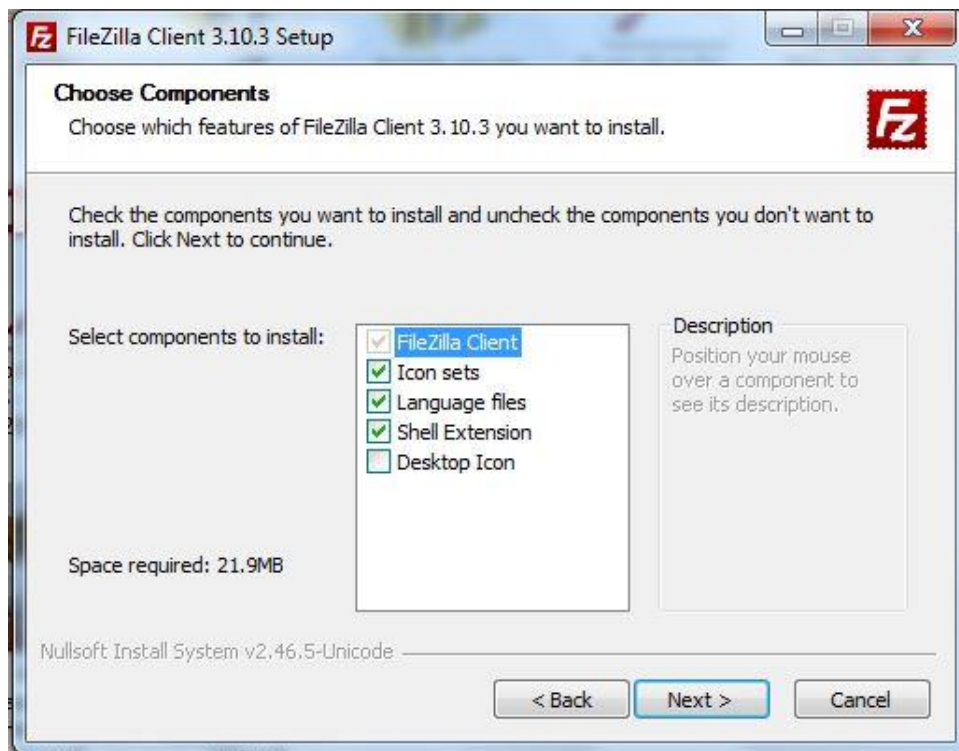
Click on the **I Agree** button.

On the next screen, decide whether every user of the OS can work with the FTP client or it is allowed only for the admin account.



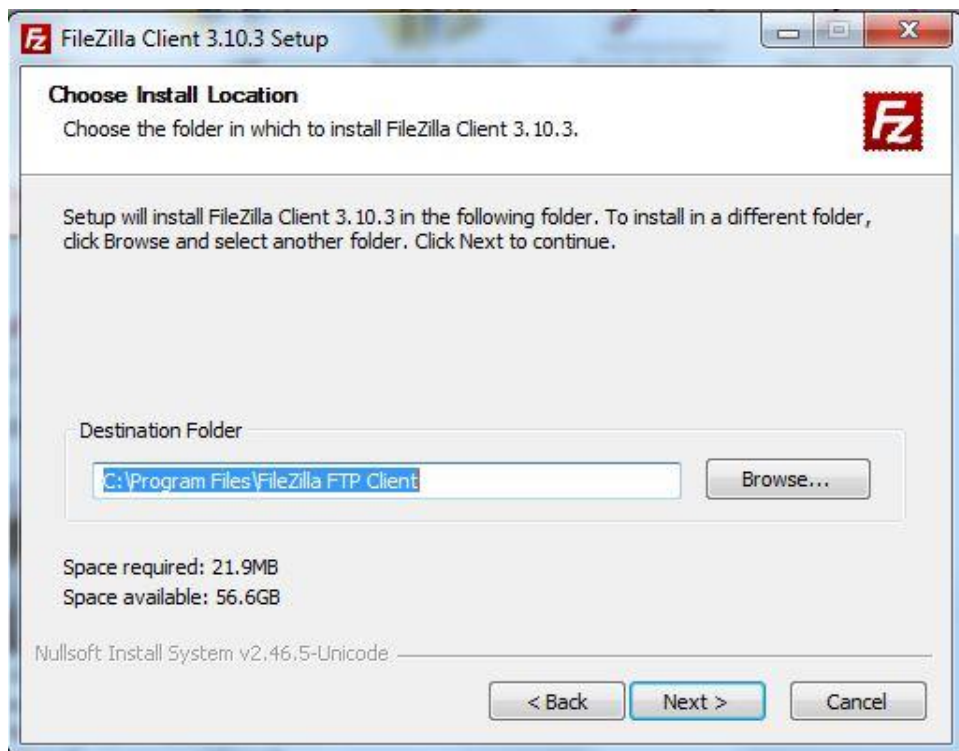
Click on the **Next** button to proceed.

Select the *components to install*.



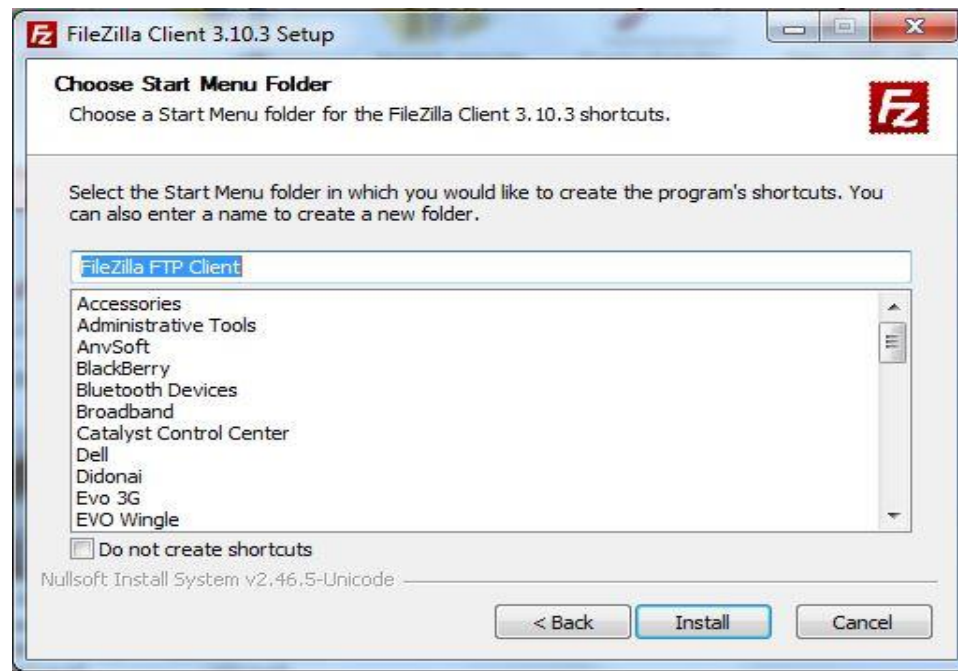
Then click on the **Next** button.

The next window allows to set the *destination* folder for the FileZilla installation.



Hit the **Next** button to continue.

Choose the *Start Menu* folder and click on the **Install** button.



The installation is completed. Start FileZilla now check box checked and click on the Finish button. This will start FileZilla FTP client.

Establish FTP Connection

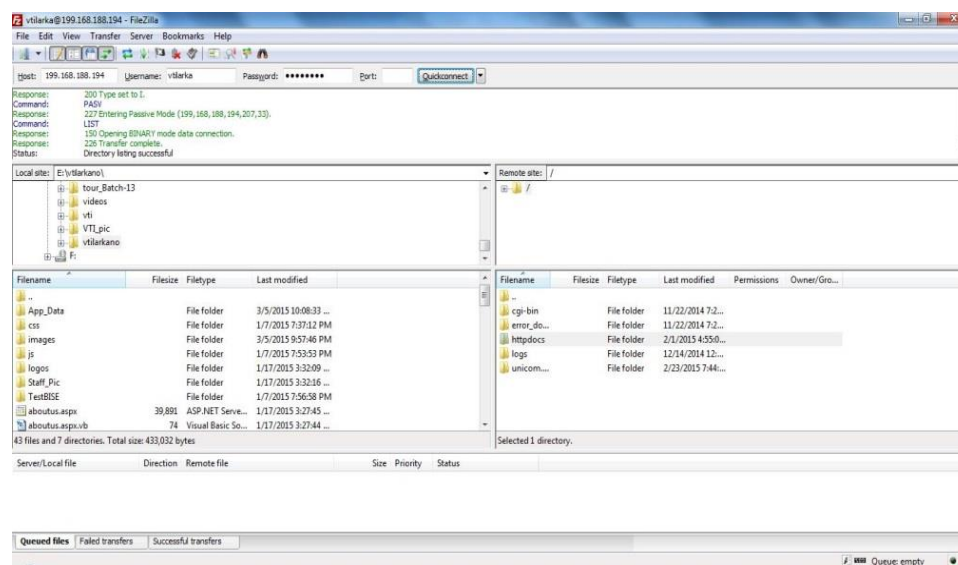
Open FileZilla installation and enter the following details:

Hostname - enter *domain name* or the name of the hosting server where account resides;

Username - enter the FTP *username*

Password - enter the corresponding FTP password

Port - enter the FTP port (by default it is 21);



Click on the **Quickconnect** button to establish the FTP connection.

Manage Files Using FileZilla

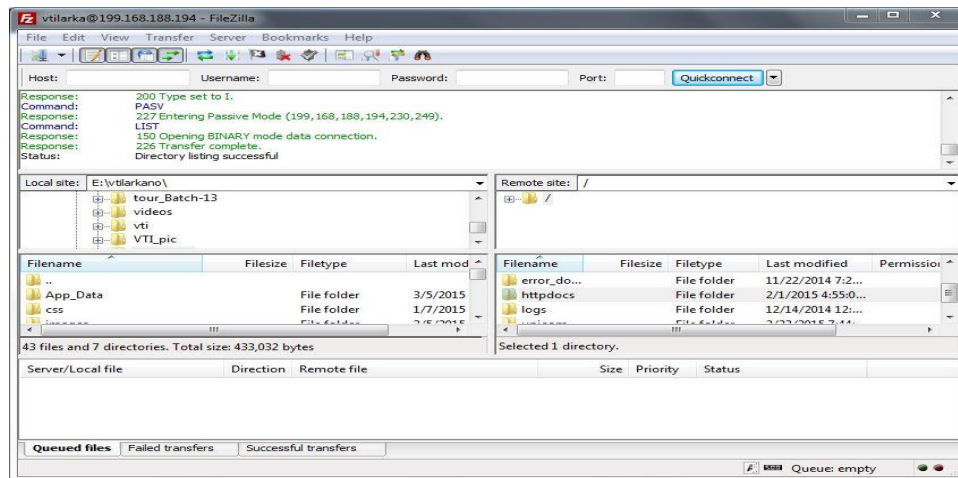
Remember

The cPanel software is installed on all the SiteGround servers. The root folder for the web site content is httpdocs.

If a web site created on a local computer, to make it live by uploading its files on web server. The **cPanel** software is installed on all the SiteGround servers. The root folder for the web site content is httpdocs. Select the web site files in the Local site area. Drag and drop them in the httpdocs folder under the Remote site area.

Do you know!

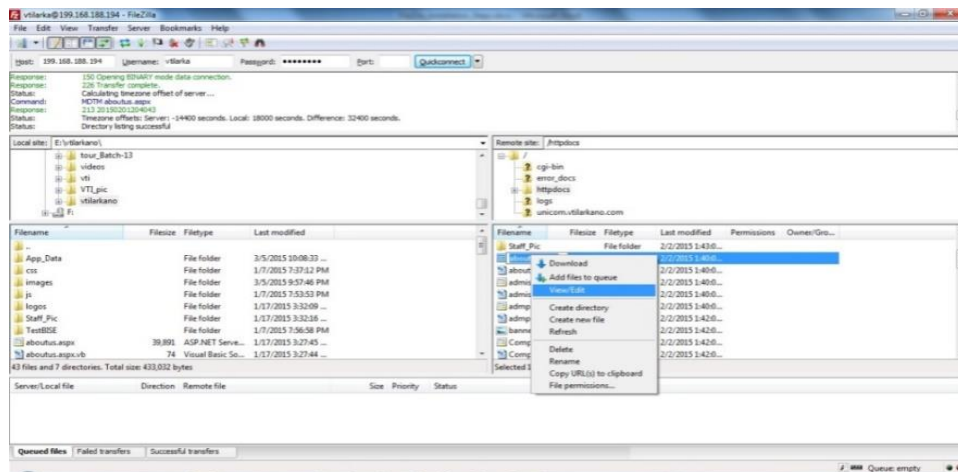
File permission, Download, add files to queue, create, delete, rename the directory options are available in FileZilla FTP Client Software.



To edit a file's code and update the web site functionality, right-click on the chosen file and pick the View/Edit option.

Do you know!

You may use other than FileZilla FTP client software for uploading the website.



The other actions that can perform on the files and folders are:

Download - this option allows to download files and folders from the remote server to local computer;

Add files to queue - schedule a later transfer of the files;

Create Directory - creating new folder under current location;

Delete - delete files and folders;

Rename - rename files and folders;

File Permissions - change the file permissions of files and folders.

Learning Unit 7: Discuss Shopping Carts and E-Commerce

Overview

In this learning unit, you will learn about shopping carts and electronic commerce. After completion of this learning unit, you will be able to understand about working of e-commerce, categories of e-commerce, popular e-commerce business in the world and shopping cart.

Remember

English entrepreneur Michael Aldrich invented online shopping in 1979

1. E-Commerce

E-commerce (electronic commerce or EC) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the Internet. The terms *e-commerce* and *e-business* are often used interchangeably. The term *e-tail* is also sometimes used in reference to transactional processes around online retail.

Do you know!

PayPal is one of the world's largest internet payment companies

Categories of E-Commerce

Traditionally commerce has four principal categories.

- **B2B** (Business to Business) — this involves companies doing business with each other. One example is manufacturers selling to distributors and wholesalers selling to retailers.
- **B2C** (Business to Consumer) — B2C consists of businesses selling to the general public through shopping cart software, without needing any human interaction. This is what most people think of when they hear "e-commerce." An example of this would be Amazon, Ali Express.
- **C2B** (Consumer to Business) — In C2B e-commerce, consumers post a project with a set budget online, and companies bid on the project. The consumer reviews the bids and selects the company. Elance is an example of this.
- **C2C** (Consumer to Consumer) — this takes place within online classified ads, forums or marketplaces where individuals can buy and sell their goods. Examples of this include Craigslist, OLX, eBay and Etsy.

PayPal

PayPal is an American worldwide online payments system. Online money transfers serve as electronic alternatives to traditional paper methods like checks and money orders.

2. Some Common Business of Ecommerce

Amazon.com

Amazon.com, Inc. Founded July 6, 1994; 20 years ago as an American electronic commerce company with headquarters in Seattle, Washington. It is the largest Internet-based retailer in the United States. Amazon.com started as an online bookstore, but soon diversified, selling DVDs, Blu-rays, CDs, video downloads/streaming, and MP3 downloads/streaming, software, video games, electronics, apparel, furniture, food, toys and jewelry. The company also produces consumer electronics—notably, Amazon Kindle e-book readers, Fire tablets, Fire TV and Fire Phone — and is a major provider of cloud computing services. Amazon also sells certain low-end products like USB cables under its in-house brand AmazonBasics.

JD.com

JD.com or **Jingdong Mall** formerly **360Buy**, is a Chinese electronic commerce company headquartered in Beijing. It is one of the largest B2C online retailers in China by transaction volume. Its English website, for worldwide shipping, launched on October 18, 2012.

The company was founded by Liu Qiangdong (a.k.a. Richard Liu) in July 1998, and its B2C platform went online in 2004. It started as an online magneto-optical store, but soon diversified, selling electronics, mobile phones, computers, etc. Jingdong Mall changed the domain name to 360buy.com in June 2007, and to JD.com in 2013.

eBay

eBay Inc. is an American multinational corporation and e-commerce company, providing consumer to consumer & business to consumer sales services via Internet. It is headquartered in San Jose, California. eBay was founded by Pierre Omidyar in 1995, and became a notable success story of the dot-com bubble. Today, it is a multi-billion dollar business with operations localized in over thirty countries.

Alibaba Group

Alibaba Group Holding Limited (NYSE: BABA) is a Chinese e-commerce company that provides consumer-to-consumer, business-to-consumer and business-to-business sales services via web portals. It also provides electronic payment services, a shopping search engine and data-centric cloud computing services. The group began in 1999 when Jack Ma founded the website Alibaba.com, a business-to-business portal to connect Chinese manufacturers with overseas buyers. In 2012, two of Alibaba's portals handled 1.1 trillion yuan (\$170 billion) in sales. The company primarily operates in the People's Republic of China (PRC), and at closing time, on the date of its initial public offering (IPO), 19 September 2014, Alibaba's market value was measured as US\$231 billion.

3. Shopping Cart

A shopping cart is a piece of software that acts as an online store's catalog and ordering process. Typically, a shopping cart is the interface between a company's Web site and its deeper infrastructure, allowing consumers to select merchandise; review what they have selected; make necessary modifications or additions; and purchase the merchandise.

Shopping carts can be sold as independent pieces of software so companies can integrate them into their own unique online solution, or they can be offered as a feature from a service that will create and host a company's e-commerce site.

Learner's Activities

Installation of Browsers: (Internet Explorer, Google Chrome, Torch, Safari)

Description:	<ul style="list-style-type: none"> • This activity will be performed by individual. • Each student has Experience of working on installation of browsers.
Time Guideline:	1 hours
Purpose:	To be able to understand functionality of each browser and will be able differentiate between them.
Presentation:	Instructor will check each individual installation.

Website Hosting on 000webhost.com

Description:	<ul style="list-style-type: none"> • This activity will be performed by individual under the supervision of instructor. • 000webhost is free web hosting server
Time Guideline:	2 hours
Purpose:	<p>To be able to understand:</p> <ul style="list-style-type: none"> • Domain registration process • Web hosting • Pages uploading on web server while using FileZilla
Outcomes:	Each individual will have its own domain registered on 000webhost

Summary of Module

- World Wide Web is a way to share resources with many people at the same time, even if some of those resources are located at opposite ends of the world.
- Many sites from the last decade are static, but more and more people are realizing the advantages of having a dynamic website. Dynamic websites can make the most of the site and either use it as a tool or create a professional, interesting experience for the visitors.
- The first computer virus, called "The Brain", was created in 1986. The Brain is a boot-sector virus, which occupies unused space on the disk to eliminate further use of memory space. After it was created, The Brain quickly spread worldwide in 1987. The Brain virus was considered first to use stealth techniques, making the virus difficult to detect.

On November 1, 1987 another virus appeared. The Lehigh virus was named after Lehigh University, the place where this particular virus was first discovered.

Computer manufacturers and software engineers began the public war against computer viruses around 1990. Corporations began to respond to growing public concern and the number of anti-virus products began to rise. The threat of computer viruses was finally taken seriously. McAfee, IBM, Digital Dispatch and Iris all introduced their anti-virus products and software in 1990.

- A domain name is the address, or URL, of the website. Every domain name is unique across the entire planet and is assigned to whoever registers them on a first-come first-serve basis. It can register domain names followed by many extensions, such as .com, .net, .org, .info.
- E-Commerce or Electronics Commerce is a methodology of modern business which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery.
- Difference between static and dynamic websites
- Architectural design of static & dynamic websites.
- Definition & working of browser
- Installation of Google chrome, Mozilla Firefox, torch, safari and distinguished features of Google chrome, Firefox, torch and internet explorer.
- Study different types of websites with example like: personal, social, wiki, blog, forum and ecommerce websites
- Study in detail different types of viruses like worms, Trojan, Malware, phishing, cross-site scripting (XSS) and denial of service attack. Function of each virus how any specific virus may disturb.
- Theoretical concept the process of domain registration and web Hosting.

How to use FileZilla for uploading websites on web server.

- E-commerce concepts, types of e-commerce.

Shopping carts concepts

Frequently Asked Questions (FAQs)

FAQ 1: What is a search engine?

Answer A program that searches the web for keywords that required. Like (www.google.com) or (www.altavista.com).

FAQ 2: What is a Domain Name? What does it mean to have it registered?

Answer A domain name is the name of the company on the web, like www.amazon.com or www.birds.net. It must apply for a domain name with a domain registrar. It's like registering a business name. Someone has to keep track of all the names out there and make sure that when a user types in the URL that they get to webpage. ICANN is the organization behind this. Wavian Web Design can do the domain name registration.

FAQ 3: I need my site hosted. What does that mean?

Answer That's like renting virtual space for an office. It need to have the website on a computer somewhere so that anyone, 24 hours a day, 7 days a week, can access it. The companies that provide these services are often called hosting companies (ISP's (Internet Service Providers) often host pages as well). Wavian can also act as the middleman and set up hosting and email services

FAQ 4: What is a URL? And what does HTTP and HTML stand for?

Answer URL stands for Uniform Resource Locator. It is the address of the site. My URL is <http://www.wavian.com>. HTTP stands for Hypertext Transfer Protocol, but there are other transfer protocols too, like FTP (file transfer protocol). Web pages are written in HTML, or Hypertext Markup Language. It is not a programming language, but rather a markup language. It doesn't do anything special like programming languages can do, it just specifies how a page should look (like what should be bold and whatnot). Though HTML is simple, there are lots of tricky factors to consider when making a web page.

FAQ 5: What is DNS?

Answer DNS - Domain Name Server - translates Internet addresses from the name to the actual numerical addresses used to route messages. The numerical addresses are known as IP addresses (see also "what is an IP address" above).

FAQ 6: What is the W3 consortium?

Answer The W3 consortium is an industry consortium headed by the Laboratory for Computer Science at the Massachusetts Institute of Technology. The W3 consortium seeks to promote standards and encourage interoperability between WWW products. [URL:http://www.w3.org](http://www.w3.org)

FAQ 7: What is the difference between domain registration and web hosting?

Answer Here is a comparison of differences between domain registration and web hosting:
Domain Registration
 Gives the sole ownership and rights to the name of the website. No one else has access to the actual name of the domain and it is taken off the market.
 However, owning the domain registration is only half of the process needed to have a website or email at the domain – it also need to connect that domain name to a service that offers the server space and bandwidth for the website content and email.
Web Hosting
 Provides the server, its network connection, its configuration, and its upkeep. It just need to upload the website to the server and configure the email via an online account control panel.
 Dream Host offers both, and it can manage everything in one place via the Dream Host Panel.

FAQ 8: How are computer viruses spread?

Answer Computer viruses are usually spread through email, by sharing files, or on disks.

FAQ 9: What is Browser Hijacking?

Answer One thing to watch out for is a virus type known as a browser hijacker, which redirects search engine inquiries for its own gain. On searching for something in Google and the link directs to a non-Google search engine, probably have one of these.

FAQ 10: Where are the virus risks?

	The Internet	Downloaded programs or documents may be infected
	Programs	Programs that carry a virus can infect machine as soon as run them
Answer	Email	Email can include infected attachments. Double-click on an infected attachment, it risk infecting the machine. Some emails even includes malicious scripts that run as soon as preview the mail or read the body text.
	Documents and Spreadsheets	These can contain macro viruses which can infect and make changes to other documents or spreadsheets
	Flash drives, external Floppy disks can contain a virus in the Boot Sector. Any drives (USB, Firewire, etc.) removable disk could contain infected programs or documents.	

FAQ 11: What is ICANN?

Answer ICANN is the new non-profit corporation that is assuming responsibility from the U.S. Government for coordinating certain Internet technical functions, including the management of Internet domain name system. More information about ICANN can be found at <http://www.icann.org>.

FAQ 12: What is FileZilla?

Answer FileZilla is a free, fast, and reliable FTP client for Windows. Use an FTP client to transfer the website from the local computer to the hosting account. This transfer is often referred to as "uploading."

FAQ 13: What is function of web forum?

Answer A Web forum is a website or section of a website that allows visitors to communicate with each other by posting messages. Most forums allow anonymous visitors to view forum postings, but require creating an account in order to post messages in the forum. When posting in a forum, IT can create new topics (or "threads") or post replies within existing threads.

Test Yourself!

Please mark the correct one from the given options.

1. A Web site is ____.

- a. a collection of related Web pages
- b. the location from which a Web page originates
- c. the source of a Web page
- d. an author of a Web page

2. ____ are two of the more widely accessed Internet services.

- a. The World Wide Web and e-mail
- b. FTP and message boards
- c. Mailing lists and chat rooms
- d. Instant messaging and newsgroups

3. Visitors to a ____ can customize some or all of the content, such as stock quotes, weather, or ticket availability.

- a. static Web page
- b. home page
- c. dynamic Web page
- d. Web server

4. To browse the Web, it need a ____.

- a. computer that is connected to the Internet and that has a Web browser
- b. wireless modem
- c. domain name
- d. home network

5. Search engines ____.

- a. are particularly helpful in locating pages about certain topics
- b. require that it enter search text
- c. allow to use operators to refine a search
- d. all of the above

6. A business/marketing Web site ____.

- a. contains content that promotes or sells products or services
- b. offers exciting, challenging avenues for formal and informal teaching and learning
- c. contains content that describes a cause, opinion, or idea
- d. is maintained by a private individual or family who normally is not associated with any organization

7. An educational Web site ____.

- a. contains content that promotes or sells products or services
- b. offers exciting, challenging avenues for formal and informal teaching and learning
- c. contains content that describes a cause, opinion, or idea
- d. is maintained by a private individual or family who normally is not associated with any organization

7. A blog Web site ____.

- a. uses a diary or journal format
- b. is an informal site consisting of time-stamped articles
- c. is short for Weblog
- d. all of the above

9. _____ occurs when one consumer sells directly to another consumer, such as in an online auction.

- a. Consumer-to-business (C2B) e-commerce
- b. Business-to-consumer (B2C) e-commerce
- c. Consumer-to-consumer (C2C) e-commerce
- d. Business-to-business (B2B) e-commerce

10. Amazon is best example of _____

- a. E-commerce
- b. Entertainment
- c. Blogging
- d. Social networking

11. A _____ is the simple form of website, in which the site's without the use of server side processing.

- a. Ecommerce
- b. Dynamic websites
- c. static website
- d. social networking website

12. Static websites are generally designed using _____

- a. Eclipse
- b. Dreamweaver
- c. Visual C++ studio
- d. Netbeans

13. Software which allows user to view the webpage is called as

- a. website
- b. Internet Browser
- c. Operating System
- d. Interpreter

14. ISP stands for _____

- a. Internet Service Provider
- b. Internet server provider
- c. none of these
- d. International service provider

15. _____ are used in denial of service attacks, typically against targeted web sites.

- a. Worm
- b. Zombie
- c. Virus
- d. Trojan horse

16. Which of the following is independent malicious program that need not any host program?

- a. Trap doors
- b. Trojan horse
- c. Virus
- d. Worm

17. Which of the following malicious program do not replicate automatically?

- a. Trojan Horse
- b. Virus
- c. Worm
- d. Zombie

18. What does the .com domain represents?

- a. Educational domain
- b. commercial domain
- c. Network
- d. None of the above

19. What is the full form of HTTP?

- a. Hypertext transfer protocol
- b. Hypertext transfer package
- c. Hyphenation text test program
- d. none of the above

20. The term e-commerce includes_____

- a. Electronic trading of Physical goods and intangibles such as information.
- b. The electronic provision of services such as after sales support or online legal advice
- c. All the steps involved in trade, such as on-line marketing ordering payment and support for delivery.
- d. All of the above.

21. Which of the following is the largest community in classification of e-commerce?

- a. Business to Business (B to B)
- b. Business to Consumer (B to C)
- c. Business to Government (B to G)
- d. Government to Government (G to G)

22._____ is simply the use of electronic means to transfer funds directly from one account to another, rather than by cheque or cash.

- a. M-Banking
- b. O-Banking
- c. E-Banking
- d. D-Banking

Answer Key

MCQ Number	Correct Answer	MCQ Number	Correct Answer
1	a	13	b
2	a	14	a
3	c	15	b
4	a	16	d
5	d	17	a
6	a	18	b
7	b	19	a
8	d	20	d
9	c	21	a
10	a	22	c
11	c		
12	b		

Module 3: Design a Website

Learning Outcomes

After completion of this learning module, you will be able to:

- Understand the basics of website designing
- Analyze functionalities of different web designing software
- Apply appropriate website templates in website

Learning Unit 1: Basics of Website Designing

Overview

In this learning unit, you will learn basic concepts of web designing. These concepts will help throughout web designing process. After completion of this learning unit, you will be able to elaborate web designing, history of web designing, types of web designing, difference between web design & development, difference between web design & graphic designing and importance of design in a website.

Remember

Website design should be user friendly and easy to navigate to find specific information.

1. Web Designing

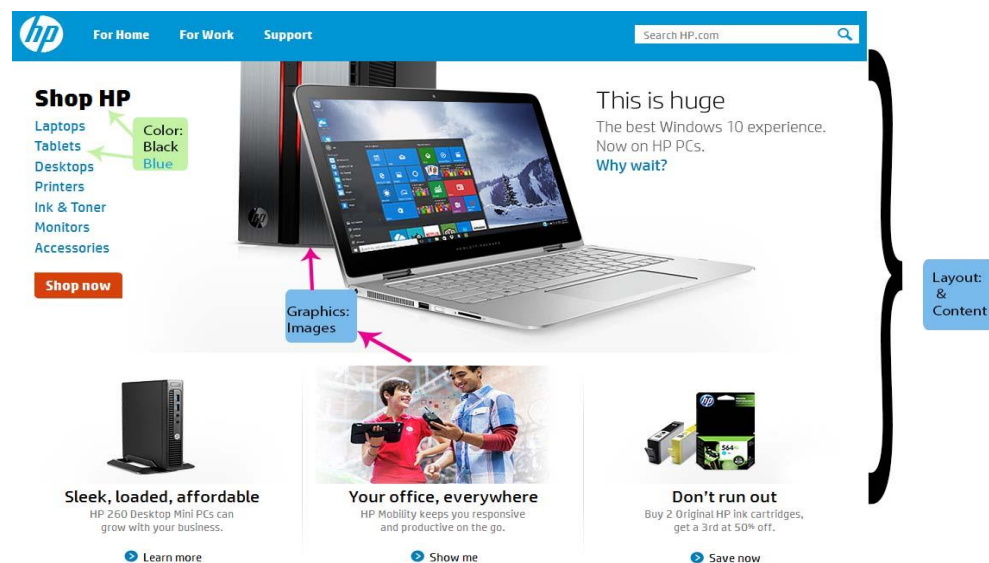
Web designing is the process of planning, creation and updating of websites. It also includes website structure, user interface, navigation ergonomics, website layout, fonts and use of graphical appearance.

Elements of Web Design

Web design uses many key visual elements as all types of design such as:

Layout: This is the way the graphics, ads and text are arranged.

Color: The choice of colors depends on the purpose and client requirement; it could be simple black-and-white to multi-colored design, conveying the personality of a person or the brand of an organization.



Graphics: Graphics can include logos, photos, clipart or icons, all of which enhance the web design.

Fonts: The use of various fonts can enhance a website design. Most web browsers can only read a selected number of fonts, known as "web-safe fonts".

Content: Content is the textual, visual or aural representation that is displayed to the users. It may include: text, images, sounds, videos and animations. Content and design can work together to enhance the message of the site through visuals and text.

2. History of Web Designing

In 1989, whilst working at CERN Tim Berners-Lee proposed to create a global hypertext project, which later became known as the World Wide Web. During 1991 to 1993 the World Wide Web was born. Text-only pages could be viewed using a simple line-mode browser. In 1993 Marc Andreessen and Eric Bina, created the Mosaic browser.

Tables – The Beginning (1995)

The birth of browsers that could display images was the first step into web design. The closest option available to structure information was the concept of tables already existing in HTML. So putting tables within tables, figuring out clever ways to mix static cells with fluid cells was the thing, started by David's Siegel's book Creating Killer Sites.

JavaScript Comes to the Rescue (1995)

JavaScript

An object-oriented computer programming language commonly used to create interactive effects within web browsers.

JavaScript was the answer to the limitations of HTML. For instance, need a popup window, want to dynamically modify the order of something? The answer was JavaScript. However, the main problem here is that JavaScript is layered on top of the fabric that makes the web work and has to be loaded separately.

The Golden Era of Freedom – Flash (1996)

To break the limitations of existing web design, a technology was born that promised a freedom never seen before. The designer could design any shapes, layouts, animations, interactions, use any font and all this in one tool – Flash. The end-result is packed as one file and then sent to the browser to be displayed.

CSS (1998)

Around the same time as Flash, a better approach to structuring design from a technical standpoint was born – Cascading Style Sheets (CSS). The basic concept here is to separate content from the presentation.

Mobile Uprising – Grids and Frameworks (2007)

Remember

The look and formatting are defined in CSS, but the content in HTML.

Browsing the web on mobile phones was a whole challenge in itself. Besides all the different layouts for devices, it introduced content-parity problems – should the design be the same on the tiny screen or should it be stripped down?

The first step to improvement was an idea of column grids. After a few iterations, the 960 grid system won, and the 12-column division became something designers were using every day. The next step was standardizing the commonly used elements like forms, navigation, buttons, and to pack them in an easy, reusable way. Basically, making a library of visual elements that contains all the code in it. The winners here are Bootstrap and Foundation, which is also related to the fact that line between a website and an app is fading. The downside is that designs often look the same and designers still can't access them without knowing how the code works.

Responsive Web Design (2010)

Do you know!

JavaScript was created in 10 days in May 1995 by Brendan Eich, then working at Netscape

A brilliant guy named Ethan Marcotte decided to challenge the existing approach by proposing to use the same content, but different layouts for the design, and coined the term Responsive web design. Technically we still use HTML and CSS, so it is rather a conceptual advancement. Yet there are lots of misconceptions here. For a designer, responsive means mocking up multiple layouts.

Bootstrap is the most popular HTML, CSS, and JavaScript framework for developing responsive, mobile-first web sites.

The Times of the Flat (2010)

Designing more layouts takes more time, so luckily we decided to streamline the process by ditching fancy shadow effects and getting back to the roots of design by prioritizing the content. Flat design is also part of the process.

The Bright Future (2015)

The holy grail of web design actually make it visual and bring it into the browser. Imagine that designers simply move things around the screen and a clean code comes out! And it doesn't mean changing the order of things, but having full flexibility and control! Imagine that developers don't have to worry about browser compatibility and can focus on actual problem solving!

Do you know!

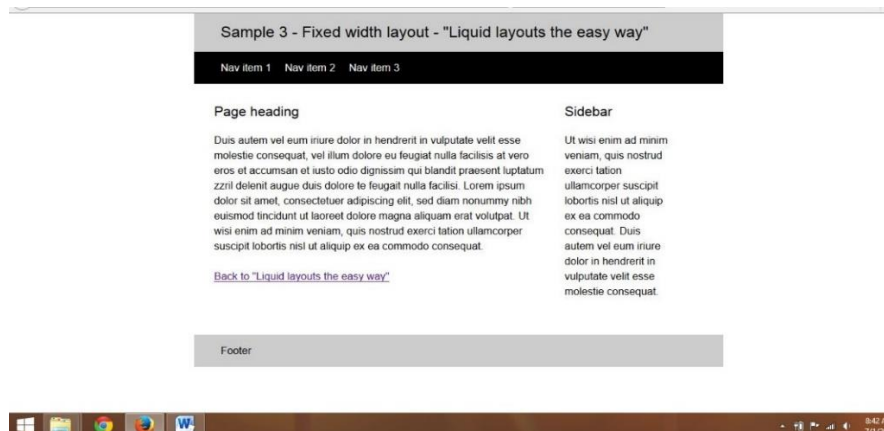
W3school is the best place where learner can learn **bootstrap**

3. Types of Web Designing

Web design in term of layout can be further sub-divided into 03 categories:

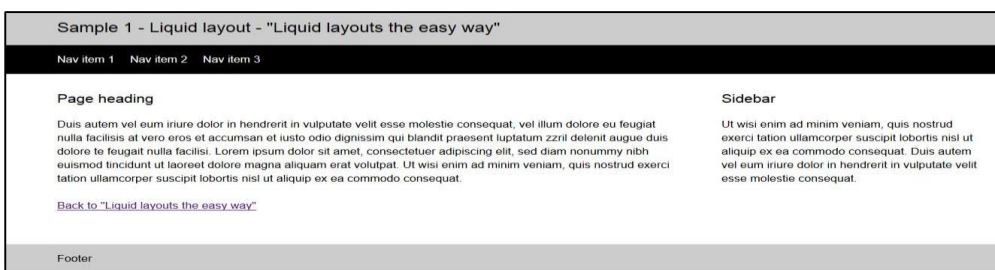
Fixed Design

Fixed web pages have a set width that won't alter when the browser is resized, no matter what device the website is being viewed on. On smaller devices, such as smartphones or tablets, content is harder to view and can be annoying for users due to the need to scroll horizontally to view the rest of the content on a page, or continuously "pinch and expand" to zoom into the page's text. When the browser on a screen is enlarged or reduced, images and text may visually fall apart on the screen.



Liquid or Fluid Design

When resizing the browser, the content on the page spreads itself out to fill the width of the browser when expanded, hence the term liquid design, and will look enlarged or as though it has shrunk. The columns containing the content on the webpage are built using percentages, rather than fixed columns used in fixed design, therefore the columns increase or decrease in size relative to each other.



Google Page Rank Algorithm

A mechanism used by Google to Rank different websites in Search Engine Results.

Responsive Design

An approach to web design that provides an optimal viewing experience across a wide range of devices.

Responsive web design is about creating web sites which automatically adjust themselves to look good on all devices, from small phones to large desktops. According to research survey Smartphone Users Worldwide is Total 1.75 Billion in 2014. Now it is also a factor for Google Page Rank Algorithm.

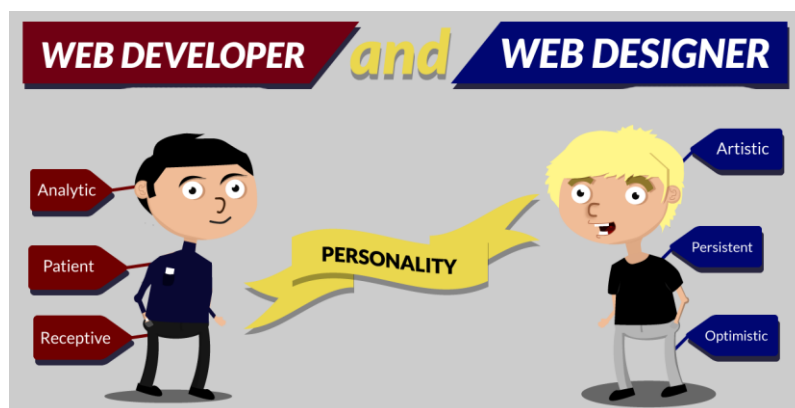
Bootstrap twitter library is used with html to create such design.

Website Layout in Different Devices:



4. Difference between Web Design and Web Development

Web Design & Web Development are two different sides of a coin. But they are actually two completely different sciences that usually require two different professionals to get the most out of your Website in both perspectives.



Web Design

Web design is the process of creating the look, feel, and branding of a Website. Working is done on the exterior (front end) features of Website. Web design includes the creation of logos, graphics, and other advanced visual elements.

A web designer:-

- Focuses on appearance of a website
- Uses HTML, CSS, and JavaScript
- Is competent in color scheming, graphic design, and information flow

- Creates a great user experience
- Is right-brained: Strong intuition, creativity, & imagination

Web Development

Web development is the programming (data processing) of your Website. This should be seen as building the engine of an automobile. Web development often refers to data driven Websites but also refers to other automated features such as mail scripts, shopping cart, registration system that require a database.

A web developer:-

- Add the functionality to Website
- Creates the inner workings of a website
- Is competent in programming languages (PHP, .NET, Python, C, Ruby)
- Develops the user interface
- Is left-brained: logic, linear thinking, technical
- Hands-on coding experience is required (either your own products or GitHub)

Remember

Designing for web and print are two different experiences. Just because a designer is good at one doesn't mean they'll be good at the other.

Resolution

The maximum number of pixels that can be displayed on a monitor, expressed as (number of horizontal pixels) x (number of vertical pixels), i.e., 24x768.

5. Difference between Web Design and Graphic Designing

On several occasions it has been found that graphic web designers have the same approach and mindset as that of print media designing, even when they are designing for web. There are many differences between the two – quite crucial to know for success of web designers. Here are some of such important differences which you need to know.

Fonts:

When designing for prints you do not have to worry about fonts displaying properly in a browser. A reader will see the font which you have specified in the designing process. In web designing a number of fonts replacing techniques are used such as @font-face and Cufón which help in incorporating nonstandard fonts in designing for user convenience.

Remember

CMYK stand for Cyan, Magenta, Yellow and Black and **RGB** stand for Red, Green and blue

Resolution:

This implies the image quality and measures in pixels Web images should not be more than 72 ppi since the image will load very slow on the screen. Designing for prints does not have such restrictions.

Monitor Size:

When designing for print media a specific print size is considered and design will be as per that specific page size. This is not the case in web designing since where different monitor sizes and screen resolutions may be used.

Color Differences:

In print projects **CMYK** color model is mainly used since printing jobs are mainly done using yellow, black, magenta and cyan inks. Websites are always viewed on a screen and hence a **RGB** color model.

File Sizes:

File size is never an issue for prints. The more details you have in your print the better it is – these are normally of 10 or 20 MB and sometimes even of 100 MB. However, you cannot have such big files in a website. These would take hours of loading time.

Layout Control:

The controlling ability of layouts on a webpage is quite different from different designing tools like Illustrator and Photoshop. These programs shall help to move graphics and texts precisely and just where desired. However, tables and HTML do not allow such kind of flexibility.

Web Graphic Designing Is Continuous Process:

If designer for a printed piece it gets over once the design is sent to print. The job is over. Web graphic designing is different. It is all about continuous improvement, regular tweaking and continuous improvement.

Measuring Effectiveness:

It is difficult to measure the effectiveness of any print design, since once it is out, you will never get an idea on how people are reacting to it and how people are seeing it. However, a graphic designer for web can be easily measured through Google analytics.

Dimensionality:

Print design is 2 dimensional and lots of attention is given to layout. Every view is meant for a fixed canvas size which is not the case for web graphic designing, where it is all about scrolling the page and is just opposite the experience of canvas.

Experience:

Print designing allows walking through the information, selecting the information, enhancing and explaining all the page elements. Web designing is a great transient experience which is completely based on users' movements.

6. Importance of Design in a Website

There are so many options out there that allow you to build a quick website. However, it's important to remember that just because you can easily create a website; it doesn't mean that it is a GOOD website.

Your website is your online Business. More people will potentially see your website than your physical location. A well-designed site will add more credibility to your business. Keep in mind that web users are more sophisticated now, and they want to be able to trust their business to a professional company. What better way of showing them that you are a serious business than having a clean looking and easy to navigate website.

Some other important design characteristics to keep in mind are:

- Use typography that is easy to read
- Always keep in mind that the average person actually only reads about 30% of the text on a page
- Use headings, bulleted lists, text formatting and good spacing
- Create and follow a brand identity
- Have a clear message and call to action

Learning Unit 2: Application Software's for Designing a Website

Overview

In this learning unit, you will learn different web designing software's. These software are used to create and design web pages. After completion of this learning unit, you will be able to understand about different designing software, procedure to install designing software's, such as adobe Photoshop, Adobe Dreamweaver and adobe flash.

Do you know!

Photoshop was created in 1988 by Thomas and John Knoll

1. List of Different Designing Software

Number of designing software's is available, most popular are mentioned below.

Adobe Photoshop

A leading paint program from Adobe Systems, Inc. For many years, Photoshop has been the model against which other paint programs are compared. Initially, it ran only on Macintosh systems, which was a strong selling point for Macs, especially among graphic artists. Today, Photoshop runs on both Macs and Windows PCs.

Adobe Dreamweaver

Adobe Dreamweaver is a proprietary web development tool developed by Adobe Systems. Dreamweaver was created by Macromedia in 1997, and was maintained by them until Macromedia was acquired by Adobe Systems in 2005.

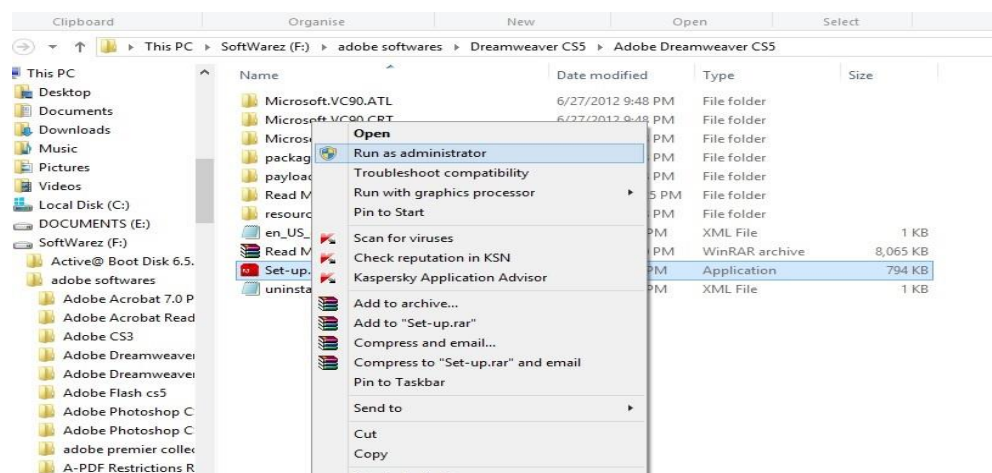
Adobe Flash

Flash is vector base software to create animations.

2. Procedure to Install Adobe Dreamweaver

Above mentioned designing software's have same procedure of installation, therefore only adobe Dreamweaver cs5 installation procedure mentioned below:

1. Click and run the .exe



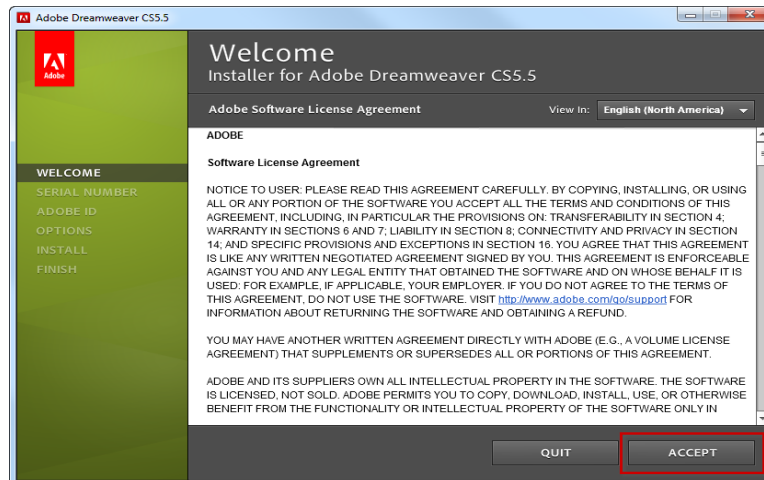
Remember

Adobe Dreamweaver has multiple versions. Dreamweaver 8, CS5, CS6.

- Click the **Accept** button to accept the license and continue installation.

Remember

Registration gives you access to exclusive benefits from Adobe such as newsletters, publications, and invitations to Adobe events and seminars.



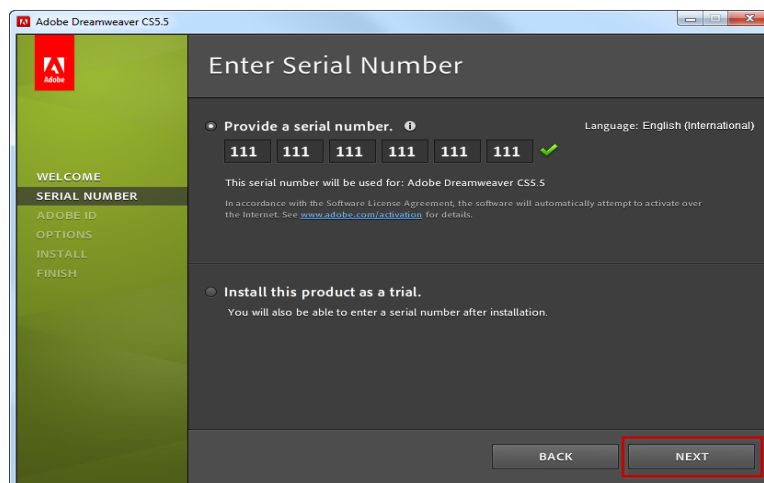
Click Accept

- The license key must be entered before the installation can continue. Click the **Next** button to proceed.

Remember

In CS6, Adobe ID Skip option is not available then do this;

- Disable internet connection
- Then Restart Setup

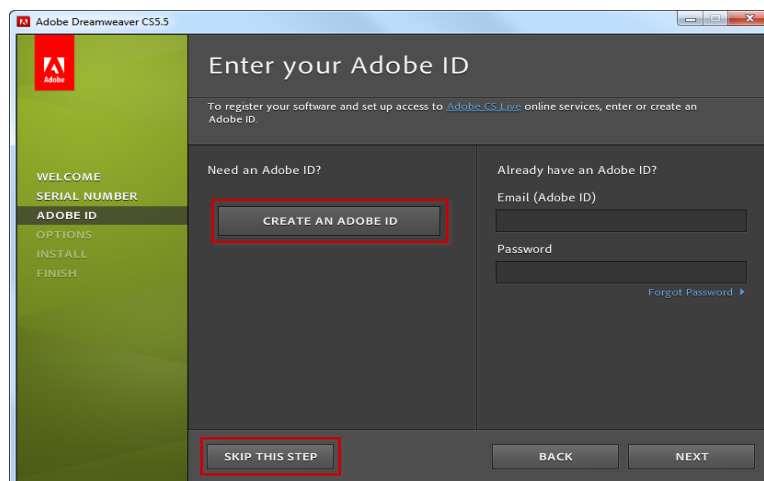


Input the serial number and click Next

- Click the **Skip This Step** button to finish the installation and enter your details later.

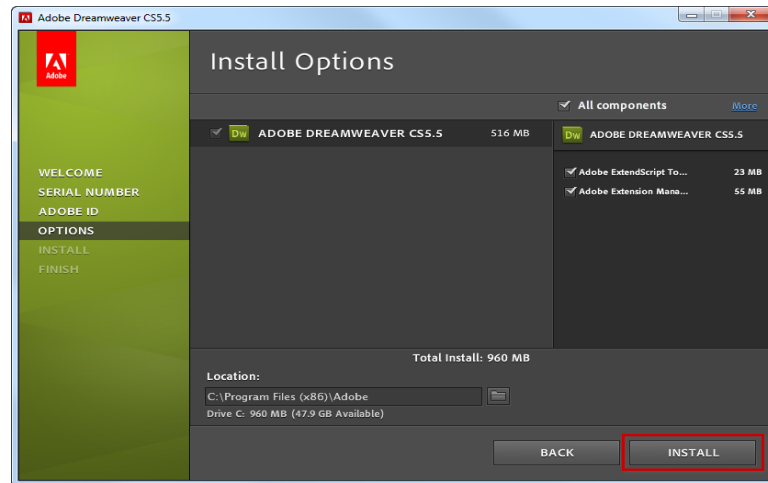
Do you know!

CS6 has 32-bit as well as 64-bit Versions.



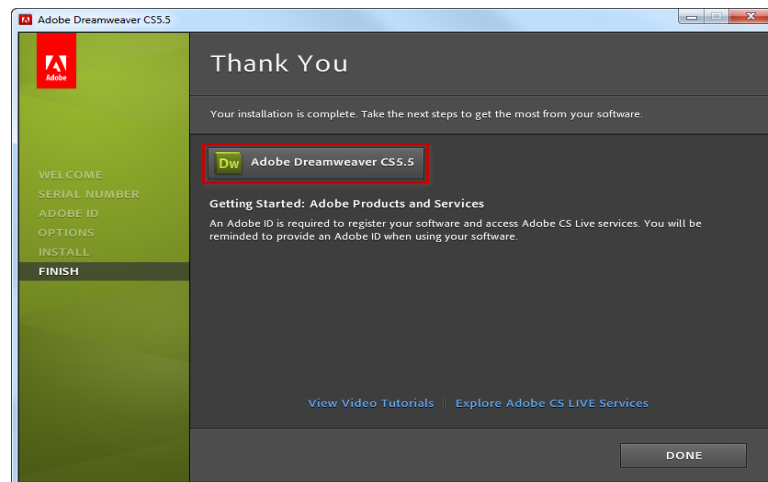
Create an ID or skip the step

5. Choose a location and Click **Install**.



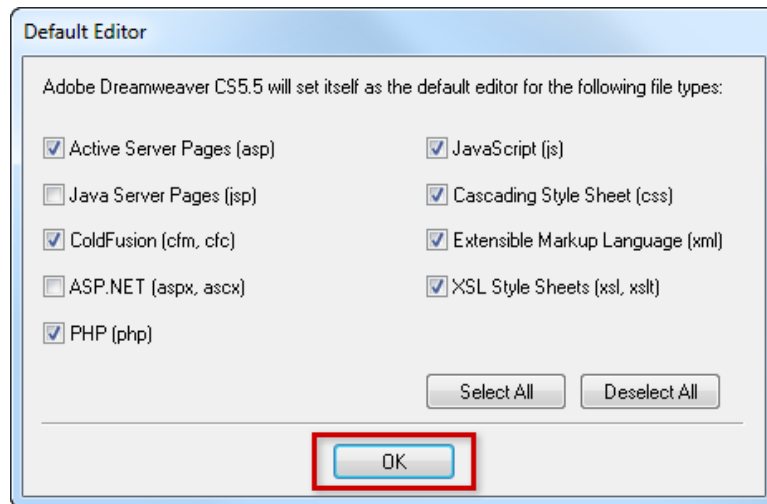
Click Install

6. Dreamweaver will begin installing on your computer. When the installation is finished, click the **Adobe Dreamweaver CS5.5** button to open Dreamweaver.



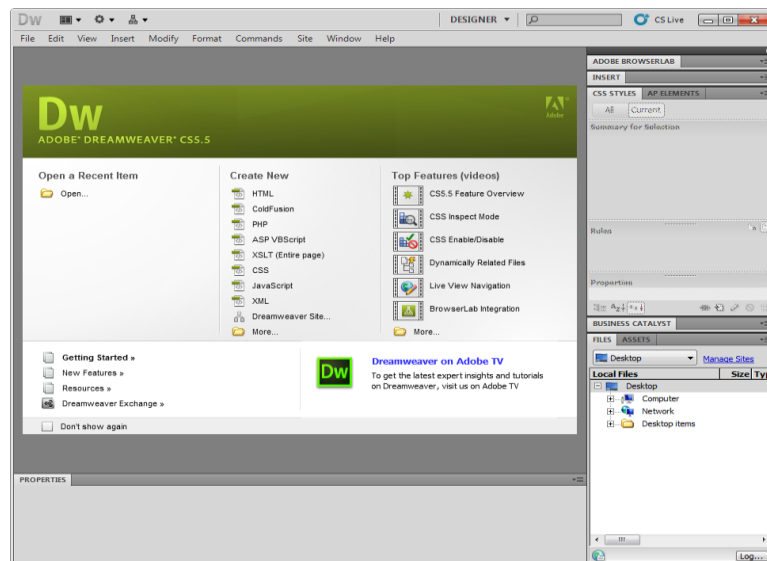
Click Adobe Dreamweaver

7. Select which file extensions should be associated with Adobe Dreamweaver CS5.5. If unsure, leave the selections unchanged and click the **OK** button.



Click OK

8. Adobe Dreamweaver CS5.5 should now successfully open for the first time.



Dreamweaver is opened

3. Designing Software's Practices

Adobe Photoshop

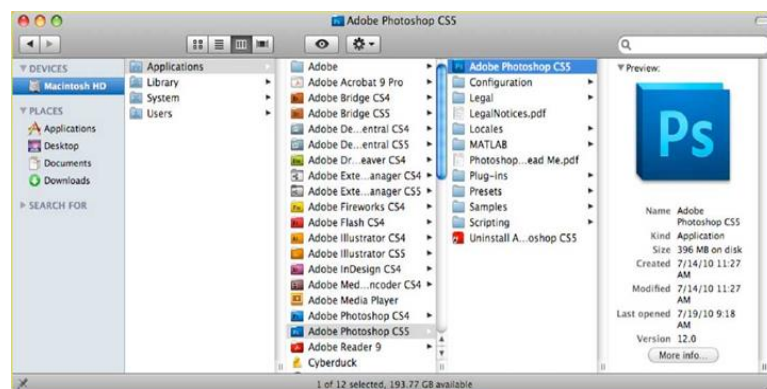
Adobe Photoshop CS5 is a popular image editing software. This section is an introduction to using Adobe Photoshop. Here you will learn how to get started, how to use the interface, and how to modify images with basic editing skills.

GETTING STARTED

Begin by opening Adobe Photoshop CS5.

If already installed on a PC,

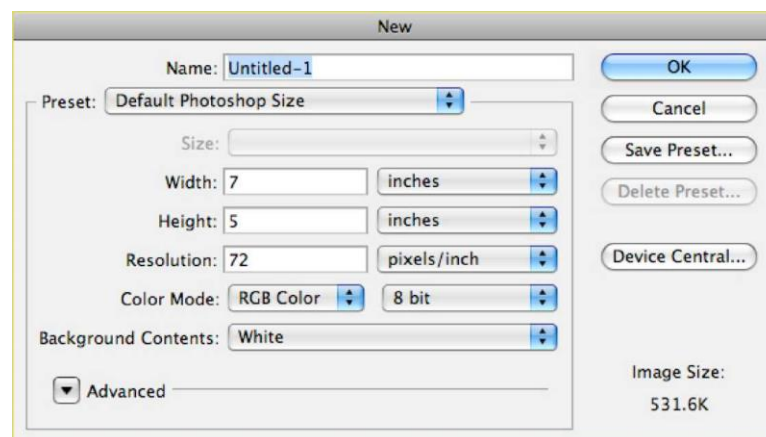
Click **Start > Programs > Adobe > Photoshop CS5**, or click on the shortcut on the desktop.



Setting up the Document

Setting up your document correctly from the start will make your job much easier as you work through your project. This will require some advanced planning. For example, if your final output will be a brochure, you may need to set up your document to be horizontal and double-sided.

To create a new document, click **File > New**. This will open the Document Setup dialog box (Figure 2).



Remember

High resolution increases the size of the file. The standard recommended resolution for printed images is 150-300, for Web images it is 72.

Here you will be able to name your file, set up the correct page size, and orientation for your document. Options include, but are not limited to:

Page Size and Orientation

Change the page size by typing in new values for width and height. Page size represents the final size you want after bleeds or trimming other marks outside the page. In the Preset dropdown menu you can find such common sizes as letter, legal, tabloid, etc. Typing in exact values for Height and Width gives you more control over the size and orientation of your page.

Resolution

Resolution is the number of pixels on a printed area of an image. The higher the resolution, the more pixels there are on the page, the better the quality of the image.

Color Mode

Choose a color mode that will best fit your project. For example, when making a graphic for a web site choose **RGB**. When making an image for prints choose **CMYK**.

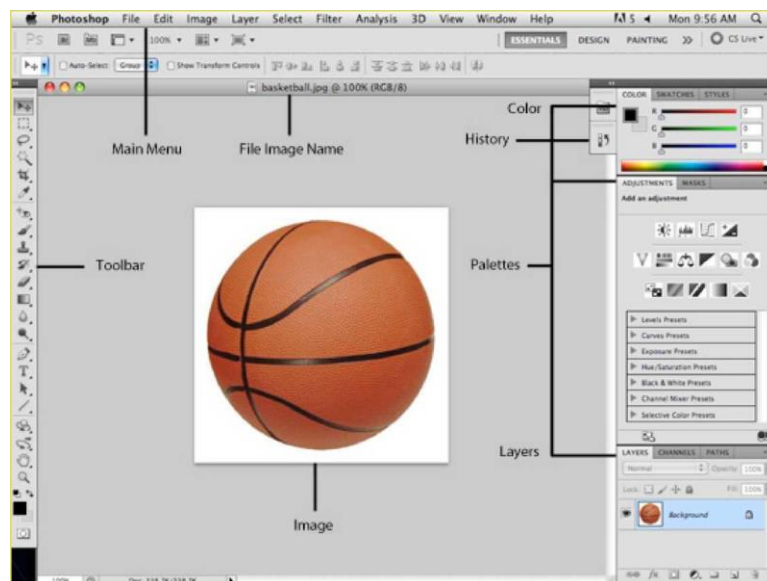
Background Contents

Choose the background: white, color or transparent. When you have entered all of your document settings click **Ok**.

Opening an image from a disk

If the image you have is saved on a disk,

Select **File > Open**, and then navigate to the disk drive where your image is saved. Choose the image file and click **Open**. At this point, you may want to save your image under a different name so that you can always have the original to fall back on in case of a mistake. To save your file, select **File > Save As** and type in the new name of the file in the dialogue box.



Menu Bar

If you look at the top of the screen you will see the Menu bar which contains all the main functions of Photoshop, such as **File, Edit, Image, Layer, Select, Filter, Analysis, 3D, View, Window, and Help**.

Toolbar

Most of the major tools are located in the Toolbar for easy access.

The Image

The image will appear in its own window once you open a file.

Image Name

The name of any image that you open will be at the top of the image window as shown above.

Palettes

Palettes contain functions that help you monitor and modify images. By default, palettes are stacked together in groups. These are the palettes that are usually visible: Color, Adjustments and Layers. If none of the palettes are visible, go to Window in the Menu bar and choose the palettes you need.

Palettes

Below is the description of the most commonly used palettes in Adobe Photoshop CS5. Palettes used for more advanced image editing will be covered in the Adobe Photoshop CS5 Tutorial -Intermediate.

Color, Swatches, Style

The Color palette (Figure 4) displays the current foreground and background colors and RGB values for these colors. You can use the sliders to change the foreground and background colors in different color modes. You can also choose a color from the spectrum of colors displayed in the color ramp at the bottom of the palette.

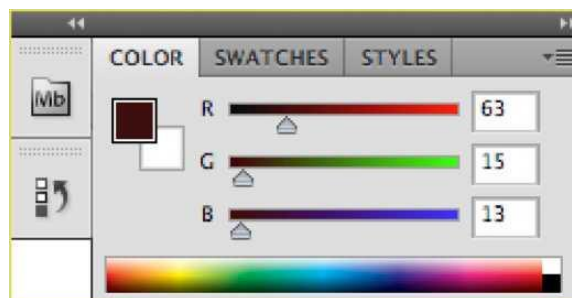


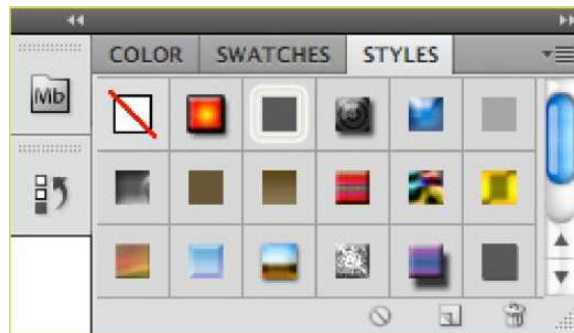
Figure 4. Color Palette

In the Swatches palette (Figure 5) you can choose a foreground or background color and add a customized color to the library.



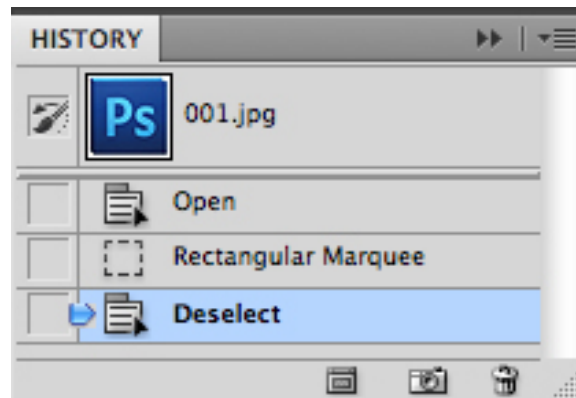
Figure 5. Swatches Palette

The Styles palette (Figure 6) allows you to view, select, and apply preset layer styles. By default, a preset style replaces the current layer style. You can use the styles in the palette or add your own using the Create New Style icon.

**Figure 6. Styles Palette**

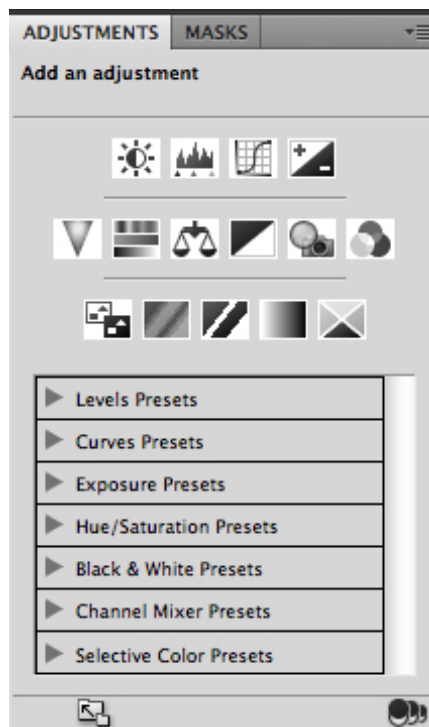
History

The History palette (Figure 7) stores and displays each action performed allowing jump to any recent stage of the image alteration. The alterations should be created during the current working session; after saving or closing the document the History palette clears all the contents. Each time you apply a change to an image, the new state of that image is added to the palette. It is important to know that once you click on any of the previous stages, all the changes that were made after it will be lost.

**Figure 7. History Palette**

Adjustments

The Adjustment layers palette give you the ability to apply an effect to a group of layers in Photoshop, and then you can edit that effect later, while preserving the original layers.

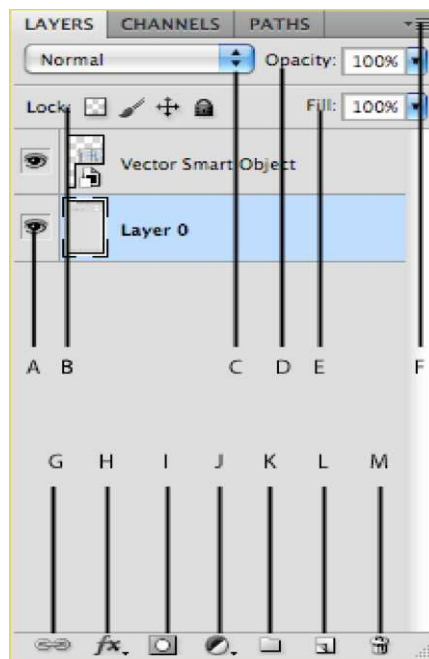


Do you know!

Every Photoshop CS5 document contains at least one layer. Creating multiple layers lets you easily control how your artwork is printed, displayed, and edited.

Layers

Layers let you organize your work into distinct levels that can be edited and viewed as individual units. You will use the Layers palette (Figure 6) often while creating a document, so it is crucial to understand what it does and how to use it.



A) Layer Visibility -The eye shows that the selected layer is visible. Click on or off to see or to hide a layer.

B) Layer Locking Options -Click the checkered square icon to lock Transparency; click the brush icon to lock the Image; click the arrow icon to lock the Position; click the lock icon to lock all options.

C) Layer Blending Mode -Defines how the layer's pixels blend with underlying pixels in the image. By choosing a particular blending mode from the dropdown menu you can create a variety of special effects.

D) Fill -By typing in a value or dragging the slider you can specify the transparency. Layers Palette color of the image or object.

E) Opacity -By typing in a value or dragging a slider you can specify the transparency of the entire layer.

F) Layer Lock -The icon shows when the layer is locked and disappears when it is unlocked. Double-click the icon to unlock the layer.

G) Layer Options Menu -Click the black triangle to see the following options: New Layer, Duplicate Layer, Delete Layer, Layer Properties, etc. Some of the options are presented as icons at the bottom of the Layers palette.

H) Link Layers – Can be used to link layers together.

I) Layer Styles -If a layer has a style, an “F” icon shows at the bottom of the Layers palette. Click the little black triangle to see style options.

J) Layer Mask -A grayscale image, with parts painted in black hidden, parts painted in white showing, and parts painted in gray shades showing in various levels of transparency.

K) Layer Set -This option helps to organize images with multiple layers. Click the icon to create a folder for several layers.

L) Create New Fill or Adjustment Layer -Have the same opacity and blending mode options as image layers and can be rearranged, deleted, hidden and duplicated in the same manner as image layers. Click the icon and select an option to create a new fill or adjustment layer.

M) Create New Layer -Click this icon to create a new layer.


N) Delete Layer -To delete a layer, select a layer in the Layers palette and drag it to the trash can icon; or, select a layer and click the icon.

Toolbox


If you used other Adobe products, such as Illustrator or InDesign, you should be familiar with the toolbox in Adobe Photoshop CS5 as it shares some of the tools from these applications. If you are a new user of Adobe products, you should keep in mind that you might not need to use all of the tools. In this tutorial, only the basic tools will be discussed in depth.

Selection Tools





Move:  Used to select and move objects on the page.


Click the tool button, and then click on any object on the page you wish to move.

Marquee:  Selects an object by drawing a rectangle or an ellipse around it.

Click the tool button, choose a rectangular or an elliptical marquee. Drag the marquee over the area of the image you wish to select.

Lasso:  Selects an object by drawing a freehand border around it. Click the tool button, drag to draw a freehand border around the area of the image you wish to select.

Magic Wand:  Selects all objects in a document with the same or similar fill color, stroke weight, opacity or blending mode. By specifying the color range or tolerance, you can control what the Magic Wand tool selects.

Crop:  Click the tool button, then click and drag the tool over the part of the image that you want to keep. Resize the selected area dragging the squares at the sides and corners. Then press Return/Enter key when your crop box is sized correctly.

Eye Dropper: 

Takes color samples from colors on the page and displays them in the Color Boxes.

Select the tool, click on the color in the image you wish to sample. The Color Box will display this color.

Alteration Tools

Healing Brush: 

Corrects small blemishes in scanned photos.

Select the tool, hold down the ALT key and left-click on the base color you need to heal. Then left-click over the blemish.

Brush: 

Draws brush strokes of different thicknesses and colors.

Select the tool. Then click on the selected area, drag to draw lines. Use the Options bar to change the brush, mode, opacity and flow.

Clone Stamp:



Takes a sample of an image and applies over another image, or a part of the same image.

Select the tool. Hold down the ALT key and left-click on a certain point of the document where you want to start your copy point. Then, put your mouse over whatever part of the new document you want the picture to go to. Hold down the left mouse button and drag the mouse across the page to copy the picture.

Art History Brush:



Paints over an image using the source data from a specified history state or snapshot.

Select the tool, specify the brush, blending mode, opacity, style, area and tolerance.

Eraser:



Remember

You can use the Erase tool on paths, but not on text.

Removes part of an existing path or stroke. Select the tool, click on the part of the image you wish to erase. Drag to erase pixels.

Gradient:



Applies a gradient fill to a selected part of the image or to an entire layer.

Select an area you wish to apply gradient to, click the tool button, choose a fill in the Options bar, click on the starting point, and hold the mouse down and drag to the endpoint.

Blur:



Blurs the sharp edges of an image.

Select an area where you wish to apply the tool. Click the tool button and choose the brush, mode, and strength. Drag the brush along the edges.

Drawing and Selection Tools

Path Selection:



Selects paths and path segments.

Select the tool, click anywhere on the path.

Type:



Type's text on a page. Every time you click the Type Tool on a new portion of the page a new layer will be created.

Select the tool, click on the page and begin to type. You can specify the font and size in the Options bar. You can also resize and transform the text box by dragging the squares at the sides and corners. Use the Move Tool to move the text on the page.



Draws smooth-edged paths.

Select the tool, click on the page and drag to draw a path. Click and drag the anchor points to modify the path.



Draws a straight line. Other shapes that are hidden in this tool are: Rounded Rectangle Tool, Ellipse Tool, Polygon Tool, and Custom Shape Tool.

Select the tool, click and drag on the page to draw a line.

Assisting Tools



Allows you to move around within the image.

Select the tool, click on the spot on the page, hold the mouse button down, and drag to move in the area.



Magnifies or reduces the display of any area in your image window.

Select the tool, choose Zoom In or Zoom Out in the Options bar, and click on the area of the image you wish to magnify or reduce.

Color Boxes and Modes



The foreground color appears in the upper color selection box and represents a color that is currently active. The background color appears in the lower box and represents an inactive color.

1. To change the foreground color, click the upper color selection box in the Toolbox.
2. To change the background color, click the lower color selection box in the Toolbox.
3. To reverse the foreground and background colors, click the Switch Colors icon (the arrow) in the toolbox.
4. To restore the default foreground and background colors, click the Default Colors icon (the little black and white boxes) in the toolbox.

Do you know!

Cropping allows you to make your image a standard photo size.

Note: If you are using the Gradient Tool, the currently selected foreground and background colors will be the default colors of the gradient.

Basic Image Editing

Now that you know how to find your way around in the Adobe Photoshop CS5 interface and are familiar with the most common commands, pallets, and tools, you can start doing some basic image editing. In the next few chapters of this tutorial you will learn how to crop, resize, correct, and sharp/blur your images.

Crop

Cropping is one of the most basic editing techniques that can improve your images. Cropping helps to bring out the most important features in your image and focus the viewers' attention on these features.

There are several ways to crop images in Adobe Photoshop:

1. Cropping with the Crop Tool
2. Cropping to a specific size
3. Cropping with the Marquee Tool

Cropping with the Crop Tool

The Crop Tool allows you to make a precise selection of an image you wish to edit. To crop with the Crop Tool, follow these steps:

1. Open the image you wish to crop (see Getting Started for detailed instructions).
2. Select the Crop Tool from the Toolbox (see Selection Tools for location and description).
3. Click on your image once and drag the mouse out to make a cropping border (See Figure 11).

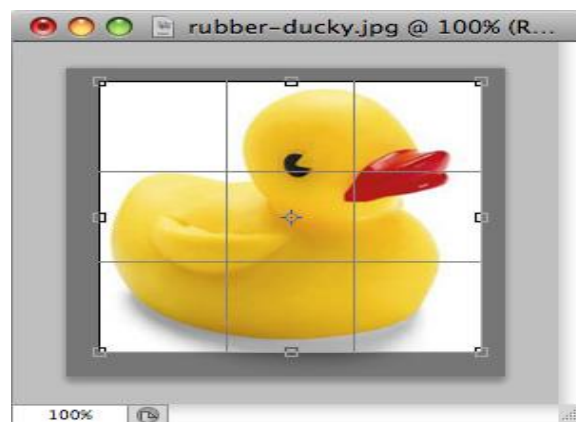


Figure 11: Cropping with the Crop Tool

4. Resize the border by dragging the squares at the sides and corners till you are satisfied with the way our image looks.
5. Once you are completely satisfied with your cropped image, press Enter.

You can also rotate your cropping border. Move the cursor outside the border; you will see how it turns into a double-headed arrow (Figure 12). Drag the arrows in the directions you wish to rotate your selection.

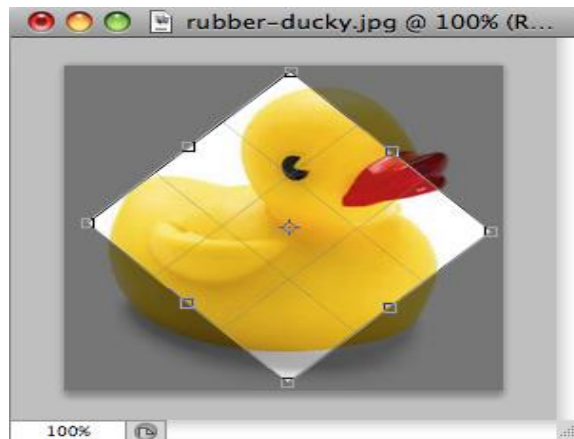


Figure 12: Rotate Cropped Area

Cropping to a Specific Size

To crop an image to a specific size, do the following:

1. Open the image you wish to crop.
2. Select the Crop Tool from the Toolbox.
3. In the Options bar, specify the values for Width and Height (Figure 13).



Figure 13: Crop Tool Options Bar

4. Click in your image and drag the cropping border. Notice that the border is constrained -you cannot make it wider or longer than the specified values (Figure 14). For example, if you entered 8 for Width and 10 for Height, whatever size you make the border, the area within it will fit on an 8x10 photo.

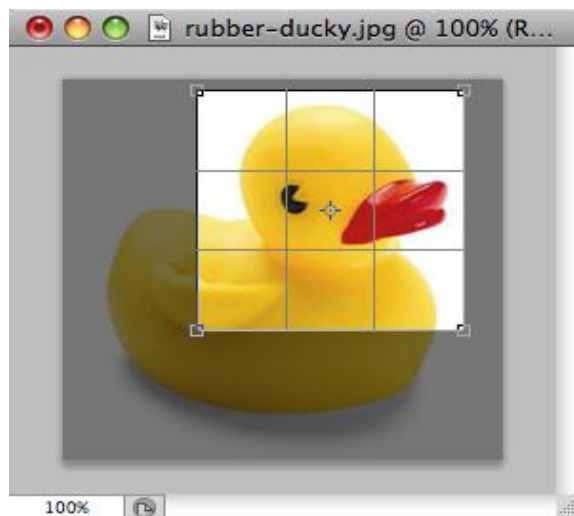


Figure 14: Crop to Specific Size

5. Once you are completely satisfied with your cropped image, press Enter.

Remember

If you wish to print your digital photos or other images on standard size photo paper, you will have to crop your images to a specific size, such as 8x10.

Remember

Use of Shift & Alt keys in combination allows resizing proportionally.

Cropping with the Marquee Tool

If you are in a hurry and need just a simple crop, you can use the Marquee Tool and a menu command. To crop with the Marquee Tool, follow the steps below:

1. Open the image you wish to crop.
2. Select the Rectangular Marquee Tool from the Toolbox (see Selection Tools).
3. Click and drag the mouse to draw a marquee around the area you wish to crop (Figure 15).

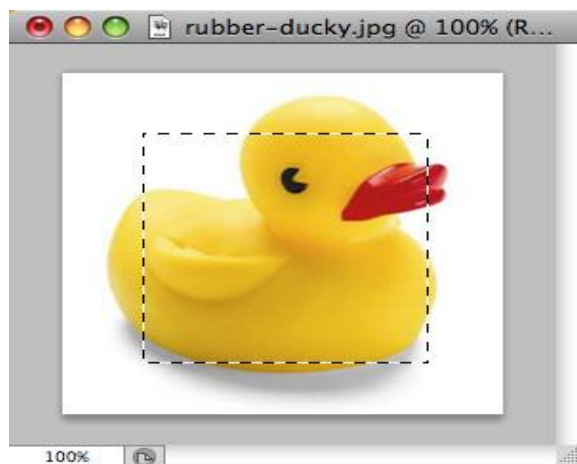
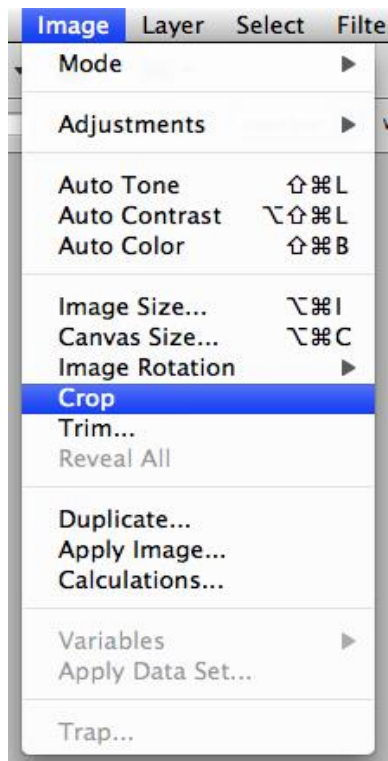


Figure 15. Drawing a Marquee

4. In the main menu, go to Image > Crop (Figure 16). The image will be immediately cropped



Resizing

Resizing in Photoshop can help you print your images in standard photo sizes, resize and preserve the high quality of digital photos, and enlarge small images to a poster size.

Resizing to a specific size

To resize your image to a preset size, follow the steps below:

1. In the main menu, go to File > New.
2. In the New dialog box, click on the Preset dropdown menu. You will see several preset sizes, such as 2x3, 4x6 and 5x7 with the preset resolution of 300 ppi (Figure 17).

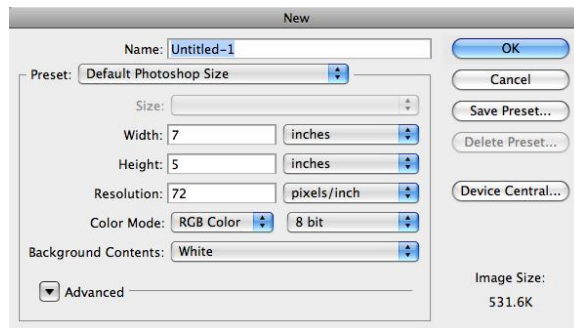


Figure 17: Adjust Resolution

3. Choose the size that you wish and click OK.

Note: All the preset sizes are in portrait orientation. If you wish to resize an image with the landscape orientation, You need to create

Your own preset.

To create your own size, do the following:

1. Type in the values for Width and Height, for example 7x5.
2. Type in your desired resolution (150 ppi for high quality prints, and 72 ppi is good for web images).
3. Click the Save Preset button

Resizing Digital Photos

Digital photos usually have large dimensions but low resolution, 72 ppi, which effects their quality when their Size is decreased or increased. When printed, the photos with the changed size will look pixilated. To resize the digital photos without losing the quality, follow these steps:

1. Open the digital photo you wish to resize.
2. In the main menu, go to View > Rulers. You will see the dimension of your photo (Figure 18).

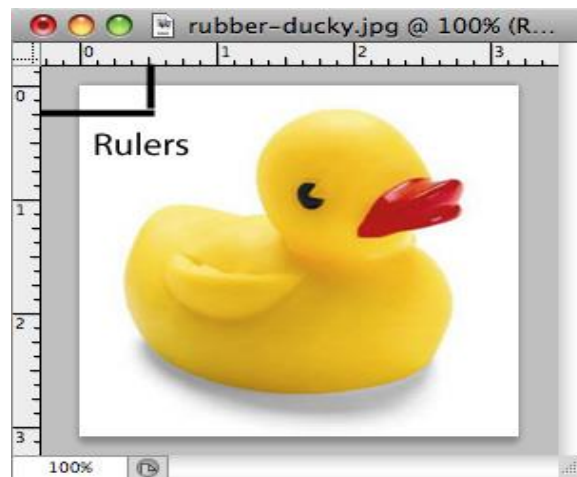


Figure 18: Ruler

3. In the main menu, go to Image > Image Size.

4. In the Image Size dialog box, check the Resample Image box off (Figure 19). Type in your desired Resolution (anything between 150 and 300 ppi). The photo is now 3.208 x 3.083 inches.

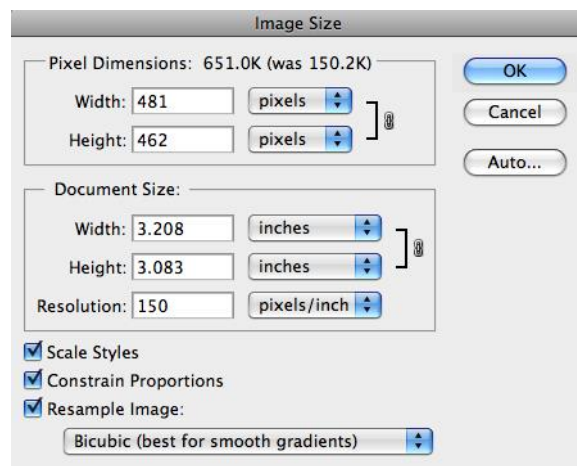


Figure 19: Changing Resolution

Enlarging

If you want to make your digital photo into a poster size image, you can do it in the Image Size dialog box.

However, just increasing the dimensions will make the image appear blurry and pixilated. To enlarge the image without losing the quality, follow these steps:

1. Open the digital image you wish to enlarge.
2. In the main menu, go to Image > Image Size.
3. In the Image Size dialog box, make sure the Resample Image box is checked off and choose Bicubic

Smoother from the dropdown box (Figure 20).

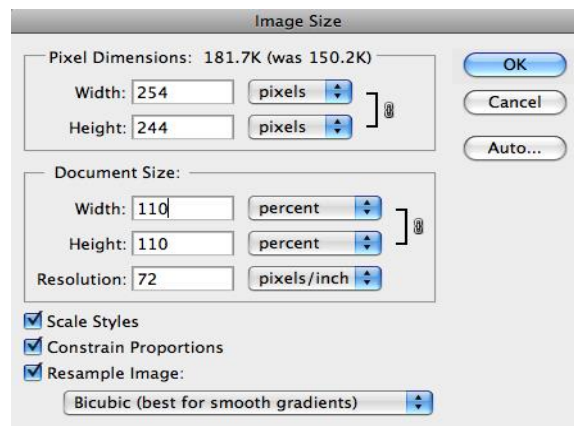


Figure 20. Increasing the Size by 10 Percent

4. Change the Document Size measurements to Percent. Type in 110; this will increase the size of the image by 10 percent (Figure 20).
5. Continue enlarging by 10 percent till you are satisfied with the size.

Correcting

Digital cameras tend to cause various problems, such as “red eye” or “hot spots”, if you use flash, or underexposure, if you don’t.

In Photoshop, you can correct these problems, as well as adjust the overall color of your digital photo.

Red Eye Removal

The digital camera flash is located right above the lens, which causes the “red-eye”; however, you can fix your Photos easily in Photoshop. To remove the “red eye”, follow the steps below:

1. Open a photo you wish to correct.
2. Select the Zoom Tool from the Toolbox. Click and drag a rectangle around the eye (Figure 21).

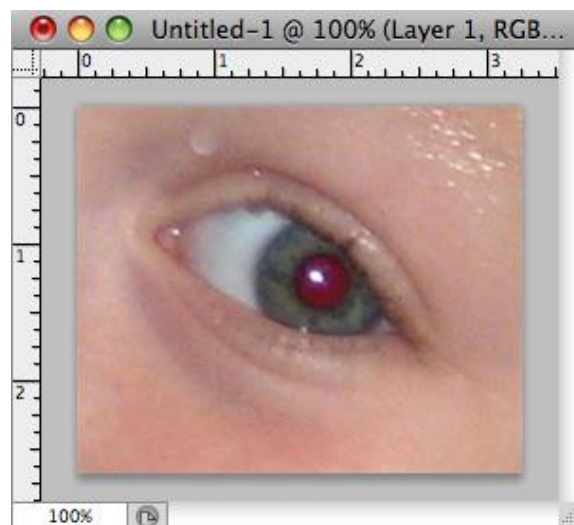
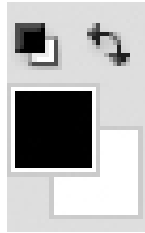


Figure 21. Red Eye Removal

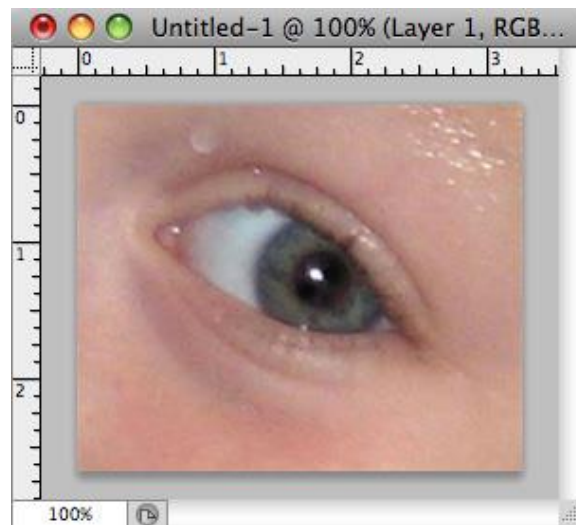
3. Make sure your default Foreground and Background colors are black and white.



4. Click and hold on the little black triangle of the Healing Brush Tool button and select the Red Eye Tool. (Figure 22).



5. Click on the red part of the eye and paint, holding down the mouse button. You will see how the red will disappear (Figure 23).



Hot Spot Removal

Using a flash can also cause another problem -shiny areas on people's faces or the flash reflection in the shiny surfaces. To correct this problem, follow the steps below:

1. Open the photo you wish to correct.
2. Select the Clone Stamp Tool from the Toolbox.
3. In the Options bar, change the Blend Mode from Normal to Darken (Figure 24).



4. Set the Opacity to 50 percent.

5. Choose a soft-edged brush, set the diameter to 40 or 50.
6. Hold down the Shift key and click in the clean area (without “hot spots”) to get a sample of color (Figure 25).
7. Paint over the “hot spot”, the light area will gradually darken (Figure 26).

Adding Flash

To fix underexposed photos, follow these steps:

1. Open a digital photo you wish to correct (Figure 27).



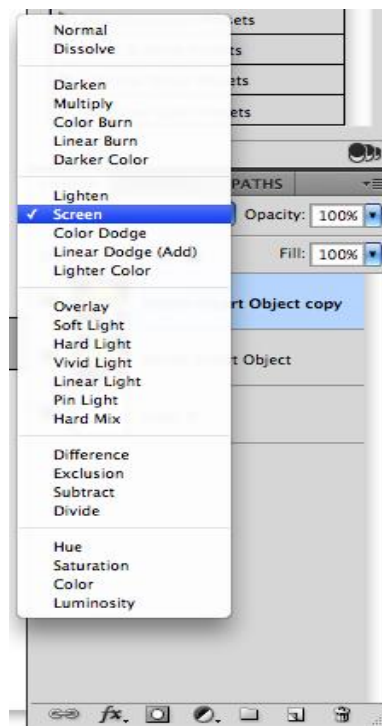
Remember

Blend Modes are widely used in Photoshop.

Remember

Color adjustment options in Photoshop CS5 can help you to make your digital photos look more natural.

2. In the main menu, go to Layers > Duplicate. In the next window, name the layer 1.
3. Make sure Layer 1 is selected in the Layers palette. In the Blending Mode drop down box, change the Blending Mode to Screen (Figure 28). The whole image will lighten.

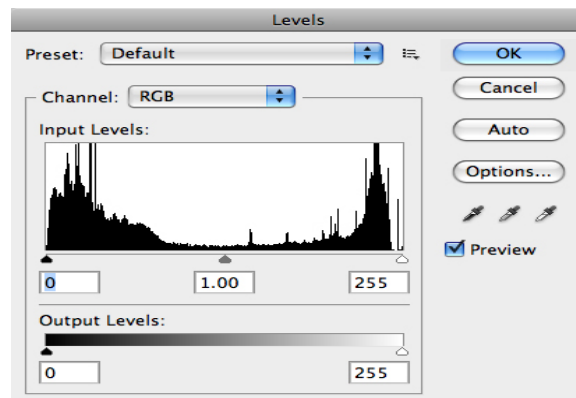


Color Adjustment

To color correct your images, follow these steps:

1. Open the image you wish to correct.

2. In the main menu, go to **Image > Adjustments > Levels**. You will see a dialog box displaying a diagram of the colors in your image (Figure 30). The black triangle is for shadows, the gray is for mid tones, the white is for highlights. In the Channels dropdown menu, you can choose between RGB, Red, Green, or Blue. These indicate whether your changes affect all the colors, or just one (red, green, or blue).



Make sure the Preview box is checked off. Choose the channel you wish to change and drag the triangles.

Dragging the black triangle to the right will make the shadows in your photo darker; dragging the white triangle to the left will make the highlights in your photo lighter; dragging the gray triangle to the left will make the mid tones in your photo lighter, dragging it to the right will make the mid tones darker. You will be able to see the changes in your image.

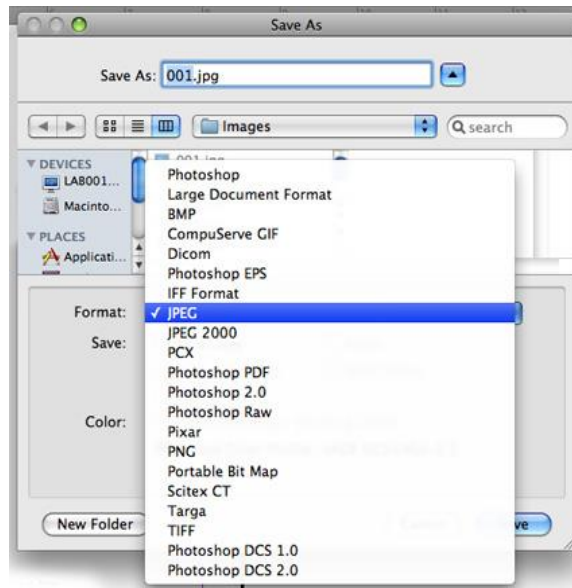


Corrected Image

Remember to save your work often. Saving frequently lessens the risk of losing the work you have been doing.

To save your Photoshop document, do the following:

1. Click File > Save.
2. Navigate to the place you would like your document to be saved by using the drop down menu and the navigation window.
3. Enter the name of your document in the Save As text field.
4. Choose a format to save your project in from the Format dropdown menu. (Figure 33)



Do you know?

“Save as” is used to save changes in existing file with other name, format or location.

Figure 23. Save as Dialogue Box

5. Click the Save button in the bottom right corner of the dialogue box.
6. Check to make sure that your document is saved in the place you intended.

Procedure to Use Slicing Images for the Web

When you define a rectangular area in an image as a *slice*, Photoshop creates an HTML table to contain and align the slice. Once you create slices, you can turn them into buttons, and then program those buttons to make the web page work.

Any new slice you create within an image (a *user slice*) automatically creates other slices (*auto slices*) that cover the entire area of the image outside the user slice.

Figure 1 shows the Slice tools, which are located in the Crop tool group. Drag the Slice tool over the image, and it will create a rectangular area indicating that a slice has been made. As you slice the image, you'll notice that other slices are created automatically (see Figure 2).

Remember

Photoshop default format is PSD, larger file size.
JPEG is flattened image with smaller size.



Figure 1 Press and Hold Down the Tool in the Toolbar to Display the other Tools in that Tool Group.

Do you know!

Photoshop can export information in a layout based on CSS. However, it's much easier to cut the graphics with a table-based mindset, and then create a CSS layout for the images later.



Figure 2 The Sample Website with One Slice Drawn on the Header.

Do you know!

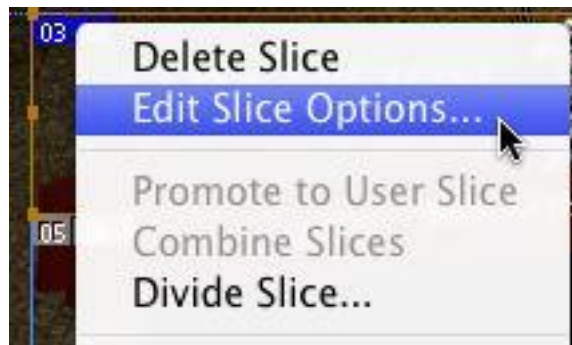
If you plan to use the option to export from Photoshop as HTML only, adding your URL in slice options dialog is a good idea, as it eliminates the need to do this later.

Images in HTML files from Photoshop need to be placed into a table. HTML tables were originally designed to show tabular data, but before long had become the standard way to align and position graphics on websites. Photoshop's ability to create automatic rows and columns with data makes it easier for designers to export graphics to the Web, eliminating guesswork. Just slice the graphics you need, and Photoshop will take care of the rest.

The slices that you create will automatically generate their own custom names based on presets. However, these slices won't add HTML functionality, such as `<a>` tags, unless you specify that information first.

The Slice Select tool (also located under the Crop tool) will let you highlight the individual slices of an image. To change the settings for the Slice Select tool, right-click the image and select Edit Slice Options (see Figure 3).

The Slice Options dialog allows you to specify how you want to name the individual slices, as well as a web address to which you want to link the sliced image (see Figure 4).



Remember

When slicing your website design remember that each slice will become a separate cell of a table and image so try to keep the slices as few and as simple as possible.

Figure 3 Right-Clicking the Slice Brings up the Slice Options Menu.

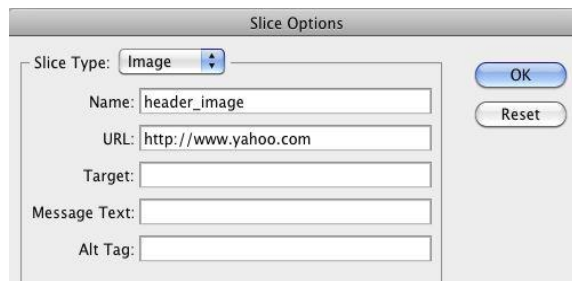


Figure 4 Slice Options Dialog.

By using the slice options to provide specific names, you'll make it a lot easier to find the graphic files that you need when you set up the image later, using HTML in a text editor or using Dreamweaver CS5.

The most common problem you'll encounter when using the Slice tool is Photoshop's tendency to create too many slices. This is usually a result of the user making slices that don't conform to a tabled layout. In Figure 5, I've drawn a slice, but I didn't have the slice matching the border (as all of the other button slices on the left did), so Photoshop tried to help me by creating a lot of unnecessary slices.



Figure 5 Our Sample Website with Slices for a Header and Menu.

To fix a problem like this, use the Slice Select tool and click the slice. Once the slice is selected, drag the resize handles to align the errant slice with the other slices that you've made. You'll know that the slice is positioned correctly when the automatic slices disappear (see Figure 6).

Do you know!

In earlier versions of Photoshop saving a sliced image for the web could only be done with Image Ready but now it's all built into Adobe Photoshop CS3.



Figure 6 Snap One Slice to another by Dragging the Selected Slice to Align it with the other Slice.

At the End: Mostly used Photoshop Shortcuts

Esc	help	F1	F2	F3	F4	Brushes F5 Palette	F6	Layers F7 Palette	Info F8 Palette	F9	F10	F11	F12
~ Tidy	1	2	3	4	5	6	7	8	9	0	-	+	Backspace
TAB Hide Palettes	Q Quick Mask	W Move Tool	E Eraser	R R Rotate Tool	T Text	Y History	U Shap es	I Eyedropper	O Dodge Burn Tool	P Pen	[Brush S et] Brush Tool	\
Caps Lock	A Path Selection	S Stamp	D Default Colors	F Full Screen	G Gradient	H Hand	J Holding Brush	K Slice	L Lasso	:	;	'	Enter
Shift	Z Zoom	X Switch Colors	C Crop	V Move	B Brush	N Notes	M Marquee	<	>	/	?	Shift	
Ctrl	Windows	Alt	Space bar Hold down for hand tool								Alt	Windows	Ctrl
Ctrl + O	Open	Ctrl + U	Hue & Saturation	A	Path Component Selection Tool	R	Blur / Sharpen / Smudge Tool	S	Clone Stamp Tool	T	Type Tool	U	Shape Tool
Ctrl + N	New	Ctrl + Z	Undo	B	Paintbrush Tool	S	Clone Stamp Tool	T	Type Tool	U	Shape Tool	V	Move Tool
Ctrl + S	Save	Ctrl + T	Transform	C	Crop Tool	D	Default Colors	E	Eraser Tool	F	Cycles Between Screens	W	Magic Wand
Ctrl + W	Close	Ctrl + J	Increase Brush Size	D	Default Colors	E	Eraser Tool	F	Cycles Between Screens	G	Gradient / Paint Bucket Tool	Y	History Tool
Ctrl + Q	Quit program	Ctrl + I	Decrease Brush Size	F	Eraser Tool	G	Gradient / Paint Bucket Tool	H	Hand Tool	I	Eyedropper / Measure Tool	X	Switch Colors
Ctrl + K	Preference	Ctrl + +	Zoom In	H	Hand Tool	I	Eyedropper / Measure Tool	J	Healing Brush / Patch Tool	K	Slice Tool	L	Lasso Tool
Ctrl + P	Print	Ctrl + -	Zoom Out	J	Healing Brush / Patch Tool	K	Slice Tool	L	Lasso Tool	M	Marquee Tool	N	Notes / Audio Record
Ctrl + R	Ruler	Ctrl + 0	Fit on Screen	L	Lasso Tool	M	Marquee Tool	N	Notes / Audio Record	O	Dodge / Burn / Sponge Tool	P	Pen Tool
Ctrl + D	Deselect	Ctrl + Shift + V	Paste Info	M	Marquee Tool	N	Notes / Audio Record	O	Dodge / Burn / Sponge Tool	P	Pen Tool	Q	Quick Mask / Standard
Ctrl + I	Invert	Ctrl + Shift + L	Auto Levels	P	Pen Tool	Q	Quick Mask / Standard	R	Blur / Sharpen / Smudge Tool	S	Clone Stamp Tool	T	Type Tool
Ctrl + G	Group With Previous	Ctrl + Shift + I	Inverse Selection	R	Blur / Sharpen / Smudge Tool	S	Clone Stamp Tool	T	Type Tool	U	Shape Tool	V	Move Tool
Ctrl + J	Jump Layer	Ctrl + Shift + B	Auto Color	S	Clone Stamp Tool	T	Type Tool	U	Shape Tool	V	Move Tool	W	Magic Wand
Ctrl + E	Merge Down	Ctrl + Shift + Z	Multi Undo	T	Type Tool	U	Shape Tool	V	Move Tool	W	Magic Wand	X	Switch Colors
Ctrl + F	Repeat Last Filter	Ctrl + Shift + T	Transform Again	U	Shape Tool	V	Move Tool	W	Magic Wand	X	Switch Colors	Z	Zoom
Ctrl + B	Color Balance	Ctrl + Shift + O	File Browser	V	Move Tool	W	Magic Wand	X	Switch Colors	Z	Zoom	Ctrl + Shift + I	Invert Selection
Ctrl + L	Levels	Ctrl + Shift + G	Ungroup Layer	W	Magic Wand	X	Switch Colors	Z	Zoom	Ctrl + Shift + I	Invert Selection	Hold the Shift to add to a Selection	
Ctrl + M	Curves			X	Switch Colors	Z	Zoom	Ctrl + Shift + I	Invert Selection	Hold the Shift to add to a Selection		Hold the Space Bar for the Hand Tool	

Adobe Dreamweaver CS5

Before building the pages using Dreamweaver it is a common practice to design the layout of the pages in an image editing software like Fireworks or Photoshop. You will also create and optimize any required images to be used in the website in Fireworks.

Main steps to creating a website in Dreamweaver are:

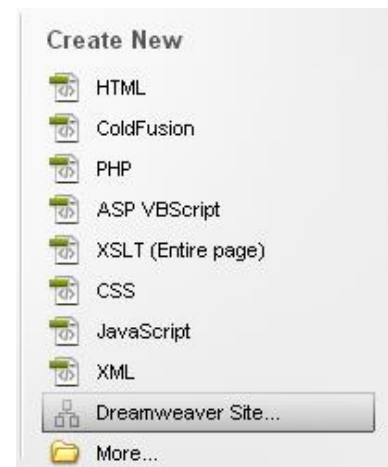
Step 1: GUI introduction

Step 2: Define a site

Step 3: Dreamweaver CS5 Template

Step 4-Dreamweaver Website Layout

Step 5: CSS Layout – Dreamweaver CS5



Step 6: Dreamweaver DIV/ CSS Layout

Step 7: Understand Dreamweaver Menu

Step 8: Editing Styles in Dreamweaver

Step 9: Editable Regions in Dreamweaver Template

Step 10: Linking to webpages in Dreamweaver

Step 11: Heading Styles | Dreamweaver

Step 12: Contact Forms | Dreamweaver

Step 13: Form Styles | Dreamweaver

Step 14: Test Website | Dreamweaver

Step 15: FTP/ Upload Files to Hosting Server | Dreamweaver

Remember

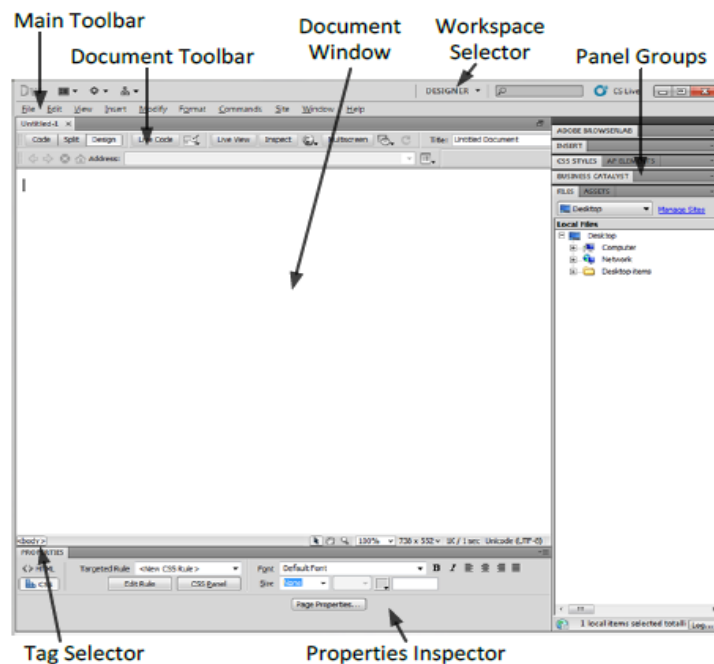
Follow the instructions of Dreamweaver CS5 installation and usage to build a website in Module 6.

Step 1: GUI Introduction

The GUI of Dreamweaver CS 5 has the following parts:

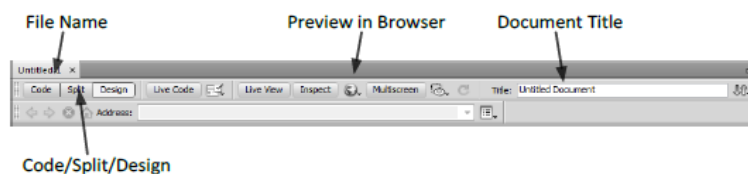
Parts of the Dreamweaver Window

The Dreamweaver window contains the following main elements:



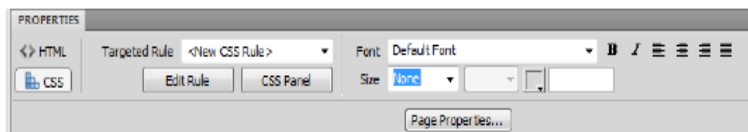
Document Toolbar

The document toolbar changes how we view the web page file. The main commands that we will use are:



Properties Inspector

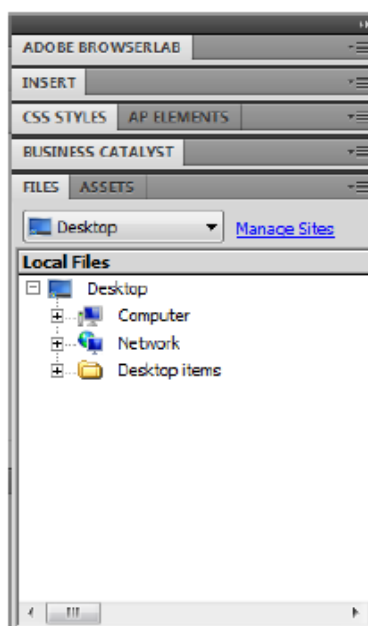
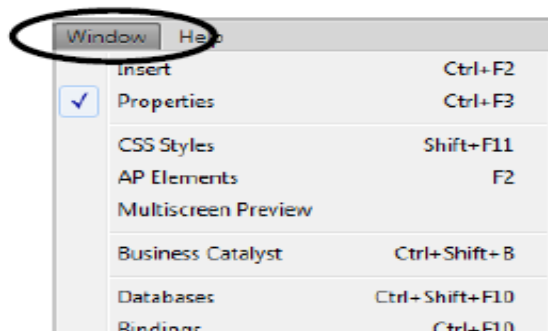
The properties inspector lets us view and change the properties of a selected object in the document window. Each type of object has a different set of properties.



Panel Groups

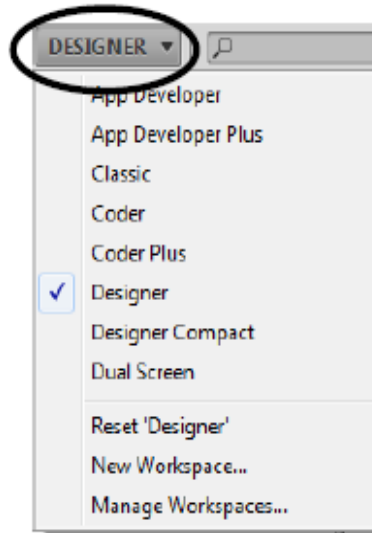
The panel groups provide information as well as methods to make changes to the web files and website.

To open or close a panel group, click the name of a panel. If you need a panel that is not currently displayed, go to the Window menu and select the panel.



Workspaces

Workspaces are different layouts for the Dreamweaver window. You can select a workspace from the Workspace selector button, or you can save a new workspace.



Step 2- Define a Site

The first step is to define the site within Dreamweaver.

In the opening screen click 'Dreamweaver Site'

In the Site Setup window give the site a name and specify the folder on your computer where all the files will be stored (by clicking the folder icon next to the Local Site Folder field).

Click the 'Save' button when done.

You will notice that the 'Files' panel will reflect the above details.



From the 'Files' panel you will be able to easily access all the files of your website. Images must be saved in "Images" folder.

Step 3- Dreamweaver CS5 Template

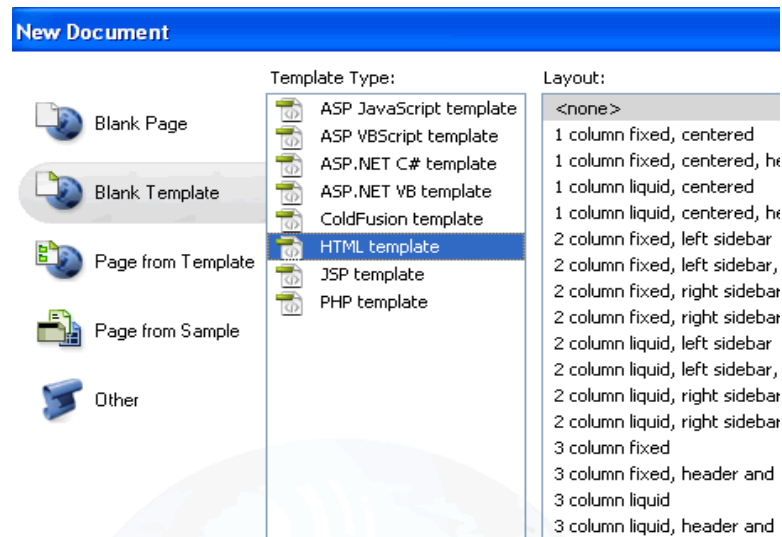
Once we have defined our site it is time to create a Dreamweaver CS5 template. This template will form the basis for all our website pages and will contain our main layout and design elements. Once this template is created the website pages can be created from it, the page specific content can be added in.

To create a Dreamweaver CS5 template, click 'File' on the main menu, then click 'New...'

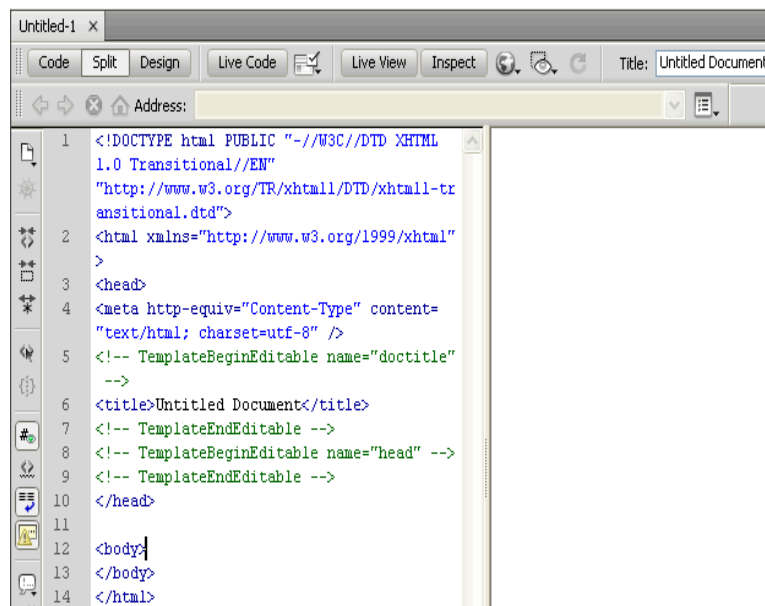
In the 'New Document' window that opens:

Select **"Blanks Template"** > **"HTML Template"** > Select **"None"** from layout

Click **"Create Button"**.



You will get the following screen:



Remember

Dreamweaver has various prebuilt templates.

This is a split screen view of your template file. The left shows the HTML code and the right shows how the page will look.

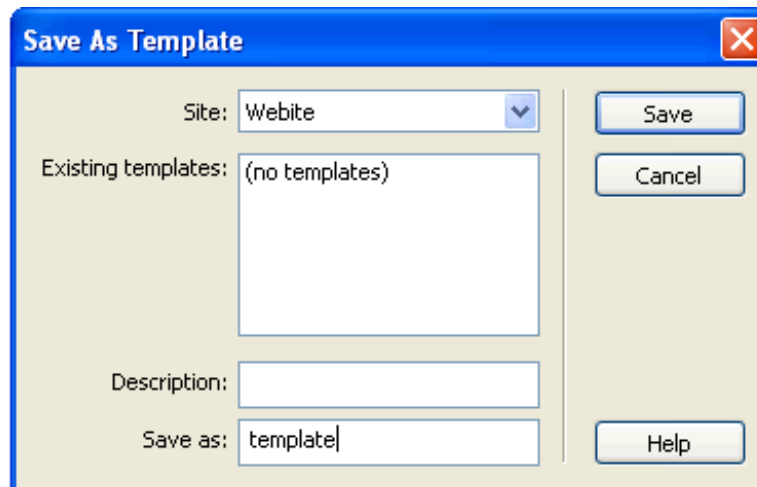
Click the 'Design' button at the top, to get into the Design View.



If you need to see the HTML code at any point you can click on the 'Code' or 'Split' button.

Save the file [**File> Save**].

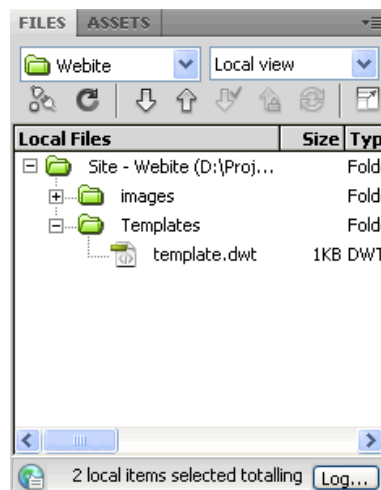
You will get a message that the template does not have any editable regions. This is ok. Give it a name. I have given it the name 'template'.



Do you know!

Dreamweaver allows you to create the webpage without actually writing HTML code as Dreamweaver writes the HTML code for you.

If you look in your Files panel you will see that your template has been saved as **template.dwt** within a new folder entitled 'Templates'



Step 4- Dreamweaver Website Layout

Now let's get ready to create the Dreamweaver website layout.

A website layout usually consists of a header area, menu bar, content area and a footer area.

- The **header** area consists of the logo and masthead.
- The **menu** bar consists of the main menu items with links to the various pages. This allows the visitor to navigate through the site.
- The **content** area is where the main content of the page will appear.
- The **footer** area will have the copyright information and may repeat the links that appear in the main menu area.



We will now recreate this layout in Dreamweaver.

Step 5: CSS Layout – Dreamweaver CS5

Before we actually get into designing the layout, it is helpful to understand what's involved in designing a CSS layout using Dreamweaver CS5.

A webpage is created using HTML code. HTML is made up of various 'tags'. It was not too long ago when web pages were designed using tables [Insert > Table], however this is no longer a good practice. Now it is best to design CSS based webpage layouts.

There are 2 parts to a CSS based website layout:

1. **DIV** (short for division) tags divides the content into individual sections.
2. **CSS** (short for Cascading Style Sheet) styles the div tags.

DIVs can be of 2 types:

- Class
- ID

The difference between 'Class' and 'ID' is that a class can be used multiple times in a page while an ID can only be used once.

- The style for a class will begin with a dot '.'
- The style for an ID will begin with a hash '#'

Keeping in mind the website layout that we have planned we will need to create at least 4 DIVs create a CSS and specify the properties for each of the div tags by defining styles of the same names i.e. header, menu, content and footer.

The style sheet can reside within the HTML page or external to the HTML page but linked to it. It is advisable to create an external style sheet so that changes can be made to this one file which will reflect on all the linked pages.

Dreamweaver CS5 Website Header

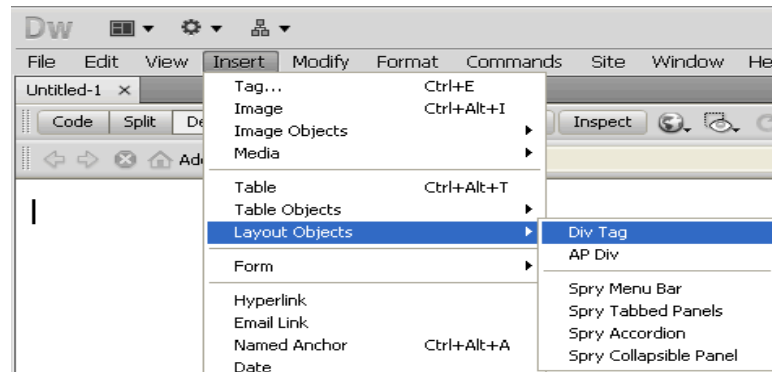
Now let's create our website header. This is the top portion of the website with the logo and masthead.

As per our layout it looks like this:



We will need to create a div called 'header' and a style also by the same name 'header'.

- Select **'Insert' > Select 'Layout Objects' > Select 'Div Tag'**



Since we are going to have only one header on the page, we can make this an ID.

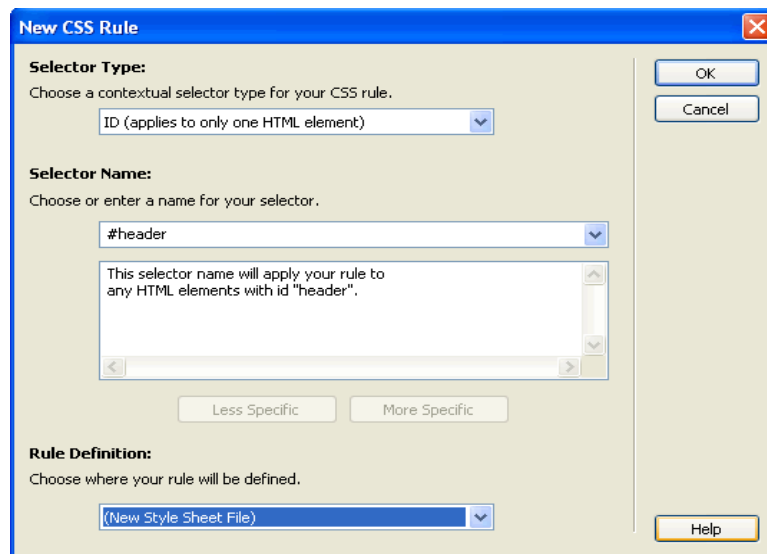
- In the Insert Div Tag Window enter 'header' next to ID.



- Now click on the 'New CSS Rule' button.

In the New CSS Rule window:

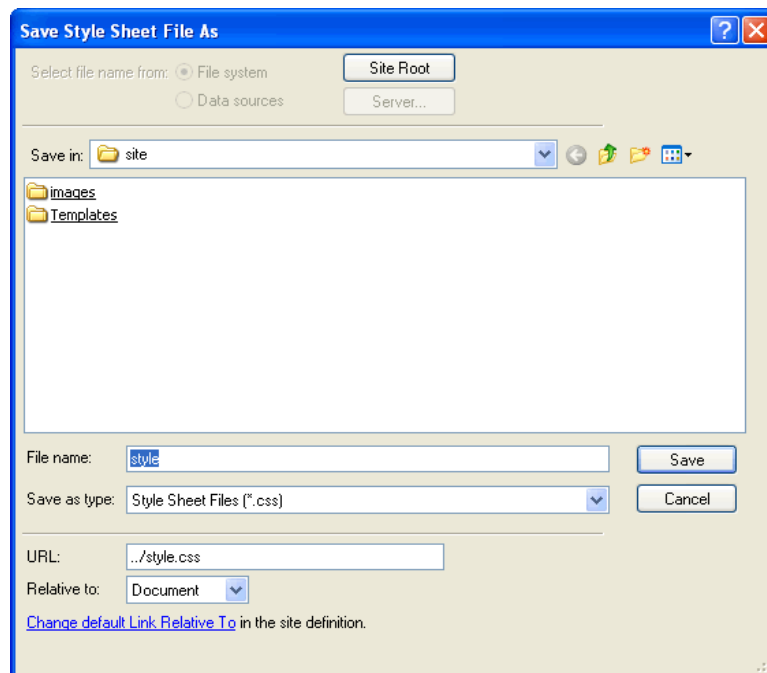
- You will see '#header' is automatically entered by Dreamweaver.
- Select 'New Style Sheet File' from the bottom drop down menu.
- Click the OK button



- Give the file name 'style' for the stylesheet.
- Click the 'Save' button.

Do you know!

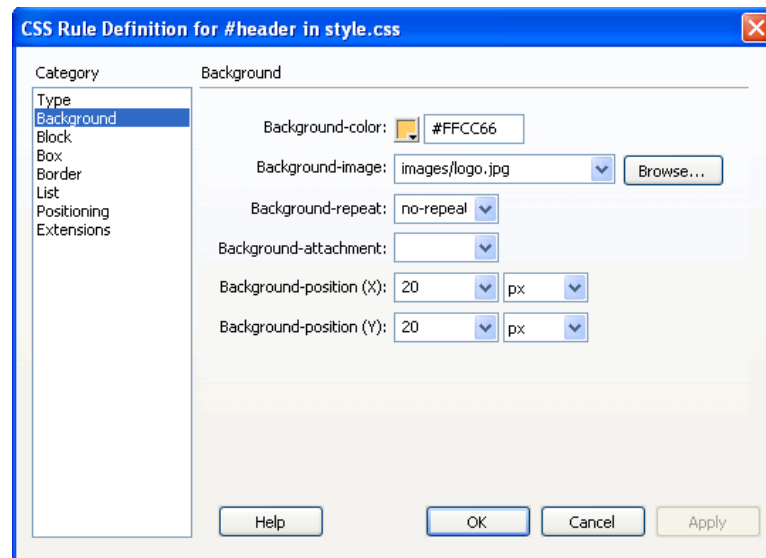
Linking "style.css" to html file is called "External Style Sheet"



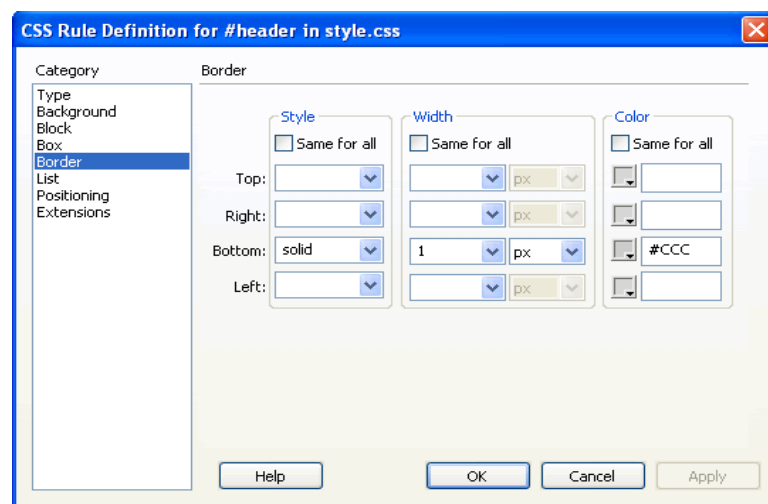
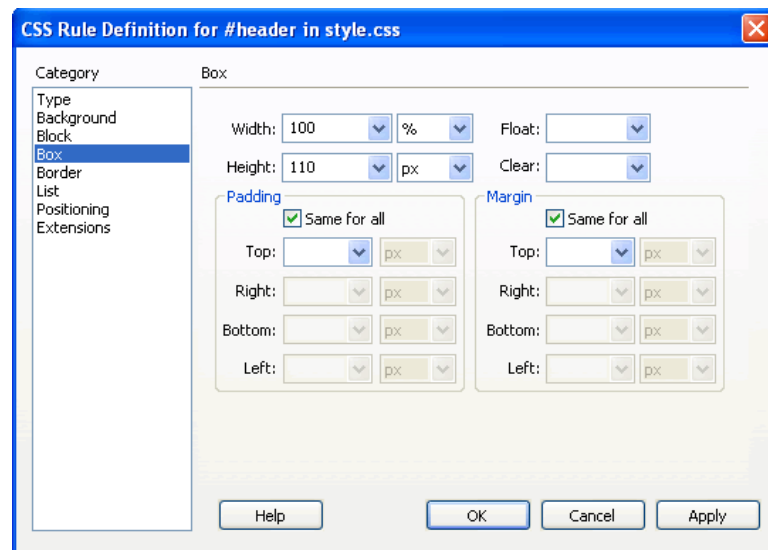
You have now created a stylesheet file names style.CSS and saved it in your site's folder.

In the 'Style Rule Definition for #header in style.CSS' window we can now specify the style properties of the header div tag. We can specify the background color, dimensions and borders. We can also specify the path to the logo image as well as its position in this style.

- Enter the following details for Background, Box and Border:

**Remember**

CSS is used for setting appearance of Website.



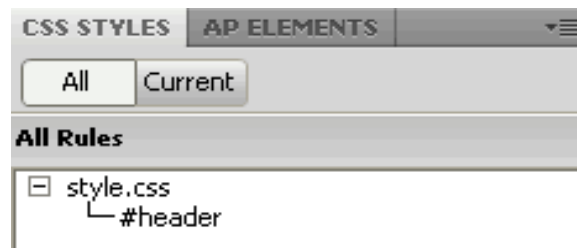
- Click the 'OK' button.

The header div and style has been created and looks like this:



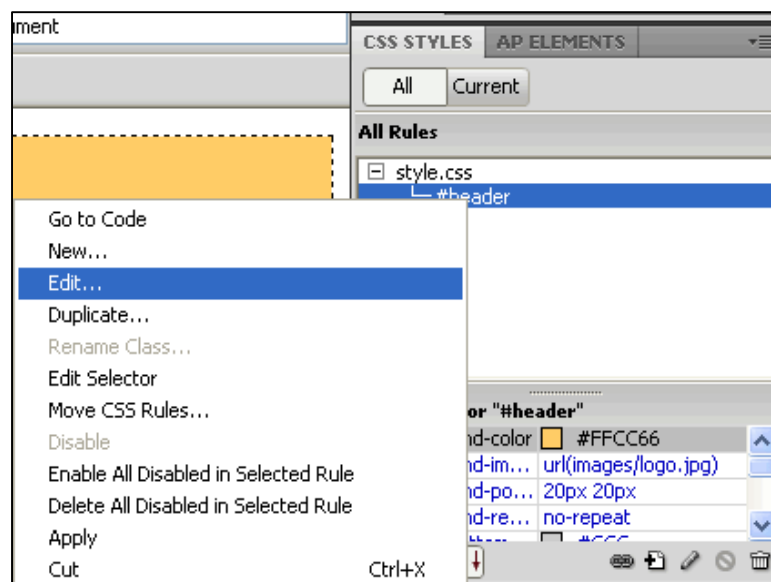
- Delete the text 'Content for id "header" Goes Here'.

If you look at the CSS Styles panel, you will see the header style.



To edit the header style:

- Right click the 'header' style
- Click 'Edit...'
- This will open the "CSS Rule Definition" window where you can edit the style.



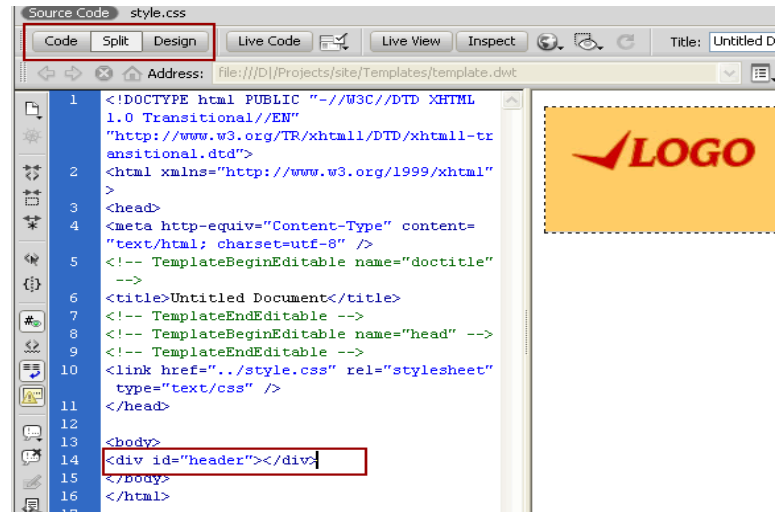
- Save the template.

Step 6: Dreamweaver DIV/ CSS Layout

Now it is time to complete the Dreamweaver DIV/ CSS Layout.

Using the same principles that we used to create the header area with its associated div tag and CSS style, let us now create the menu area, the content area and the footer area.

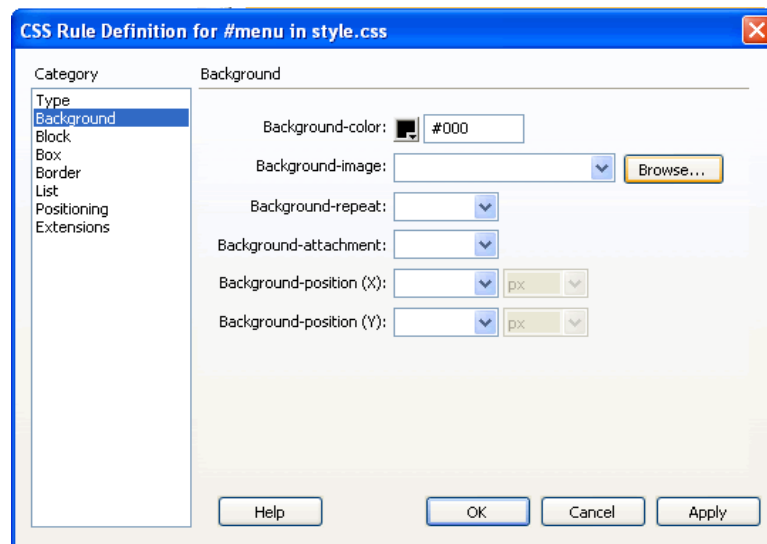
- Click the 'Code' or 'Split' buttons to see the HTML code create thus far.

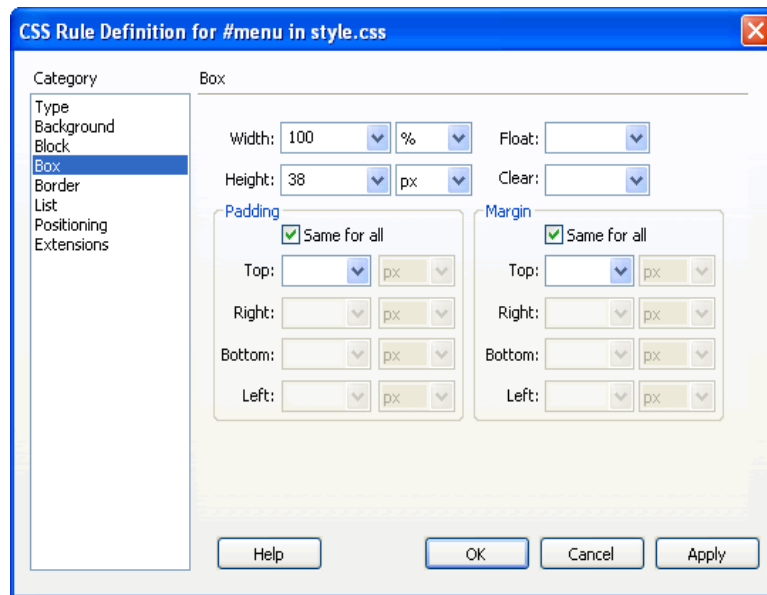


- Click after the header div tag ends (so that the next div tag is inserted after the header div).

Create a menu div tag and style (the same way you created the header div and style).

- Insert > Layout objects > Div tag
- Enter 'menu' against ID
- Click the 'New CSS Rule' button
- Make sure that the style rule will be defined in "style.CSS"
- Click the OK button
- Enter the following properties:





- Click the 'OK' button to save the CSS Rule definition for #menu in style.CSS
- Click the 'OK' button to save the 'menu' Div tag
- The web page and code will look like this. The menu div is created and styled. The text "Content for id 'menu' Goes Here" is automatically inserted by Dreamweaver (though you may not be able to see it because of the black background of the menu area). Select and delete this text.



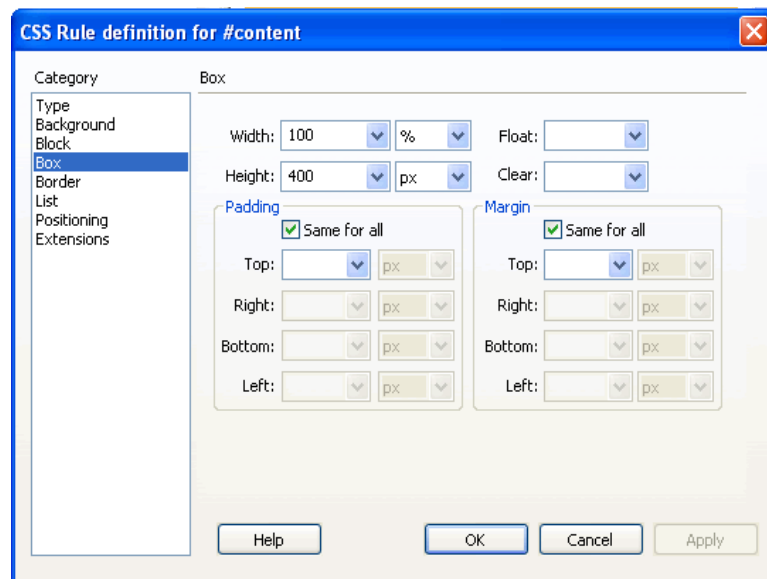
Click after the menu close tag in the Code view

```
<div id="menu"></div>
```

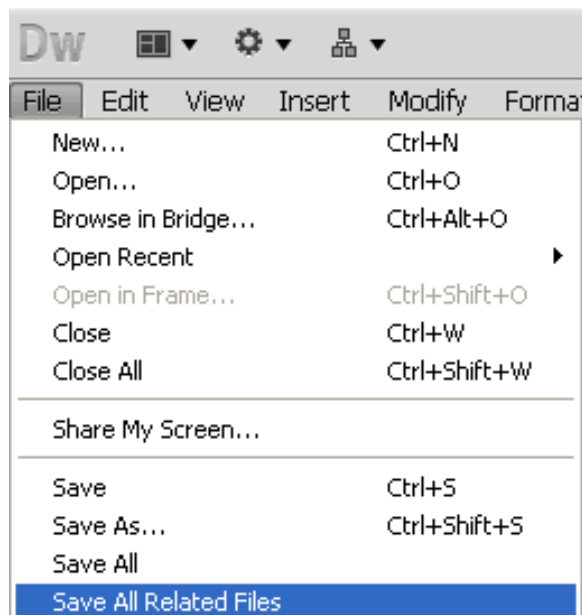
Now let us create the content area:

- Insert > Layout objects > Div tag
- Enter 'content' against ID
- Click the 'New CSS Rule' button

- Make sure that the style rule will be defined in "style.CSS"
- Click the OK button
- Enter the following properties:



- Click the OK button to store the style and then click the OK button to store the div tag.
- Save the template and the associated CSS [File > Save all Related Files].



Finally let us create the footer area:

- Insert > Layout objects > Div tag
- Enter 'footer' against ID

- Click the 'New CSS Rule' button
- Make sure that the style rule will be defined in "style.CSS"
- Click the OK button
- Enter the following properties:
 - Background > Background color: #000
 - Box > Width: 100% , Height: 30 px
- Click OK and OK
- Select and delete the text "Content for id "footer" Goes Here"
- Save all related files

Now the basic layout of the webpage is ready.

Step 7: Understand Dreamweaver Menu

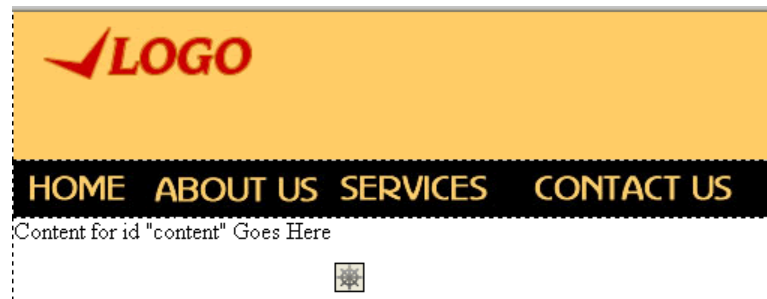
Now that our web layout is ready in Dreamweaver, let us work on the menu. Since the menu will appear in all the pages of the site it is advisable to put this into the template as well.

Our main menu items are going to be images since the text is written in a font that may not be available on all the visitor's computers. These have already been created in Fireworks and are available in your images folder.

We will simply insert these images into the menu area now. We will link them to the associated pages after we create the respective pages.

To insert the menu images:

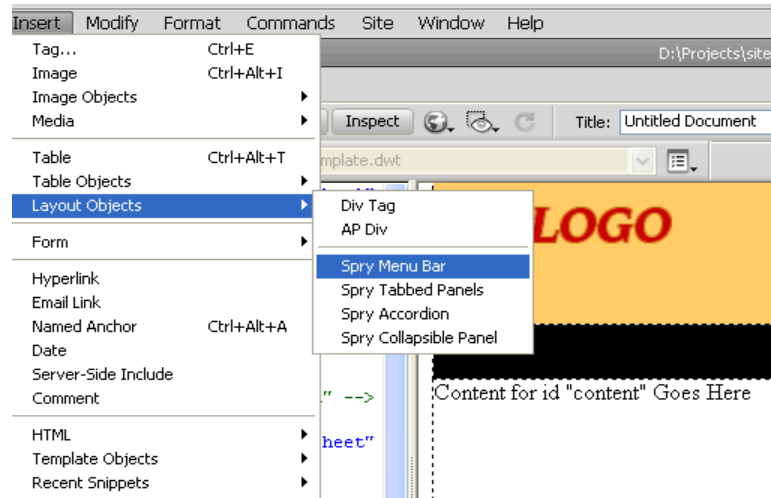
- Click in the menu area
- Insert > Image > Browse to the images folder and click home.jpg
- Click the OK button
- You will see the Home image appears in the menu area of your layout.
- Click after the home image
- Repeat the above procedure for the images about-us.jpg, services.jpg and contact-us.jpg.
- The menu layout now looks like this:



Spray Menu

Spray Menu bar is built in functionality of Adobe Dreamweaver CS versions that automatically adds drop down menu list in web applications.

In case you want to use drop down menus you can use the Dreamweaver feature – **Spry Menu Bar** [Insert > Layout Objects > Spry Menu Bar> then follow the instructions]



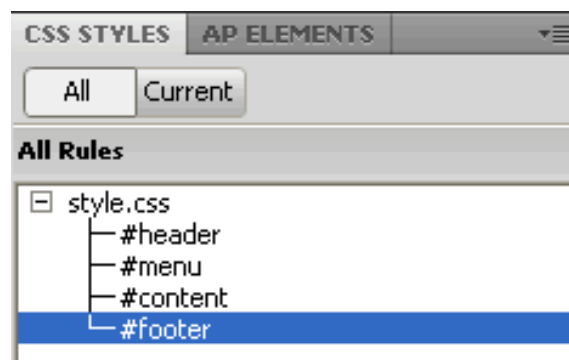
Step 8: Editing Styles in Dreamweaver

Let us now create the footer menu and copyright information.

The footer menu will be made of text so we simply need to type in the menu items: 'Home', 'About Us', 'Services' and 'Contact Us'.

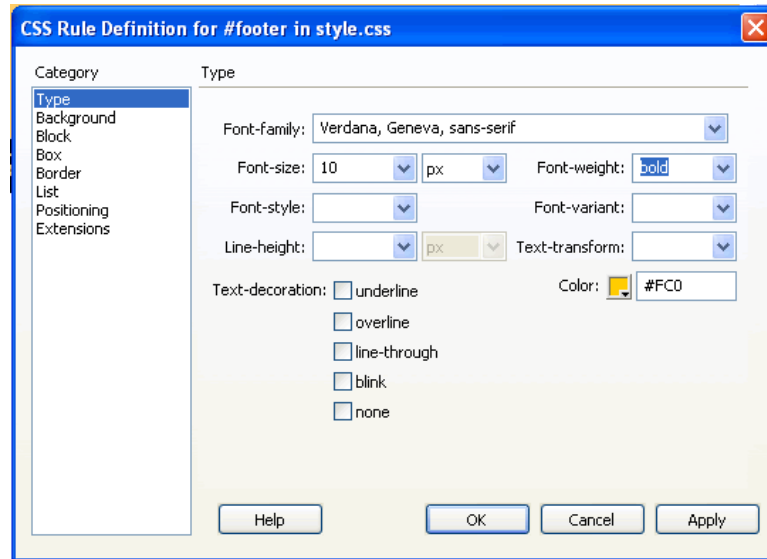
The text is not visible because of the black background. Let us edit the #footer stylesheet and specify the yellow text color.

- Select the footer style in the CSS styles panel

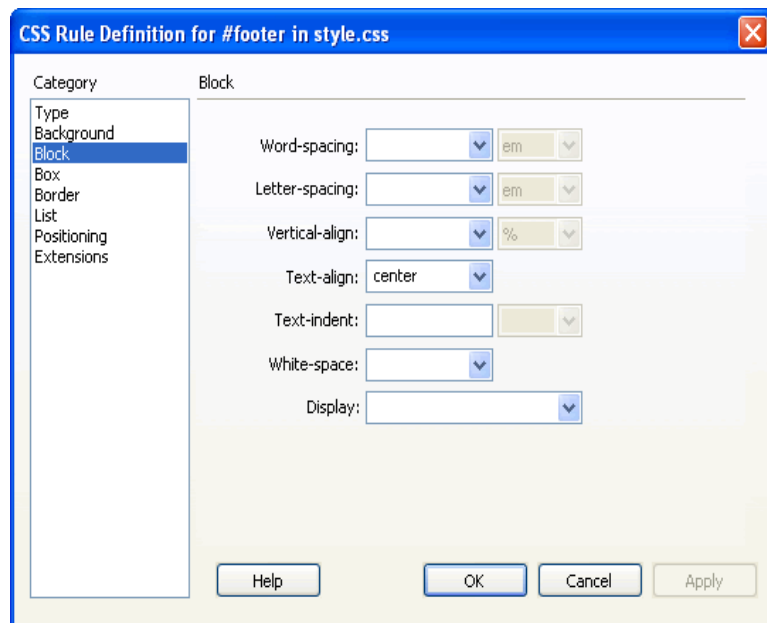


- Right click on the #menu style and then select 'Edit...'

- Specify the following style details:



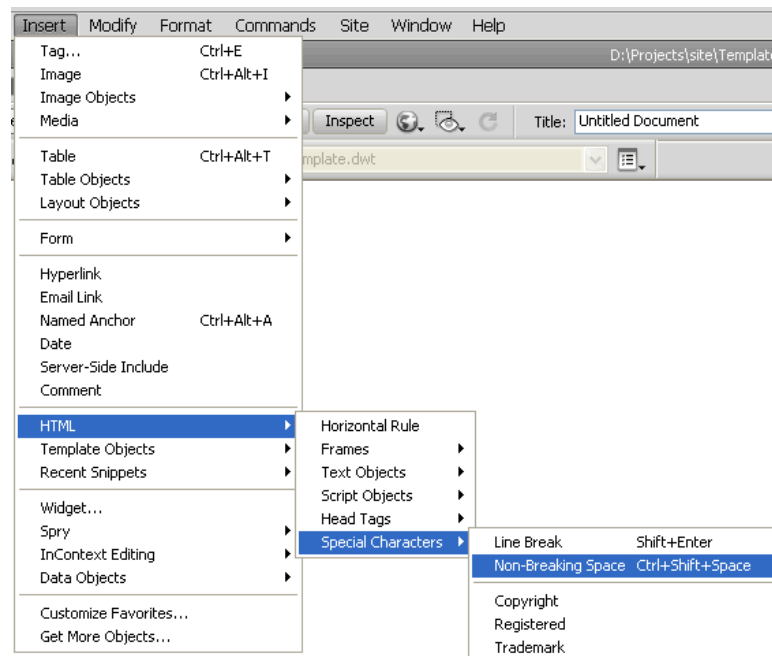
- To center the text



- Click the OK button
- The footer now looks like this:



To add more than one space between the menu items you will need to add a non-breaking space [**Insert > HTML > Special Characters > Non-Breaking Space**]



- Insert 2 – 3 non breaking spaces between the menu items
- The footer menu now looks like this:

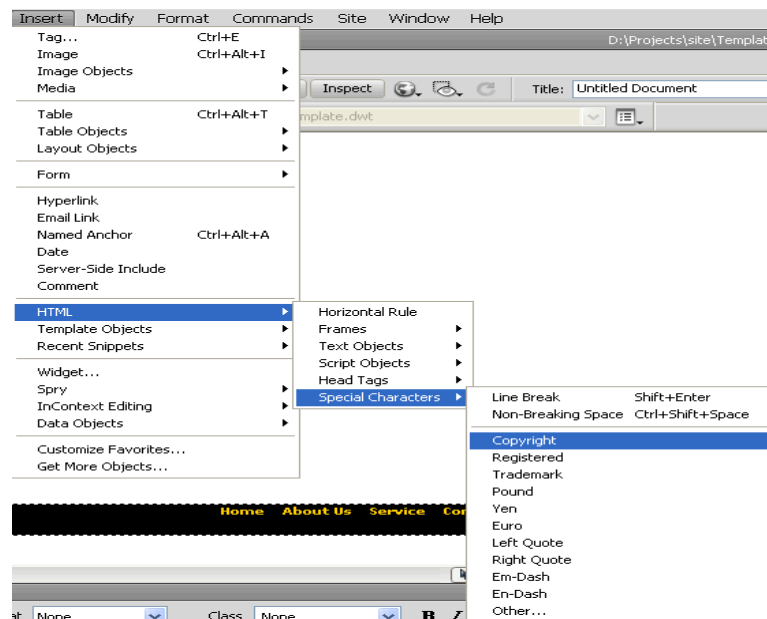


Now let's add the copyright information below the footer menu:

- Press the Shift and Enter keys to get on the next line
- Insert the copyright symbol [Insert > HTML > Special Characters > Copyright]

Remember

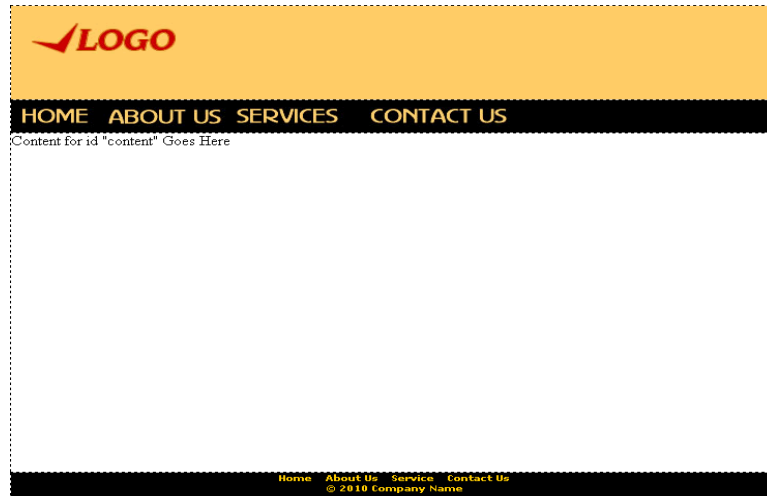
Website Menu can be on left or right side of layout instead of top.



- Type in the text '2010 Company Name'
- The footer now looks like this:



Our webpage now looks like this in Dreamweaver:



Step 9: Editable Regions in Dreamweaver Template

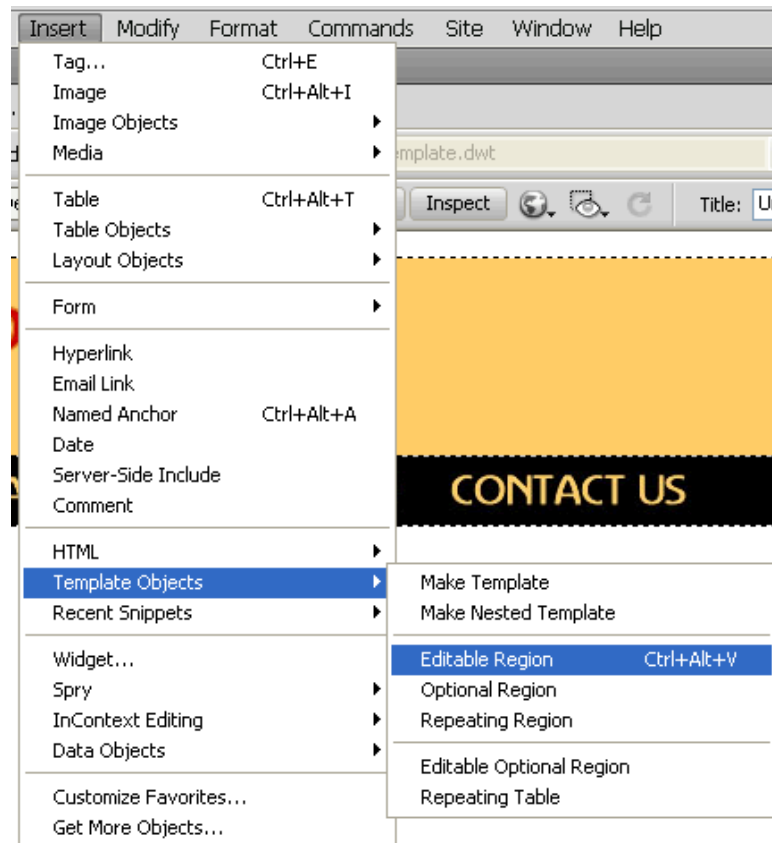
Now that our template layout is more or less complete it is time to define the editable regions within the Dreamweaver template.

The editable regions can be different in different web pages. Since the content of different pages will differ, we will create an editable region within the content area.

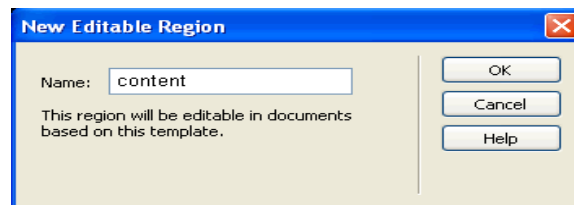
To create editable regions in a Dreamweaver Template:

Select and delete all the text in the content area i.e. delete 'Content for id "content" Goes Here'

Insert > Template Objects > Editable Region



In the 'New Editable Region' window enter the name of the editable region 'content'.



Click the OK button

The Editable Region in the Template will look like this:



Save All Related Files

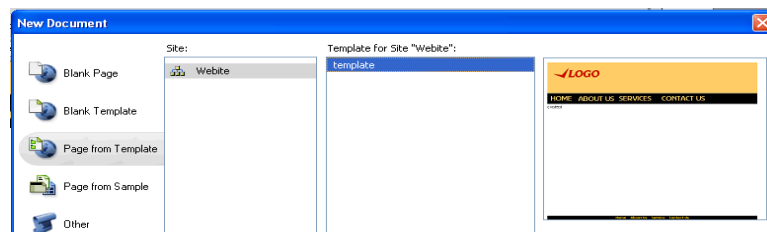
Our Dreamweaver template is now ready

Webpages in Dreamweaver

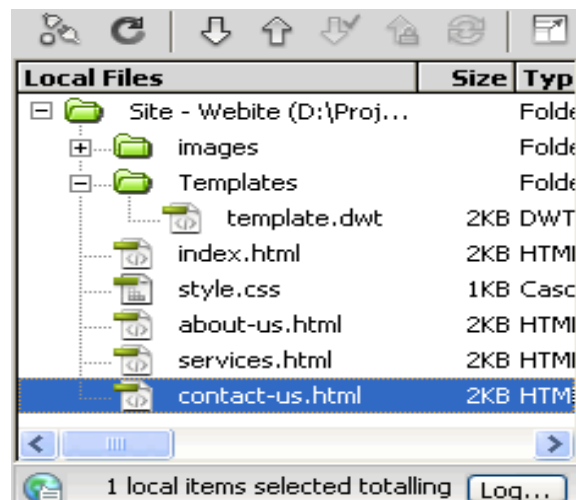
Now that our template is ready let us make the 4 webpages of our site – home, about us, services and contact us.

The homepage file is usually named 'index'. This is recognized by your hosting server as the home page and is shown when someone types in your domain name into the browser. HTML pages end with the file extension .htm or .html and it is a good practice not to have spaces in the file names, so we will create the following files:

- index.html
- about-us.html
- services.html
- contact-us.html
- To create a webpage in Dreamweaver select 'File' from the Dreamweaver Menu, then select 'New'.
- From the New Document Window, select 'Page from Template', then our website's name under 'Site' and finally the template name under Template

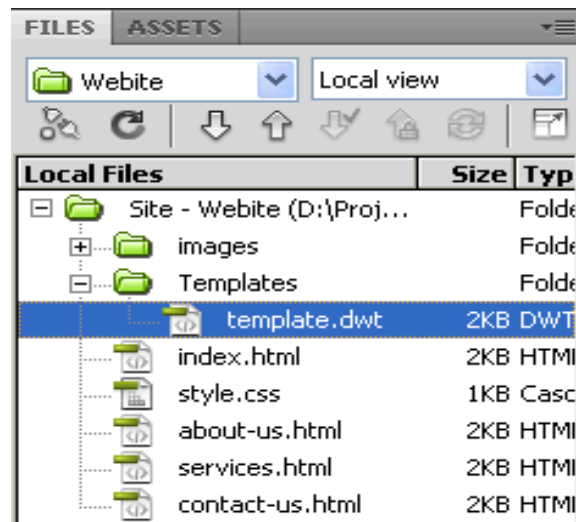


- Click the 'Create' button.
- Dreamweaver will create an HTML page using the template.
- Save [**File > Save**] the file as index.html
- We have created our first html page. Repeat the process to create the other 3 pages.
- The 'Files' panel will look like this:

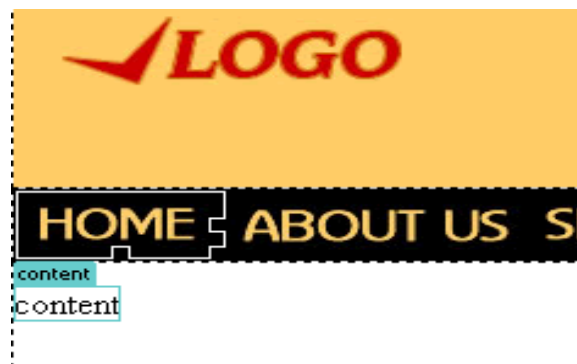


Step 10: Linking to Webpages in Dreamweaver

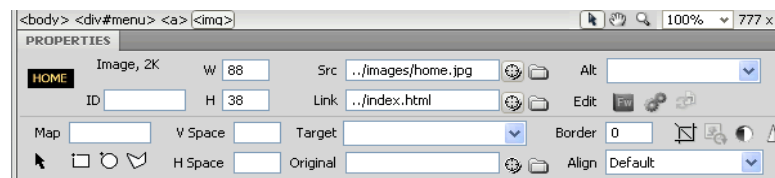
- Now that all our pages have been created we can link them from the main menu and the footer menu.
- Since our menus are in the template, let's open the template file and create the links to the webpages in Dreamweaver.
- If your template file is not already open, double click on template.dwt in the Files panel.



- Click on the 'Home' image in the menu area to select it:

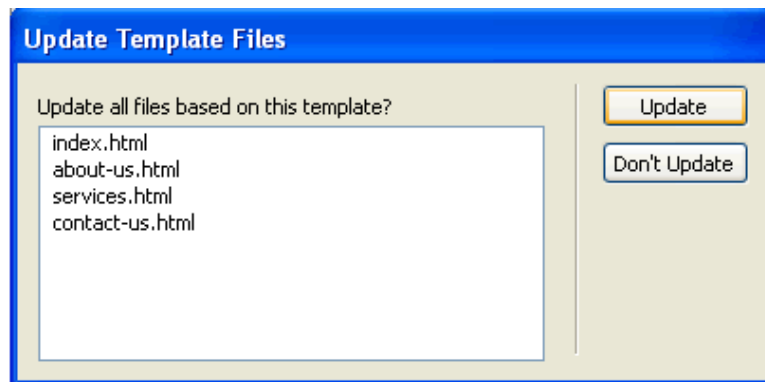


- In the Properties panel link to index.html, by clicking on the folder icon next to the Link field and then selecting index.html.
- Type 0 (zero) in the Border field otherwise there will be a blue border around the menu image.



- Similarly select the other 3 menu images and link them to the respective files.
- The main menu navigation is now ready.

- Save the template and all the website files created from the template [**File > Save All**]
- In the Update Template Files window click the Update button. This will update all the site pages that were created from this template so you don't need to go into each page and make the changes again and again. This is the main advantage of using a Dreamweaver template as a base for all your website files.

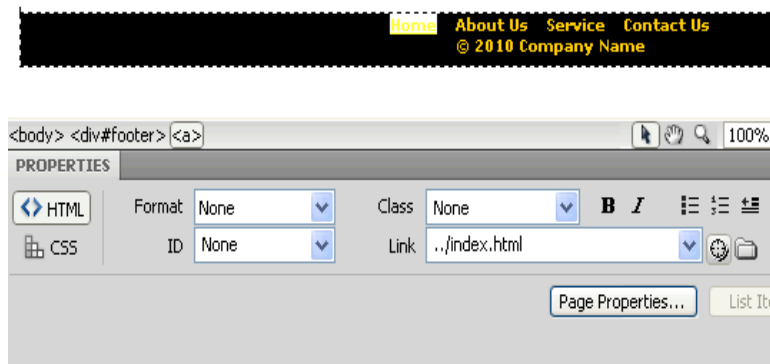


Styles for Text Links in Dreamweaver

Now let us link the footer menu items. Once we link them we will also need to define a style for the linked text otherwise they the links will turn blue.

To link the footer menu items:

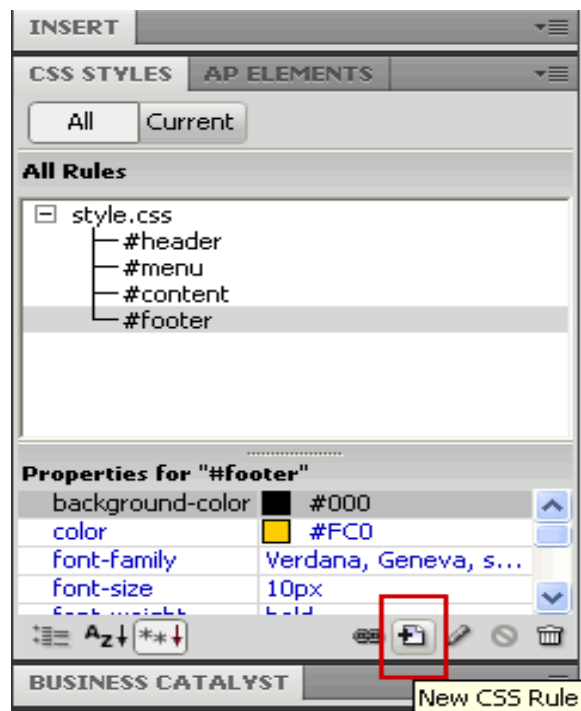
- First select 'Home' in the footer area
- Click the folder icon next to the link field in the Properties panel, and select index.html.



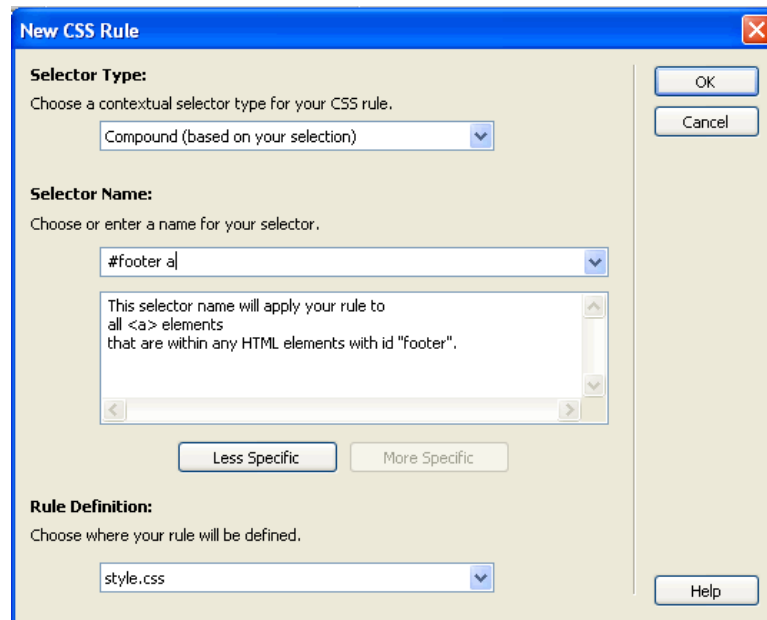
- You will notice that the Home link and turns blue

We need to create a style for the linked text in the footer div. To do this:

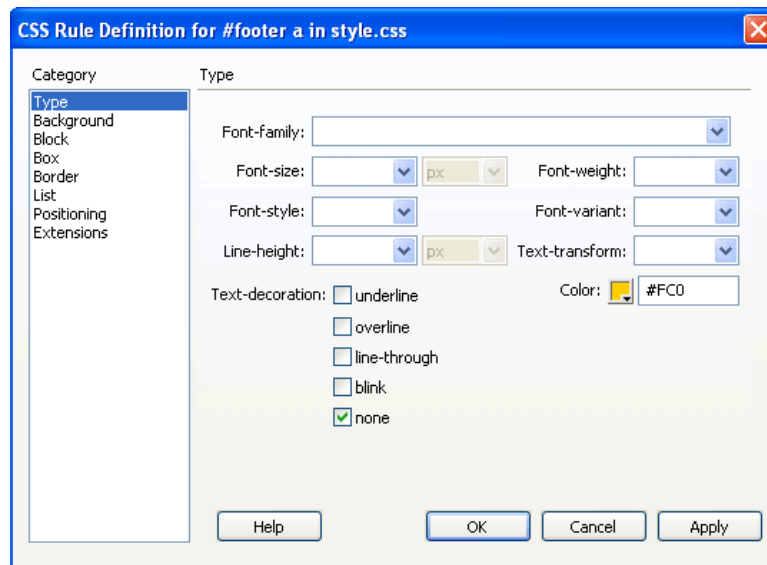
- Click on the 'New Style Rule' icon at the bottom of the CSS Styles panel.



- In the New CSS Rule Window select 'Compound' under 'Selector Type'
- Enter "#footer a" under Selector Name



- Click the OK button
- Enter the following style details:



- You will notice that the Home link looks as it did before it was linked. Link the remaining 3 menu items to the respective html pages.



- The footer menu is ready. Save the template and update all pages.

Web Page Content

Now that we have created the pages of our site and linked them together, let us enter the web page content.

- In the Files panel, double click index.html to open it.
- Select and delete the word 'content'



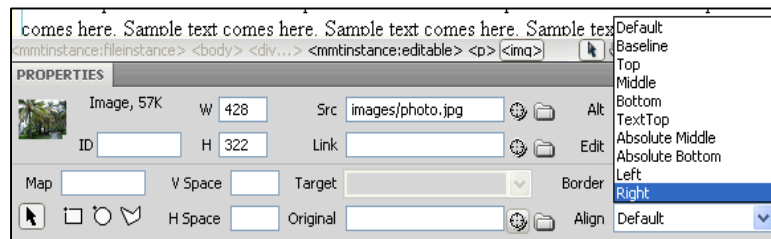
- Type in your website's home page text.
- See how your web page will look by previewing it in a browser [File > Preview in Browser > select the browser of your choice]

Now let's us insert an image and align it right. To do this:

- Click before the start of the text
- Insert > Image** > browse to the 'image' folder > select photo.jpg. The image will be inserted into the web page.



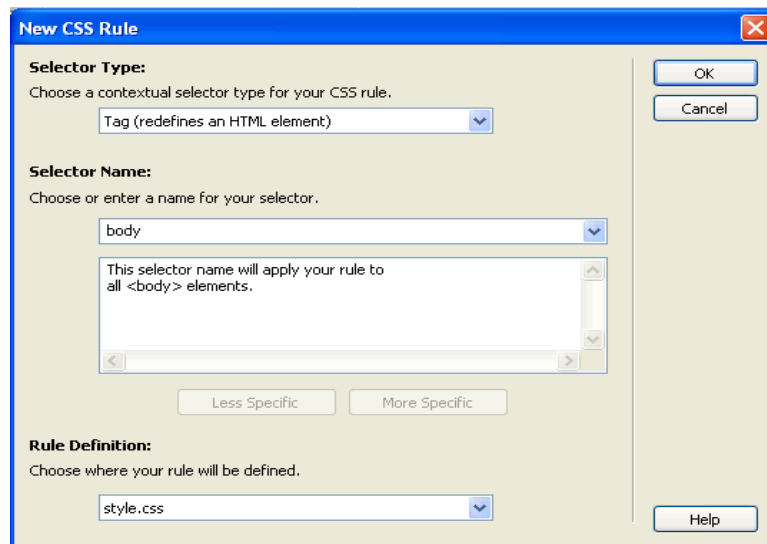
3. Now we need to align it right. Click on the image.
4. In the Properties panel, select 'right' from the drop down menu next to 'Align'.



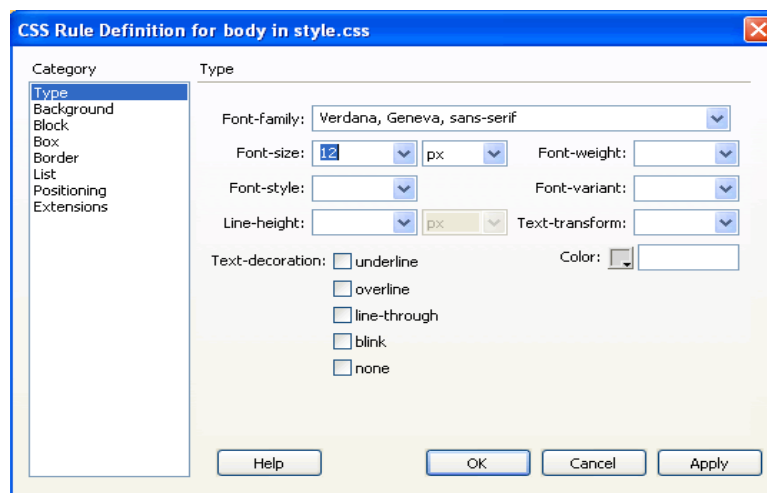
5. The image will be aligned right.

Text Styles in Dreamweaver

1. We have added the text to our pages but the default font doesn't really look good. Let us specify the text styles in Dreamweaver.
2. All the visible content in the web pages will be between the <body> tag in HTML. We can specify the properties of this body tag in our style sheet so that all the text in our web pages display in the Verdana/ Helvetica font and are a size 12px.
3. To do this:
4. Click on the 'New CSS Rule' icon at the bottom of the CSS Styles Panel
5. In the 'New CSS Rule' window, under 'Selector Type', select 'Tag'
6. Under 'Selector Name', select or type 'body'



7. Click OK
8. In the 'CSS Rule Definition' window for 'Font Family' select 'Verdana, Geneva, sans-serif'
9. For Font-size, type '12' and select 'px'



10. Click OK
11. The style of the text in the web page will change. It looks better now!

Remember

There are total 6 headings in HTML h1, h2, h3, h4, h5, h6.



Step 11: Heading Styles | Dreamweaver

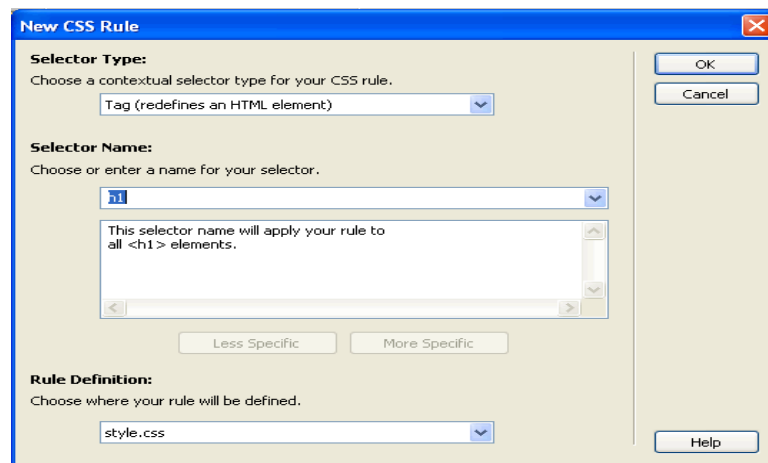
Now that we have specified the text font style it is time to define the heading styles in Dreamweaver.

HTML has various heading tags. Let us define the style of some of these specifically:

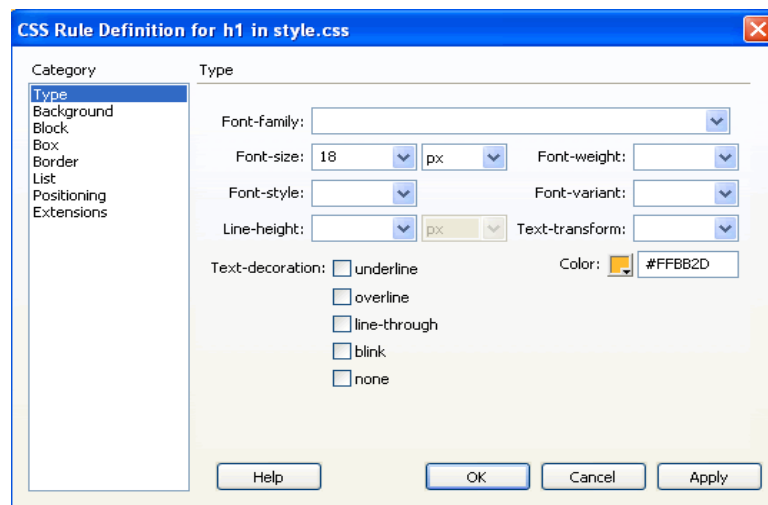
- H1 (Heading 1)
- H2 (Heading 2)

To define the style for the Heading 1 tag:

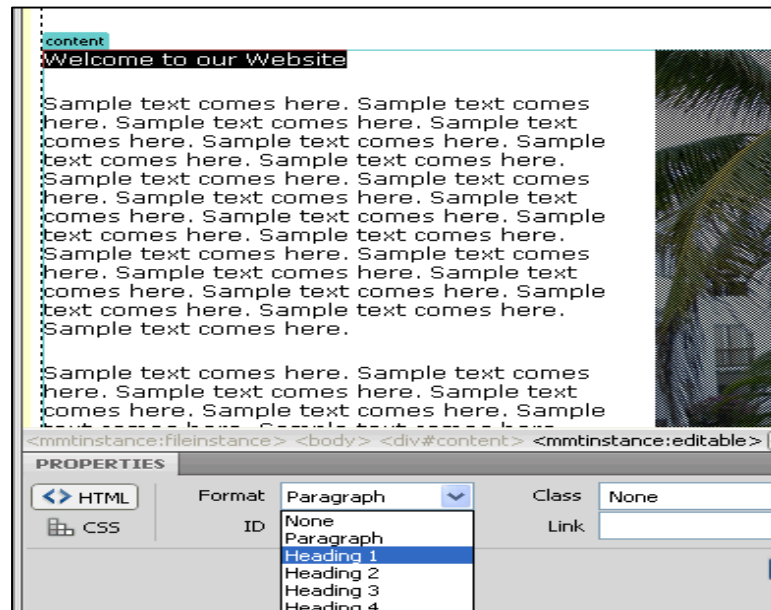
- Click the 'New Style Rule' icon at the bottom of the CSS styles panel.
- Selector Type: Tag
- Selector Name: H1



- Click OK
- In the 'CSS Rule Definition' window, specify the font size 18 px
- Set the color #FFBB2D



- Click OK
- Now select the heading text in your web page and apply the H1 tag by selecting Heading 1 from the Format drop down in the Properties panel.



- You will see that the style is applied to the heading text

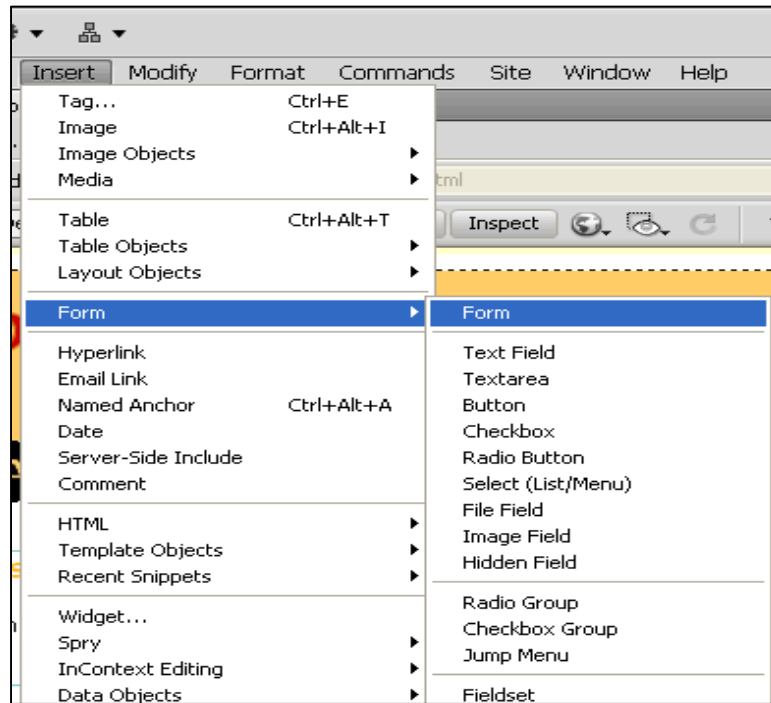


- If you plan to have sub-headings in your webpages you can define the styles for the H2 tag and apply the Heading 2 format to them. Usually the font size would be smaller than the H1 tag font size.

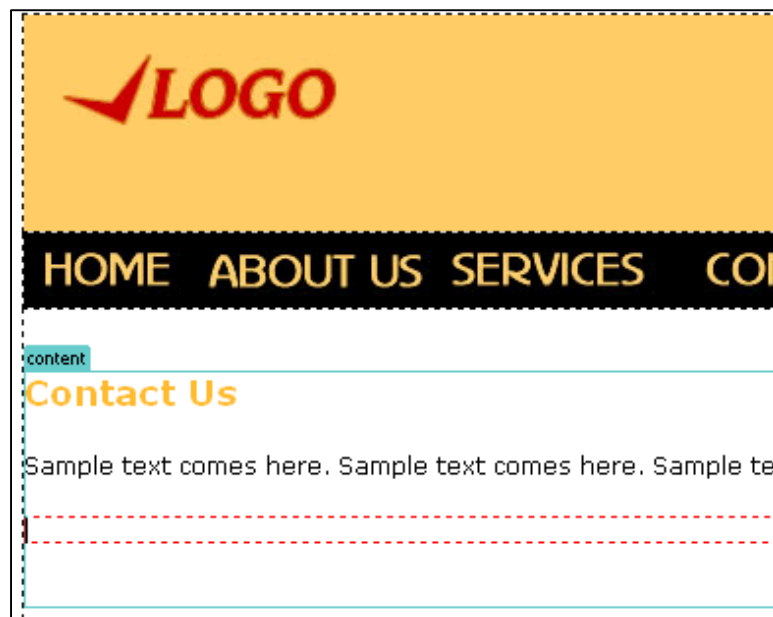
Step 12: Contact Forms | Dreamweaver

Most websites would need a contact form. Let us now create a contact form in Dreamweaver.

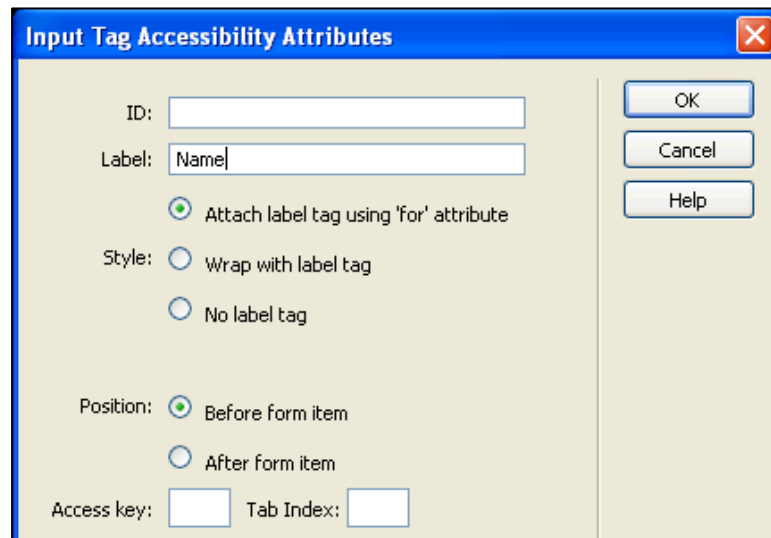
- Open the contact-us.html page.
- Click in the area that you want the form to appear
- **Insert > Form > Form**



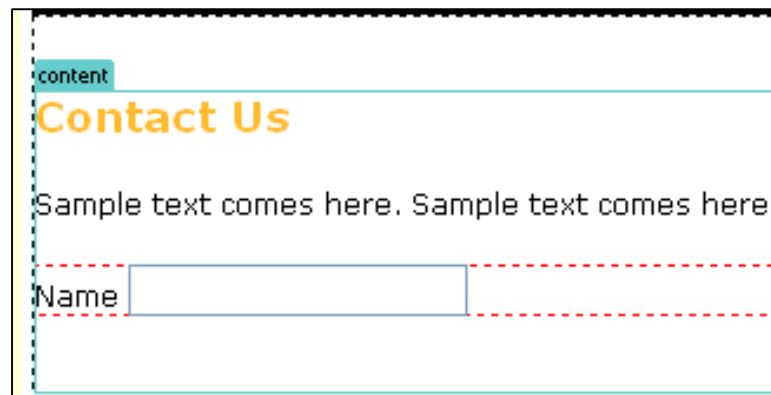
- A red dashed box will be visible in your page



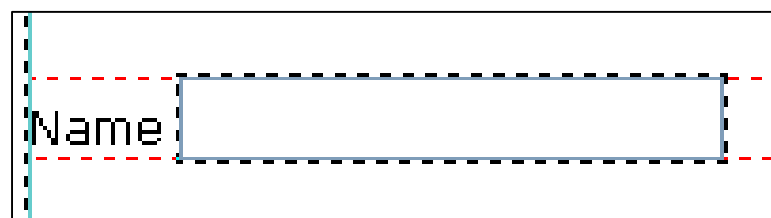
- All the form elements need to be placed within this red box
- Insert > Form > Text field
- Label: Name
- Style: Attach label tag using 'for' attribute
- Position: Before form item



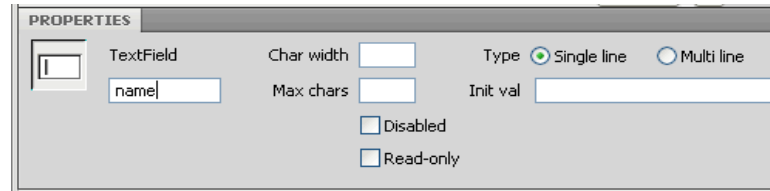
- Click OK
- The Name text field will appear in the web page



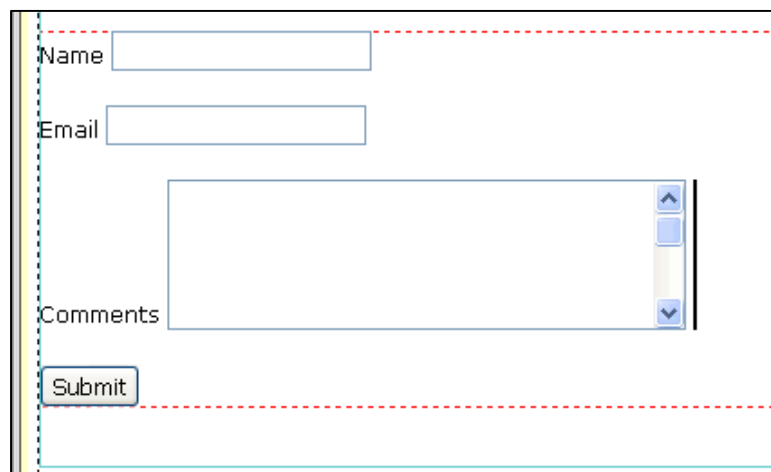
- Select the field by clicking on it



- Type 'name' in the Properties panel under 'Text Field'



- In the web page press the Enter button to go to the next line and insert another text field labeled Email
- Insert a Text area [Insert> Form > Textarea] labeled Comments
- Insert a button with no label [Insert > From > Button]
- The form will now look like this:

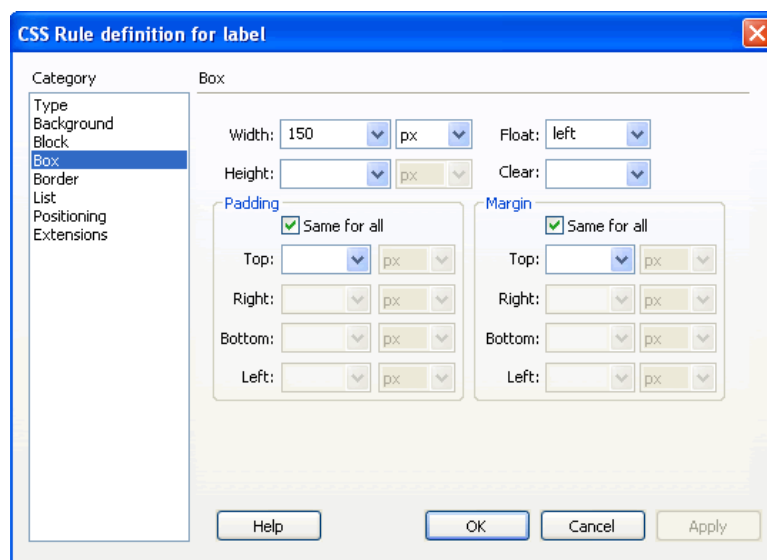


Step 13: Form Styles | Dreamweaver

We can make the form look more presentable by defining form styles in Dreamweaver.

We can give a style to the <label> tag. To do this:

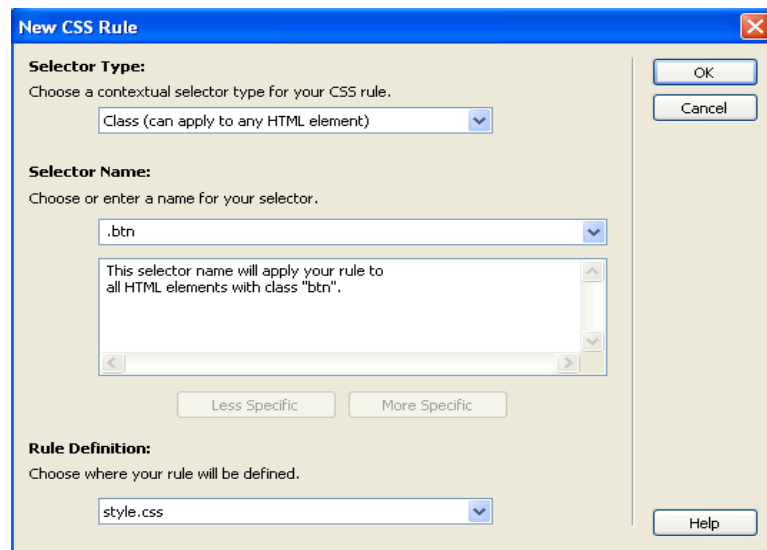
- Create a style for the label tag
- Click 'Box' and enter:
- Width : 150 px
- Float: Left
- Click OK



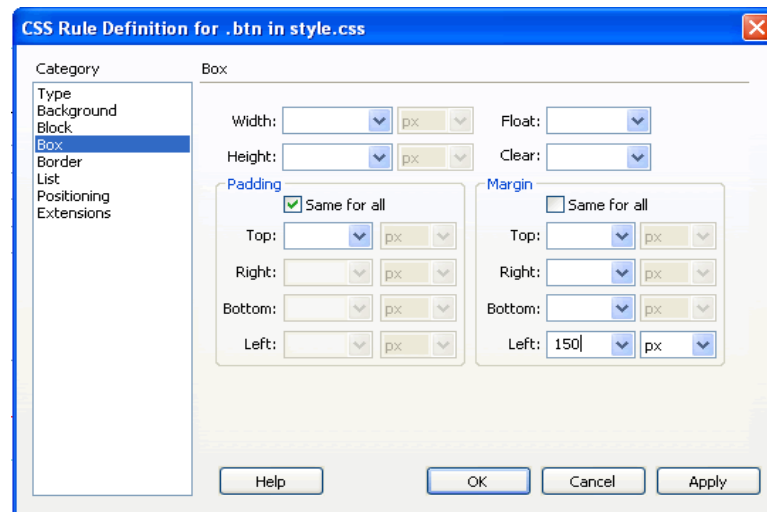
- The form looks better now:

Let's push the submit button to align with the form fields. To do this:

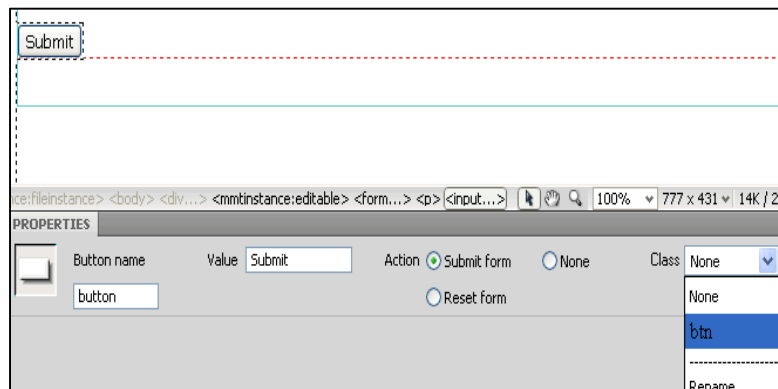
- Create a new CSS style
- Select Class and name it '.btn'



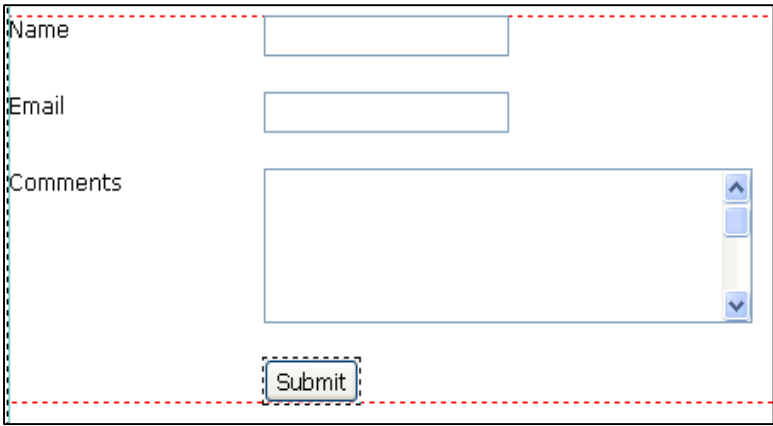
- Box > Left: 150 px



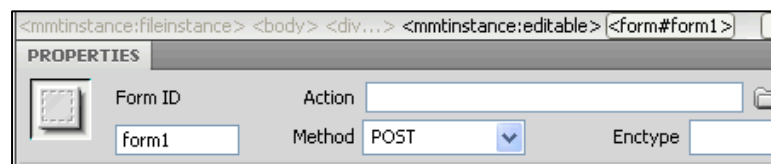
- Select the button on the web page and select 'btn' from the drop down next to Class in the Properties panel.



- The button moves to the right and aligns nicely with the other fields:

A web form with a dashed red border. It contains three input fields: 'Name' (a single-line text box), 'Email' (a single-line text box), and 'Comments' (a multi-line text area with a vertical scrollbar). Below these fields is a 'Submit' button. The form is set against a light blue background.

To program the form to be sent to specific email addresses when filled, you will need to install a php or asp form script and point the form to it in the action field of the Properties panel.



The php / asp script is out of the scope of this tutorial. However there are free service providers that take care of the programming for you as well.

Some of these free form service providers are:

- **Bravenet Email Forms**
(URL: <http://www.bravenet.com/webtools/emailfwd/>)
- **Response-o-Matic Forms**
(URL: <http://www.response-o-matic.com/>)
- **EmailMeForm**
(URL: <http://www.emailmeform.com/>)

Step 14: Test Website | Dreamweaver

Now that all our web pages are ready it time to test the website in Dreamweaver.

The best way to test the website is to actually see how it looks in the browser. It is a good practice to check the site in multiple browsers as some things which might work well in some browsers might not work so well in other browsers.

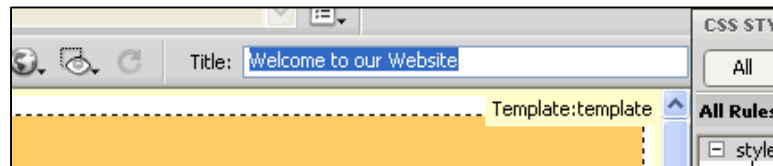
To test in a browser:

- File > Preview in browser > Firefox / IExplorer

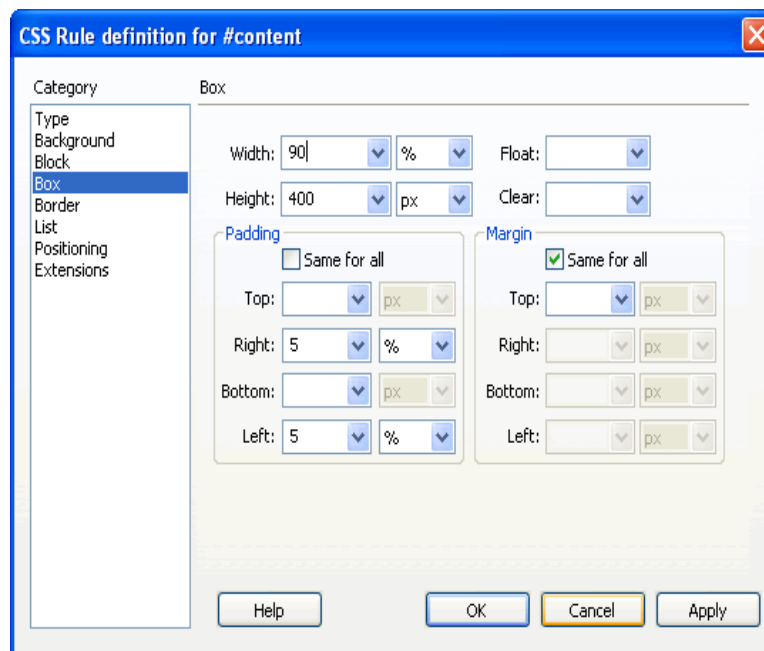
Some things to test for:

- Click on the main menu items and see if it links correctly to the appropriate pages

- Click on the footer menu items to check if each link links to the appropriate pages.
- Check if the headings are formatted correctly on each page
- Check if the text fonts are looking right on all the pages
- Check if the form fields are aligned correctly
- If you want you can do a spell check [Commands > Check spelling]
- Web page titles – these will appear in the top bar of the browser and by default will be 'Untitled Document'. These can be changed by entering the page titles for each page in Dreamweaver in the 'Title' field.



- Another thing you will notice is that the text is sticking to the left side of the browser. This does not look professional. To add some space on the left and right side of the content area you can edit the content style with the following details:
 - Reduce the width to 90%
 - Uncheck 'Same for all' below Padding
 - Enter 5% for left and right padding



Remember

File uploading software's can also be used for uploading to servers e.g. FileZilla, CuteFTP.

Do you know?

Famous hosting websites are Godaddy.com, Hostgator.com, dynadot.com, servage.net, whois.com etc.

Save all the files including the style.CSS file [File > Save All]

Test the site again by previewing all the pages in the browser. If everything is OK, it is time to upload the files and make your site live.

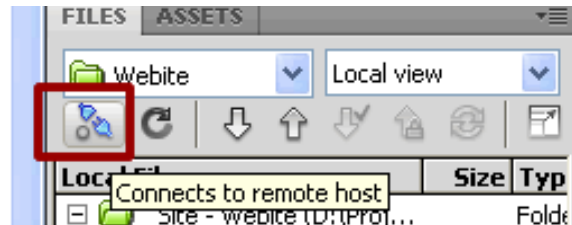
Step 15: FTP/ Upload Files to Hosting Server | Dreamweaver

Now that your site is ready it is time to upload the files to your hosting server and make your site live.

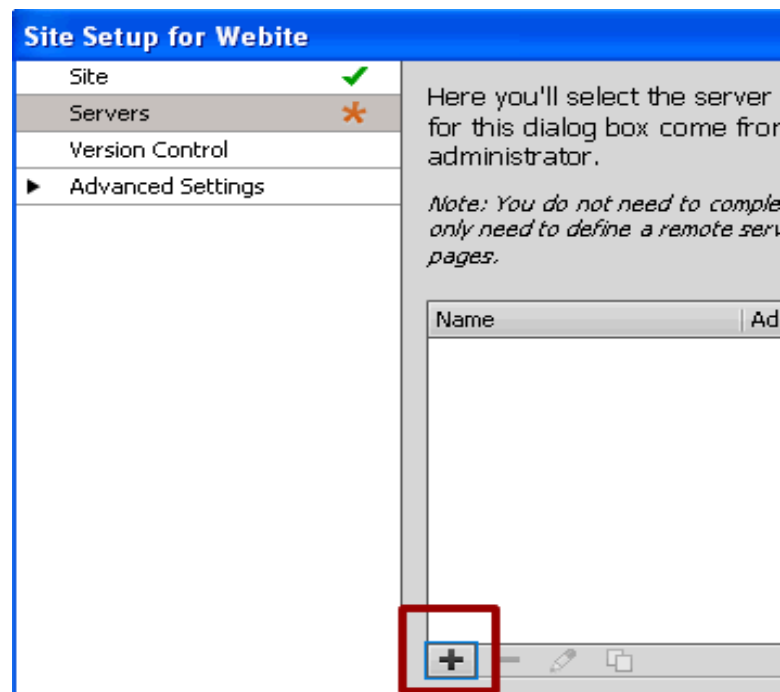
You will need to purchase a domain name and web hosting. We use Hostgator to host this site.

To upload your files:

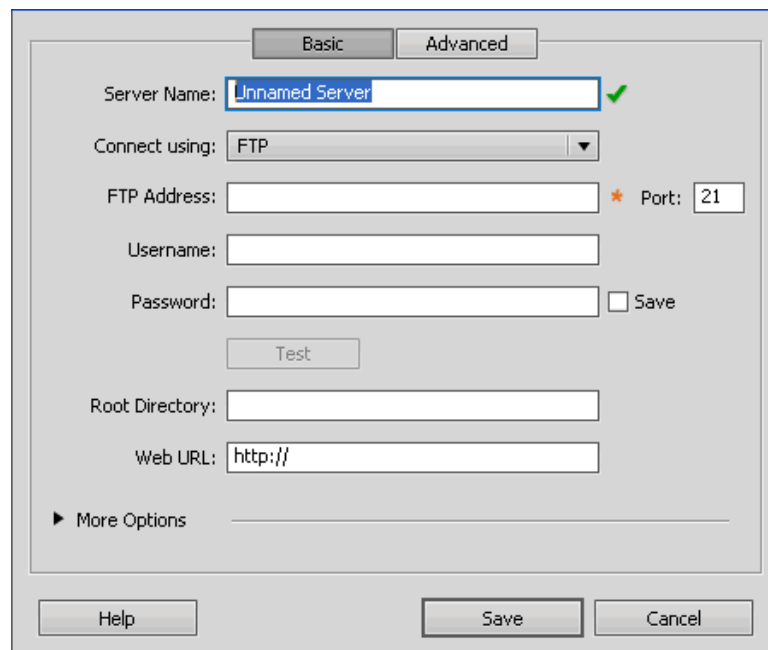
- Click on the 'Connect to remote host' icon at the top of the files panel



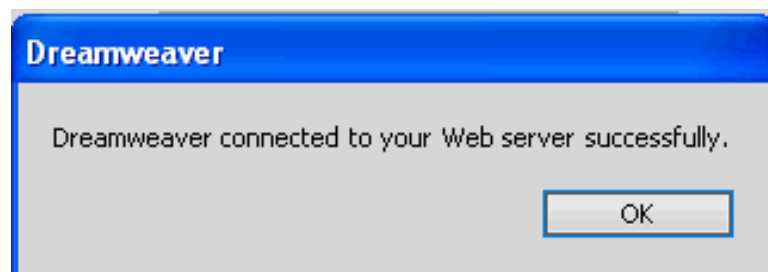
- Click the + button to add a new server



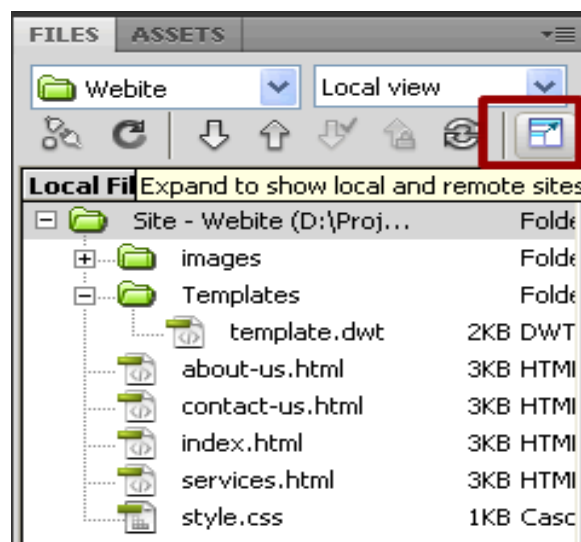
- Enter any server name, your FTP address/ hostname, username and password (you will receive these when you purchase hosting).



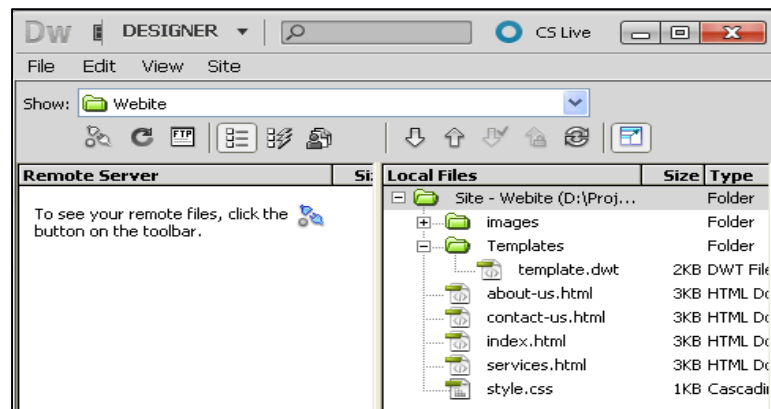
- Click the 'Test' button



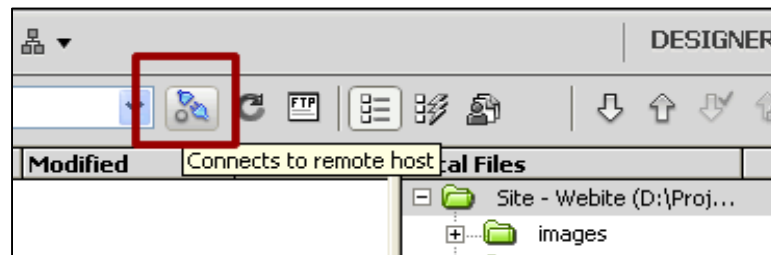
- Click the 'Save' button
- In the Files panel click the 'Expand to show local and remote sites' icon



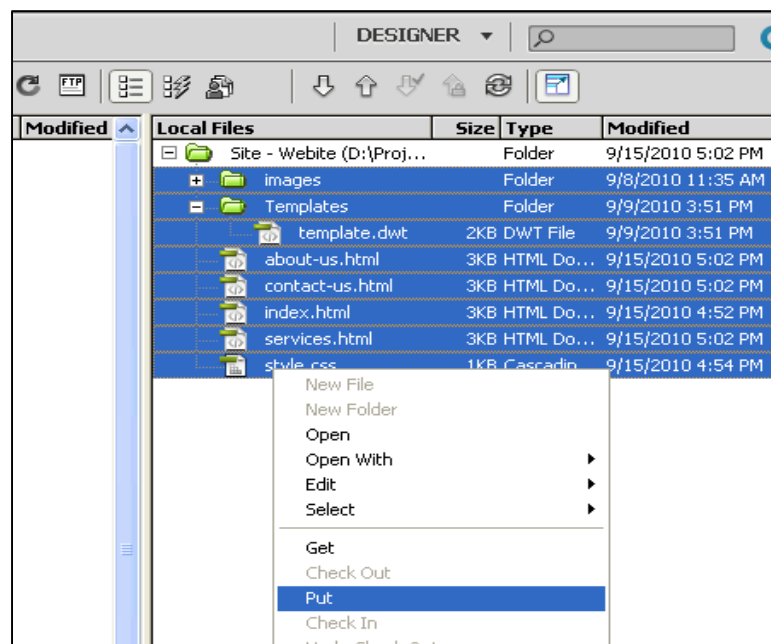
- You will see an expanded File Window:



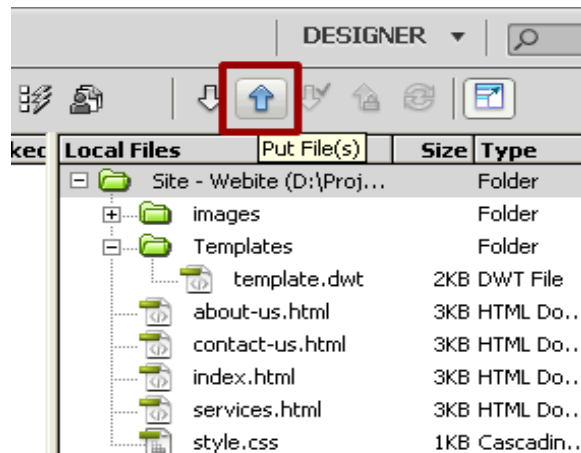
- Click to connect



- Dreamweaver will connect to your remote hosting server. You will see your remote hosting server on the left side and your local files on the right side.
- You may need to navigate to a 'www' or 'public_html' folder on your remote server.
- Select all the local files
- Right click and select 'Put'



- You can also use the 'Put' icon at the top



- A copy of all your website files will be stored on your remote hosting server.
- Using a browser, browse to your domain name. Your website should appear.
- Test to see if everything is working file.
- Configure your form to work using a script that will work on your server technology or a form service provider like those mentioned earlier.

Flash CS5 Capabilities

Adobe Flash is the best software used to create 2 – D Animation. By using Flash you can create:

Cartoon Movies, Web Banners, Animated Clipart, Video Games, Websites Multimedia Presentations

General Flash Workflow

- Plan the application
- Add media elements
- Arrange the elements
- Apply special effects.
- Use ActionScript to control behavior
- Test and publish your application.

Flash Interface



Exploring Toolbar

Types of Animation

Flash supports the following types of animation:

- Motion tweens
- Classic tweens
- Shape tweens
- Frame-by-frame animation

Frames Fundamentals

The rate at which the illusion of animation is considered is normally between Twelve to thirty frames per seconds.

Frame Rate:

Persistence of vision has been claimed to be sufficient at 12 frames per second (fps) but is more often considered acceptable at between 18 and 24 fps. There are however, fixed display speeds associated with different media, which should be listed.

Old 16-mm home movies	Frame rate 18 fps.
Standard movies films	Frame rate 24 fps
TV in United Kingdom	Frame rate 25 fps
TV in USA	Frame rate 30 fps

Frame and its Types

Frame is unit of information on the stage or we can also say that it container of object. In Flash there are three types of frames.

- Frame
- Key Frame
- Blank Key Frame

A black dot in the first frame of the span indicates that the tween span has a target object assigned to it. Black diamonds indicate the last frame and any other property key frames.



Symbol:

Symbols are the key components in Flash and are essential aspect of creating animations and interactive elements

Instance:

An instance is a copy of master symbol. Rather than using the symbol on the stage we use and modify the instance of the symbol on the stage.

Type of Symbols:

In Flash there are three types of symbols:

1. Graphic
2. Movie

3. Button

Work with Mask Layers**Importing Sound into Flash:**

To import a sound file into the Flash authoring environment:

Choose: File ⇒ Import

Select: All Sound Formats. From the Files of Type drop-down.

Select: The .MP3, .AIFF, or .WAV file that you want to import.

Click: Open

To Attach a Sound to a Timeline:

- 1 Choose File ⇒ Import to import a sound.
- 2 Select the sound in the library and choose Linkage from the Options menu.
- 3 Select Export This Symbol and give it the identifier mySound.
- 4 Select frame 1 in the main Timeline and choose Window ⇒ Actions.

The code should look like this:

```
s = new Sound();
s.attachSound("mySound");
s.start();
```

To Create a Sliding Volume Control:

- 1 Drag a button to the Stage.
- 2 Select the button and choose Insert ⇒ Convert to Symbol. Choose the movie clip behavior. This creates a movie clip with the button on its first frame.
- 3 Select the movie clip and choose Edit ⇒ Edit Symbol.
- 4 Select the button and choose Window ⇒ Actions.
- 5 Enter the following actions:

```
on (press) {
    startDrag ("", false, left, top, right, bottom);
    dragging = true;
}
on (release, releaseOutside) {
    stopDrag ();
    dragging = false;
}
```

The startDrag parameters left, top, right, and bottom are variables set in a clip action.

- 6 Choose Edit ⇒ Edit Movie to return to the main Timeline.
- 7 Select the movie clip on the Stage.
- 8 Enter the following actions:

```
onClipEvent (load) {
    top=_y;
    left=_x;
    right=_x;
    bottom=_y+100;
}
onClipEvent(enterFrame){
    if (dragging==true){
        _root.s.setVolume(100-(_y-top));
    }
}
```

- 9 Choose Control ⇒ Test Movie to use the volume slider.

To Create a Balance Sliding Control:

- 1 Drag a button to the Stage.
 - 2 Select the button and choose Insert ⇒ Convert to Symbol. Choose the movie clip property.
 - 3 Select the movie clip and choose Edit ⇒ Edit Symbol.
 - 4 Select the button and choose Window ⇒ Actions.
 - 5 Enter the following actions:
- ```
on (press) {
 startDrag ("", false, left, top, right, bottom);
```

```
 dragging = true;
 }
 on (release, releaseOutside) {
 stopDrag ();
 dragging = false;
 }
```

The startDrag parameters left, top, right, and bottom are variables set in a clip action.

6 Choose Edit ⇒ Edit Movie to return to the main Timeline.

7 Select the movie clip on the Stage.

8 Enter the following actions:

```
onClipEvent(load){
 top=_y;S
 bottom=_y;
 left=_x-50;
 right=_x+50;
 center=_x;
}
onClipEvent(enterFrame){
 if (dragging==true){
 _root.s.setPan((_x-center)*2);
 }
}
```

9 Choose Control ⇒ Test Movie to use the balance slider.

```
on (release) {
 unloadMovie("cont");
}
on (release) {
 loadMovie ("mov.swf", _root.cont);
}
```

## Learner's Activities

### Developing Mockup of Website Using Adobe Photoshop

|                        |                                                                                                                                                                                                                             |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description:</b>    | This activity based on individual performance. Each student will develop layout of website in Photoshop with help of slice tool                                                                                             |
| <b>Time Guideline:</b> | 2 hours                                                                                                                                                                                                                     |
| <b>Purpose:</b>        | To be able to mockup of website                                                                                                                                                                                             |
| <b>Outcomes:</b>       | <ol style="list-style-type: none"> <li>1- Each individual , first sketch layout on paper</li> <li>2- Then will draw layout in adobe Photoshop</li> <li>3- Individual will demonstrate his/her work before class.</li> </ol> |

### Develop a Website Using Adobe Dreamweaver

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| <b>Description:</b>    | This activity consists of group of 2 participants.                             |
| <b>Time Guideline:</b> | 4 hours                                                                        |
| <b>Purpose:</b>        | To be able to develop website in Dreamweaver and practice in adobe Dreamweaver |

### Developing an Image Gallery in Flash

|                        |                                                                                                                                      |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description:</b>    | <p>This activity consists of group of 2 participants.</p> <p>Minimum 5 image in gallery</p> <p>Gallery have option of slide show</p> |
| <b>Time Guideline:</b> | 2 hours                                                                                                                              |
| <b>Purpose:</b>        | To be able to develop animations and galleries in flash for web pages.                                                               |
| <b>Outcomes:</b>       | Group will demonstrate his/her work before class.                                                                                    |

# Learning Unit 3: Application of Templates in Website

## Overview

### Remember

Website templates allow anyone to setup a website without having to hire a professional web developer or designer.

In this learning unit, you will learn web templates. After completion of this learning unit, you will be able to use website Templates, how to download template, differentiate in free and paid templates and how to customized templates in editor.

## 1. Website Template

### Template

A template is a file that serves as a starting point for a new document. When you open a template, it is pre-formatted in some way.

A **website template** is a pre-designed webpage or set of HTML webpages that anyone can use to "plug-in" their own text content and images into. Usually they are built with HTML and CSS code. For templates two basic Options are available

### Free Website Template

The main benefit of a free website template is the cost. You spend no money upfront. Free web templates are often harder to customize and often lack certain functionalities, such as online shopping carts. They lack the polished look of a professional design. This might be fine for some websites, but business owners will probably want to consider something else when establishing their company's online presence.

### Paid Website Templates

In case of paid website template, you'll find that some places will sell them for a one-time, upfront fee, while others will charge you a small monthly fee. Places that require a monthly fee typically give you access to a customer support team — a great benefit if you ever run into a problem or just want some help setting up your website. Most paid templates provide you with designs that can easily be customized to reflect your style or brand, helping you to create a website you can be proud of.

## 2. Searching and Downloading Website Templates

There are many websites which provides open source templates without any cost but some highly professional and prefect design are paid design.

### Do you know!

Open Designs was founded in 2006 as a community for sharing free open source web designs online.

**Free website templates are available for download on following links.**

1. <http://www.opendesigns.org/>
2. <http://www.freewebsitetemplates.com/freewebsite/>
3. <http://all-free-download.com/free-website-templates/free-html-CSS-templates.html>
4. <http://designscrazed.org/free-responsive-html5-css3-templates/>

### 50 Free Responsive HTML5 CSS3 Website Templates

1. <http://webdesigncone.com/2014/free-bootstrap-templates/>
2. <http://startbootstrap.com/template-categories/all/>

**Following are few links to download paid websites Templates**

1. <http://www.templatemonster.com/properties/features/premium-templates/>
2. <https://wrapbootstrap.com/>
3. <http://www.pixeden.com/web-design-templates>
4. <http://www.justfreetemplates.com/premium-templates/web>

**Wrap Bootstrap**

Wrap Bootstrap is a marketplace for premium Bootstrap themes and templates.

**Remember**

www.justfreetemplates.com provides both free and paid web design templates

**Bootstrap**

Bootstrap is an HTML5 & CSS3 framework designed to help you kickstart the development of webapps and sites.

## Learner`s Activity

In previous learning activity working, learners have experienced working in adobe Dreamweaver and also have developed an application using Dreamweaver. Now in this session class will customized Templates using Dreamweaver under the supervision of instruction.

### Developing a Website Using a Templates

**Description:**

- This activity will be performed by individual.
- Each student has Experience of working on adobe Dreamweaver.
- Each student will present his web project idea before class.
- Download Free Templates from above mention link as per project design requirement download relevant design templates.
- Instructor will guide and help out students in selection of designing
- Customized Templates in Dreamweaver.

**Time Guideline:**

4 hours

**Purpose:**

To be able to customized templates and will try develop design like these professional developed design.

**Presentation:**

Individual will present Template and also present his/her new developed web application developed from templates.

## Summary of Module

- Web Designing is an art of building web pages and technically design is a process for developing solutions that effectively integrate task, context of use, and “user.”

Web design isn't the same as web development. Development involves coding the backend of your website but you're here for web design. For the look-and-feel.

- Time Berners-Lee is known as father of web. In 1989 he developed a web page.

In 1990, the first text only browsers were setup and CERN scientists could access hypertext files.

By early 1993, there were only about 50 websites worldwide. A browser Mosaic having web's graphical capabilities was developed at NCSA (National Centre for super computers).

JavaScript was developed in 1995.

Macromedia Flash first version was release in 1996.

For formatting of HTML documents CSS came in use in 1998.

Grid framework for mobile devices was developed in 2007.

Idea of response designs was presented in 2009 but its implementation in web was possible with development of Bootstrap was by Mark Otto and Jacob Thornton at Twitter, and released as an open source product in August 2011 on GitHub.

- Adobe Photoshop is a powerful, easy-to-use tools that let you combine and cut out images, apply looks, and helps us in development of webpages mockups.
- Adobe Dreamweaver is a web design and development application tool with standard features such as syntax highlighting, code completion, and code collapsing as well as more sophisticated features such as real-time syntax checking and code introspection for generating code hints to assist the user in writing code.
- Flash started its life in 1996 as Future Splash Animator. A re-branded version of the Future Splash Animator was introduced as Macro Media Flash-1 in 1996.

It is a best Tool to create 2 – D Animation

- Web templates are pre-designed templates developed by professional designers, and are available for free and on fee as well. Individual having little knowledge of any HTML editing tool can easily customized these templates as per requirement and developed web application. Web designing templates are web designs developed by the professional. Individual having little knowledge of any HTML editor tool can easily develop web application within short time.

## Frequently Asked Questions (FAQs)

**FAQ 1:** What are the benefits of a Website?

**Answer** A Website acts as a promotional tool that helps you to promote your business among a global audience. It helps in establishing a brand identity since a Website increases credibility of your business. You become more competitive since most of the businesses are establishing their presence over the Internet and you cannot afford to stay behind.

**FAQ 2:** Who is the inventor of W3C

**Answer** Tim Berners-Lee invented the World Wide Web in 1989. He founded and Directs the World Wide Consortium (W3C) the forum for technical development of the Web. He founded the Web Foundation whose mission is that the WWW serves Humanity, and co-founded the Open Data Institute in London. His research group at MIT's Computer Science and AI Lab ("CSAIL") plans to re-decentralize the Web. Tim spends a lot of time fighting for rights such as privacy, freedom and openness of the Web.

**FAQ 3:** What is responsive Web Design?

**Answer** Responsive web design is about creating web sites which automatically adjust themselves to look good on all devices, from small phones to large desktops.

**FAQ 4:** CMYK stand for

**Answer** CMYK is abbreviation of Cyan, Magenta ,Yellow and Black

**FAQ 5:** What is resolution?

**Answer** Resolution is the quality of an image. It is measured in terms of pixels. If you see an image listed as "72 ppi", that means the image has 72 pixels per inch (ppi).

**FAQ 6:** What is JPEG?

**Answer** JPEG stands for Joint Photographers Experts Group. It's a great format that retains color and detail found in photographs and graphics with lots of color blends but not well for web pages because of its size.

**FAQ 7:** What is CSS?

**Answer** Cascading Style Sheets (CSS) is a mechanism for changing the appearance of HTML or XML elements, by assigning styles to element types, self-defined classes of elements or individual instances.

**FAQ 8:** Role of Adobe Photoshop in web development?

**Answer** Photoshop is used in the modern web design workflow. Together, you'll create a mockup for a creative company that contains responsive templates, a fully developed color and font theme, and a UI kit full of buttons, navigation bars, check boxes, and other ready-to-use interface elements. He also shows how to optimize web graphics, create image sprites, and integrate other apps like Illustrator and Muse in your web design workflow.

**FAQ 9:** What is benefit of site definition in Dreamweaver?

**Answer** Even if you don't yet have a website or remote web server, Dreamweaver expects you to organize your files exactly as they would be in a real site. Before you can start working, you need to define a site.

**FAQ 10:** What is Spray Menu in Dreamweaver?

**Answer** Spray Menu bar is built in functionality of Adobe Dreamweaver CS versions that automatically adds drop down menu list in web applications.

## Test Yourself!

Please mark the correct one from the given options. You can check your answer with the Answer Key at the end of this module.

- 1. In Photoshop The zoom tool allows you to do what?**
  - a. Move around your graphic
  - b. Increase/decrease the magnification size of graphic
  - c. Select objects
  - d. None of above
- 2. Photoshop file default format that preserves layers is**
  - a. JPEG
  - b. PSD
  - c. PNG
  - d. AI
- 3. Short key to fill the whole background with current color:**
  - a. Alt+B
  - b. ALT+BACK SPACE
  - c. ALT+SPACE BAR
  - d. NONE
- 4. To cut down the size of the entire graphic design, including all layers, select the \_\_\_\_\_ tool. (2 points)**
  - a. Marquee
  - b. Magic wand
  - c. Eraser
  - d. Crop
- 5. To fill in a layer as a background, which of the following tools would be useful? Choose all that apply, select all correct possibilities. (2 points)**
  - a. Line
  - b. Paint bucket
  - c. Gradient
  - d. Smudge
- 6. The \_\_\_\_\_ tool is best selected when you need to select an irregular shaped image in a layer.**
  - a. Crop
  - b. Marquee
  - c. Lasso
  - d. Magic wand
- 7. The \_\_\_\_\_ tool allows you to select a rectangular or circular area of a layer to change or delete.**
  - a. Marquee
  - b. Crop
  - c. Hand
  - d. Zoom
- 8. Drop shadow, inner glow and bevel are examples of \_\_\_\_\_ you need to use with text.**
  - a. Filters
  - b. Bending options
  - c. Image adjustment
  - d. Layer modes
- 9. How many Sites can you define with one copy of Dreamweaver installed on your computer?**
  - a. unlimited
  - b. 1
  - c. 10
  - d. 999



- 10. Which of the following is not supported by older browsers?**
- a. CSS
  - b. Layers
  - c. Frames
  - d. All of the above
- 11. Dreamweaver users work in the Document Window using one of how many views?**
- a. 3
  - b. 2
  - c. 5
  - d. 1
- 12. Dreamweaver's \_\_\_\_\_ feature allows users to select colors and make perfect color matches.**
- a. Color Cube
  - b. Palates
  - c. HTML view
  - d. Eye dropper
- 13. \_\_\_\_\_ view is a hand-coding environment for writing and editing code.**
- a. Design
  - b. Split
  - c. Code
  - d. None of above
- 14. In order to define a site, users must create a both a \_\_\_\_\_ and \_\_\_\_\_.**
- a. domain name / IP address
  - b. login / password
  - c. site name / home page
  - d. site name / root folder
- 15. Which graphic format can you Not insert into your web page?**
- a. bmp
  - b. Gif
  - c. png
  - d. None of above
- 16. What is the proper way to manually type an email link?**
- a. email:myname@austincc.edu
  - b. mailto:myname@austincc.edu
  - c. mail:myname@austincc.edu
  - d. None of above
- 17. Dreamweaver is sold by what software company:**
- a. Adobe
  - b. Macromedia
  - c. Microsoft
  - d. None of above
- 18. Use Dreamweaver to create:**
- a. HTML, XML, and CSS files
  - b. PHP, Java, and ASP.NET
  - c. The new space-time continuum format STCML
  - d. All of the above, except the space-time continuum thing...
- 19. You can save images for the Web in these formats:**
- a. JPG, GIF, PNG
  - b. PSD, Tiff
  - c. Flickr
  - d. ftp, fla, jsp

- 20. \_\_\_\_\_ is a way to partially hide an image in the layer immediately below another layer. The 2 layers get “locked” together to produce the effect.**
- a. Morphing
  - b. Twining
  - c. Stacking
  - d. Masking
- 21. In Photoshop \_\_\_\_\_ panel contains the basic tools needed to draw and modify objects.**
- a. Actions
  - b. Properties
  - c. Tools
  - d. Layers
- 22. In Adobe Flash The \_\_\_\_\_ shows the frames in the movie.**
- a. Toolbar
  - b. Properties pane
  - c. Timeline
  - d. Scene
- 23. In Adobe Flash \_\_\_\_\_ allow you to make objects move in a more random or non-straight path.**
- a. Mask
  - b. Shape tween
  - c. Guided layer
  - d. Gravity effect
- 24. In Adobe Flash \_\_\_\_\_ is used to change an object from a circle to a square.**
- a. Mask
  - b. Shape tween
  - c. Motion tween
  - d. Morphing
- 25. In Adobe Flash every animation needs a starting and ending point. \_\_\_\_\_ are used to set these.**
- a. Scenes
  - b. Key frames
  - c. Blank frames
  - d. Graphic symbols
- 26. The \_\_\_\_\_ panel contains the basic tools needed to draw and modify objects.**
- a. Actions
  - b. Properties
  - c. Tools
  - d. Layers
- 27. In Adobe Flash Empty key frames are indicated by a \_\_\_\_\_ circle on the timeline**
- a. Hollow
  - b. Black
  - c. Open eye
  - d. Closed eye
- 28. In Adobe Flash a key frame that contains objects will be represented by a \_\_\_\_\_ circle.**
- a. Hollow
  - b. Black
  - c. Blue
  - d. Gray

## Answer Key

| MCQ Number | Correct Answer | MCQ Number | Correct Answer |
|------------|----------------|------------|----------------|
| 1          | b              | 15         | a              |
| 2          | b              | 16         | b              |
| 3          | b              | 17         | a              |
| 4          | c, d           | 18         | d              |
| 5          | b, c           | 19         | a              |
| 6          | c              | 20         | d              |
| 7          | a              | 21         | b              |
| 8          | b              | 22         | c              |
| 9          | a              | 23         | c              |
| 10         | d              | 24         | b              |
| 11         | a              | 25         | b              |
| 12         | d              | 26         | c              |
| 13         | c              | 27         | a              |
| 14         | d              | 28         | b              |



# **Module 4: Plan Website and Explain Software Development Life Cycle for Web Applications**

## **Learning Outcomes**

After completion of this learning module, learner will be able to:

- Develop website project plan
- Utilize the software development life cycle in a web project



# Learning Unit 1: Develop Website Project Plan

## Overview

In this learning unit you will learn about project planning includes arrangement & management of project meetings, gathering project requirements, creating story boards, development of time lines and evaluation of finances.

After completion of this learning unit you will be able to define project meetings, story boarding, financial evaluations, functional and non-functional requirements and client management.

### Meeting

In a meeting, two or more people come together to discuss one or more topics, often in a formal setting.

## 1. Arrange and Manage Project Meetings

Meetings are necessary to coordinate individual efforts, collaborate on joint projects, garner support for ideas, sell ideas, solve problems collectively, and make consensus-based decisions.

### Elements for Effective Project Meetings

- Why to meet (Objective)
- Whom to meet (Participant)
- When & where to meet (Location & Time)

**Objective:** for planning a meeting it should have clear objectives for example to decide the marketing strategy for the product of this year.



### Agenda

**Agenda** is a list of items to be discussed at a formal meeting.

**Participants:** are the people who attend the meeting to accomplish for the specific purpose?

**Structure:** is the procedure for the meeting how to organize it in its best accomplish to get the specific purpose. Examples: guest speakers, videos, brainstorming sessions, discussion groups, demonstrations, etc.

**Location and Time:** Select a meeting place that best matches the participant's needs, the objective, and the meeting structure. When planning where to meet, give consideration to size, comfort, accessibility, adequate parking, room acoustics, equipment needs, etc.

**Agenda:** Most important, to distribute to participants at least three days prior to the meeting day.

An agenda is crucial to meeting success in three ways:

1. It clarifies the objectives.
2. Distributing the agenda prior to the meeting helps participants plan and prepare to make an effective contribution.

- During the meeting, the agenda provides direction and focus for the discussion.

**Responsibilities:** is a work freedom with limitation, bound under rules.

### Requirement Gathering

A requirement gathering is an essential part of any project and project management. Understanding fully what a project will deliver is critical to its success. This may sound like common sense, but surprisingly it's an area that is often given far too little attention.

### Do you know!

Requirement Gathering is also an important component of Software Development Life Cycle (SDLC) Project planning is part of Project Management.

**Confirmation:** before the commencement of meeting must confirm.

- Participant availability
- Agenda distribution & authentication
- Place and time
- Arrangement, structure of meeting

### Requirements for a Successful Meeting

- Define the purpose, goals, and objectives of the meeting
- Determine the participant
- Create a detailed agenda for the meeting
- Determine the appropriate time length of the meeting
- Determine the best meeting format and location
- Send out the meeting invite and agenda days in advance
- Facilitate and lead the meeting
- Document and summarize action items
- Send out a meeting summary
- Follow up on action items and schedule additional meetings as necessary

### Run an Effective Project Meeting

Here are some suggested guidelines on how to run effective meetings:

- Begin on time and end on time.
- Use the Agenda
- Control dominating individuals.
- Refreshment & beverages.
- Compactness.

## 2. Gather Project Requirements

A requirement gathering is about creating a clear, concise and agreed set of customer requirements that allow to provide exactly what they are looking for.

### Sources of Requirements

Good requirements start with good sources.  
Examples of sources of requirements include:

- Customers
- Users
- Administrators and maintenance staff
- Partners
- Domain Experts
- Industry Analysts
- Information about competitors

### Rules for Successful Requirements Gathering

- Don't assume what the customer wants, ask.
- Involve the users from the start.



3. Define and agree the scope of the project.
4. Ensure requirements are specific, realistic and measurable.
5. Gain clarity if there is any doubt.
6. Create a clear, concise and thorough requirements document and share it with the customer.
7. Confirm the understanding of the requirements with the customer (play them back).
8. Avoid talking technology or solutions until the requirements are fully understood.
9. Get the requirements agreed with the stakeholders before the project starts.
10. Create a prototype if necessary to confirm or refine the customers' requirements.

### Requirements Gathering Techniques

- Conduct a brainstorming session
- Interview users
- Send questionnaires
- Work in the target environment
- Study analogous systems
- Examine suggestions and problem reports
- Talk to support teams
- Study improvements made by users
- Look at unintended uses
- Conduct workshops
- Demonstrate prototypes to stakeholders

#### Brainstorming

**Brainstorming** is a method of shared problem solving in which all members of a group spontaneously contribute ideas.

### Conduct a Brainstorming Session

Brainstorming is a short group session where everyone is allowed to say whatever they feel is important to the topic of discussion. After that, a facilitator leads the group in organizing and prioritizing the results.

The following basic rules for brainstorming ensures better results:

- Start out by clearly stating the objective of the brainstorming session.
- Generate as many ideas as possible.
- Let imagination soar.
- Do not allow criticism or debate while gathering information.
- Once information is gathered, reshape and combine ideas.

### Interview Users

Face-to-face contact with users through individual interviewing is the primary source of requirements and an important way to gather and validate their requirements. Remember that it is not the only possible technique.



Use the system to make an effort to understand and experience the user's problem to describe it clearly and correctly.

### Send Questionnaires

Sometimes, face-to-face meetings with stakeholders are not feasible (for example: when developing products for the consumer market). In those situations, use questionnaires.

Create a set of questions (as per requirement), possibly with multiple choice instances, to the relevant stakeholders, and ask them to complete it and return it to.

#### Questionnaire

**Questionnaire** a set of printed or written questions with a choice of answers, devised for the purposes of a survey or statistical study.



#### Work In the Target Environment

##### Analogous

**Analogous** means similar or corresponding in some respect.

Working in an open target environment is quite easy than target base environment. It would be good to see the same dedication devoted to solving problems in target based work too. Where the work cannot easily be experienced in this way, it may still be possible to do a bit more than just sit quietly and observe.

##### Study Analogous Systems

The starting point for many projects is often a similar or an existing system. Sometimes, comparable products and systems contain working versions of good ideas for solving user problems. Even if they are trying to solve slightly different problems, they often provide valuable clues as to what need to do.

Such a process might involve the following activities:

- Read the document from seller-end to purchaser-end (several times) to comprehend what the customer wants and what actually has been written.
- Classify all of the types of information in the document. (user, system requirements, design elements, plans, background material, irrelevant detail)
- Mark up the original text to separate out such requirements.
- Find a good structure for each of the different types of information such as: a scenario for the user requirements, functional breakdown for the system requirements, and architecture for the design.
- Organize the information to show gaps and overlaps.
- Create traceability links between these information elements to show the designers exactly what the users want.
- Convince the customer to accept the new information as the basis for the contract.

#### Examine Suggestions and Problem Reports

Requirements can come from change suggestions and user problems. A direct road to finding requirements is to look at suggestions and problems as first described. Ask users some questions about these areas to clarify the users' actual needs.

#### Workshop

**Workshop** is a meeting at which a group of people engage in intensive discussion and activity on a particular subject or project.

##### Talk to Support Teams

Most large sales organizations have a help desk that keeps a log of problems and fixes, and support engineers who do the fixing. Many organizations have similar facilities to support their own operations. Also talk to the training team and installation teams about what users find to be difficult.

##### Study Improvements Made by Users

Users of a standard company spreadsheet may have added a few fields, or related different sheets together, or drawn a graph, that exactly meets their individual needs. For example, a lathe operator may have manufactured a special clamp, or an arm that prevents movement of the tool beyond a certain

point. Any such modification points to something wrong with the existing product, which makes it a valid requirement for the new version.

### Look at Unintended Uses

People often use things for purposes for which they were not designed. This is a good way to get new ideas and to think of innovations. For example, an observant product manager noticed that an engineer was staying in the office late to use an advanced computer-aided design system to design a new kitchen layout for his home. Inexpensive commercial products are now widely available for home use.

### Conduct Workshops

Workshops can rapidly pull together a good set of requirements. In two to five days, can create a set of requirements, and then review and improve them. If everyone in a workshop tries to estimate the cost and value of each requirement, the document becomes much more useful and cost-effective.



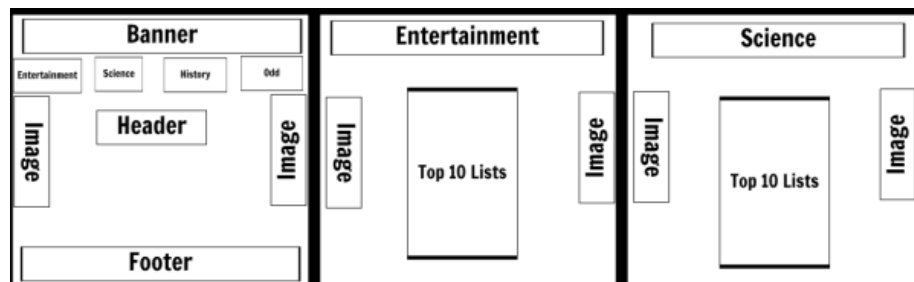
Workshops are quicker and better at discovering requirements than other techniques, such as sending questionnaires.

## 3. Perform Storyboarding

Storyboarding is an iterative, interaction design methodology that uses a series of sketches or pictures to demonstrate an end to end solution for a user scenario.

Storyboards originated in the motion picture industry to help directors and cinematographers visual a film's scenes in sequence. Such storyboards resemble cartoon strips.

Storyboarding can strengthen the user experience elements of designs, and software for building prototypes from those sketches can be an invaluable tool.



### Storyboard for a Web Project

A storyboard is the blueprint for a web project. It is a simple, flexible tool which can be used to display the elements on a single Web page such as images, banners, navigation, graphic elements and text. It is also an excellent tool for presenting a project to clients.

## Purpose of a Website Storyboard

The purpose of a website storyboard is threefold.

1. It serves as an outline of the design approach.
2. It defines the elements that need to go on each page.
3. It shows the navigational architecture and information flow to the team and demonstrates how the pages are to work together to provide the user's interactive experience.

## Types of Storyboards

Three types of storyboards are detailed below.

- **Presentation Storyboard.** Used to demonstrate visualization of the site and solidify the design model; can be compared to an architectural sketch of a new home.
- **Production Storyboard.** Used by production teams to present a clear picture of what will be happening throughout the entire site, what each page will look like, and what each team member/developer will do.
- **Maintenance Storyboard.** Used by the production team to present a clear picture of what parts of the site will need to be updated or maintained, as well as what parts of the website that should be left alone or modified by a professional. This is the plan for site upkeep, such as performing homeowner maintenance.

## The storyboard illustration should include:

- A flowchart depicting the opening screen and the major sections of the website.
- A description of the text that will be placed on each major page of the website.
- A description of graphic images that belong on each page.
- The navigational tools and their location.
- The cross-links to all of the information contained on the website.
- The external links to other websites.
- The color scheme of the website.

## Storyboard Checklist

A storyboard can be used to provide the details of an entire website by outlining the hierarchy or architecture of a site.

### Navigation

- Does the site design contain numerous links on every page in an effort to keep everything “just a click away?” Can they be better organized?
- Is the navigation weak? Are there few basic links that then lead to hundreds of wandering links? Do the elements need to be reorganized?
- Does the navigation make sense? Will viewers be able to find their way to the information they want if they follow the links provided?
- Have links been grouped logically?
- Are there gratuitous pages added: links that lead to another page of links?
- Is there a way back to the dominant section or home page from the subsections or do viewers have to use the “back” button on their browsers?

### Site Structure

- Given the complexity of the site is it necessary to add a website map?
- Are other referral elements such as an index needed? Table of contents? Glossary?
- Are there too many forms that basically perform the same function? Can they be consolidated?
- Is the site balanced or does the site contain just one really good page located in a virtual ghost town?
- Graphics

- Is the site overloaded with graphics? Are they necessary? Are they annoying? Do they go with the content?
- Does the site start with a strong graphic presence, only to putter out once further into the site?
- Given the number of graphics anticipated per page and per section, are visitors forced to survive the longest downloads on those pages which are utilized most frequently?
- Are graphics taking over the page? Does the content get relegated to a tiny visual space?



### Content

- Is the “meat” of the content hidden too deep into the site to be found?
- Is the content being updated most frequently easy to get to?
- Are there repeating content elements, such as department Rolodexes that would be better combined into one section.
- Are there too many “under constructions” flags?
- Is there too much pointless content, fluff, or dry reading in a more dynamic section? \*Is there enough technical information in those areas where it is warranted?
- Does the content logically flow within the section? Between sections?
- If providing a website as a means of answering questions, have questions been answered or are viewers required to email or call for more assistance?
- Can the site be created as envisioned or is it too ambitious an undertaking?

## 4. Develop Timelines

Timelines can use any time scale, depending on the subject and data. A project timeline is an important component of time management planning and a useful project management tool for keeping the client informed and project on target.

| Phase                | Days | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 |
|----------------------|------|--------|--------|--------|--------|--------|--------|--------|
| 1. Content Analysis  | 3    |        |        |        |        |        |        |        |
| 2. Content Collation | 3    |        |        |        |        |        |        |        |
| 3. Course Analysis   | 1    |        |        |        |        |        |        |        |
| 4. Course Design     | 1    |        |        |        |        |        |        |        |
| 5. Course Writing    | 4    |        |        |        |        |        |        |        |
| 6. Review & Refine   | 2    |        |        |        |        |        |        |        |

### Time Line

**A timeline** is a graphical representation of a period of time, on which important events are marked.

A project timeline allows an IT project manager to:

- Identify potential problems before they delay the project;
- Give customers earlier notice of potential delays or scope changes - before over estimate;
- Provide immediate, on-demand status reports regarding which aspects of the project are complete, due or running behind;
- Always keep in touch with each project, and whether out and ahead or behind financially;

- Bill the client as project milestones are attained.
- Track the actual time spent on all aspects of the project, so that, to make better development in future estimates and timelines.

## 5. Evaluate Finances (Budgeting and Costing)

### Creating a Project Budget

When starting a project, it is difficult to know how much it will cost. Project managers are held to account for their budget estimates and with so much uncertainty in projects, it can be one of the project managers' greatest challenges.

#### Budget

**Budget** is an estimate of income and expenditure for a set period of time.



The ability to create an accurate budget is an essential skill for a project manager.

#### Budgeting Basics

There are two main approaches can take when creating a budget:

- **Top-down approach:** deciding how much the project will cost and dividing the amount between the work packages.
- **Bottom-up approach:** estimating the total cost of the project by costing the lowest-level work packages and rolling up.

#### Top-Down Budgeting Approach

The decision is made, often by senior management, about how much the project should cost. The amount is divided between the work packages. This approach is more than guessing, it needs to explain how do the work within the allocated amount of budget on each work package.

Prior experience from other projects will play a part in validating the budget allocation for work packages. It should be asked whether the budget looks realistic based on experience from past projects.

**The advantage.** The top-down budgeting approach is focuses on achieving the project within the budget allocated and leads to efficiencies and reduction in wasteful practices.

**The disadvantage.** The top-down budgeting approach is assumes the person creating the budget has enough knowledge and expertise to make a reasonable cost estimate.

#### Bottom-Up Budgeting Approach

The team, often involving the final budget holder, identifies the tasks and activities needed to complete the project. The project is based on the lowest-level work packages and rolled up to arrive at the total project cost. The direct and indirect costs are calculated for each work package.

**The Advantage.** The bottom-up budgeting approach is accurate (as long as not missed any task or activity). It is good for team morale because the project manager involves the team in budget creation. This approach is sometimes called participative budgeting.

**The Disadvantage.** The bottom-up budgeting approach is difficult in getting a full list of tasks and activities needed to complete the project. It is easy to miss some that will be needed and that will later throw the budget out.



## Different Cost Types

There are two cost types that concern project managers when they create budgets: direct and indirect costs.

### Direct Costs

These costs can easily be attributed to the project and are charged to the project on an item-by-item basis.

Examples are:

- Labor (people)
- Consultant fees
- Raw materials
- Software licenses
- Travel

#### Cost

**Cost** is an amount that has to be paid or spent to buy or obtain something.

### Indirect Costs

These costs are for items that benefit more than one project, and only a proportion of their total cost is charged to the project.

Examples are:

- Telephone charges
- Office space (rent)
- Office equipment
- General administration
- Company insurance

## 6. Differentiate between Functional Requirements and Non-Functional Requirements

Requirements may be functional or nonfunctional and both are essential to a successful software project.

### Functional Requirements

Most requirements definition focuses mainly on functional requirements, which are based upon the expected functioning of the product or system to be created. Functioning typically is equated with product/system features for which might have a menu or button choice, such as: identify a customer, select an item to order, and calculate the amount due.

#### Functional Requirement

**A functional requirement** defines a function of a system and its components. A function is described as a set of inputs, the behavior, and outputs.



## Examples of Functional Requirements

Functional requirements may be **calculations**, **technical details**, **data manipulation** and **processing** and **other specific functionality** that define what a system is supposed to accomplish.

### Non-functional Requirement

**A non-functional requirement** is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors.

### Non-Functional Requirements

Non-functional requirements are often called **qualities** of a system. Other terms for non-functional requirements are "**constraints**", "**quality attributes**", "**quality goals**", "**quality of service requirements**" and "**non-behavioral requirements**". Non-functional requirements can be divided into two main categories:

- **Execution qualities**, such as security and usability, which are observable at run time.
- **Evolution qualities**, such as testability, maintainability, extensibility and scalability, which are embodied in the static structure of the software system.

### Examples of Non-Functional Requirements

- Accessibility
- Capacity, current and forecast
- Compliance
- Documentation
- Disaster recovery
- Efficiency
- Effectiveness
- Extensibility
- Fault tolerance
- Interoperability
- Maintainability
- Privacy
- Portability
- Quality
- Reliability
- Response time
- Robustness
- Scalability
- Security
- Stability
- Supportability
- Testability

## 7. Exhibit the Significance of Client Management

### Client

**Client** is a person or organization using the services of a lawyer or other professional person or company.

**Customer Relationship Management (CRM)** is a system for managing a company's interactions with current and future customers. It often involves using technology to organize, automate, and synchronize sales, marketing, customer service, and technical support.

**Managing client expectations** is a critical skill in delivering good quality work, which both ends are happy with. Client expectations tie directly into the level of satisfaction a client will receive from the service provider work.

**If a client appears to be dissatisfied**, the best place to start when looking for causes, at the client's level of expectation performance is should at the outset of the project. Sometimes, even the best management consultants become so wrapped up in their own work processes that they lose sight of the expectations a client.



### What are the Client's Expectations?

**Key is asking questions.** For example, if a client has hired the consultant to help grow their business, ask questions about like,

- “How much growth?”
- “Over what time period to grow?”
- “What is a realistic percentage of growth?”

However, **a client may not always verbalize their expectations.** These are implicit expectations (that client holds only with self). These expectations are based upon several things:

- Client organization standards and culture
- Industry standards and quality benchmarks
- Personal reputation,
- Articulation of what is expected

### Don't Promise What Can't Deliver

The client may want to perform tasks that cannot be performed, or the time frame may make it nervous. Whatever do / do not promise things that cannot be delivered on.

### Prevention

As a final note, it is important to be sure that both ends are on the same page when it comes to their expectations. Be sure to check, and double check to make sure that no minor miscommunication gets in the way of the success of a project. Never make any assumptions.

## Learning Unit 2: Utilize the Software Development Life-Cycle in a Web Project

### Overview

#### SDLC

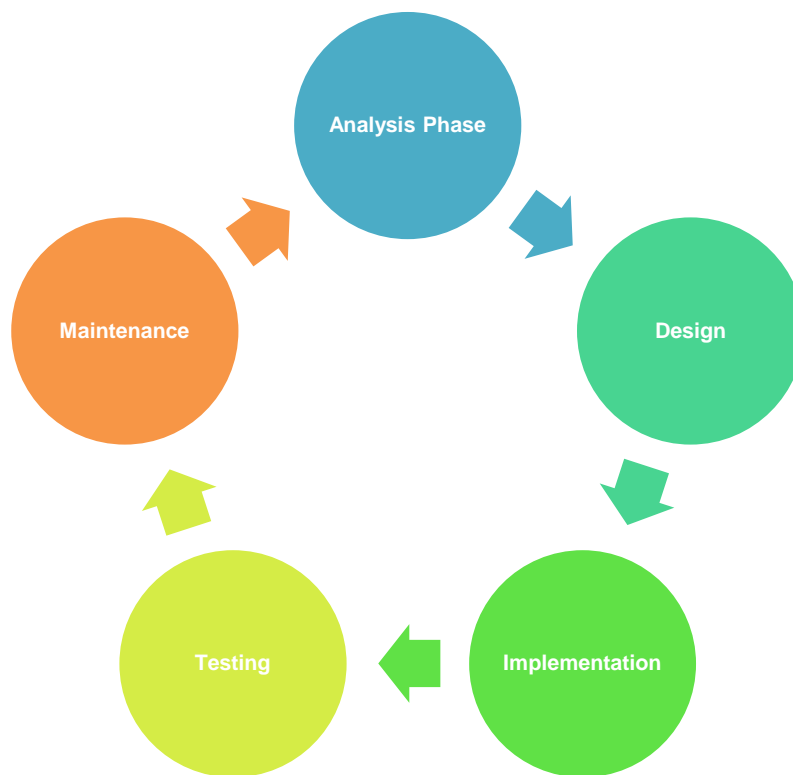
The software development life cycle is a sequence of events in software development describing tasks performed at each step.

In this learning unit learner will be introduced about overall direction that the project will take to creation of project strategy documents, break down the deliverables into more detailed business / client requirements.

After this Learning unit the learner will able to define and implement Software Development Life Cycle (SDLC).

#### Recount Software Development Life Cycle:

The software development life cycle (SDLC) is a sequence of events in software development describing tasks performed at each step. SDLC is a structure followed by a development team within the software organization. It consists of a detailed plan describing how to develop, maintain and replace specific software. The Software Development Life Cycle defines a methodology for improving the quality of software and the overall development process.



System Development Lifecycle Steps

### 1. Carry out the Project Analysis Phase

The Analysis Phase is where the project lifecycle begins. The Analysis Phase is break down the deliverables in the high-level Project Charter into the more detailed business requirements. The Analysis Phase is also the part of the project where identify the overall direction that the project will take through the creation of the project strategy documents.

**Series of steps followed by developers are:**

1. Collection of Facts: End user requirements are obtained through documentation, client interviews, observation and questionnaires,
2. Scrutiny of the existing system: Identify pros and cons of the current system in-place, so as to carry forward the pros and avoid the cons in the new system.
3. Analyzing the proposed system: Solutions to the shortcomings in step two are found and any specific user proposals are used to prepare the specifications.

**2. Design Phase**

Based on the client's need and the detailed analysis of the existing system, the new system must be designed. This is the phase of system designing. It is the most crucial phase in the developments of a system. The logical system design arrived at as a result of systems analysis is converted into

- **Preliminary or General Design**
- **Structured or Detailed Design**

There are several tools and techniques used for describing the system design of the system. These tools and techniques are:

- Flowchart
- Data flow diagram (DFD)
- Data dictionary
- Decision table
- Decision tree

**3. Implementation Phase**

In this stage physical system specifications are converted into a working and reliable solution. This is where the system is developed. It is followed by testing and then implementation.

**Steps in Implementation Phase:**

1. **Coding:**
2. **Integration and Testing**
3. **Installation:**

**Implementation**

**Implement / coding the Project:** Based on the client's need and the detailed analysis of the existing system, the new system must be designed. This is the phase of coding the software.

**4. Testing Phase**

Testing Phase provides only a shorter version of the testing techniques.

Testing is the process of evaluating a system or application, to check whether the application meets all requirements of the client and to detect the errors. There are two phases.

- Static Testing
- Dynamic Testing
- Structural (or) white box testing
- Functional (or) Black Box testing.

**Testing**

**Testing** is the process of evaluating a system or application to check whether the application meets all requirements of the client and to detect the errors.

## 5. Maintenance & Support Phase

Maintenance is necessary to eliminate errors in the system during its working life and to tune the system to any variations in its working environments. It has been seen that there are always some errors found in the systems that must be noted and corrected. It also means the review of the system from time to time. The review of the system is done for:

- Knowing the full capabilities of the system
- Knowing the required changes or the additional requirements
- Studying the performance.

If a major change to a system is needed, a new project may have to be set up to carry out the change. The new project will then proceed through all the above life cycle phases.

## Summary of Module

- Arranging and managing project meetings is very important in development of the software to gather the project requirements and Performing storyboarding Develop timelines.  
  
Evaluation of finances (budgeting and costing) is the technique that how to manage entire project in available financial resource.  
  
Identification of functional and non-functional requirement play vital role in any project.
- Software Development life cycle (SDLC) is a framework to develop software. It helps you to analyze, execute, deploy and maintain the software.

## Frequently Asked Questions (FAQs)

**FAQ 1:** What is the significance of project meetings in project planning?

**Answer** Meetings are necessary to coordinate individual efforts, collaborate on joint projects, garner support for ideas, sell ideas, solve problems collectively, and make consensus-based decisions.

**FAQ 2:** Name different sources of requirements

**Answer** Customers, Users, Administrators, Maintenance Staff, Partners, Domain Experts, Industry Analysts and Competitors.

**FAQ 3:** Explain the purpose of storyboarding

**Answer** It serves as an outline of the design approach. Defines the elements that need to go on each page and shows the navigational architecture and information flow to the team and demonstrates how the pages are to work together to provide the user's interactive experience.

**FAQ 4:** What is the difference between functional and non-functional requirements?

**Answer** Functional requirement defines a function of a system and its components and a non-functional requirement is a requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors.

**FAQ 5:** What are the main budgeting approaches?

**Answer** Top-down approach & Bottom-Up Budgeting Approach

**FAQ 6:** What are the different phases in SDLC?

**Answer** There are 5 phases in Software Development Life Cycle:

1. Analysis
2. Design
3. Coding
4. Testing
5. Maintenance

**FAQ 7:** What is Software Life Cycle?

**Answer** Software life cycle comprise the total life of the software developed right from the time of initial development to the time it is scrapped out or terminated. This includes the development phases, revisions and upgrades and if necessary adding it up with other software project as well.

**FAQ 8:** Is it mandatory to implement SDLC methods while developing any type of software project?

**Answer** This is a tricky question and must be tackled smartly. Yes it can sure implement SDLC approaches for every type of software need to develop. But it is not a cost effective solution for smaller projects. For every kind of software development needs different approach and solution and must not be considered to be developed under mandatory SDLC guidelines.

**FAQ 9:** Can I build a software project without SDLC models?

**Answer** Of course. There is no hard and fast requirement for a developer to implement any SDLC model for developing a software project. The ability to simplify project into modules and ascertain correct progression for completion is the only reason for which SDLC models and methodology was designed in the first place. Work without SDLC is the biggest challenge and there won't be any specific process to organized work.

**FAQ 10:** Which types of software's are used to upload / manage the files / folders on web servers?

**Answer** FTP Client software types are used to upload / manage the folders and files on web server.

## Test Yourself!

Please mark the correct one from the given options.

1. Which one of the following is NOT a non-functional requirement?
 

|                  |                     |
|------------------|---------------------|
| a. Documentation | b. Interoperability |
| c. Efficiency    | d. Login Facility   |
2. Which of the following is a (an) requirement gathering technique?
 

|           |                    |
|-----------|--------------------|
| a. Coding | b. Support         |
| c. Design | d. Interview users |
3. What is Analogy?
 

|              |             |
|--------------|-------------|
| a. Similar   | b. Opposite |
| c. Different | d. Diverse  |
4. Which is not a Storyboard?
 

|                 |                  |
|-----------------|------------------|
| a. Presentation | b. Production    |
| c. Maintenance  | d. Configuration |
5. Expectations of Clients does not include
 

|               |                  |
|---------------|------------------|
| a. Respect    | b. Communication |
| c. Aggression | d. Feedback      |
6. What is full form of SDLC?
 

|                                     |                                    |
|-------------------------------------|------------------------------------|
| a. a) System Design Life cycle      | b. b) Software Design Life Cycle   |
| c. c) System Development Life Cycle | d. Software Development Life Cycle |
7. Which tool and technique is NOT used for describing the system design?
 

|                 |                            |
|-----------------|----------------------------|
| a. Flow Chart   | b. Data Flow Diagram (DFD) |
| c. Spiral Model | d. Decision Table          |
8. Which phase is necessary to eliminate errors in the system during its working?
 

|                 |                      |
|-----------------|----------------------|
| a. Analysis     | b. Deployment Phase  |
| c. Design Phase | d. Maintenance Phase |
9. Which one IS the FTP Client software from the following?
 

|                         |                   |
|-------------------------|-------------------|
| a. FileZilla            | b. Microsoft Word |
| c. Adobe Acrobat Reader | d. Google Chrome  |

## Answer Key

| MCQ Number | Correct Answer |
|------------|----------------|
| 1          | d              |
| 2          | d              |
| 3          | a              |
| 4          | d              |
| 5          | c              |
| 6          | b              |
| 7          | c              |
| 8          | b              |
| 9          | a              |



# Module 5: Use Databases in Web Development

## Learning Outcomes

After completion of this learning module, learner will be able to:

- Explain the basic concepts of database
- Differentiate among different Database Management systems
- Design create and manage database in MySQL using PhpMyAdmin



# Learning Unit 1: Basic Perspectives of Database

## Overview

In this learning unit, you will learn basic concept of database, building blocks to understand and develop database in any Database Management System. After the completion of this learning unit you will be able to understand the database, term of database such as Row, Column, Table, Relationship, Quires, Normalization, Demoralization, Database, Relational Database Management System, Primary Key, Foreign key, indexing and entity Relationship Diagram etc.

### Remember

RDBMS stands for Relational Database Management System

## 1. Database

To find out what database is, it must have to start from data, which is the basic building block of any DBMS.

**Data:** Facts, figures, statistics etc. having no particular meaning (e.g. 1, ABC, 19 etc.).

**Record:** Collection of related data items, e.g. in the above example the three data items had no meaning. But organize them in the following way, and then they collectively represent meaningful information.

| Roll | Name | Age |
|------|------|-----|
| 1    | ABC  | 19  |

**Relation (table):** Collection of related records.

| Roll | Name | Age |
|------|------|-----|
| 1    | ABC  | 19  |
| 2    | DEF  | 22  |
| 3    | XYZ  | 28  |

### Do you know!

Relational database was invented by E. F. Codd at IBM in 1970

### RDBMS

RDBMS is a database that is organized through the use of tables or files that are linked to each other. A good example of a RDBMS is Microsoft SQL or MySQL.

The columns of this relation are called **Fields**, **Attributes** or **Domains**. The rows are called **Tuples** or **Records**.

Database is an **organized** collection of **related** data that is stored in an **efficient** and **compact** manner.

**Organized** means that data is stored in such a way that the user can use this data easily.

**Related** means, database is normally created to store the data about a particular topic.

**Efficient** means that the user can search the required data quickly.

**Compact** means that the stored data occupies as little space as possible in computer.

## 2. Database Management System

A software system that enables users to define, creates, and maintains the database and which provides controlled access to this database. e.g. Oracle , MS Access, SQL Server and MySQL

### Do you know!

E.F Codd presented the 12 rules that all databases must follow to qualify as relational database.

### 3. Keys in Database

#### Remember

3 rules that apply to primary keys:

- 1- Exist
- 2- Be unique.
- 3- Not change over time (unique sustained existence)


Keys are very important part of Relational database. They are used to establish and identify relation between tables. They also ensure that each record within a table can be uniquely identified by combination of one or more fields within a table.

#### Super Key

A Super key is any combination of fields within a table that uniquely identifies each record within that table.

#### Candidate Key

A candidate is a subset of a super key. A candidate key is a single field or the least combination of fields that uniquely identifies each record in the table. The least combination of fields distinguishes a candidate key from a super key. Every table must have at least one candidate key but at the same time can have several.



| S # | Emp-ID | Name           | CNIC            | City   |
|-----|--------|----------------|-----------------|--------|
| 001 | AL-DI  | Ahmad          | 35201-9696781-1 | Gujrat |
| 002 | AL-DI  | Qaisar         | 34501-3456789-0 | Gujrat |
| 003 | ALDI   | Mehar Muhammad | 34501-0987651-1 | Gujrat |

In order to be eligible for a candidate key it must pass certain criteria.

- It must contain unique values
- It must not contain null values
- It contains the minimum number of fields to ensure uniqueness
- It must uniquely identify each record in the table

Once the candidate keys have been identified it can now select one to be primary key

#### Primary Key

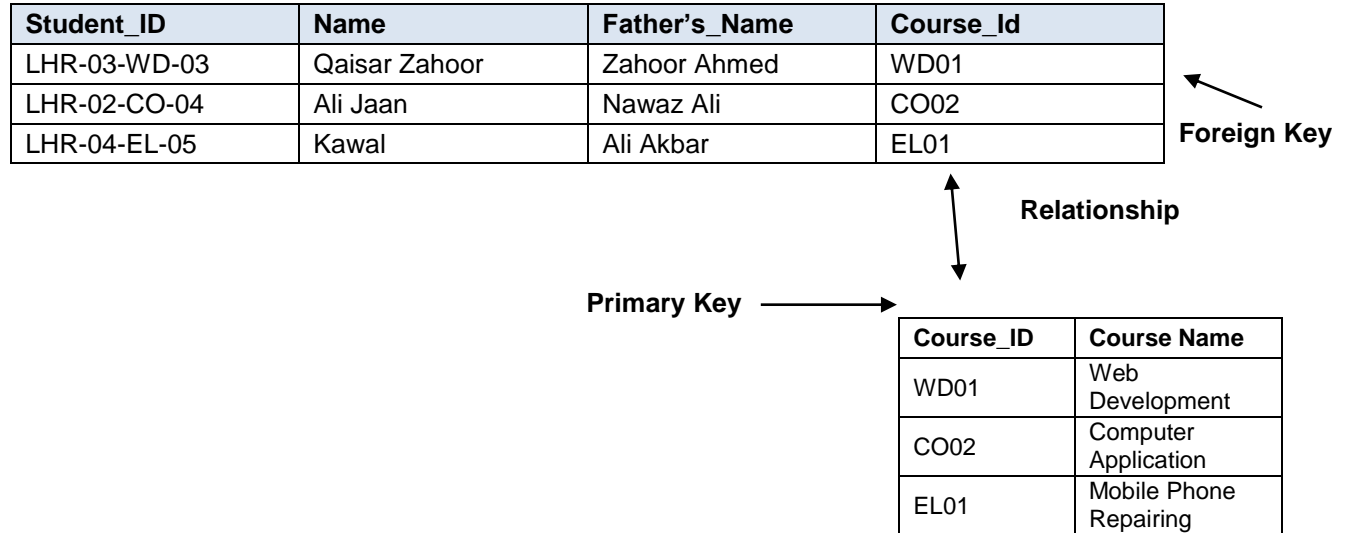
Primary key is a candidate key that is most appropriate to become main key of the table. It is a key that uniquely identify each record in a table.

| <u>Emp-ID</u> | Name   | Dept -Name | Salary |
|---------------|--------|------------|--------|
| 100           | Munir  | Software   | 12,000 |
| 140           | Akmal  | Hardware   | 11,000 |
| 110           | Amir   | Marketing  | 6,000  |
| 150           | Shazia | Software   | 45000  |

#### Foreign Key

A foreign key is generally a primary key from one table that appears as a field in another where the first table has a relationship to the second. In other words, if one had a table A with a primary key X that linked to a table B where X was a field in B, then X would be a foreign key in B.

An example might be a student table that contains the course\_id the student is attending. Another table lists the courses on offer with course\_id being the primary key. The 2 tables are linked through course\_id and as such course\_id would be a foreign key in the student table.



### Composite Key

Key that consists of two or more attributes that uniquely identify an entity occurrence is called Composite key. But any attribute that makes up the Composite key is not a simple key in its own.

| Registration     |                  |                 |                    |
|------------------|------------------|-----------------|--------------------|
| <u>Client No</u> | <u>Branch No</u> | <u>Staff No</u> | <u>Date joined</u> |
| CR 76            | B005             | SL 41           | 2-Jan-2005         |
| CR 56            | B006             | SG 37           | 11-Apr-05          |
| CR 74            | B005             | SG 37           | 17-March-05        |
| CR 74            | B006             | SA 9            | 8-June-05          |

In the Registration, relation Primary key is the combination of two attribute client No and Branch No So it is a composite Primary key.

### Secondary or Alternative key

The candidate key which are not selected for primary key are known as secondary keys or alternative keys

### Non-key Attribute

Non-key attributes are attributes other than candidate key attributes in a table.

### Non-prime Attribute

Non-prime Attributes are attributes other than Primary attribute.

## 4. Normalization of Database

Database Normalization is a technique of organizing the data in the database. Normalization is a systematic approach of decomposing tables to eliminate data redundancy and undesirable characteristics like Insertion, Update and Deletion Anomalies. It is a multi-step process that puts data into tabular form by removing duplicated data from the relation tables.

Normalization is used for mainly two purpose,

- Eliminating redundant (useless) data.
- Ensuring data dependencies make sense i.e. data is logically stored.

Normalization rule are divided into following normal form.

- First Normal Form
- Second Normal Form
- Third Normal Form
- BCNF

### First Normal Form (1NF)

As per First Normal Form, no two Rows of data must contain repeating group of information i.e. each set of column must have a unique value, such that multiple columns cannot be used to fetch the same row. Each table should be organized into rows, and each row should have a primary key that distinguishes it as unique.

The Primary key is usually a single column, but sometimes more than one column can be combined to create a single primary key. For example consider a table which is not in First normal form

Student Table :

| Student | Age | Subject        |
|---------|-----|----------------|
| Adam    | 15  | Biology, Maths |
| Alex    | 14  | Maths          |
| Stuart  | 17  | Maths          |

#### Do you know!

Boyce and Codd Normal Form (BCNF) is a higher version of 3<sup>rd</sup> Normal Form or you can say 4<sup>th</sup> Normal Form.

In First Normal Form, any row must not have a column in which more than one value is saved, like separated with commas. Rather than that, it must separate such data into multiple rows.

Student Table following 1NF will be :

| Student | Age | Subject |
|---------|-----|---------|
| Adam    | 15  | Biology |
| Adam    | 15  | Maths   |
| Alex    | 14  | Maths   |
| Stuart  | 17  | Maths   |

Using the First Normal Form, data redundancy increases, as there will be many columns with same data in multiple rows but each row as a whole will be unique.

### Second Normal Form (2NF)

As per the Second Normal Form there must not be any partial dependency of any column on primary key. It means that for a table that has concatenated primary key, each column in the table that is not part of the primary key must depend upon the entire concatenated key for its existence. If any column depends only on one part of the concatenated key, then the table fails Second normal form.

In example of First Normal Form there are two rows for Adam, to include multiple subjects that he has opted for. While this is searchable, and follows First normal form, it is an inefficient use of space. Also in the above Table in First Normal Form, while the candidate key is {Student, Subject}, Age of Student only depends on Student column, which is incorrect as per Second Normal Form. To achieve second normal form, it would be helpful to split out the subjects into an independent table, and match them up using the student names as foreign keys.

New Student Table following 2NF will be :

| Student | Age |
|---------|-----|
| Adam    | 15  |
| Alex    | 14  |
| Stuart  | 17  |

In Student Table the candidate key will be Student column, because all other column i.e. Age is dependent on it.

New Subject Table introduced for 2NF will be :

| Student | Subject |
|---------|---------|
| Adam    | Biology |
| Adam    | Maths   |
| Alex    | Maths   |
| Stuart  | Maths   |

In Subject Table the candidate key will be {Student, Subject} column. Now, both the above tables qualifies for Second Normal Form and will never suffer from Update Anomalies. Although there are a few complex cases in which table in Second Normal Form suffers Update Anomalies, and to handle those scenarios Third Normal Form is there.

### Third Normal Form (3NF)

Third Normal form applies that every non-prime attribute of table must be dependent on primary key, or it can say that, there should not be the case that a non-prime attribute is determined by another non-prime attribute. So this transitive functional dependency should be removed from the table and also the table must be in Second Normal form. For example, consider a table with following fields.

Student\_Detail Table :

| Student_id | Student_name | DOB | Street | city | State | Zip |
|------------|--------------|-----|--------|------|-------|-----|
|------------|--------------|-----|--------|------|-------|-----|

In this table Student\_id is Primary key, but street, city and state depends upon Zip. The dependency between zip and other fields is called transitive dependency. Hence to apply 3NF, it need to move the street, city and state to new table, with Zip as primary key.

New Student\_Detail Table :

| Student_id | Student_name | DOB | Zip |
|------------|--------------|-----|-----|
|------------|--------------|-----|-----|

Address Table :

| Zip | Street | city | state |
|-----|--------|------|-------|
|-----|--------|------|-------|

The advantage of removing transitive dependency is,

Amount of data duplication is reduced.

#### Do you know!

In the 1970s by IBM researchers Raymond Boyce and Donald Chamberlin developed SQL.

**Remember**

SQL is pronounced  
as SEQUEL

Data integrity achieved.

**De-normalization**

De-normalization is the process of taking a normalized database and modifying table structures to allow controlled redundancy for increased database performance. Attempting to improve performance is the only reason to ever de-normalize a database. De-normalization may involve recombining separate tables or creating duplicate data within tables to reduce the number of tables that need to be joined to retrieve the requested data. A de normalized database should not be confused with a database that has never been normalized.

## 5. Structure Query Language(SQL)

### What is SQL?

SQL is a standard language for accessing databases

- SQL stands for Structured Query Language
- SQL gives access and manipulate databases
- SQL is an ANSI (American National Standards Institute) standard

### What Can SQL do?

- SQL can execute queries against a database
- SQL can retrieve data from a database
- SQL can insert records in a database
- SQL can update records in a database
- SQL can delete records from a database
- SQL can create new databases
- SQL can create new tables in a database
- SQL can create stored procedures in a database
- SQL can create views in a database
- SQL can set permissions on tables, procedures, and views

### Using SQL in the Web Site

To build a web site that shows data from a database,

- An RDBMS database program (i.e. MS Access, SQL Server, MySQL)
- To use a server-side scripting language, like PHP or ASP
- To use SQL to get the data as required
- To use HTML / CSS

### RDBMS

RDBMS stands for Relational Database Management System.

RDBMS is the basis for SQL, and for all modern database systems such as MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access. The data in RDBMS is stored in database objects called tables. A table is a collection of related data entries and it consists of columns and rows.

### Some of The Most Important SQL Commands

- **SELECT** - extracts data from a database
- **UPDATE** - updates data in a database
- **DELETE** - deletes data from a database
- **INSERT INTO** - inserts new data into a database
- **CREATE DATABASE** - creates a new database



- **ALTER DATABASE** - modifies a database
- **CREATE TABLE** - creates a new table
- **ALTER TABLE** - modifies a table
- **DROP TABLE** - deletes a table
- **CREATE INDEX** - creates an index (search key)
- **DROP INDEX** - deletes an index

### SELECT Statement

The SELECT statement is used to select data from a database. The result is stored in a result table, called the result-set.

### SQL SELECT Syntax

```
SELECT column_name,column_name
FROM table_name;
```

and *SELECT \* FROM table\_name;*

Select \* will select all columns of table while select column\_name will select only specific column from table.

### WHERE Clause

The WHERE clause is used to extract only those records that fulfill a specified criterion.

### SQL WHERE Syntax

```
SELECT column_name,column_name
FROM table_name
WHERE column_name operator value;
```

*Example*

```
SELECT * FROM Customers
WHERE City='lahore';
```

### Operators in The WHERE Clause

The following operators can be used in the WHERE clause:

| Operator | Description                                                                        |
|----------|------------------------------------------------------------------------------------|
| =        | Equal                                                                              |
| <>       | Not equal. <b>Note:</b> In some versions of SQL this operator may be written as != |
| >        | Greater than                                                                       |
| <        | Less than                                                                          |
| >=       | Greater than or equal                                                              |
| <=       | Less than or equal                                                                 |
| BETWEEN  | Between an inclusive range                                                         |
| LIKE     | Search for a pattern                                                               |
| IN       | To specify multiple possible values for a column                                   |

## AND & OR Operators

The AND operator displays a record if both the first condition AND the second condition are true. The OR operator displays a record if either the first condition OR the second condition is true.

```
SELECT * FROM Customers
WHERE Country='Pakistan'
AND City='Islamabad';
```

## Combining AND & OR

Combine AND & OR (use parenthesis to form complex expressions).

```
SELECT * FROM Customers
WHERE Country='Germany'
AND (City='Rawalpindi' OR City='Lahore');
```

## ORDER BY Keyword

The ORDER BY keyword is used to sort the result-set by one or more columns.

The ORDER BY keyword sorts the records in ascending order by default. To sort the records in a descending order, it can use the DESC keyword.

## SQL ORDER BY Syntax

```
SELECT column_name,column_name
FROM table_name
ORDER BY column_nameASC|DESC,column_name ASC|DESC;
```

## Example

```
SELECT * FROM Customers ORDER BY Country DESC;
```

## SQL INSERT INTO Statement

The INSERT INTO statement is used to insert new records in a table.

## SQL INSERT INTO Syntax

It is possible to write the INSERT INTO statement in two forms.

The first form does not specify the column names where the data will be inserted, only their values:

```
INSERT INTO table_name
VALUES (value1,value2,value3,...);
```

The second form specifies both the column names and the values to be inserted:

```
INSERT INTO table_name (column1,column2,column3,...)
VALUES (value1,value2,value3,...);
```

## INSERT INTO Example

To insert a new row in the "Customers" table.

Use the following SQL statement:

```
INSERT INTO Customers (CustomerName, ContactName, Address, City, PostalCode, Country)
VALUES ('Atif','Mehmood','E-Block F7/2','Islamabad','5400','Pakistan');
```

### UPDATE Statement

The UPDATE statement is used to update existing records in a table.

### SQL UPDATE Syntax

```
UPDATE table_name
SET column1=value1,column2=value2,...
WHERE some_column=some_value;
```

### Example

```
UPDATE Customers
SET ContactName='Alfred Schmidt', City='Hamburg'
WHERE CustomerName='AlfredsFutterkiste';
```

### DELETE Statement

The DELETE statement is used to delete rows in a table.

### SQL DELETE Syntax

```
DELETE FROM table_name
WHERE some_column=some_value;
```

### Example

```
DELETE FROM Customers
WHERE CustomerName='AlfredsFutterkiste' AND ContactName='Maria Anders';
```

### CREATE DATABASE Statement

The CREATE DATABASE statement is used to create a database.

### SQL CREATE DATABASE Syntax

```
CREATE DATABASE dbname;
```

### SQL CREATE DATABASE Example

The following SQL statement creates a database called "my\_db":

```
CREATE DATABASE my_db;
```

Database tables can be added with the CREATE TABLE statement.

### CREATE TABLE Statement

The CREATE TABLE statement is used to create a table in a database.

Tables are organized into rows and columns; and each table must have a name.

### SQL CREATE TABLE Syntax

```
CREATE TABLE table_name
(
```

```
column_name1 data_type(size),
column_name2 data_type(size),
column_name3 data_type(size),
....
);
```

### Example

```
CREATE TABLE Persons
(
 PersonID int,
 LastName varchar(255),
 FirstName varchar(255),
 Address varchar(255),
 City varchar(255)
);
```

### SQL Constraints

SQL constraints are used to specify rules for the data in a table.

If there is any violation between the constraint and the data action, the action is aborted by the constraint.

Constraints can be specified when the table is created (inside the CREATE TABLE statement) or after the table is created (inside the ALTER TABLE statement).

### SQL CREATE TABLE + CONSTRAINT Syntax

```
CREATE TABLE table_name
(
 column_name1 data_type(size) constraint_name,
 column_name2 data_type(size) constraint_name,
 column_name3 data_type(size) constraint_name,

);
```

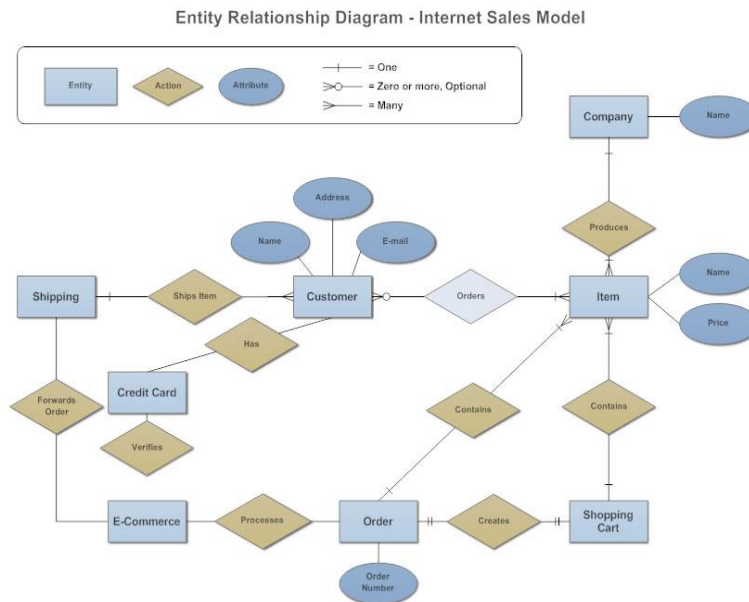
In SQL, following constraints are used:

- **NOT NULL** - Indicates that a column cannot store NULL value
- **UNIQUE** - Ensures that each row for a column must have a unique value
- **PRIMARY KEY** - A combination of a NOT NULL and UNIQUE. Ensures that a column (or combination of two or more columns) have an unique identity which helps to find a particular record in a table more easily and quickly
- **FOREIGN KEY** - Ensure the referential integrity of the data in one table to match values in another table
- **CHECK** - Ensures that the value in a column meets a specific condition
- **DEFAULT** - Specifies a default value when specified none for this column

## 6. Entity Relationship Diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is a component of data. In other words, ER diagrams illustrate the logical structure of databases.

At first glance an entity relationship diagram looks very much like a flowchart. It is the specialized symbols, and the meanings of those symbols, that make it unique.



## The History of Entity Relationship Diagrams

Peter Chen developed ERDs in 1976. Since then Charles Bachman and James Martin have added some slight refinements to the basic ERD principles.

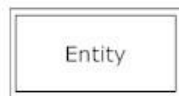
## Structure of an Entity Relationship Diagram with Common ERD Notations

An entity relationship diagram is a means of visualizing how the information a system produces is related. There are five main components of an ERD:

- **Entities**, which are represented by rectangles. An entity is an object or concept about which, information is to be stored in databases.



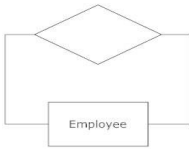
- A **weak entity** is an entity that must be defined by a foreign key relationship with another entity as it cannot be uniquely identified by its own attributes alone.



- **Relationship**, which are represented by diamond shapes, show how two entities share information in the database.



- In some cases, entities can be self-linked. For example, employees can supervise other employees.



- **Attributes**, which are represented by ovals. A key attribute is the unique, distinguishing characteristic of the entity. For example, an employee's social security number might be the employee's key attribute.



A multivalued attribute can have more than one value. For example, an employee entity can have multiple skill values.

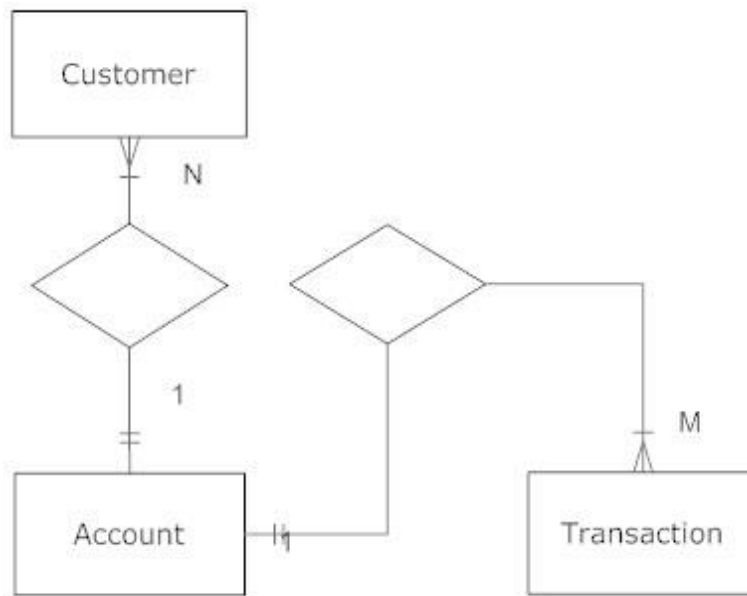
A derived attribute is based on another attribute. For example, an employee's monthly salary is based on the employee's annual salary.



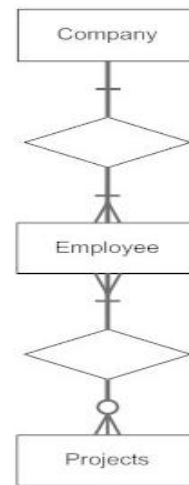
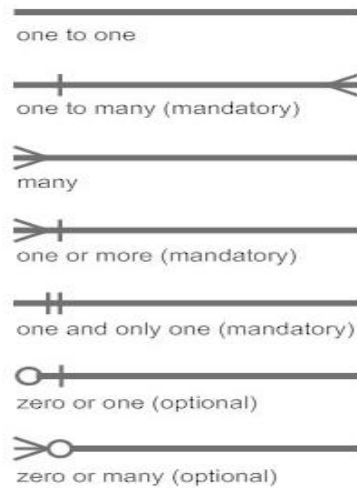
- **Connecting lines**, solid lines that connect attributes to show the relationships of entities in the diagram.



- **Cardinality** specifies how many instances of an entity relate to one instance of another entity. Ordinarily is also closely linked to cardinality. While cardinality specifies the occurrences of a relationship, ordinarily describes the relationship as either mandatory or optional. In other words, cardinality specifies the maximum number of relationships and ordinarily specifies the absolute minimum number of relationships.



There are many notation styles that express cardinality.

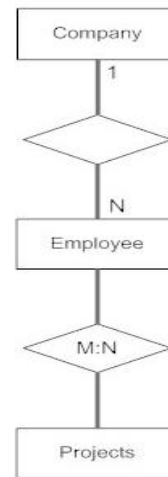
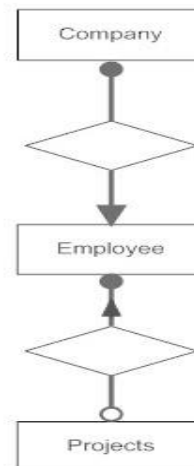
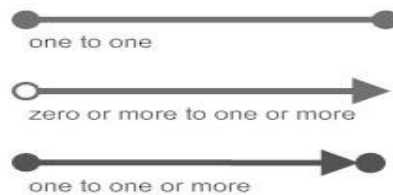
**Information Engineering Style****Chen Style**

Ordinality - describes the minimum (optional vs mandatory)  $\rightarrow$  M:N  $\leftarrow$  Cardinality - describes the maximum

1:N (n=0,1,2,3...) one to zero or more

M:N (m and n=0,1,2,3...) zero or more to zero or more (many to many)

1:1 one to one

**Bachman Style**

### Martin Style

1 - one, and only one (mandatory)

\* - many (zero or more - optional)

1...\* - one or more (mandatory)

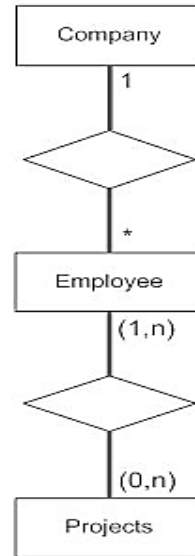
0...1 - zero or one (optional)

(0,1) - zero or one (optional)

(1,n) - one or more (mandatory)

(0,n) - zero or more (optional)

(1,1) - one and only one (mandatory)



### Entity Relationship Diagram Uses

When documenting a system or process, looking at the system in multiple ways increases the understanding of that system. ERD diagrams are commonly used in conjunction with a data flow diagram to display the contents of a data store. They help us to visualize how data is connected in a general way, and are particularly useful for constructing a relational database.

### How to Create an Entity Relationship Diagram

Here are some best practice tips for constructing an ERD:

- **Identify the entities.** The first step in making an ERD is to identify all of the used entities. An entity is nothing more than a rectangle with a description of something that the system stores information about. This could be a customer, a manager, an invoice, a schedule, a student, a patient etc. Draw a rectangle for each entity. Keep them spaced out a bit.



- **Identify relationships.** Look at two entities, are they related? If so draw a solid line connecting the two entities.
- **Describe the relationship.** How are the entities related? Draw an action diamond between the two entities on the line just added. In the diamond write a brief description of how they are related.
- **Add attributes.** Any key attributes of entities should be added using oval-shaped symbols.
- **Complete the diagram.** Continue to connect the entities with lines, and adding diamonds to describe each relationship until all relationships have been described. Every entity may or may not have any relationships, some may have multiple relationships.



## 7. Difference between Open Source and License Database

### Open Source / free database software

The terms "free software licenses" and "open-source licenses" are usually interchangeable. While there is no one universally agreed-upon definition of free software, various groups maintain approved lists of licenses. The Open Source Initiative is one such organization keeping a list of "open source" licenses. The Free Software Foundation maintains a list of what it considers free.

Free Software provides the user's 4 essentials freedoms to use the *program*, to study and modify it, to copy it, and redistribute it for any purpose. While open-source criteria focuses only on the availability of the *source code*.

### License / Paid software

Every piece of software – even free software - has some kind of software license. They're often lengthy and difficult to read, and usually cover these key points:

- **Use of how many copies of the software.** It is possible to install a software on to lots of computers in a business, or just one?
- **What organizations can use the software?** Some licenses are for charities, students or home users. These are cheaper, but can't be used by businesses.
- **How long a software can be used?** Perpetual software licenses last forever. But some license agreements expire unless to renew them.

A license agreement may also include information about upgrading or reselling the software (resale is usually prohibited), and any steps might to take to activate the software.

Make sure any license agreement meets the needs, and understand the restrictions and cost implications before agreeing to it.

# Learning Unit 2: Database Management Systems

## Overview

### Remember

255 users can work in MS Access at same time.

In this learning unit, the learner will be introduced to how to use different Relational Database Management Systems. After the completion of this unit, the learner will be able to design, create and manage database in any Database Management System like MS Access, MySQL and MS SQL.

## 1. Comparative Study of Different Database Management System

### MS Access

#### Do you know!

MS Access has an .mdb extension

Microsoft Access is the database application from the Microsoft Office Suite of applications. It is a powerful personal database and data manipulation tool that is also widely used in many small businesses.

Access allows the user to create "forms" and "reports". A form shows one record in a user-designed format and allows the user to step through records one at a time. A report shows selected records in a user-designed format, possibly grouped into sections with different kinds of total (including sum, minimum, maximum, average).

There are also facilities to use links ("joins") between tables which share a common field and to filter records according to certain criteria or search for particular field values.

### MS SQL Server

SQL Server is Microsoft's relational database management system (RDBMS). It is a full-featured database primarily designed to compete against competitors Oracle Database (DB) and MySQL.

SQL Server is offered in several editions with different feature set and pricing options to meet a variety of user needs, including the following:

- Enterprise: Designed for large enterprises with complex data requirements, data warehousing and Web-enabled databases. Has all the features of SQL Server, and its license pricing is the most expensive.
- Standard: Targeted toward small and medium organizations. Also supports e-commerce and data warehousing.
- Workgroup: For small organizations. No size or user limits and may be used as the backend database for small Web servers or branch offices.
- Express: Free for distribution. Has the fewest number of features and limits database size and users. May be used as a replacement for an Access database.

### MySQL

MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL).

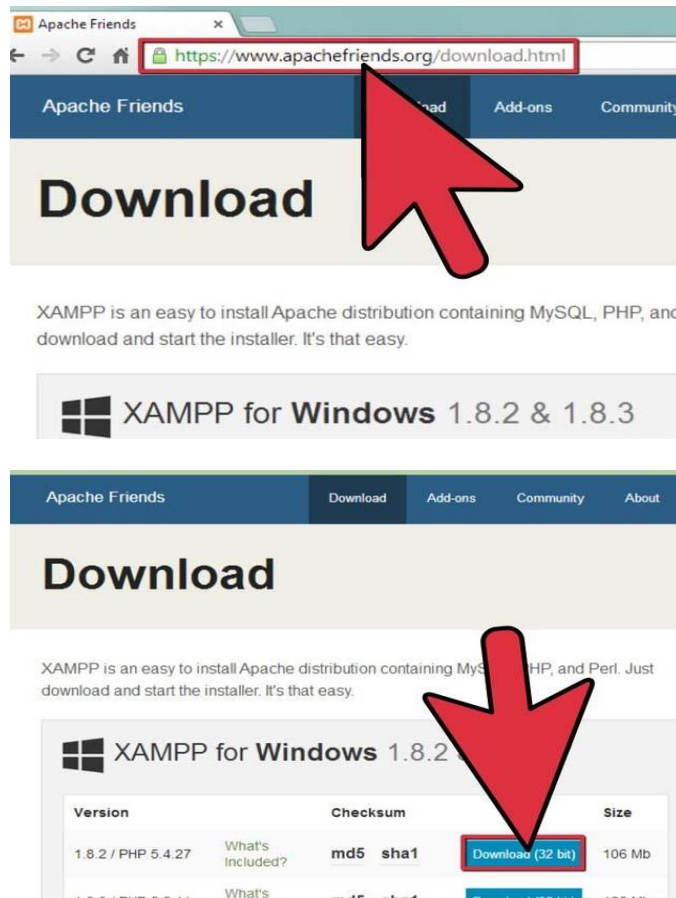
SQL is the most popular language for adding, accessing and managing content in a database. It is most noted for its quick processing, proven reliability, ease and flexibility of use. MySQL is an essential part of almost every open source PHP application. Good examples for PHP/MySQL-based scripts are phpBB, osCommerce and Joomla.

One of the most important things about using MySQL that online there are many free web hosting database server that provide the MySQL free hosting like [www.000webhost.com](http://www.000webhost.com).

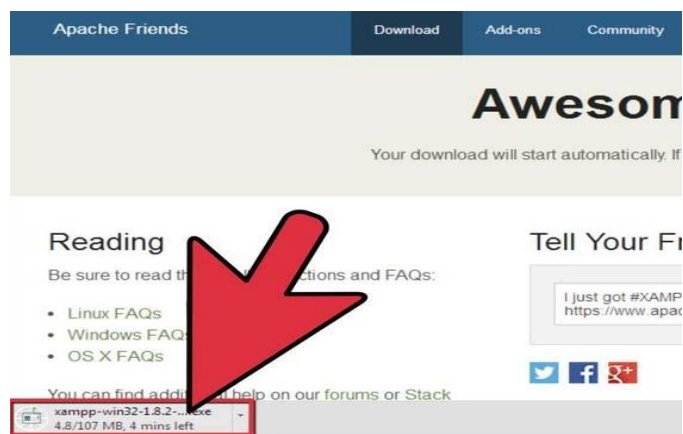
## 2. Procedure to Install MySQL

XAMPP for Windows provides an easy to install Apache-MySQL-PHP-PERL-PEAR framework. XAMPP saves time and effort and provides the software support for web frameworks like Drupal, Joomla or Moodle on any Windows PC.

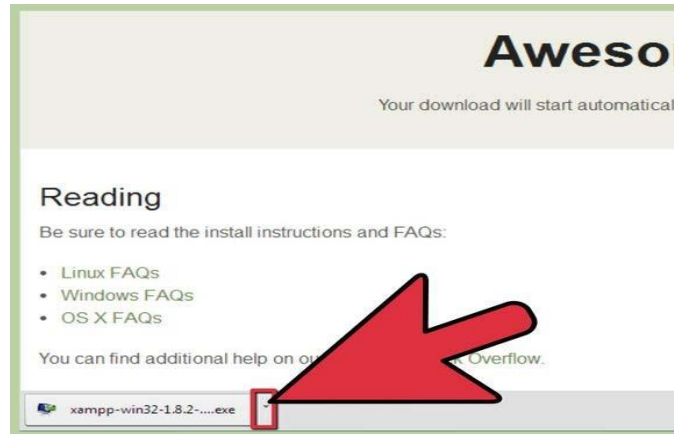
### Steps



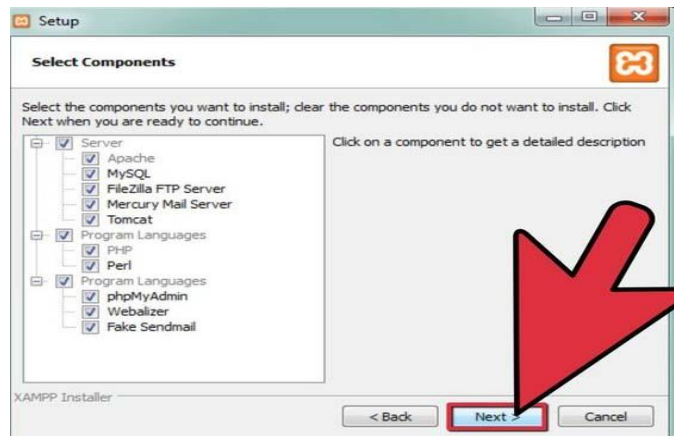
2-Click on the download link for XAMPP.



3-When prompted for the download, click "Save" and wait for the download to finish.



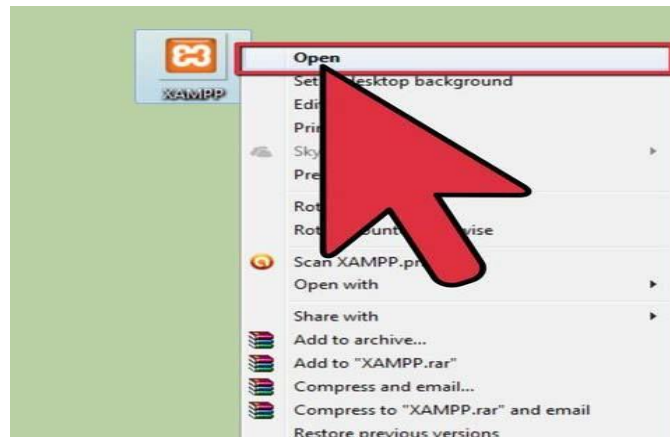
4-Once the download is complete, install the program, click on "Run"



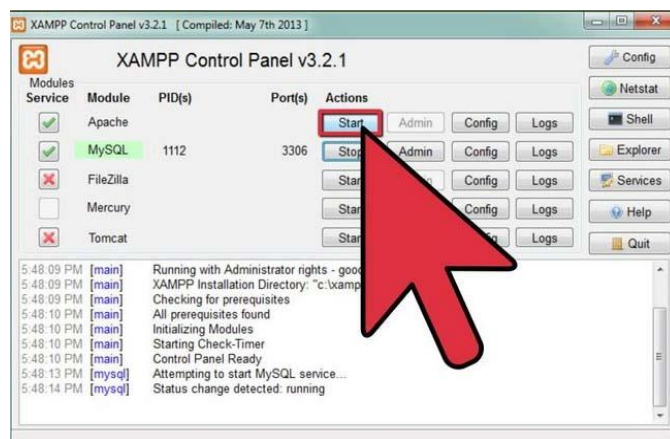
5-**Accept the default settings.** A command will open and offer an initial installation prompt. Just hit the Enter key, and accept the default settings. To simplify installation, just hit ENTER when prompted on the command line.



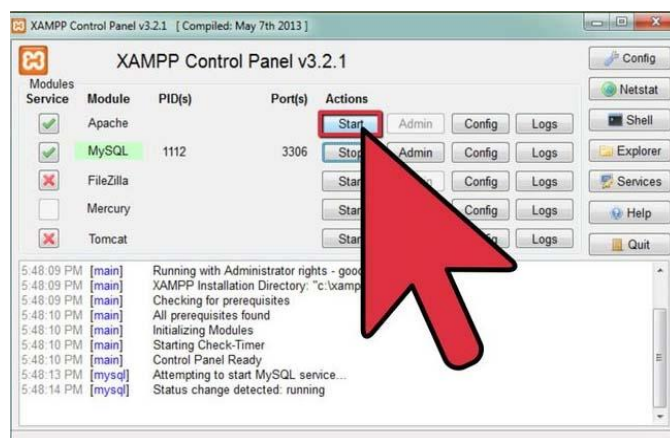
6-When the installation is complete, exit the command window by typing x on the command line.



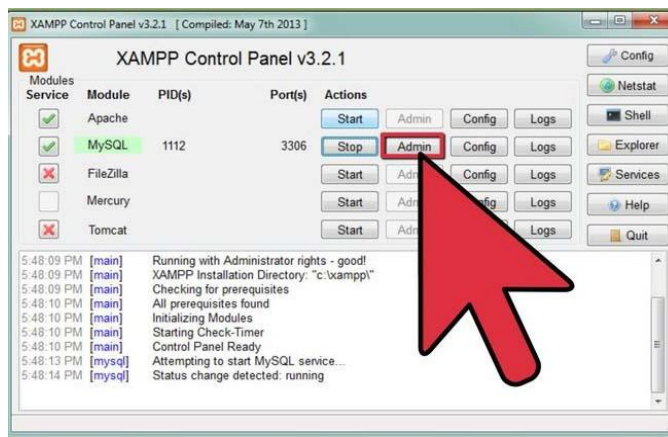
7-Start the XAMPP Control Panel.



8-Start the Apache and MySQL Components.



9-Verify the Apache install, by clicking on the Apache administrative link in the Control Panel.



10-Verify the MySQL installation, by clicking on the MySQL administrative link in the XAMPP Control Panel.

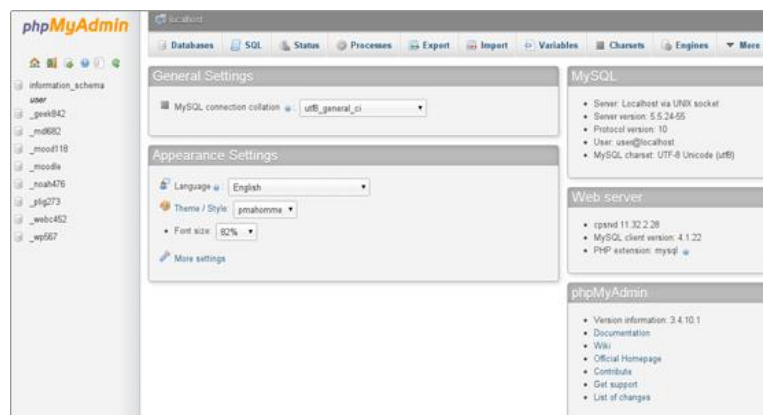
If the verification steps are successful, XAMPP should be successfully installed on the PC.

### 3. MYSQL

#### What is PhpMyAdmin

PhpMyAdmin is a free software tool written in PHP, intended to handle the administration of MySQL over the Web. PhpMyAdmin supports a wide range of operations on MySQL, MariaDB and Drizzle. Frequently used operations (managing databases, tables, columns, relations, indexes, users, permissions, etc.) can be performed via the user interface, have the ability to directly execute any SQL statement.

In the following pages of our PhpMyAdmin describe the functionality of the software, integrated in cPanel.



In the upper part, find the server hostname, the databases will manage stored on the same server as the software and the hostname is: localhost.

Under it there is information regarding the MySQL server, the MySQL client and the PhpMyAdmin version.

Next, the MySQL charset and will be able to define the MySQL connection collation.

In the right column formatting (style, color, & font etc.) and language option come to alter and customize, also available option to links PhpMyAdmin resources.

To create a new database from cPanel->MySQL Databases, navigate to the Create New Database box, enter the database name in the New Database text field and click on the Create Database button. The database name will start with the cPanel user name. For example if cPanel user name is user and have a database named test,

the actual database name will be user\_test. In the left panel, the list of the databases for which cPanel user has privileges.

The main PhpMyAdmin areas are as follows:

### Databases

In the Databases tab, a list with all the databases which can be managed through the cPanel user, click on a chosen database, start its management. Please note that the enabling of the statistics will increase the load caused by account on the server.



### Status

Open the Status tab by clicking on the Show MySQL runtime information link. There is all detailed information regarding the MySQL server since the last restart.



The traffic handled by the MySQL server, the maximum number of simultaneous connections, the total number of connections, the failed and the aborted attempts, the total number of queries sent to the server and more related details.

### Variables

The Variables tab will be opened after clicking on the Show MySQL system variables link.

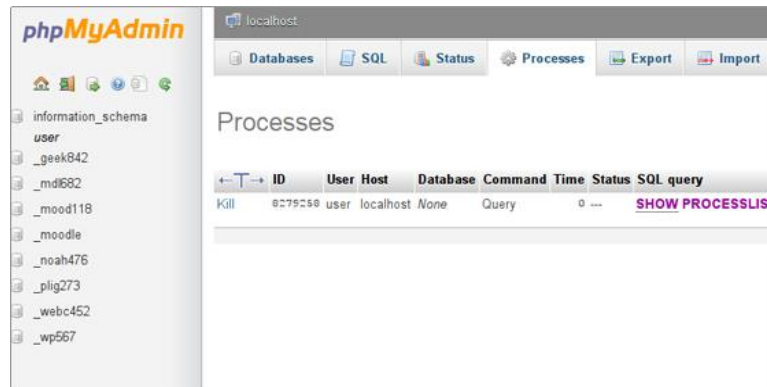




Find a list with the MySQL server system variables and their values.

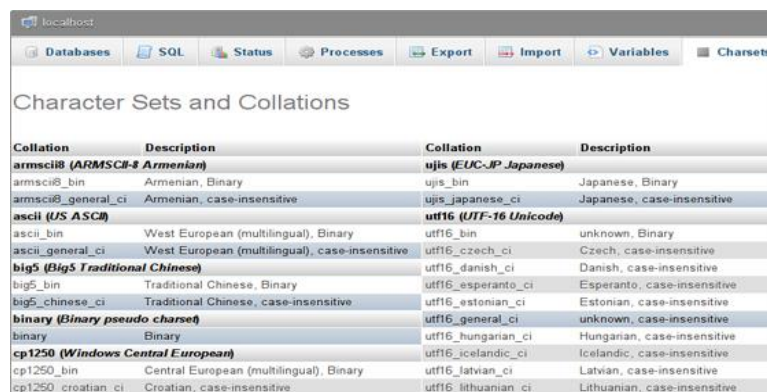
## Processes

By clicking on the Processes link, find all the processes running by cPanel user.



## Charsets

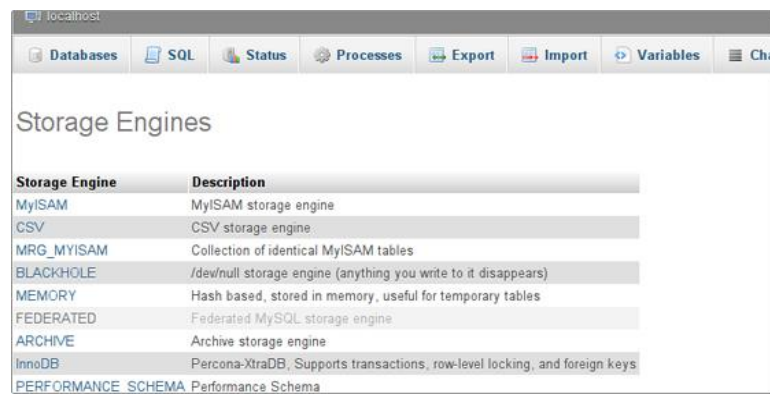
The Character Sets and Collations link leads to the Charset area.



## Engines

The Storage Engines link opens a list with all the engines supported by the MySQL server. The default one is MyISAM. Another popular storage engine, used by many databases is InnoDB. More about the MySQL storage engines can be found in the official documentation.

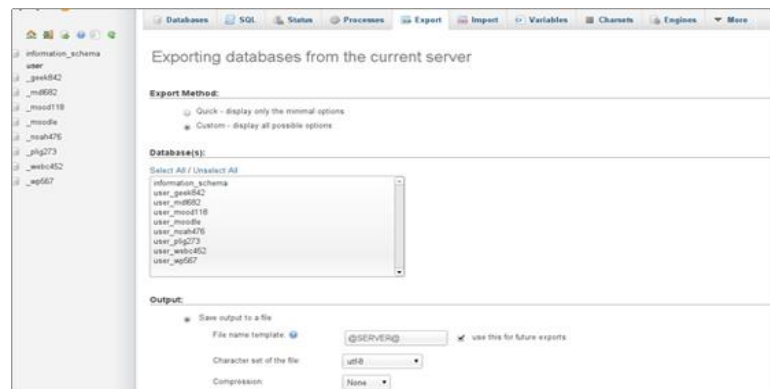




| Storage Engine     | Description                                                                |
|--------------------|----------------------------------------------------------------------------|
| MyISAM             | MyISAM storage engine                                                      |
| CSV                | CSV storage engine                                                         |
| MRG_MYISAM         | Collection of identical MyISAM tables                                      |
| BLACKHOLE          | /dev/null storage engine (anything you write to it disappears)             |
| MEMORY             | Hash based, stored in memory, useful for temporary tables                  |
| FEDERATED          | Federated MySQL storage engine                                             |
| ARCHIVE            | Archive storage engine                                                     |
| InnoDB             | Percona-XtraDB, Supports transactions, row-level locking, and foreign keys |
| PERFORMANCE_SCHEMA | Performance Schema                                                         |

## Export

In the Export section, export the database table's content in different formats (CSV, SQL, PDF, Microsoft Excel, Microsoft Word, XML, and many more).



Exporting databases from the current server

**Export Method:**  
☐ Quick - display only the minimal options  
☒ Custom - display all possible options

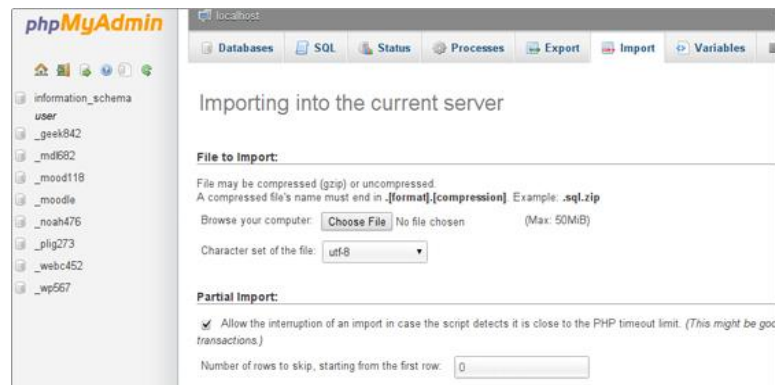
**Database(s):**  
 Select All / Unselect All  
 information\_schema  
 user  
 \_geek842  
 \_md682  
 \_mood118  
 \_moodle  
 \_noah476  
 \_plg273  
 \_webc452  
 \_wp567

**Output:**  
☒ Save output to a file  
 File name template: @SERVER@  
 Character set of the file: utf8  
 Compression: None

Can be added custom comments in the header of the exported content. It can be export the database tables in a file and compress it or visualize the queries directly on the screen.

## Import

Importing of the database tables from a file, saved on the local computer can be possible by Import Section.



Importing into the current server

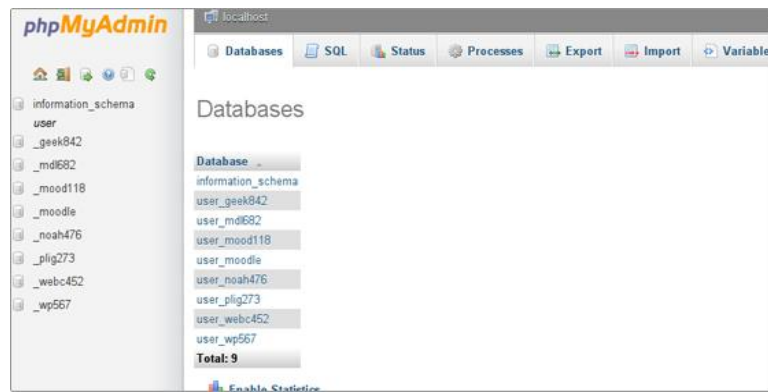
**File to Import:**  
 File may be compressed (gzip) or uncompressed.  
 A compressed file's name must end in **[format].[compression]**. Example: **.sql.zip**  
 Browse your computer:  No file chosen (Max: 50MiB)  
 Character set of the file: utf8

**Partial Import:**  
☒ Allow the interruption of an import in case the script detects it is close to the PHP timeout limit. (This might be good transactions.)  
 Number of rows to skip, starting from the first row:

## Database Management

The main functionality of the PhpMyAdmin tool is to manage the databases.

Click on the Databases link. Pick the preferred database need to manage and click on its name.



In the new screen, find a list with the database tables, the allowed actions with them, and the number of the records, the storage engine, the collation, the tables' sizes and the overhead.

| Table                      | Action                                    | Rows | Type   | Collation       | Size   |
|----------------------------|-------------------------------------------|------|--------|-----------------|--------|
| mdl_assignment             | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 32.0 K |
| mdl_assignment_submissions | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 60.0 K |
| mdl_backup_controllers     | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 64.0 K |
| mdl_backup_courses         | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 32.0 K |
| mdl_backup_files           | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 32.0 K |
| mdl_backup_files_template  | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 32.0 K |
| mdl_backup_ids             | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 32.0 K |
| mdl_backup_ids_template    | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 64.0 K |
| mdl_backup_logs            | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 48.0 K |
| mdl_block                  | Browse Structure Search Insert Empty Drop | 20   | InnoDB | utf8_general_ci | 32.0 K |
| mdl_block_community        | Browse Structure Search Insert Empty Drop | 0    | InnoDB | utf8_general_ci | 16.0 K |
| mdl_block_instances        | Browse Structure Search Insert Empty Drop | 5    | InnoDB | utf8_general_ci | 48.0 K |

The possible actions which can be performed to a chosen table are:

## Browse

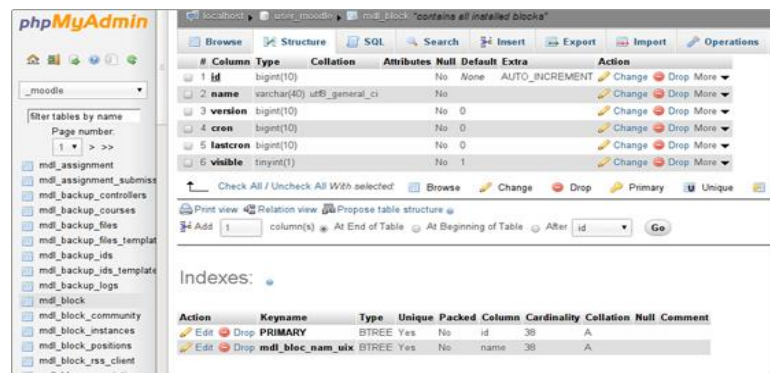
Only the tables with existing records can be browsed. Once click on the Browse icon a new window with the records list will be opened.

| id | name              | version    | cron | lastseen | visible |
|----|-------------------|------------|------|----------|---------|
| 1  | activity_modules  | 2011112900 | 0    | 0        | 1       |
| 2  | admin_bookmarks   | 2011112900 | 0    | 0        | 1       |
| 3  | blog_menus        | 2011112900 | 0    | 0        | 1       |
| 4  | blog_recent       | 2011112900 | 0    | 0        | 1       |
| 5  | blog_tags         | 2011112900 | 0    | 0        | 1       |
| 6  | calendar_month    | 2011112900 | 0    | 0        | 1       |
| 7  | calendar_upcoming | 2011112900 | 0    | 0        | 1       |
| 8  | comments          | 2011112900 | 0    | 0        | 1       |

By clicking on the Pen icon, edit the chosen record, record structure and alter the values of the records as required.

## Structure

The next option is named Structure. In the Structure screen of database's table structure.



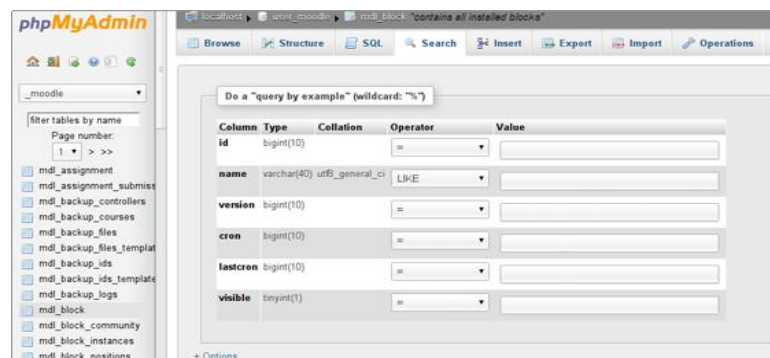
See the fields' names, their types, collations, attributes, additional extra information, the default values and whether the fields' values can be NULL. Browse for distinct values by clicking on the corresponding action icon, also, edit a field's structure or delete a field. Can be defined different indexes: Primary, Unique, Index and Fulltext.

In the Indexes area, the indexes assigned for the table and the fields for which they are set can be edited (update, Add & delete)

Additionally, in the same screen, Space Usage and the Row Statistics can be checked.

## Search

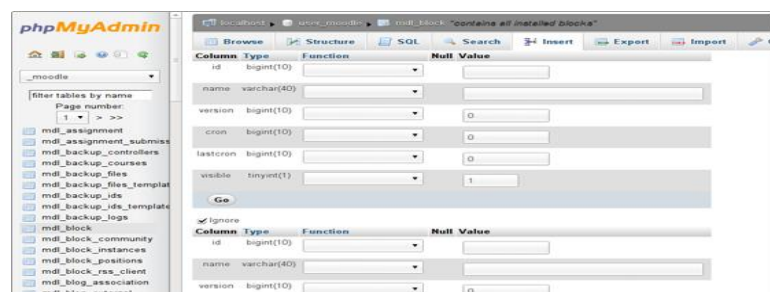
Through the Search action, generate a search query for the chosen table.



Write the WHERE clause or use the "query by example" functionality. For example, if one wants to visualize all the records with a field value that starts with, fields which want to show. Pick the LIKE operator from the drop-down menu and enter in the corresponding field value a% (% stands for a wildcard string). Click on the Go button to see the result.

## Insert

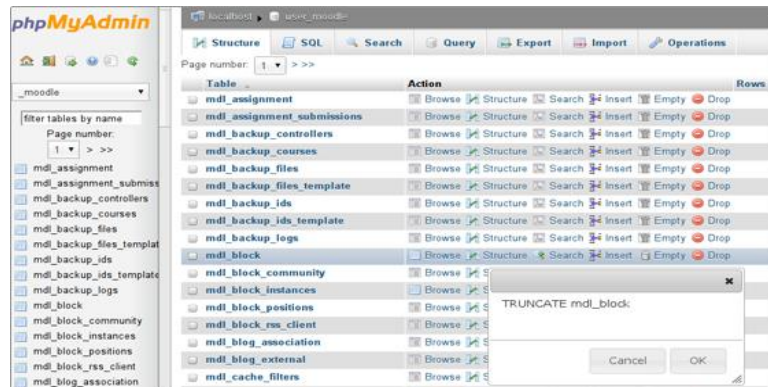
Using the Insert action to insert records in the database table.



Fill in the corresponding values click on the Go button and the new record will be inserted.

## Empty

The Empty action allows to empty the database table, removing the data and keeping the empty table.



## Drop

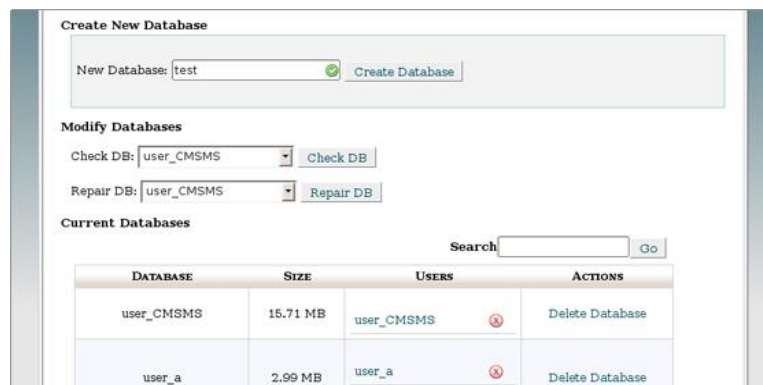
Through the Drop action, delete the whole table and all the records stored in it.

## Create Database

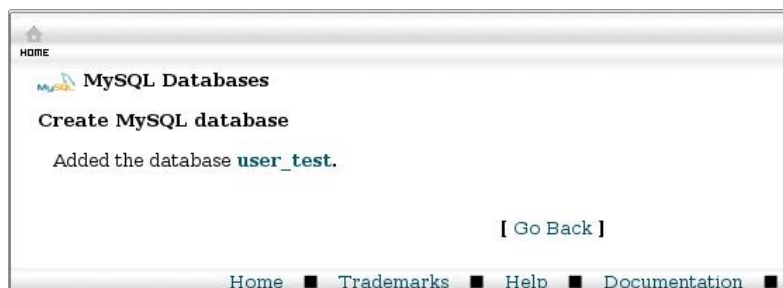
Follow the steps in order to create a new database, add a table with records, create a database backup and perform a database restore procedure.

## How to Create a MySQL Database?

It cannot be possible to create a database directly through cPanel->PhpMyAdmin due to the lack of user privileges. However, it is easily create a new database from cPanel->MySQL Databases. Navigate to the Create New Database box. Enter the database name in the New Database text field and click on the Create Database button.

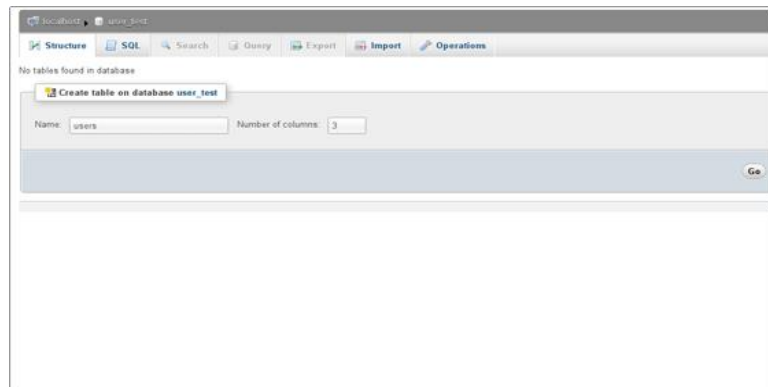


The database name will be preceded by the cPanel username.



## How to Add MySQL Database Tables?

Navigate to cPanel->PhpMyAdmin tool and open the newly create database. It is empty and there are no tables.



Enter the table name and the number of fields. Click on the Go button to create the table. On the next screen, enter the fields' names and the corresponding properties. The properties are:

### Type

Pick the appropriate type of the data, which will be stored in the corresponding field. More details about the possible choices can be found in the official MySQL Data Types documentation.

### Length/Values

Enter the appropriate length of the field. If the field type is "enum" or "set", enter the values using the following format: 'a','b','c'...

### Collation

Pick the data collation for each of the fields.

### Attributes

The possible attributes' choices are:

**BINARY** - the collation for the field will be binary, for example utf8\_bin;

**UNSIGNED** - the field numeric values will be positive or 0;

**UNSIGNED ZEROFILL** - the field numeric values will be positive or 0 and leading zeros will be added to a number;

**ON UPDATE CURRENT\_TIMESTAMP** - the value for a data type field has the current timestamp as its default value, and is automatically updated;

### Null

Check whether the field value can be NULL. More about the NULL value can be found in the corresponding MySQL documentation.

### Default

Allows to set the default value for the field.

## Extra

In the Extra property, define whether the field value is auto-increment.

The radio buttons that come below define whether there is an Index defined for the particular field and specify the Index type.

## Comments

Add comments, which will be included in the database sql code.

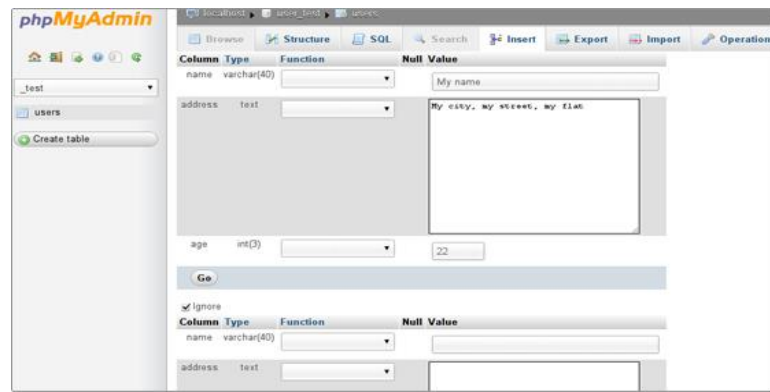
At the end, include Table comments and pick the MySQL Storage Engine and the Collation, click on the Save button.

To add more fields, specify their number and click on the Go button instead of Save. The database table will be created

## How to Add Content in a Database Table?

In order to add records in a database table click on the Insert tab.

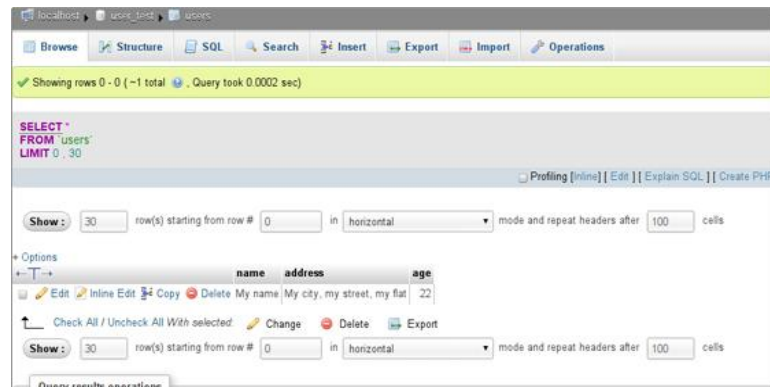




Enter the data in the corresponding fields and click on the Go button to store it.

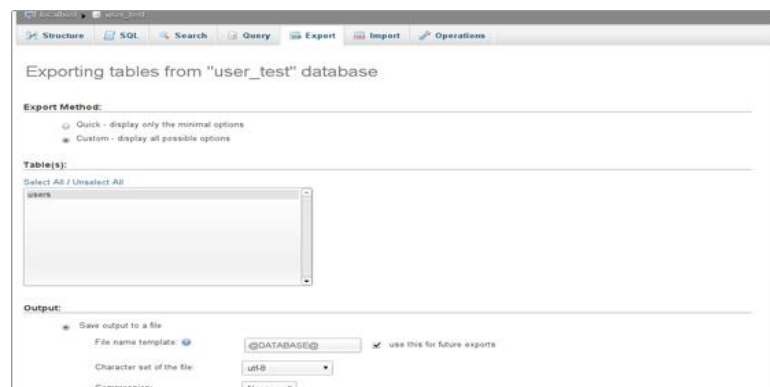
At the bottom of the page, see a drop-down menu labelled Restart insertion with x rows, pick the number of the rows that need to populate with data and insert at once. By default the value is 2.

The Ignore check box will allow to ignore the data entered below it. It will not be added. To view the newly inserted record, click on the Browse tab.



### How to Back up a Database?

To create a backup of the required database use the Export tab.



Select the tables which are required to export, leave the radio button selection to the SQL option. The Structure and the Data check boxes should remain checked.

Select the Save as file check box and then click on the Go button.

In case of a large database with a lot of records, the server timeout value can be reached. In such a case, export the database in several batches.

### How to Restore a Database Backup?

To restore the required database backup from the Import tab.

Click on the Browse button to select the required database backup file from the local computer.

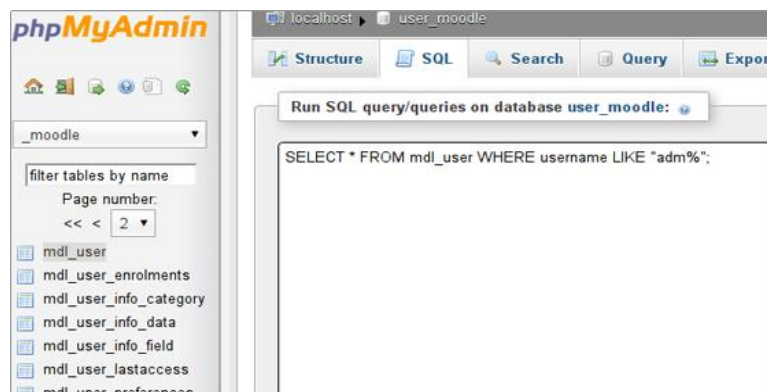
Pick the charset of the file from the corresponding drop-down menu.



### Run MySQL Query

There are two options to run a MySQL query.

The one for advanced users is through the SQL tab, should enter the entire SQL query code and click on the Go button to execute it.



The other option is to construct a MySQL query in the Query tab.



There one can define different search conditions, sort the results and query multiple tables. Select the tables used in the query from the Use Tables list.

The fields which will be included in the SELECT MySQL statement should be picked from the Field drop-down menus. The Show check box should be selected.

In the Criteria text field, enter the criteria according to which the search will be completed. Through the Sort drop-down menu, visualize the result sorted in an ascending or a descending order. The text window located below allows to add extra search conditions.

In the Modify section, to define the relations between the fields (whether they are connected through the AND or the OR logical operators), click on the Update Query button to complete the modifications.

To run the query click on the Submit Query button.

The query which have included in our example is:

```
SELECT `AT_admins` . * FROM AT_admins WHERE (`AT_admins`.`login` LIKE "a%");
```

It shows all the records from the AT\_admins table for which the login field starts with "a".

## PhpMyAdmin Database Operation

There are different operations which can be performed on the whole database or on a separate table.

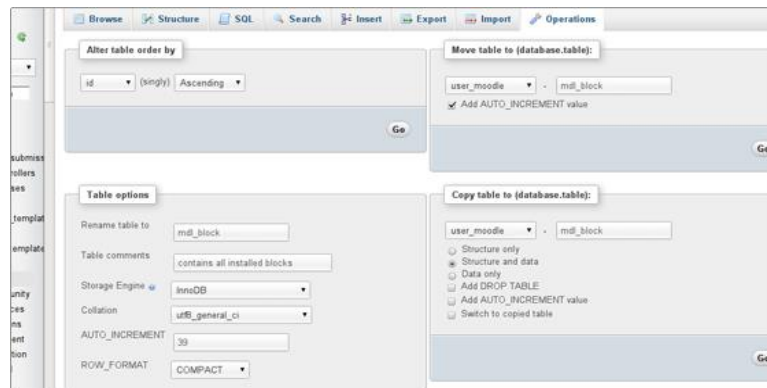
### Database Operations

Select a database and navigate to the Operations tab, find all the possible actions which can be applied on a database.

- Allows to create a new table under the current database. Enter the table name and the number of the fields. Then click on the Go button.
- The second option is called Rename database to. However, the action cannot be performed directly through the PhpMyAdmin area due to lack of privileges for the user.
- The last option allows to change the database collation. Pick the preferred one from the drop-down menu and confirm the modification by clicking on the Go button.

## Database Tables Operations

In order to perform the corresponding operations on a database table, select one and click on the Operations tab.



The Alter table order by option allows to change the listing order for the table's records. It can be ascending or descending. Pick the field on which to base the sorting. Click on the Go button to confirm choice.

The Move table to option allows to move the table with a new name under the current database or to move it under a different database.

In the Table options section can be renamed the table, insert comments, change the storage engine and the collation, additionally, Using the pack\_keys option. It takes effect only with MyISAM tables. It packs the keys. When the DEFAULT choice is selected, the storage engine packs only long CHAR, VARCHAR, BINARY and VARBINARY columns. When 1 is selected numbers columns are packed along with the strings. The 0 choice disables the packing of keys.

Also, there are 2 more check-boxes. When the checksum option is enabled the table checksum is calculated. The delay\_key\_write option makes the index updates faster because they are not flushed to disk until the table is closed.

Using the Copy table option to copy the table with a new name under the current database or it can be duplicated in another database.

Under the Table Maintenance section, find different options which help to maintain the database table:

- **Check table** - checks the table and the views associated with it for errors and problems;
- **Analyze table** - analyses and stores the key distribution for the table. Then the MySQL server uses the stored key distribution for JOIN operations and for decisions which index to be used in a table query;
- **Repair table** - repairs a possibly corrupted table;
- **Optimize table** - the action should be performed when required to delete or modify many records from the table. It will reclaim the used space, defragment the data file removing the overhead and sort the indexes.
- **Flush the table** - clears and reloads the internal cache related to the table.

# Learning Unit 3: Database Designing of Website in Database Management System

## Overview

In this learning unit, learner will be introduced and demonstrate database designing for a web project. After the completion of this unit, the learner will be able to create Entity Relationship Diagram of any projects, create Database in MySQL, and create Tables in MySQL of web project.

## 1. Database Designing for Web Project

Databases are everywhere, including everywhere in the world of web development. Everything from the simplest blogs and directories and to robust user-oriented websites use **databases**. No matter how complex or simple the website and corresponding database may be though, each takes careful planning in order to run efficiently and also securely.

Over the basics of how to design a good plan for a database, no matter what its final intended use. For all **database designs**, there are a set of standard rules and best practices to follow, all of which can help a database stay organized and help to team up with the respective site in a smart and efficient way.

### What Functionality is Needed from the Database?

The first method for planning for a database is to simply brainstorm, on paper or otherwise, concerning what the database will need to store, and what the site will need out of it. Try not to think of the individual fields or tables that will be needed at this point - all that specific planning can take place later. The goal is to start with a general and complete view, and narrow down. It can often times be more difficult to add in items later, rather than get it right the first time.



**Think outside the Database.** Try to think about what the website will need to do. For example, if a membership website is needed, the first instinct may be to begin thinking of all the data each user will need to store. Forget it, that's for later. Rather, write down that users and their information will need to be stored in the database, and what else? What will those members need to do on the site? Will they make posts, upload files or photos, or send messages? Then the database will need a place for files/photos, posts, and messages.

What information will they need to derive from the site? Will they need to search for their favorite recipe, be able to access member-only content, or need to look up products and their recently purchased or viewed products? Then the database will need a place to hold those recipes, a place for content that is defined as members-only or not, or hold all products and create a method to link certain products to a specific member.

## Determining Tables and Fields

The next phase would be to begin determining exactly what tables and fields one would need in the database. This is the core of database design, and the most difficult part. Using correct methods for linking tables together, sorting the data within each table correctly, and grouping it or keeping it separate are all arising problems when it comes to database design. At this point, list out what tables and fields are clear at this point, trying to be as specific as possible. Through the process, items can be rearranged or reorganized to improve the database's efficiency and security.

## Use a Data Modeling Tool

It's time to organize what exact information needs to be stored. A great database design tool can be helpful for this; specifically one that can help set up visual database models, such as MySQL Workbench (*for MySQL databases only*).

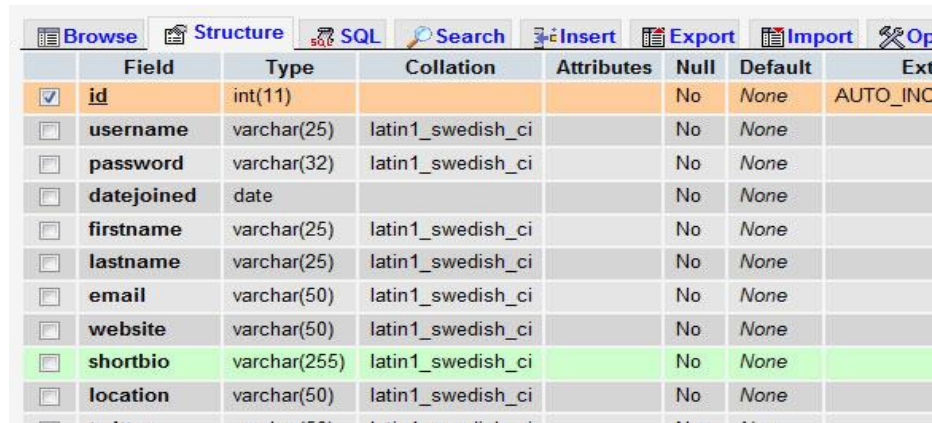
## Relational Databases

Almost all databases are **relational databases**. This means that the tables in the database are related to each other in some way. For example, if there is a member on an ecommerce website, that member may be related to certain products based on what they ordered last, or what they have expressed they are interested in. For a blog database, authors would have to be somehow related to the posts they wrote, and logged in users could be related to any comments they've left.

By using the techniques for relational databases, which can store plenty of information in an organized fashion within separate tables: one table for members, one for posts, another for comments, and yet another for products. Then, it can link the data between different tables together via **unique keys**.

### Remember

The best way to improve the performance of SELECT operations is to create indexes



|                                     | Field      | Type         | Collation         | Attributes | Null | Default | Ext      |
|-------------------------------------|------------|--------------|-------------------|------------|------|---------|----------|
| <input checked="" type="checkbox"/> | id         | int(11)      |                   |            | No   | None    | AUTO_INC |
| <input type="checkbox"/>            | username   | varchar(25)  | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | password   | varchar(32)  | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | datejoined | date         |                   |            | No   | None    |          |
| <input type="checkbox"/>            | firstname  | varchar(25)  | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | lastname   | varchar(25)  | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | email      | varchar(50)  | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | website    | varchar(50)  | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | shortbio   | varchar(255) | latin1_swedish_ci |            | No   | None    |          |
| <input type="checkbox"/>            | location   | varchar(50)  | latin1_swedish_ci |            | No   | None    |          |

### Do you know!

MySQL supports up to 64 indexes per table. Each index may consist of 1 to 16 columns. The maximum index size is 1000 bytes.

**Every entry in every table needs a Unique Primary Key.** This is the "social security number" or "bar code" for each entry. It is unique to each entry, and no other entry can have the same ID in the same table. Having unique usernames or product names in a database table is not enough. It is far more efficient, and best practice as well, to use unique primary keys. Even with other types of unique fields, a database is still vulnerable to duplicate records, which can later break code within the website.

To relate two tables, use a **foreign key**, which is just a number ID that references a unique key in another table, usually our primary key. As an example, see that our first table (below) for authors has three authors with their own unique ID. In the separate articles table, we link each article to an author via that ID. Now look up the author for the first article, and vice versa, see that Tom has two articles, Mary has one, and Jane has none yet.

| ID | Name |
|----|------|
| 1  | Mary |
| 2  | Tom  |
| 3  | Jane |

| ID | Article       | Author_ID |
|----|---------------|-----------|
| 1  | Article One   | 2         |
| 2  | Article Two   | 1         |
| 3  | Article Three | 2         |

This is a simple one-to-one relationship model. There are also models for one-to-many and many-to-many relationships.

### Grouping or Separating Data into Fields

Within fields, it's also important to know when to group certain pieces of data together, and when to keep them separate. A good way to determine which information should be in the same field or otherwise is to think about what it would take to change that piece of information if necessary. For example, would it be necessary to place a full address in separate fields, based on 1) street address, 2) city, 3) state, 4) zip code, and then 5) country?

Is it essential for the functionality of the site (perhaps users or admins would need to search addresses by state only), or is it just a waste of fields and database space? If it's not essential, just to change an address the database would have to update five separate fields, when it could just update one field in string form. In order to keep such a field organized, one could take in the information via an HTML form with these fields separated, but then concatenate them into one single string before placing the address into the database.

This is just one example, but always keep in mind the most efficient ways to organize table fields, and when to combine them, or when to keep them separate for the sake of the website's functionality.

### Database Normalization

Database normalization is a set of guidelines created by the community for organizing data in a database efficiently. It mentioned a few of the most important and basic practices already, which are included in some of the most standard normalization forms. There are five normal forms to follow, and it's a good idea to learn about these five forms in order to conform any database's design to their best practices.

## 2. Implementing Indexing to the Database

Indexes are used to find rows with specific column values quickly. Without an index, MySQL must begin with the first row and then read through the entire table to find the relevant rows. The larger the table, the more this costs. If the table has an index for the columns in question, MySQL can quickly determine the position to seek to in the middle of the data file without having to look at all the data. This is much faster than reading every row sequentially.

Most MySQL indexes (PRIMARY KEY, UNIQUE, INDEX, and FULLTEXT) are stored in B-trees. Exceptions are that indexes on spatial data types use R-trees, and that MEMORY tables also support hash indexes.

MySQL uses indexes for these operations:

- To find the rows matching a WHERE clause quickly.
- To eliminate rows from consideration. If there is a choice between multiple indexes, MySQL normally uses the index that finds the smallest number of rows (the most selective index).

#### Do you know!

The maximum size of a row in a MySQL table is 65,535 bytes

- If the table has a multiple-column index, any leftmost prefix of the index can be used by the optimizer to look up rows. For example, if there are a three-column index on (col1, col2, col3), and have indexed search capabilities on (col1), (col1, col2), and (col1, col2, col3)
- To retrieve rows from other tables when performing joins. MySQL can use indexes on columns more efficiently if they are declared as the same type and size. In this context, VARCHAR and CHAR are considered the same if they are declared as the same size. For example, VARCHAR(10) and CHAR(10) are the same size, but VARCHAR(10) and CHAR(15) are not.

For comparisons between no binary string columns, both columns should use the same character set. For example, comparing a utf8 column with a latin1 column precludes use of an index.

Comparison of dissimilar columns (comparing a string column to a temporal or numeric column, for example) may prevent use of indexes if values cannot be compared directly without conversion. For a given value such as 1 in the numeric column, it might compare equal to any number of values in the string column such as '1', ' 1', '00001', or '01.e1'. This rules out use of any indexes for the string column.

- To find the **MIN()** or **MAX()** value for a specific indexed column *key\_col*. This is optimized by a preprocessor that checks whether one is using WHERE *key\_part\_N*= *constant* on all key parts that occur before *key\_col* in the index. In this case, MySQL does a single key lookup for each **MIN()** or **MAX()** expression and replaces it with a constant. If all expressions are replaced with constants, the query returns at once. For example:
  - SELECT MIN(*key\_part2*),MAX(*key\_part2*)
  - FROM *tbl\_name* WHERE *key\_part1*=10;
- To sort or group a table if the sorting or grouping is done on a leftmost prefix of a usable index (for example, ORDER BY *key\_part1*, *key\_part2*). If all key parts are followed by DESC, the key is read in reverse order.
- In some cases, a query can be optimized to retrieve values without consulting the data rows. (An index that provides all the necessary results for a query is called a covering index.) If a query uses from a table only columns that are included in some index, the selected values can be retrieved from the index tree for greater speed:
  - SELECT *key\_part3* FROM *tbl\_name*
  - WHERE *key\_part1*=1

Indexes are less important for queries on small tables, or big table where report queries process most or all of the rows. When a query needs to access most of the rows, reading sequentially is faster than working through an index. Sequential reads minimize disk seeks, even if not all the rows are needed for the query.



## Learner's Activities

### Developing a ERD of Web Project

|                        |                                                                                                                                                                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description:</b>    | <ul style="list-style-type: none"> <li>• This activity will be performed by individual.</li> <li>• Each student has basic concept of database and know how to develop ERD of any project.</li> <li>• Course Instructor will assign a web project to each student.</li> </ul> |
| <b>Time Guideline:</b> | 2 hours                                                                                                                                                                                                                                                                      |
| <b>Purpose:</b>        | To be able to develop entity relationship diagram of any project.<br>Individual will draw ERD at chart                                                                                                                                                                       |
| <b>Presentation:</b>   | Individual will present relationship between entities of ERD before class.                                                                                                                                                                                                   |

### Developing a Database of Web Project in MySQL

|                        |                                                                                                                                                                                                                                                                                                                          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description:</b>    | <ul style="list-style-type: none"> <li>• This activity will be performed by individual.</li> <li>• This activity will start upon successful completion of ERD development activity.</li> <li>• Each student has basic knowledge of MySQL and basic working experience of working in PhpMyAdmin IDE for MySQL.</li> </ul> |
| <b>Time Guideline:</b> | 2 hours                                                                                                                                                                                                                                                                                                                  |
| <b>Outcome:</b>        | To be able to develop Database in MySQL using PhpMyAdmin IDE and will able to import and export created database in .sql file.<br>Individual will keep record of .sql file and submit it teacher after showing Database Tables before class.                                                                             |

## Summary of Module

- A modern database is an efficient way to organize, and gain access to, large amounts of data. A *relational database* is able to create relationships between individual database elements, to organize data at a higher level than a simple table of records, avoid data redundancy and enforce relationships that define how the database functions.
- RDBMS is the basis of all SQL databases like; MS SQL Server, Sysbase, Oracle, MySQL, etc. It works on the base of a relational database model. The RDBMS stores all its data in the form of an object that is called Table. A Table consists of columns, rows, and related data entry fields.
- SQL is the standard language for Relation Database System. All relational database management systems like MySQL, MS Access, and Oracle, Sybase, Informix, postgres and SQL Server use SQL as standard database language.
- MySQL is a free, open-source database engine available for all major platforms. (Technically, MySQL is a relational database management system (RDBMS).) MySQL represents an excellent introduction to modern database technology, as well as being a reliable mainstream database resource for high-volume applications.



## Frequently Asked Questions (FAQs)

**FAQ 1:** Why a database is called as relational database model?

**Answer** A database model represents the relationship between one or more databases. The relationship is known as the relational database model. It is an extension of the normal databases without relations. It provides flexibility and allows one database to be in relation with another database. It can access the data from many databases at one time over the network.

**FAQ 2:** What do you understand by relation in relational database model?

**Answer** Relation in the relational database model is defined as the set of tuples that have the same attributes. Tuple represents an object and also the information that the object contains. Objects are basically instances of classes and used to hold the larger picture. Relation is described as a table and is organized in rows and columns. The data referenced by the relation come in the same domain and have the same constraints as well. Relations in the relational database model can be modified using the commands like insert, delete etc.

**FAQ 3:** What are constraints in database?

**Answer** Constraints are kind of restrictions that are applied to the database or on the domain of an attribute. For example an integer attribute is restricted from 1-10 and not more than that. They provide the way to implement the business logic and the rules in database. In database it can be implemented in the form of check constraints that checks for the rules that haven't been followed by the programmer. Constraint also used to restrict the data that can be stored in the relations. Domain constraint can be applied to check the domain functionality and keep it safe.

**FAQ 4:** What is the difference between primary and foreign key?

**Answer** Primary key uniquely identify a relationship in a database, whereas foreign key is the key that is in other relation and it has been referenced from the primary key from other table.

- Primary key remains one only for the table, whereas there can be more than one foreign key.
- Primary key is unique and won't be shared between many tables, but foreign key will be shared between more than one tables and will be used to tell the relationship between them.

**FAQ 5:** What is an index represent in relational database model?

**Answer** Index is a way to provide quick access to the data and structure. It has indexes maintain and can be created to combine attributes on a relation. Index allows the queries to filter out the searches faster and matching data can be found earlier with simplicity. For example it is same as the book where by using the index it can directly jump to a defined section. In relational database there is a provision to give multiple indexing techniques to optimize the data distribution.

**FAQ 6:** What do understand by database Normalization?

**Answer** Normalization is very essential part of relational model. It consists of set of procedures that eliminates the domains that are non-atomic and redundancy of data that prevents data manipulation and loss of data integrity. Normal forms are the common form of normalization. It helps in reducing redundancy to increase the information overall. It has some disadvantages as it increases complexity and have some overhead of processing.

FAQ 7: How de-normalization is different from normalization?

Answer

Analytical processing databases are not very normalized. The operations which are used are read most databases. It is used to extract the data that are ancient and accumulated over long period of time. For this purpose de-normalization occurs that provide smart business applications. Dimensional tables in star schema are good example of de-normalized data. The de-normalized form must be controlled while extracting, transforming, loading and processing. There should be constraint that user should not be allowed to view the state till it is consistent. It is used to increase the performance on many systems without RDBMS platform.

FAQ 8: Why E-R models are used?

Answer

E-R model stands for entity-relationship model and it is used to represent a model with their relationships. This is an object oriented approach and it is based on real world that consists of objects which are called entities and relationship between them. Entities are further used inside the database in the form of attributes.

FAQ 9: What is the difference between DBMS and RDBMS?

Answer

DBMS is persistent and accessible when the data is created or exists, but RDBMS tells about the relation between the table and other tables.

- RDBS supports a tabular structure for data and relationship between them in the system whereas DBMS supports only the tabular structure.
- DBMS provide uniform methods for application that has to be independently accessed, but RDBMS doesn't provide methods like DBMS but provide relationship which link one entity with another.

FAQ 10: What is SQL and where does it come from?

Answer

Structured Query Language (SQL) is a language that provides an interface to relational database systems. The proper pronunciation of SQL, and the preferred pronunciation within Oracle Corp, is "sequel" and not "esscue ell".

SQL was developed by IBM in the 1970s for use in System R, and is a de facto standard, as well as an ISO and ANSI standard.

In common usage SQL also encompasses DML (Data Manipulation Language), for INSERTs, UPDATES, DELETES and DDL (Data Definition Language), used for creating and modifying tables and other database structures.

The development of SQL is governed by standards. A major revision to the SQL standard was completed in 1992, called SQL2. SQL3 support object extension.

## Test Yourself!

Please mark the correct one from the given options.

1. **A relational database consists of a collection of**
  - a. Tables
  - b. Fields
  - c. Records
  - d. Keys
2. **A \_\_\_\_\_ in a table represents a relationship among a set of values.**
  - a. Column
  - b. Key
  - c. Row
  - d. Entry
3. **The term \_\_\_\_\_ is used to refer to a row.**
  - a. Attribute
  - b. Tuple
  - c. Field
  - d. Instance
4. **The term attribute refers to a \_\_\_\_\_ of a table.**
  - a. Record
  - b. Column
  - c. Tuple
  - d. Key
5. **For each attribute of a relation, there is a set of permitted values, called the \_\_\_\_\_ of that attribute.**
  - a. Domain
  - b. Relation
  - c. Set
  - d. Schema
6. **Course(course\_id,sec\_id,semester)**  
**Here the course\_id, sec\_id and semester are \_\_\_\_\_ and course is a \_\_\_\_\_.**
  - a. Relations, Attribute
  - b. Attributes, Relation
  - c. Tuple, Relation
  - d. Tuple, Attributes
7. **The tuples of the relations can be of \_\_\_\_\_ order.**
  - a. Any
  - b. Same
  - c. Sorted
  - d. Constant
8. **..... is the powerful language for working with RDBMS.**
  - a. Embedded Programs
  - b. Dynamic Programs
  - c. Query Language
  - d. Static Language Programs
9. **Which normal form is considered adequate for relational database design?**
  - a. 2 NF
  - b. 3 NF
  - c. 4 NF
  - d. BCNF
10. **In an ER model..... is described in the database by storing its data.**
  - a. Entity
  - b. Attribute
  - c. Relationship
  - d. Notation

- 11. Key to represent relationship between tables is called**
  - a. primary key
  - b. secondary key
  - c. foreign key
  - d. none of the above
- 12. Which of the following query is correct for using comparison operators in SQL ?**
  - a. SELECT sname, courseName FROM studentinfo WHERE age>50 and <80;
  - b. SELECT sname, courseName FROM studentinfo WHERE age>50 and age <80;
  - c. SELECT sname, courseName FROM studentinfo WHERE age>50 and WHERE age<80;
  - d. None of above
- 13. Which of the following SQL query is correct for selecting the name of staffs from 'tblstaff' table where salary is 15,000 or 25,000?**
  - a. SELECT sname from tblstaff WHERE salary IN (15000, 25000);
  - b. SELECT sname from tblstaff WHERE salary BETWEEN 15000 AND 25000;
  - c. Both A and B
  - d. None of the above
- 14. Which query is used for sorting data that retrieves the all the fields from empinfo table and listed them in the ascending order?**
  - a. SELECT \* FROM empinfo ORDER BY age;
  - b. SELECT \* FROM empinfo ORDER age;
  - c. SELECT \* FROM empinfo ORDER BY COLUMN age;
  - d. SELECT \* FROM empinfo SORT BY age;
- 15. MySQL runs on which operating systems?**
  - a. Linux and Mac OS-X only
  - b. Any operating system at all
  - c. Unix, Linux, Windows and others
  - d. Unix and Linux only
- 16. To remove duplicate rows from the result set of a SELECT use the following keyword:**
  - a. NO DUPLICATE
  - b. UNIQUE
  - c. DISTINCT
  - d. None of the above
- 17. To use MySQL on the computer, it'll need?**
  - a. FTP and Telnet
  - b. Some sort of client program to access the databases
  - c. A Browser
  - d. Perl, PHP or Java
- 18. MySQL is**
  - a. a) A Programming language
  - b. A OOP Programming language
  - c. ) A technique for writing reliable programs
  - d. A Relational Database Management System
- 19. Which function used to get the current time in MySQL?**
  - a. getTime()
  - b. Time()
  - c. NOW()
  - d. None of above

**20. MySQL Access security is controlled through?**

- |    |                                                                                                        |    |                                                                          |
|----|--------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------|
| a. | The ID that the user logged into the server through and privileges set up for that account.            | b. | MySQL login accounts, and privileges set for each account                |
| c. | The normal login security is sufficient for MySQL, and it does not have any extra controls of its own. | d. | A table of valid IP addresses, and privileges set up for each IP address |

## Answer Key

| MCQ Number | Correct Answer | MCQ Number | Correct Answer |
|------------|----------------|------------|----------------|
| 1          | a              | 11         | c              |
| 2          | c              | 12         | b              |
| 3          | b              | 13         | a              |
| 4          | b              | 14         | a              |
| 5          | a              | 15         | c              |
| 6          | b              | 16         | c              |
| 7          | a              | 17         | b              |
| 8          | c              | 18         | d              |
| 9          | b              | 19         | c              |
| 10         | a              | 20         | b              |

# Module 6: Develop Website Using Client Side Scripting Language

## Learning Outcomes

After completion of this learning module, you will be able to:

- Create a static website using HTML code
- Use JavaScript for client side validation
- Implement Cascading Style sheets (CSS) for website designing





# Learning Unit 1: Client Side Scripting Languages

## Overview

In this learning unit, you will learn client side scripting languages. These fundamental concepts are building blocks for the development of web site.

After completion of this learning unit, you will be able to understand and will have working experience of following concepts: HTML tags, elements, Attributes, formatting, layout, forms, iframes, url encode , input types, media object audio and video, styling HTML with CSS, HTML 5

### Markup Language

A Markup Language is a system for annotating a document in a way that is syntactically distinguishable from the text.

## 1. HTML Elements

HTML document is created using HTML elements. Which are individual components with a start, end tag and content written between the tags.

For example `<h1> My Heading </h1>`

| Start Tag               | Content    | End Tag                  |
|-------------------------|------------|--------------------------|
| <code>&lt;h1&gt;</code> | My Heading | <code>&lt;/h1&gt;</code> |

HTML elements code with output example

```
<!DOCTYPE html>
```

```
<html>
```

```
<body>
```

```
<h1>Main heading</h1>
```

```
<p> contents of paragraph</p>
```

```
</body>
```

```
</html>
```

**Main heading**

contents of paragraph

### Do you know!

The start tag is often called the opening tag. The end tag is often called the closing tag.

### Remember

Only the `<body>` area is displayed by the browser.

## 2. HTML Attributes

HTML elements can have attributes

- Attributes provide additional information about an element
- Attributes are always specified in the start tag
- Attributes come in name/value pairs like: `name="value"`

### The Lang Attribute

The document language can be declared in the `<html>` tag. The language is declared in the `lang` attribute.

### Remember

Using quotes around attributes values is the most common. Omitting quotes can produce errors.

Declaring a language is important for accessibility applications (screen readers) and search engines:

Example

```
<!DOCTYPE html>
<html lang="en-US">
<body>
<h1>My First Heading</h1>
<p>My first paragraph.</p>
</body>
</html>
```

# My First Heading

My first paragraph.

The first two letters specify the language (en). If there is a dialect, use two more letters (US).

## The title Attribute

HTML paragraphs are defined with the <p> tag.

In this example, the <p> element has a title attribute. The value of the attribute is "About W3Schools":

Example

```
<p title="About HTML">
```

*IT is a Hypertext Markup Language.*

```
</p>
```

## The href Attribute

HTML links are defined with the <a> tag. The link address is specified in the href attribute:

Example

```
This is a link
```

**Image Tag:** HTML images are defined with the <img> tag.

The filename of the source (src), and the size of the image (width and height) are all provided as attributes:

Example

```

```

*The image size is specified in pixels: width="104" means 104 screen pixels wide.*

## The alt Attribute

The alt attribute specifies an alternative text to be used, when an HTML element cannot be displayed.

The value of the attribute can be read by "screen readers". This way, someone "listening" to the webpage, i.e. a blind person, can "hear" the element.

Example

```

```

### Single or Double Quotes?

Double style quotes are the most common in HTML, but single style can also be used.

In some situations, when the attribute value itself contains double quotes, it is necessary to use single quotes:

Example

```
<p title='John "ShotGun" Nelson'>
```

Or vice versa:

Example

```
<p title="John 'ShotGun' Nelson">
```

#### Do you know!

Browsers automatically add an empty line before and after a paragraph.

## 3. HTML Heading

Headings are important part of the HTML code. Six levels of headings can be defined in HTML. Heading elements state all the font changes, before and after paragraph breaks, and any white space necessary to properly show the heading. The heading elements are H1, H2, H3, H4, H5, and H6 with H1 being the most important level and H6 the least. For example

```
<H1>This is a most important heading</H1> some text.
```

```
<H2>Second most important heading</H2> some more text.
```

## 4. HTML Paragraphs

Paragraph tags are most commonly used tags in HTML. Block of text between these tags is defined as paragraph.  
<p> </p>

## 5. HTML Formatting

For HTML documents formatting following elements are used:

- Bold ( for bold text)  
`<b> here is some bold text</b>`
- Important text  
`<strong> </strong>`
- Italic text  
`<i> </i>`
- Emphasized text  
`<emp> </emp>`
- Marked text

#### Remember

Browsers display `<strong>` as `<b>`, and `<em>` as `<i>`. But the meaning of these tags: `<b>` and `<i>` defines bold and italic text, but `<strong>` and `<em>` means that the text is "important".

<mark> </mark>

- Small text

<small> </small>

- Subscripts

<sub> </sub>

- Superscripts

- <sup> </sup>

## 6. HTML Links

HTML links are used to connect different webpages to create a website. HTML link syntax :

<a href=<http://www.google.com> > Visit Google </a>

## 7. HTML Heads

### Do you know!

When you move the mouse over the element, the title will be displayed as a tooltip.

Head element is a container that includes title for the document, script, styles and some meta tags. Head element is used right after the HTML element tag and closed before body tag.

For Example

<Head> <Title> Page Title</title></Head>

<h1 title="heading1">This is a Heading</h1>  
<p>This is a paragraph.</p>

# This is a Heading

heading1

This is a paragraph.

## 8. HTML Images

### Remember

Always specify the width and height of an image. If width and height are not specified, the page will flicker while the image loads.

To add images in HTML documents <img> tag is used. Image tag doesn't have any closing tag. It has attributes like src, alt, width, height to add styling to the images.



## 9. HTML Table

HTML Tables are defined with the <table> tag. Table header is defined with <th> tag, table rows are defined with <tr> tag and table columns are defined with <td> tag.

For example:

Sr. No.	Student Name	Class
01	Sadia	CCA
02	Jamal	DIT

### Do you know!

Table data <td> are the data containers of the table. They can contain all sorts of HTML elements like text, images, lists, other tables, etc.

To create above table in HTML following code is used:

```
<!DOCTYPE html>
<html lang="en-US">
<body>
<table width="80%" border="1" cellpadding="1">
 <tr>
 <td>Sr.No</td>
 <td>Student Name</td>
 <td>Class</td>
 </tr>
 <tr>
 <td>01</td>
 <td>Sadia</td>
 <td>CCA</td>
 </tr>
 <tr>
 <td>02</td>
 <td>Jamal </td>
 <td>DIT</td>
 </tr>
</table>

</body>
</html>
```

In HTML table use some attributes like borders, width, cell padding and align.

## 10. HTML Lists

HTML list have three types unordered list, ordered list and description list.

### Unordered List:

Unordered lists start with a <ul> tag and each item with <li> tag e.g.

```
<h2>Courses</h2>

 CCNA
 DIT
 MCIT

```

**Ordered List:**

Ordered lists start with a `<ol>` tag and each item with `<li>` tag. Ordered list have type attribute to define the types of orders. Here is an example of ordered list

**Do you know!**

List items can contain new list, and other HTML elements, like images and links, etc.

```
<h2>Courses</h2>
```

```

 CCNA
 DIT
 MCITP

```

**Remember**

HTML Tables can also be used as Block Elements

**Descriptive List:**

A list with a term and short detail. `<dt>` tag is used to list the term/names in a descriptive order. `<dd>` tag is used for the short description of terms.

For example:

```
<dl>
 <dt>CCA</dt>
 <dd>Certificate of Computer Application</dd>
 <dt>DIT</dt>
 <dd>Diploma in Information Technology</dd>
</dl>
```

**11.HTML Block****Remember**

Input types, not supported by old web browsers, will behave as input type text.

Most of the HTML elements are defined as a block level element or inline element. Block Level elements start with new line Like `<h1>`, `<p>`, `<ul>`, `<table>`.

Inline elements normally display text without breaking line.e.g. `<b>`, `<td>` `<a>`, `<img>` etc.

**<div> Elements:**

A block level element that can be used as a container for HTML elements. `<div>` element is used in a combination style sheet to organize the layout of webpage.

**12.HTML Layout**

`<div>` element is used as a layout tool because with the help of CSS we can easily position the div where we want to position it.

```
<body>
<div id="header">
<h1>Course Information</h1>
</div>
<div id="nav">
CCA

DIT

MCITP

</div>
<div id="section">
```

**Course Information**

CCA  
DIT  
MCITP

**CCA**

CCA stands for Certificate of Computer Application It is a 3 months short course.

[www.tevta.gov.pk](http://www.tevta.gov.pk)

```
<h1>CCA</h1>
<p>CCA stands for Certificate of Computer Application. It is a 3 months short course.</p>
</div>
<div id="footer">www.tevta.gop.pk</div>
</body>
```

## 13. HTML Forms

Form elements are used to get input from the user. <form> tag act as a container for different form elements. Attributes of <form> tag are name, *action="login.php"*, *method="get/post"*.

### Input Element:

Input element is important element of the form. It has many variations depending on the type of the attributes. e.g. For text field input.

```
<input type="text" name="Enter Name">
```

### Radio Button

These allow user to select one option from multiple choices.

```
<input type="radio" name="sex" value="male" checked>Male

<input type="radio" name="sex" value="female">Female
```

#### Do you know!

Registration / Sign Up pages use form elements.

### Select Element (Drop Down List):

Select element shows a drop down list and allows user to select single option from multiple options <select name="courses">

```
<select name="courses">
<option value="cca">CCA</option>
<option value="DIT">DIT</option>
<option value="MCITP">MSCITP</option>
</select>
```

#### Do you know!

140 Color Names are supported by All Browsers

### Text Area:

Text area elements are used for multi-line inputs from users. e.g.

```
<textarea name="message" rows="10" cols="30">
96 H Gulberg, Lahore
</textarea>
```

#### Remember

Entity Names are case sensitive.

### Checkbox:

Checkboxes allow users to select one or more than one options from available options. Unlike radio buttons which allows to select only one option.

```
<input type="checkbox" name="vehicle" value="Bike">I have a bike


```

```
<input type="checkbox" name="vehicle" value="Car">I have a car
```

### Submit Button

Submit buttons are for submitting the forms data to server page.

```
<input type="submit" value="submit">
```

Submit is used at the end of the text fields but within the form.

## 14. HTML Iframes

An Iframe is used to create a webpage within a webpage.

Syntax for adding Iframe:

```
<iframe src="contents_iframe.htm" width="400" height="400"></iframe>
```

## 15. HTML Colors

### URL

A URL is another word for a web address.

<https://www.ask.com>

Colors are displayed in the combination with RGB. Color is an attribute of HTML elements

## 16. HTML Entities

### Do you know!

Only MP4, WebM, and Ogg video is supported by the newest HTML5 standard.

Some characters are reserved word for HTML language e.g. less than (<) and greater than (>) sign. The browser will assume it is used for HTML tag. To display reserve words we use HTML entities.

< less than & lt; > greater than & gt;

## 17. HTML Uniform Resource Locator

URL is used to locate a page within a directory or on web. common scheme for the URL

### Protocol

http, https ,ftp

### File Path

File path reference may be absolute (<http://tutotrial.com/html/url.html>) or it may be a relative reference (html folder/url.html)



## 18. HTML Media

HTML multimedia object on web is a sound, music, videos or movies.

### Video:

Video tag is used to embed the videos in HTML documents. e.g.

```
<video width="400" controls>
 <source src="mov_bbb.mp4" type="video/mp4">
</video>
```

### Audio:

Audio tag is used to embed the audios in HTML documents. e.g. audio code

```
<audio controls>
 <source src="sound.mp3" type="audio/mpeg">
 The browser does not support the audio element.
</audio>
```

## 19. HTML CSS

HTML can be styled with css in different 3 ways:

**In line style :** using a **style attribute** in HTML elements

```
<h1 style="color:blue">This is a Blue Heading</h1>
```

**Internal style:** using a **<style> element** in the HTML <head> section

```
<head>
<style>
body {background-color:lightgrey}
h1 {color:blue}
p {color:green}
</style>
</head>
```

**External style:** using one or more **external CSS files**

```
<head>
 <link rel="stylesheet" href="styles.css">
</head>
```

## 20. HTML 5

### Do you know!

The World Wide Web Consortium is the main international standards organization for the World Wide Web.

### Remember

Adobe Dreamweaver complete installation is demonstrated in Module 3.

HTML 5 is fifth revision in html by w3c. It has many new semantic tags. The new features in HTML5 include specific functions for embedding graphics, audio, video, and interactive documents. New elements also allow to define sections of Web page using new tags such as < article > which defines an article, < nav > which defines navigation links, < source > which defines media resources, and many others. For example, the navigation section of the page would be enclosed in the < nav > tags.

Example with Output:

```
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">

<title>HTML 5 new document</title>
</head>
<body>
 This is html 5 documents
</body>
</html>
```

## 21. Dreamweaver as HTML Editor

### Do you know!

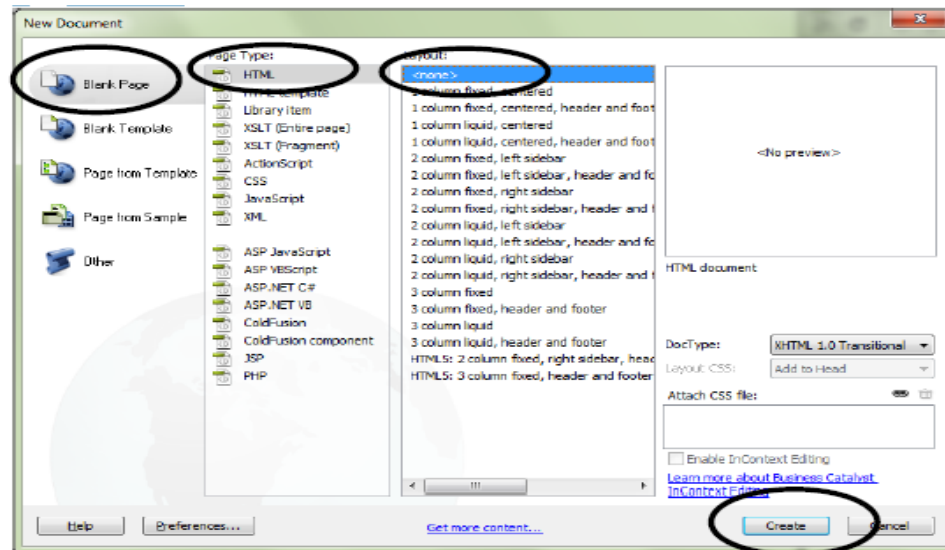
Dreamweaver was created by Macromedia in 1997

To use Dreamweaver to create a website, first define sites.

### A. Creating a HTML page

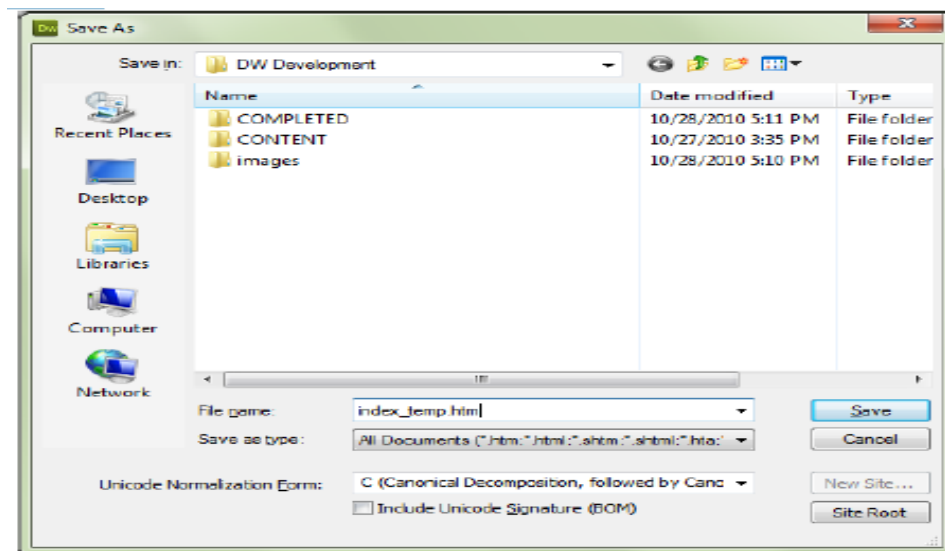
Open a blank HTML document in Dreamweaver.

1. In Dreamweaver, go to File → New...
2. In the New Document dialog box.
3. Select the Page Type as HTML.
4. Select the Layout as <none>.
5. Click Create.



## B. Saving a HTML Page

1. Go to File → Save.
2. In the Save As dialog box, make sure that the location is the top level of Local Site folder.
3. In the File name field, enter a file name.
4. Click Save.



## C. Naming Conventions

When saving a file to be used in a website, such as a HTML page or an image file, name the file using lower case and no spaces. For example, an image file should be named "portrait\_smith.jpg" instead of "Portrait Smith.jpg".

When naming HTML files, find out from the web server administrator whether the file name extension should be .htm or .html. Different web servers require one or the other ending. Keep the ending consistent throughout the entire website.

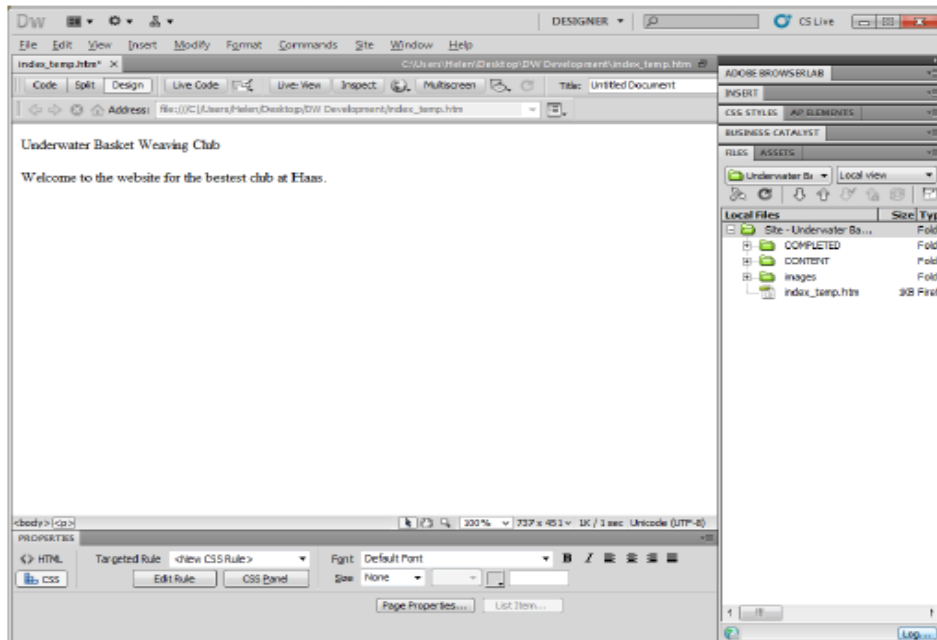
### Do you know!

Use either .htm or .html as file extension. There is no difference.

Keep in mind that all file names and folder names are public. Use appropriate and descriptive terms.

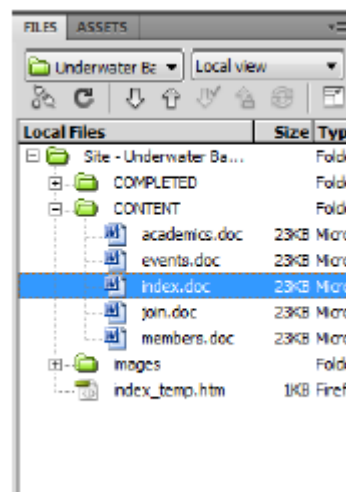
#### D. Entering Text

1. Click in the document window.
2. Type the text. Separate paragraphs with a Return.



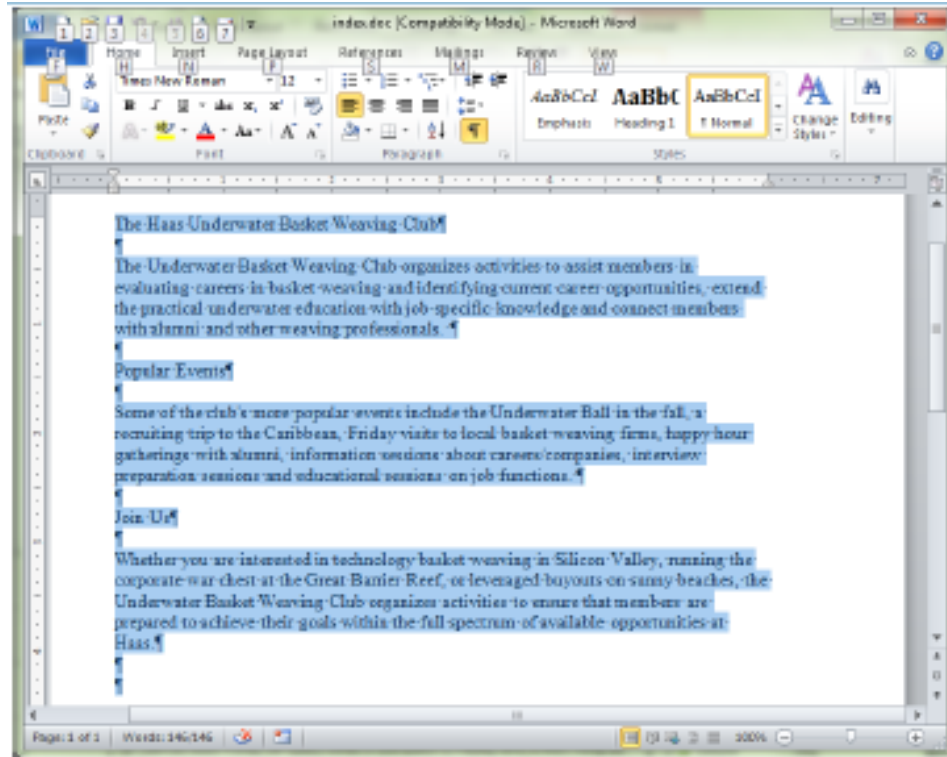
#### E. Copying Text into a Page

1. In the File panel, click the plus symbol to expand folders until required document open.

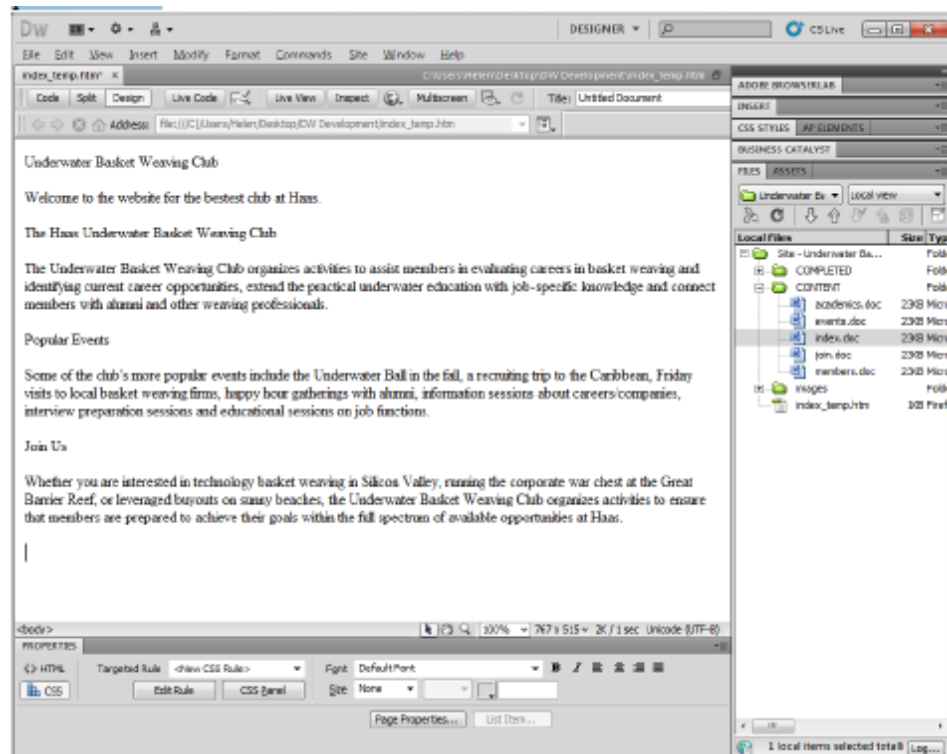


2. Double click the document name.
  - If it is a file type that Dreamweaver can manage, such as a CSS file or TXT file, the document will open in Dreamweaver.
  - If Dreamweaver cannot manage that file type, such as a Microsoft Word file, the document will open in an appropriate program.

3. In the opened document, select and copy the text that want to put in HTML page.



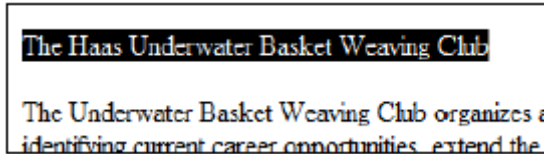
4. In Dreamweaver, click in the HTML document where to paste the text.



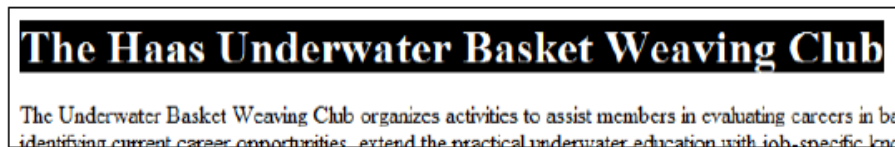
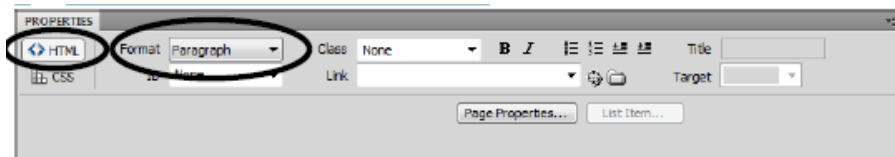
## F. Applying Heading Formatting

When a text change from a regular paragraph to a Heading format, apply a logical structure to the content.

1. Select the paragraph to mark Heading.
  - Select the entire paragraph or click inside the paragraph.



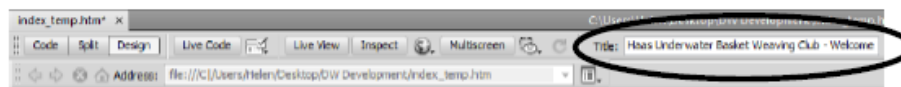
2. In the Properties Inspector, click HTML if necessary.
3. For the Format, select Heading 1, Heading 2, etc.



## G. Page Document Title

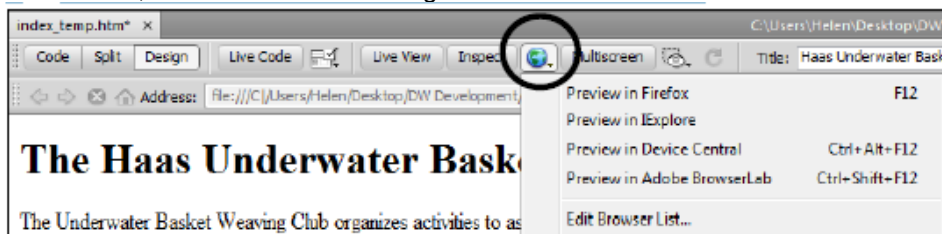
All web pages should have an appropriate and descriptive page document title. This title appears in the title bar of the browser and will be used as the name of a Favorite or Bookmark.

1. In the Document toolbar, click inside the Title field and enter an appropriate title.
2. Click anywhere outside the Title field or press Return to commit the changes.

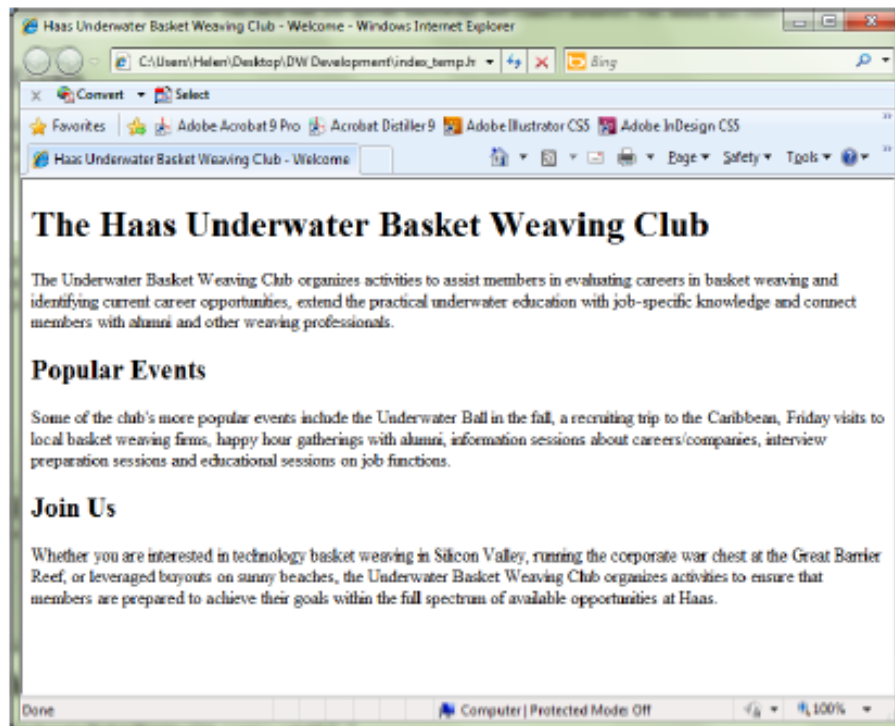


## H. Previewing a Page

1. Save the page.
2. In the Document toolbar, click the Preview/Debug in Browser button.



3. From the drop-down list, select the browser.



## Basic Formatting using CSS

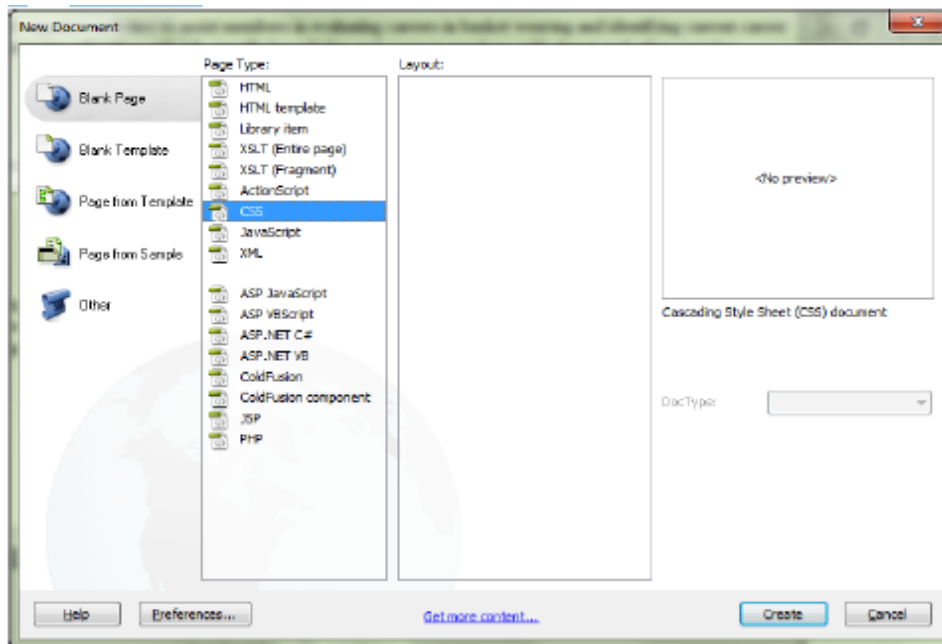
To set the formatting of the paragraphs, headings, or background colors use CSS.

### A. Internal and External Stylesheets

CSS rules can be kept in an internal stylesheet in the HTML page, in which case the formatting is only available within that HTML page.

### B. Creating and Saving an External CSS Stylesheet

1. Go to File → New.
2. In the New Document dialog box, select Blank Page from the left side.
3. Under Page Type, select CSS.
4. Click Create.



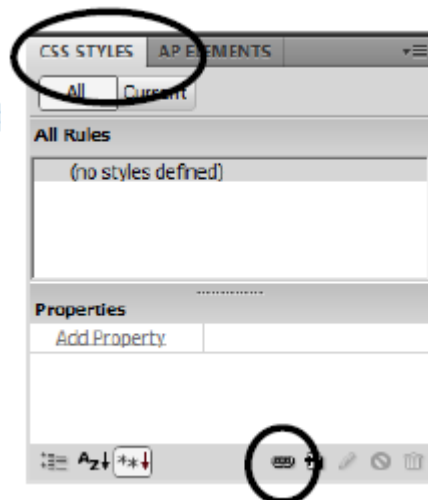
### C. Attaching an External CSS Stylesheet to a HTML Page

To use the CSS styles saved into an external stylesheet, link stylesheet from the HTML page.

1. Click on the name of HTML page above the Document toolbar to switch back to the HTML page.

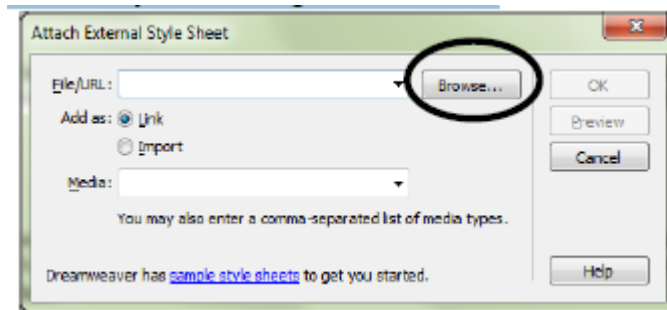


2. Click the CSS Styles panel name to open the panel.
3. At the bottom of the panel, click the Attach Style Sheet button.

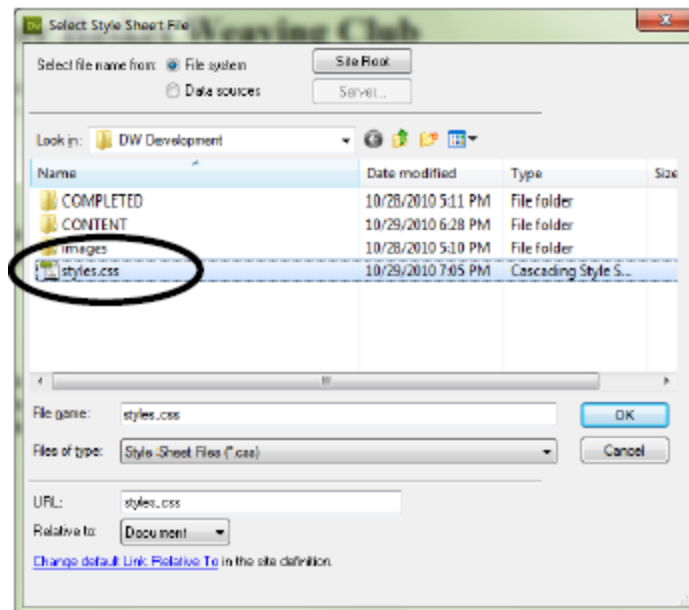


4. In the Attach External Style Sheet dialog box, click Browse.





5. In the Select Style Sheet File dialog box, select the external stylesheet.
6. Click OK.
7. In the Attach External Style Sheet dialog box, click OK.



## D. Basics of CSS Rules

There are three basic types of CSS rules:

**Tag rules** (also called element rules) are CSS rules that are applied to any content that has been marked with that particular HTML tag. For example, to make all Heading 1 text look bold and pink, create a CSS tag rule for the h1 tag.

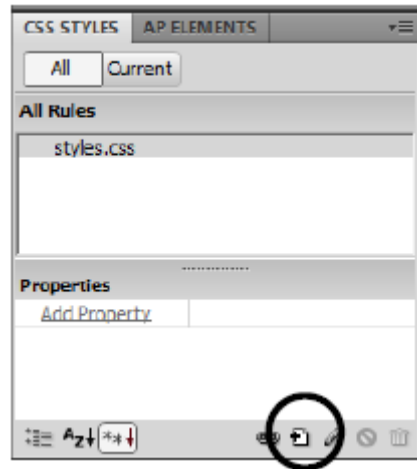
**Class rules** are CSS rules that are applied to any content that has been marked with that class name. For example, to make the club name italic and bold everywhere that the club name is used in a paragraph, create a class rule and apply that class rule to all the club names.

**ID rules** are CSS rules that are applied to any content that has been marked with that ID name. This is similar to a class rules, except that ID rules can only be applied to one item per page.

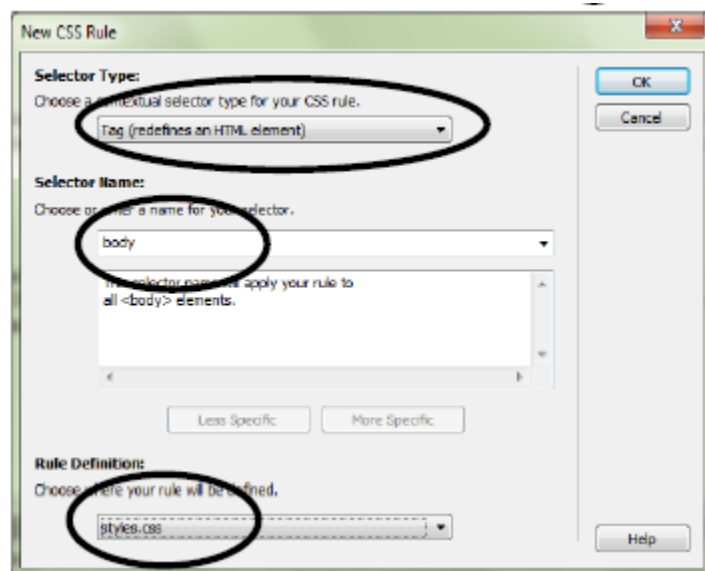
## E. Creating a Tag Rule

To change the font and background for the entire page, set a CSS rule for the body tag.

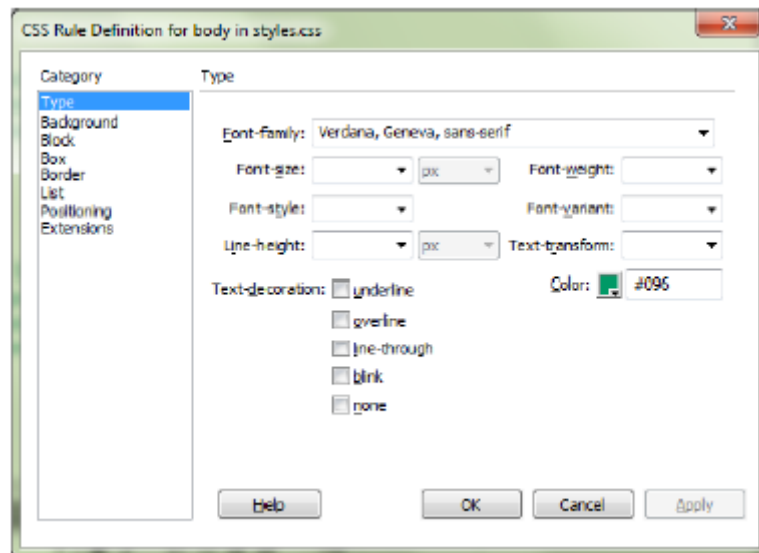
1. In the HTML page, click the New CSS Rule button in the CSS Styles panel.



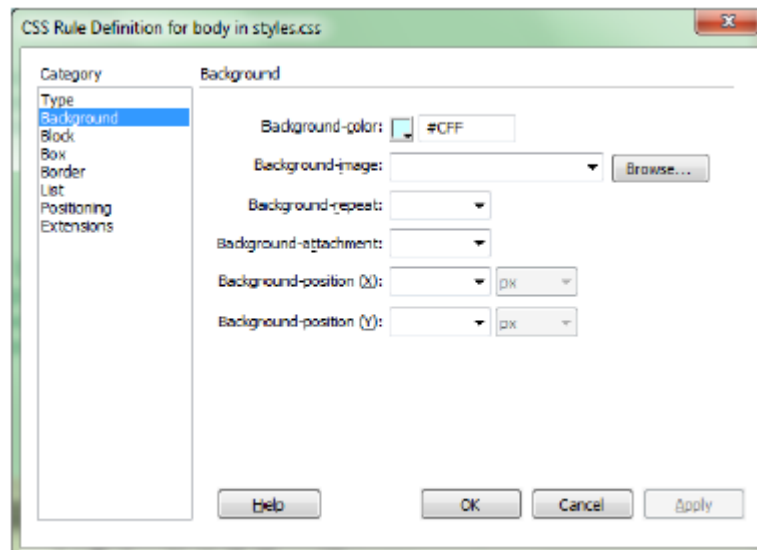
2. In the New CSS Rules dialog box, change the contextual selector type to **Tag**.
3. For the Selector Name, type **body** or select **body** from the drop-down list.
4. For the Rule Definition, select **external stylesheet**.
5. Click **OK**.



6. In the CSS Rule Definition dialog box, select the options for this rule.
  - Be minimal. Set only the options need to change.
  - For Font formatting, set options in the **Type** category.



- For Background formatting, set options in the **Background** category.

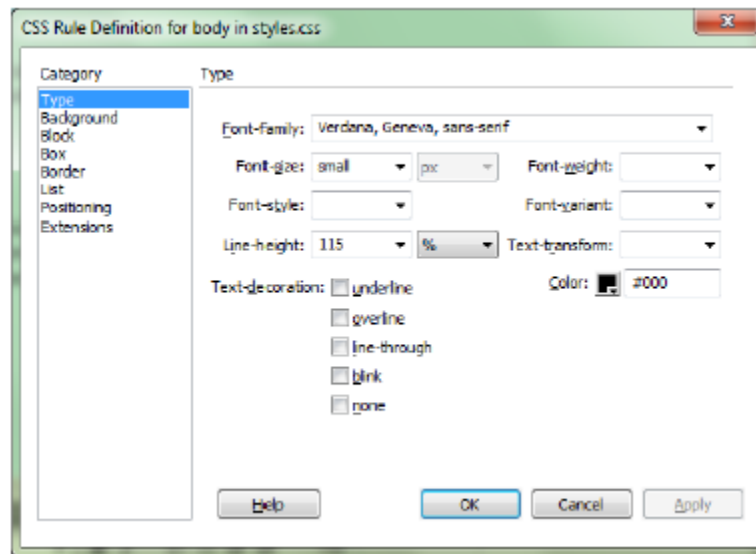
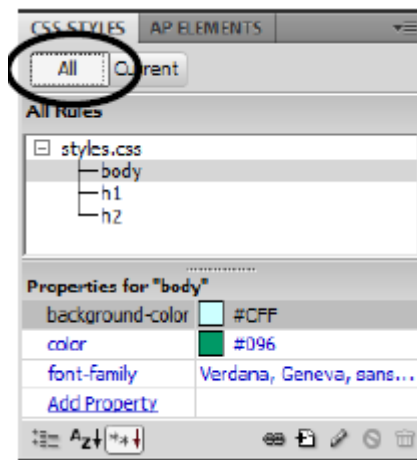


7. Click Apply to preview changes, or OK to save.

- To change the formatting of Heading 1, set a CSS rule for the h1 tag.
- To change the formatting of Heading 2, set a CSS rule for the h2 tag.

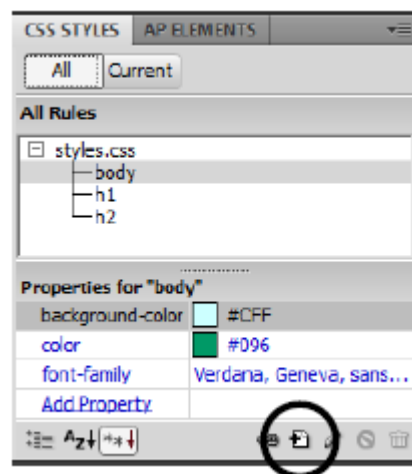
## F. Modifying a Rule

1. Find the rule in the CSS Styles panel to modify.
2. Double-click the rule name.
3. In the CSS Rule Definition dialog box, modify as required.
4. Click OK.



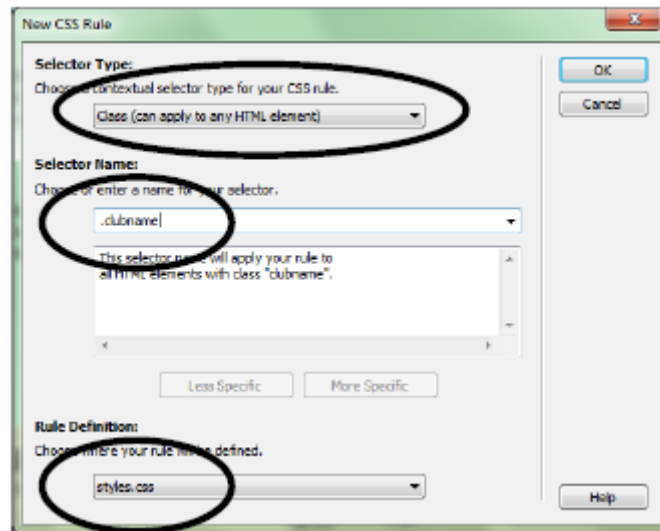
## G. Creating a Class Rule

1. In the HTML page, click the New CSS Rule button in the CSS Styles panel.

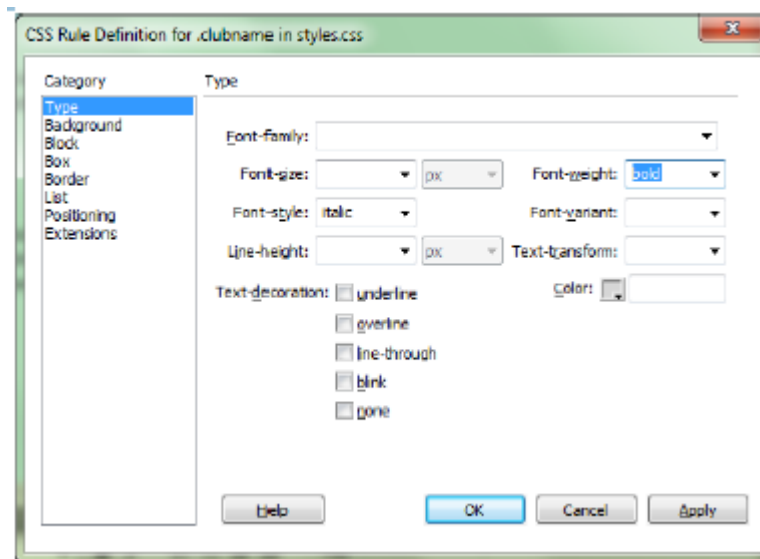


2. In the New CSS Rules dialog box, change the contextual selector type to class.
3. For the Selector Name, type a name for the class.

- The name must start with a period and must contain no spaces.
4. For the Rule Definition, select external stylesheet.
  5. Click OK.

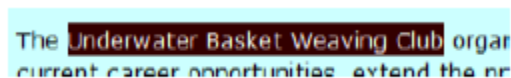


6. In the CSS Rule Definition dialog box, select the options for this rule.
7. Click OK.

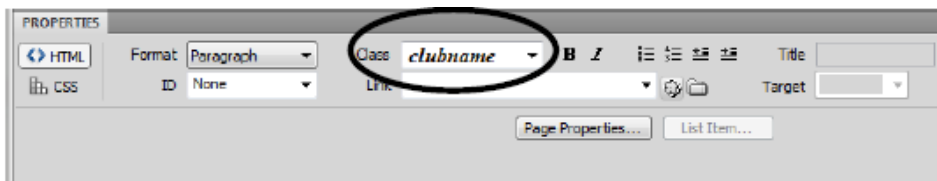


## H. Applying a Class Rule

1. Select the text to apply required rule.



2. In the Property Inspector, change Class to the name of the class.



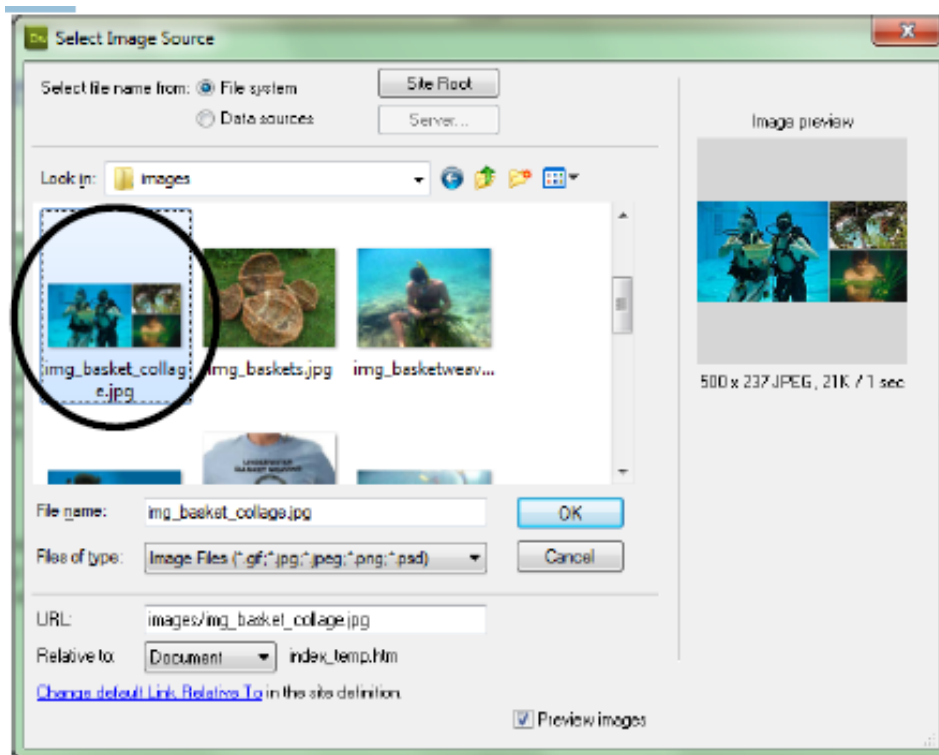
The **Underwater Basket Weaving Club** organizes various activities, including identifying current career opportunities, extending...

## Managing Images

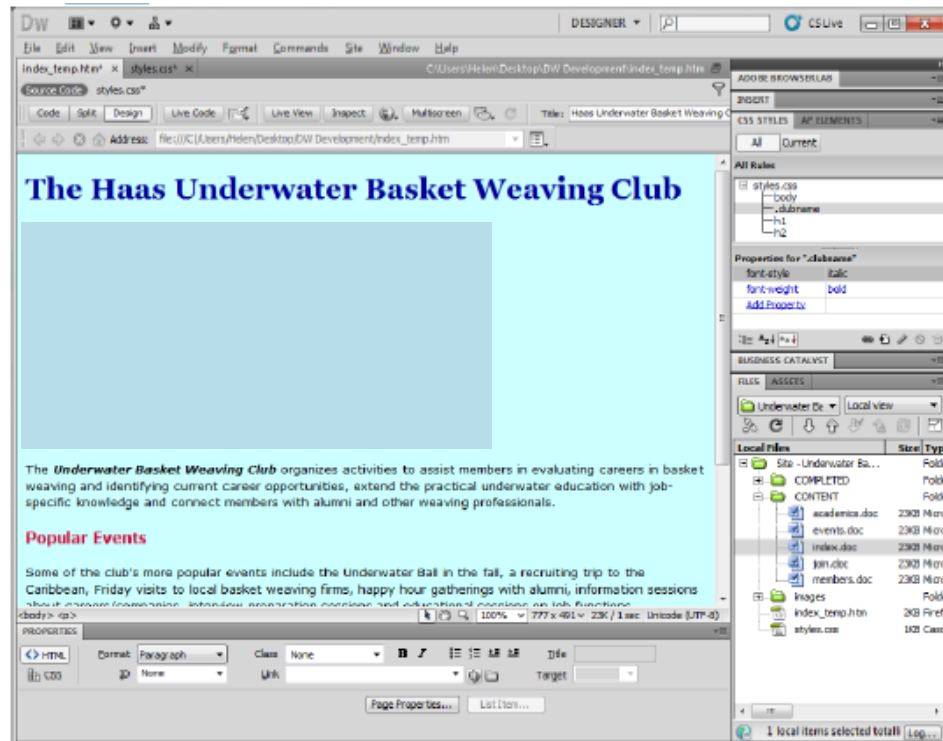
Image files must be prepared in a graphics program before its use in Dreamweaver.

### A. Inserting an image to be “in line with text”

1. Create an empty paragraph immediately below the Heading 1 title.
2. Go to Insert → Image.
3. In the Select Image Source dialog box, navigate to the images folder and select image.
4. Click OK.

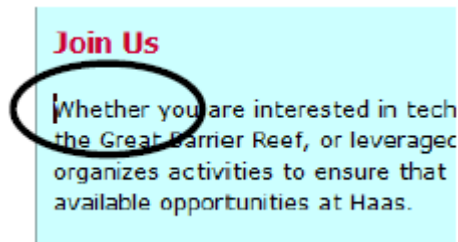


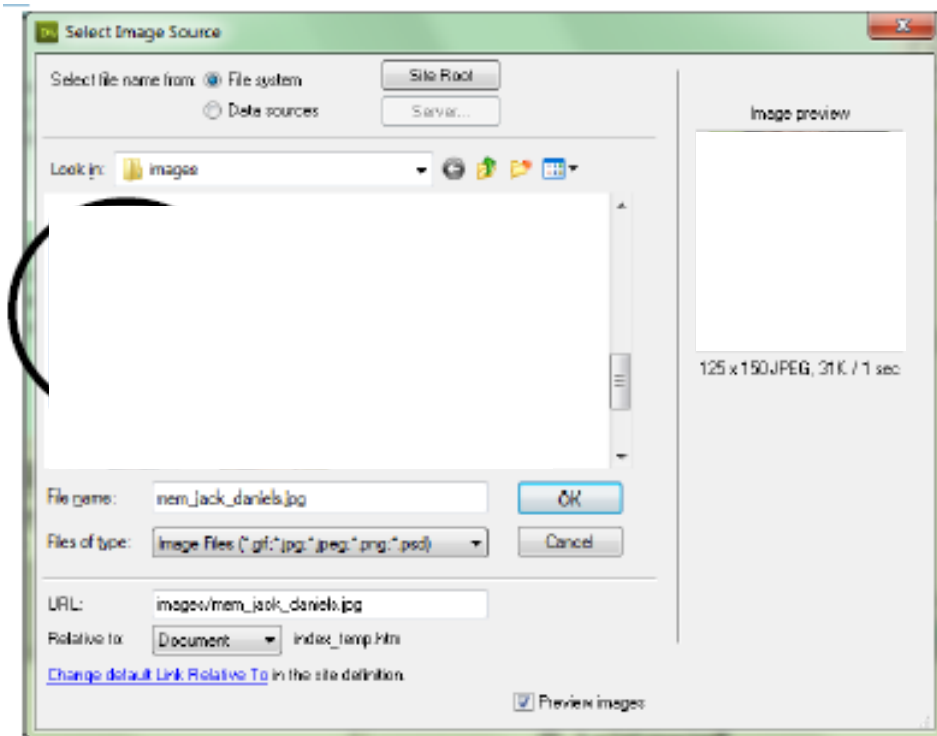
5. In the Image Tag Accessibility Attributes dialog box, enter an Alternate text.
  - An “Alt Text” is essential for search engine optimization and accessibility for all significant images that use in web pages.
6. Click OK.



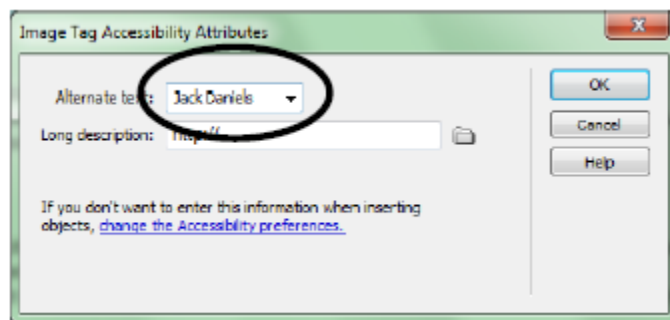
## B. Inserting an Image to be “Floating” or “Text-Wrapped”

1. Click at page where image need to place
2. Go to Insert → Image.
3. In the Select Image Source dialog box, navigate to the images folder and select image.
4. Click OK.





5. In the Image Tag Accessibility Attributes dialog box, enter an appropriate Alternate Text.
6. Click OK.



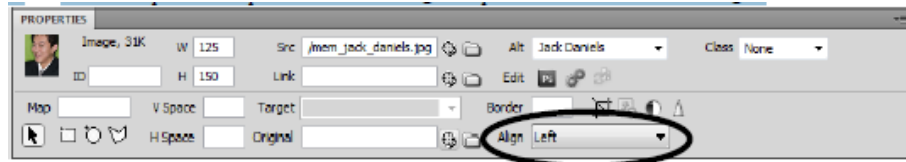
7. To make the text wrap around the image, select the image.



7. To make the text wrap around the image, select the image.



8. In the Properties Inspector, from the Align drop-down list, select Left or Right.



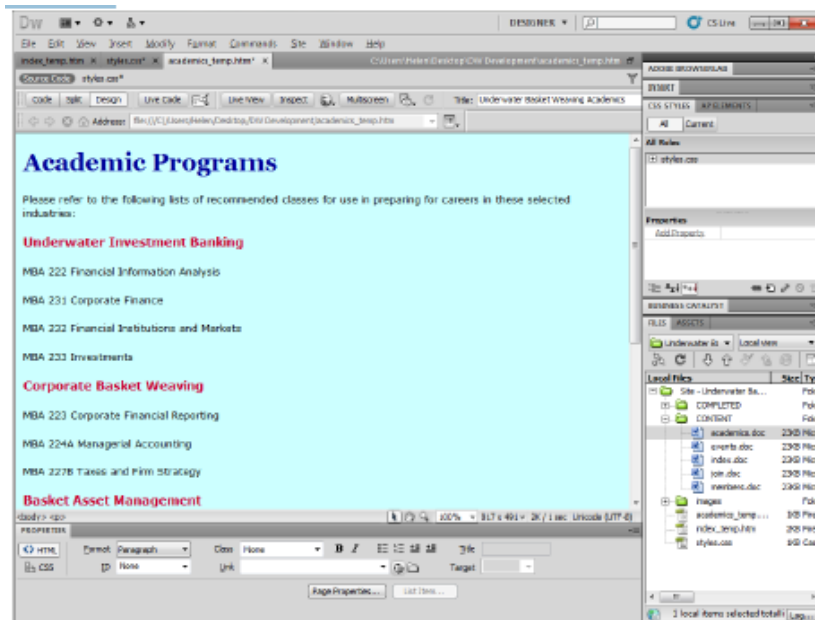
## Creating Lists

The two main types of lists used in web pages are UL (unordered lists), otherwise known as bulleted lists, and OL (ordered lists), and otherwise known as numbered lists.

### A. Creating a New Web Page for Lists

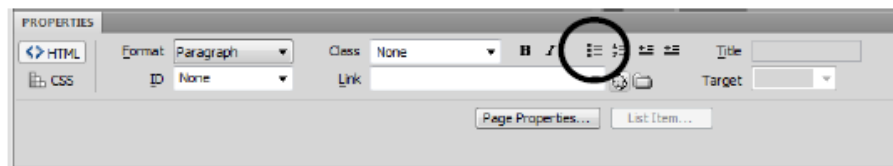
For our exercise, we will create a new web page for the Academics page.

1. Create a new, blank HTML page.
2. Save it at the top level of the Local Site folder as "academics\_temp.htm".
3. Provide an appropriate page document title.
4. Open the Academics.doc document from the CONTENTS folder, and copy and paste the text into the web page.
5. Attach the external stylesheet.
6. Apply any Heading 1 and Heading 2 formats as necessary.
7. Save the file.



## B. Inserting an Unordered List

1. Select the paragraphs that need to convert to an unordered list.
2. In the Properties Inspector, click the Unordered List button.

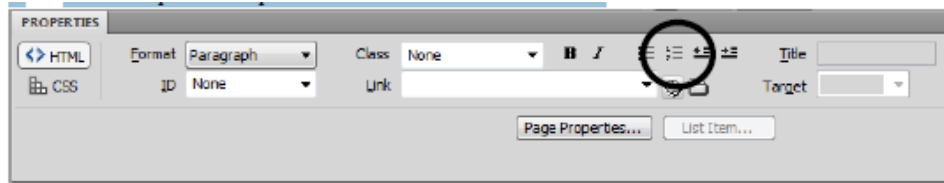


## C. Inserting an Ordered List

1. Select the paragraphs that need to convert to an ordered list.



2. In the Properties Inspector, click the Ordered List button.



## Basket Asset Management

1. MBA 222 Financial Information Analysis
2. MBA 232 Financial Institutions and Markets
3. MBA 233 Investments
4. MBA 235 Risk Management
5. MBA 235 Portfolio Management
6. MBA 236A Options and Futures Markets
7. MBA 236B Investment Styles and Strategies

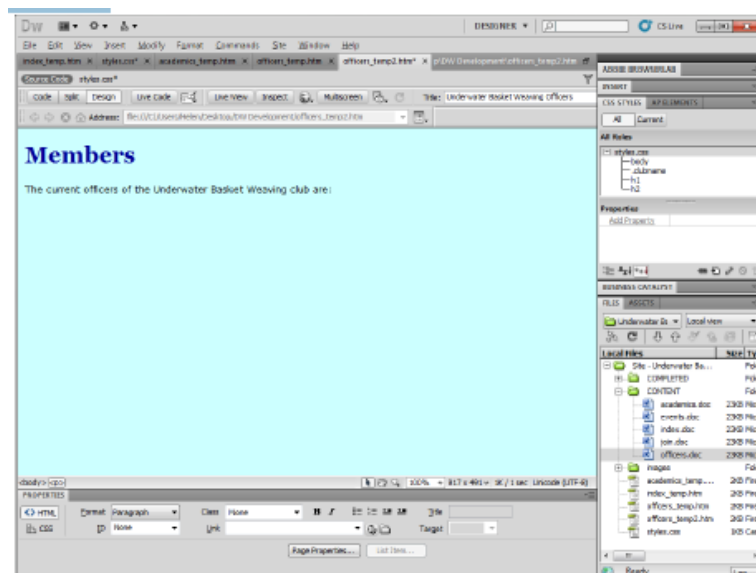
## X. Using Tables for Data

To display data in a well-structured format, create a table for data.

### A. Creating a New Web Page for Tables

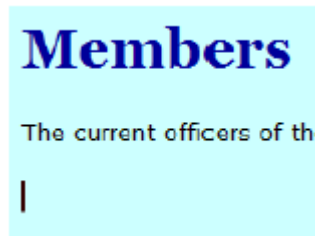
For our exercise, create a new web page for the Officers page.

1. Create a new, blank HTML page.
2. Save it at the top level of the Local Site folder as "officers\_temp.htm".
3. Provide an appropriate page document title.
4. Open the officers.doc document from the CONTENTS folder, and copy and paste title and first paragraph into the web page.
5. Attach the external stylesheet.
6. Apply any Heading 1 format as necessary.
7. Save the file.

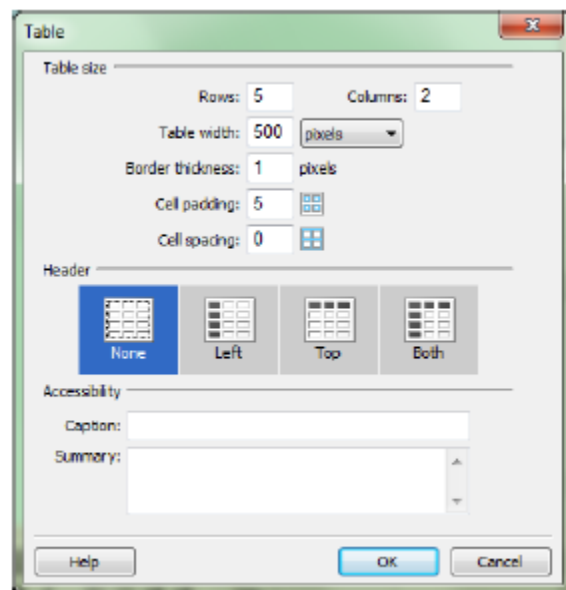


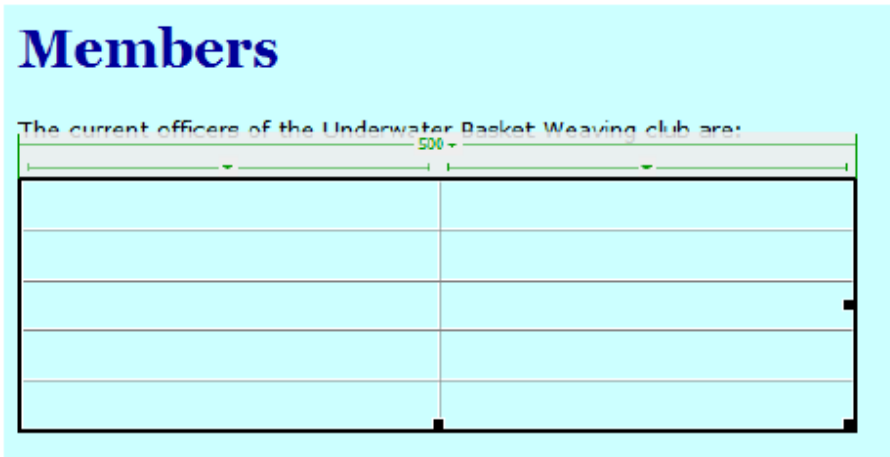
## B. Inserting a Table

1. Create a new paragraph.
2. Go to Insert → Table.

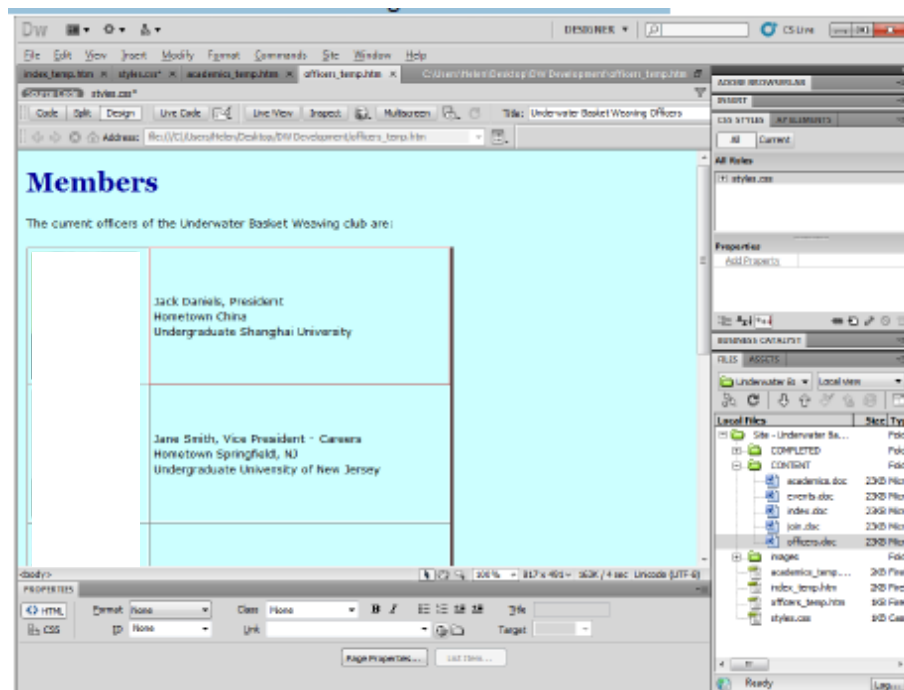


3. In the Table dialog box, enter the following options:
  - Rows: 5
  - Columns: 2
  - Table width: 500 pixels
  - Border thickness: 1 pixel
  - Cell padding: 5
  - Cell spacing: 0
  - Header: None
4. Click OK.





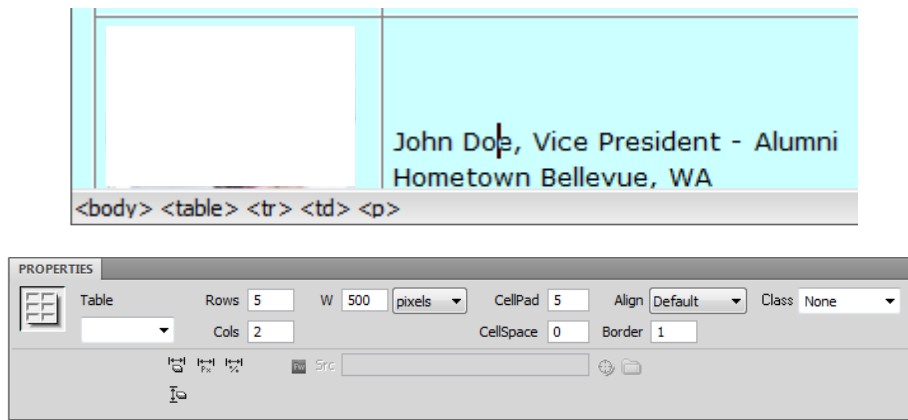
5. In cells on the right column, copy and paste the name and information for each officer from the officers.doc document.
6. In cells on the left column, insert images for each of the officers.



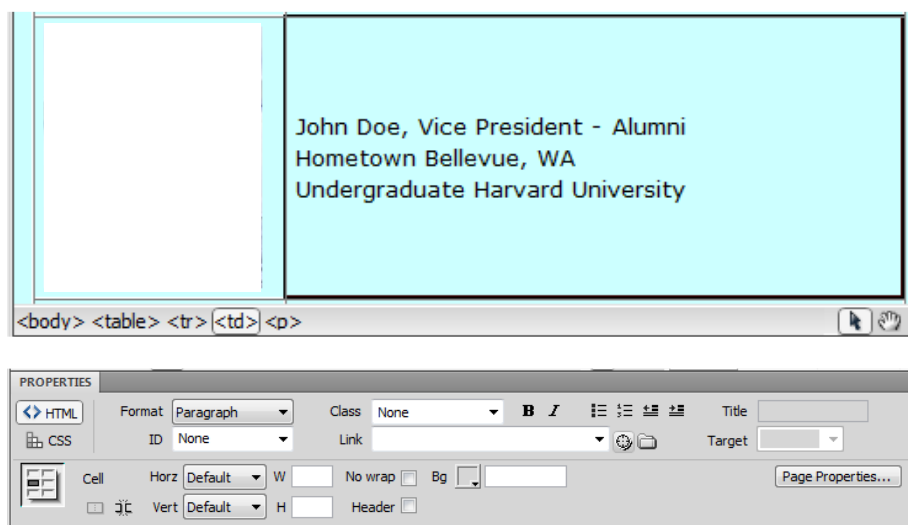
### C. Managing Table and Cell Properties

To set table layout setting like width, border, cell padding, cell spacing, or other properties of the table or table cells, select the HTML tag that controls that section.

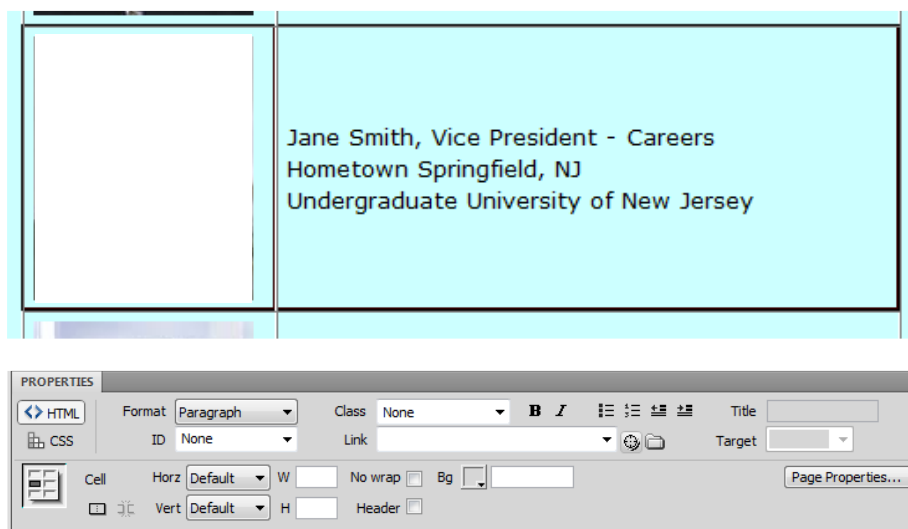
To make changes for the entire table, click inside the table and then select the <table> tag from the Tag Selector. Then, change the property in the Property Inspector.



To make changes for one cell, click inside the cell and then select the `<td>` or `<th>` tag from the Tag Selector. Then, change the property in the Property Inspector.



To make changes for several cells, drag to select several cells in the table. The cells should become outlined. Then, change the property in the Property Inspector.

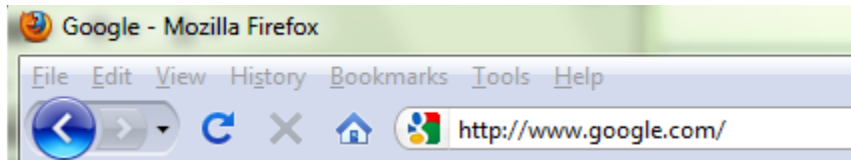


## XI. Creating Links

Create a link to an external website, or internal web page.

### A. Creating an External Link

1. Open a browser and browse to the website.
2. In the browser's address bar, select the URL and copy it.
  - Right-click and select copy, or use the Ctrl-C keyboard shortcut. In most browsers, use the Edit → Copy command.

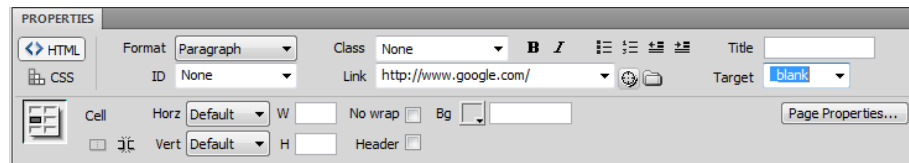


7. select the text

Jack Daniels, President  
Hometown China  
Undergraduate **Shanghai University**

8. In the Property Inspector, paste the URL into the Link field.

In external website to open in a separate window, select \_blank from the Target field.



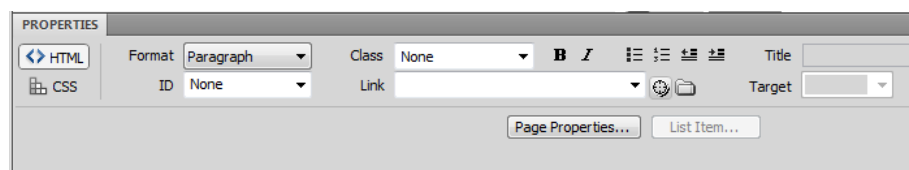
Jack Daniels, President  
Hometown China  
Undergraduate [Shanghai University](http://www.google.com/)

### B. Creating an Internal Link

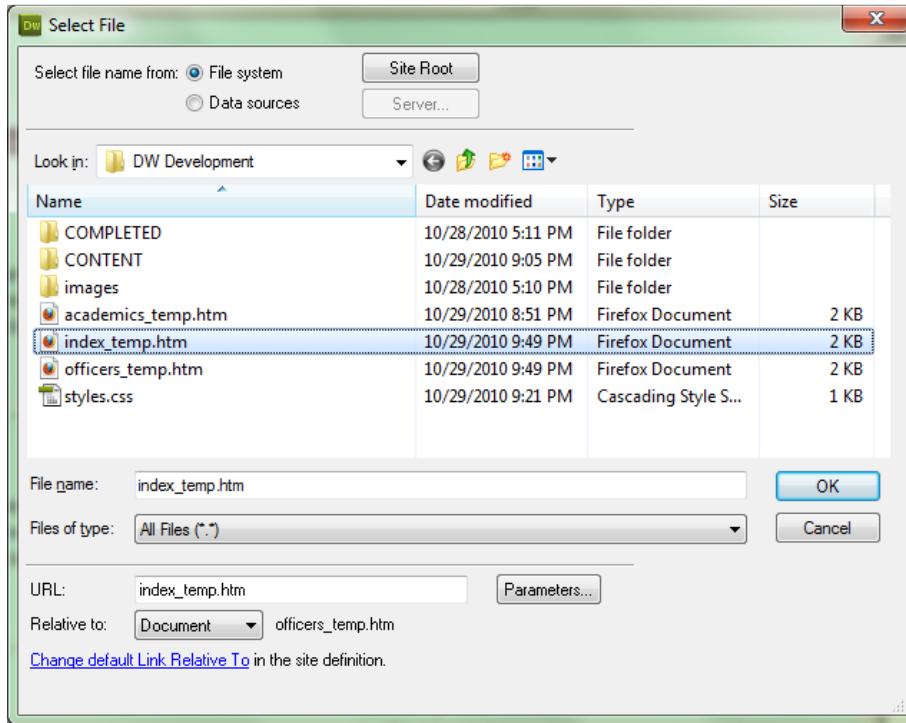
1. select the text

The current officers of the **Underwater Basket Weaving club** are:

2. In the Property Inspector, click the Browse for File button next to the Link field.



3. In the Select File dialog box, navigate to the file to link and select the file. The file must be inside the Local Site folder.
4. Click OK.



The current officers of the [Underwater Basket Weaving club](#) are:

## Basic Page Layout using CSS

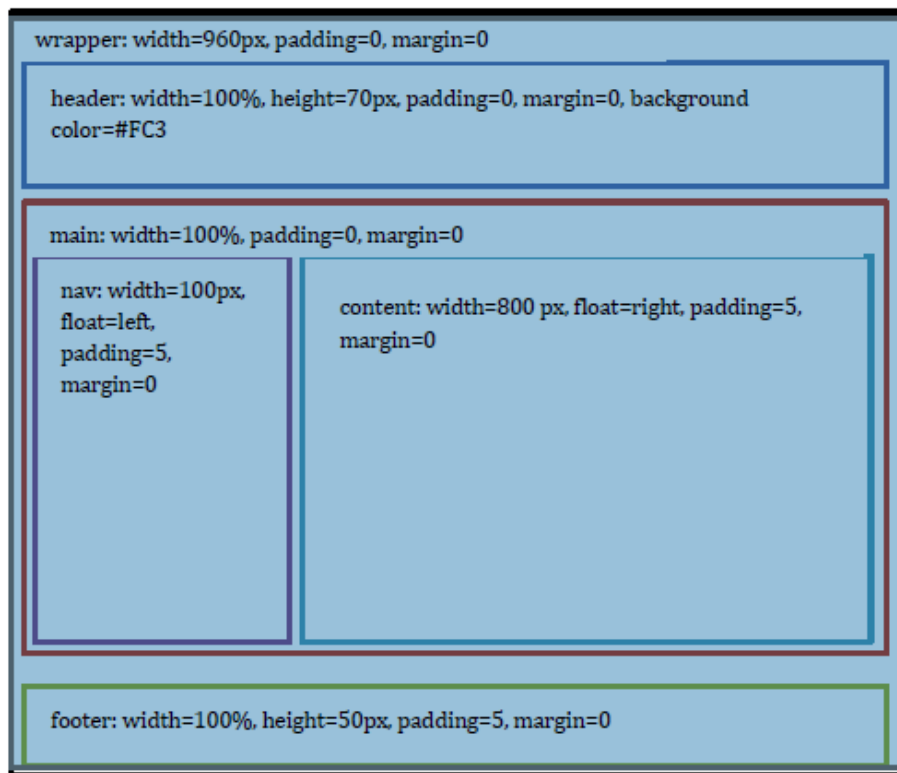
So far, we have been creating temporary pages that contain content, but they do not have the page layout that we sketched in our wireframe and mockup.

To create page layout, the old way was to use table structures in HTML. However, the current method is to use CSS. Sections of the HTML code are surrounded by div tags which are given a specific ID name, and a CSS ID rule defines the size and other properties of that div group.

### A. Planning the Layout

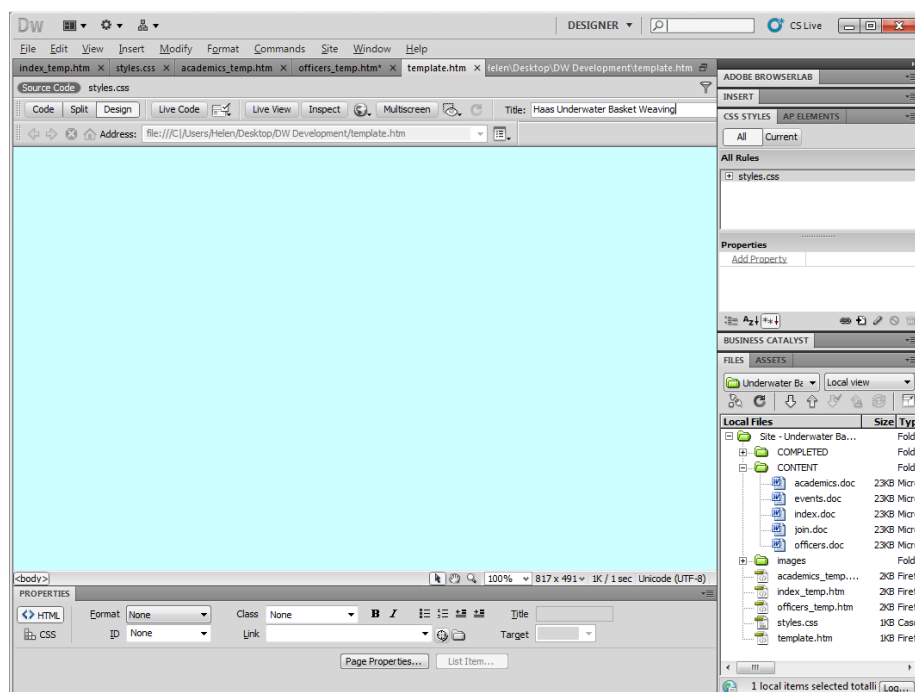
From the wireframe and mockup, decide how many div areas need to create.





## B. Creating a New Web Page for Page Layout

1. Create a new, blank HTML page.
2. Save it at the top level of the Local Site folder as "template.htm".
3. Provide an appropriate page document title.
4. Attach the external stylesheet.
5. Save the file.

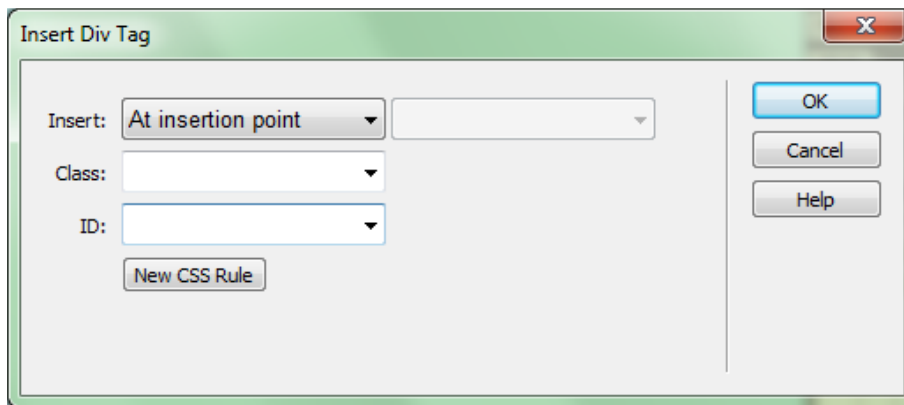


### C. Creating the Wrapper

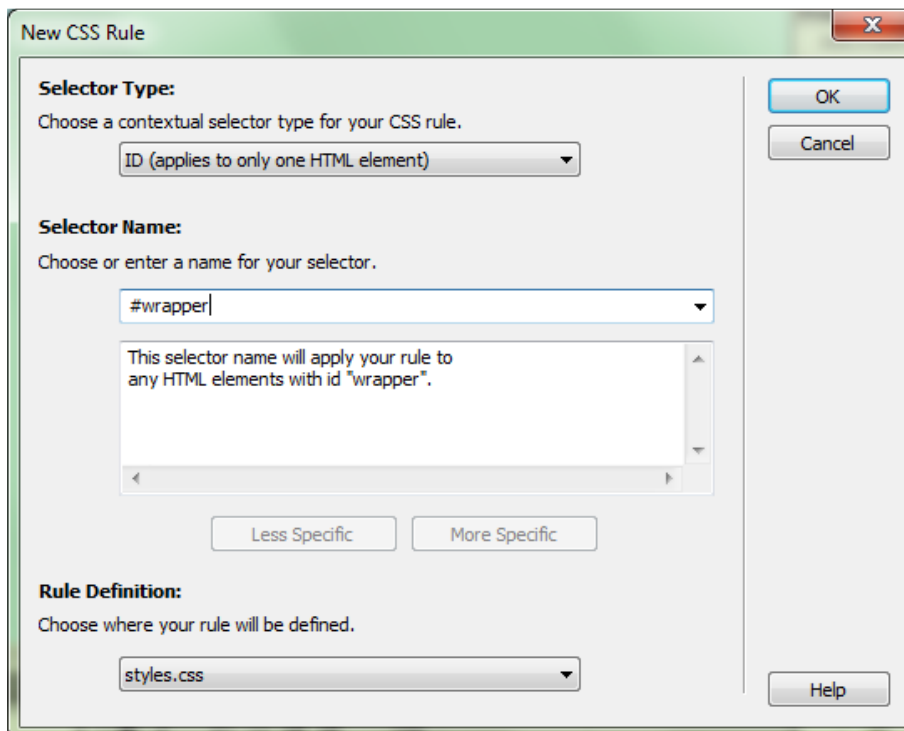
1. Click at the top of the page.
2. Go to Insert → Layout Objects → Div tag.



3. In the Insert Div Tag dialog box, click New CSS Rule.



4. In the New CSS Rule dialog box, select the following options:
  - Selector type: ID
  - Selector name: #wrapper

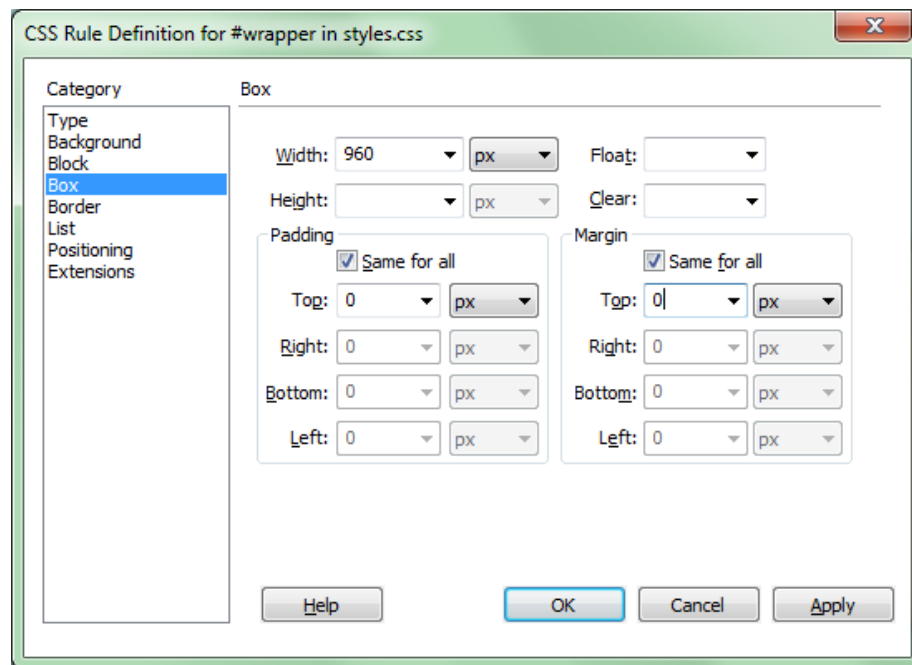


- Rule Definition : styles.css

5. Click ok.
6. In the CSS Rule Definition dialog box, select the following

Box category options:

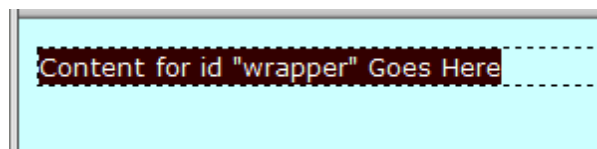
- Width: 960px
  - Padding: 0
  - Margin: 0
7. Click **OK**.



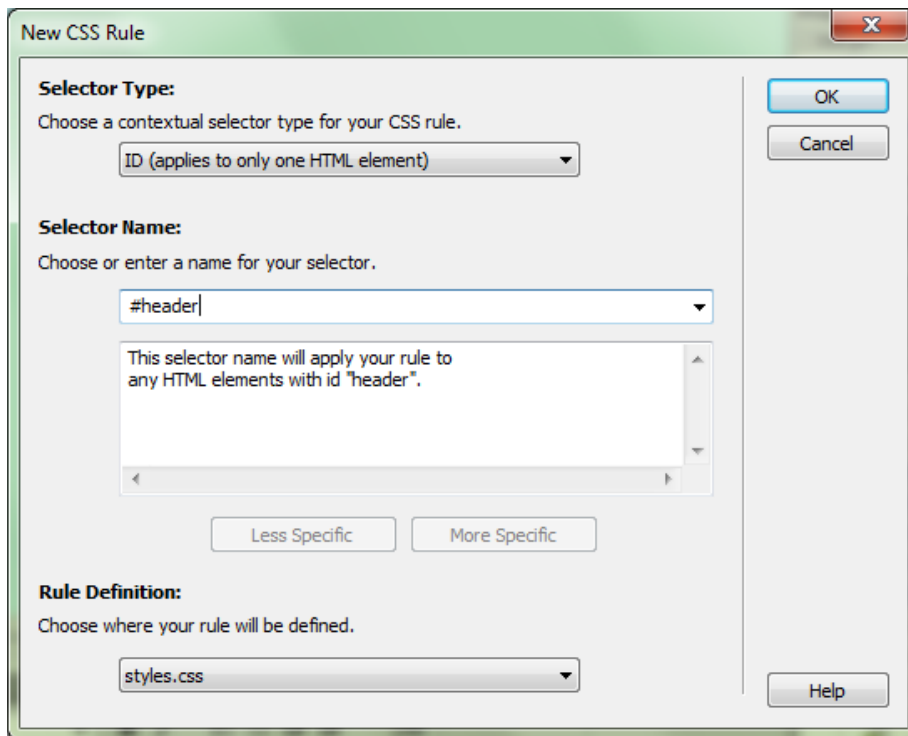
8. In the Insert Div Tag dialog box, make sure the ID field displays wrapper, then click OK.

#### D. Creating the Header

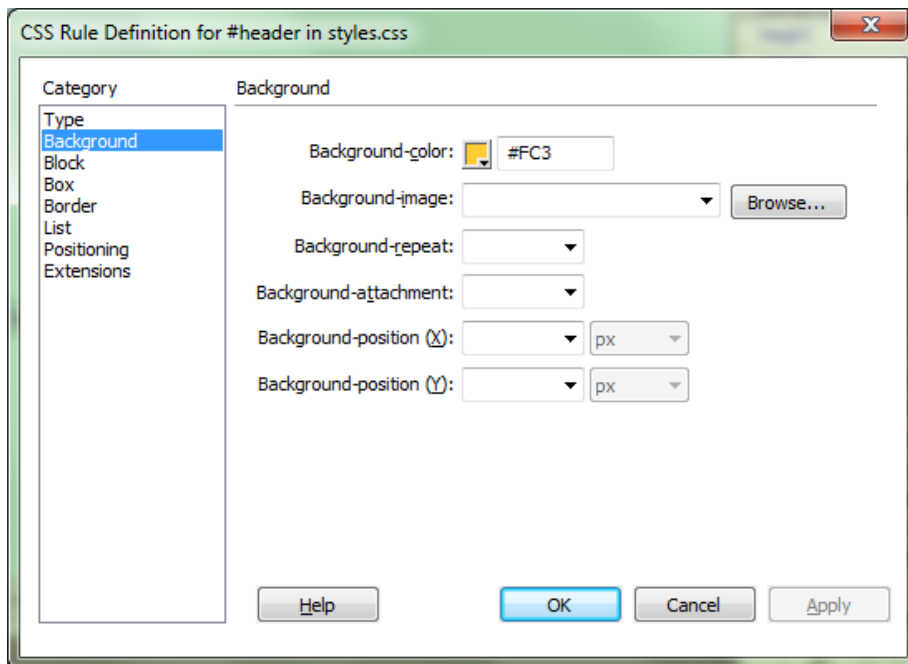
1. Select the contents of the wrapper div and delete it.



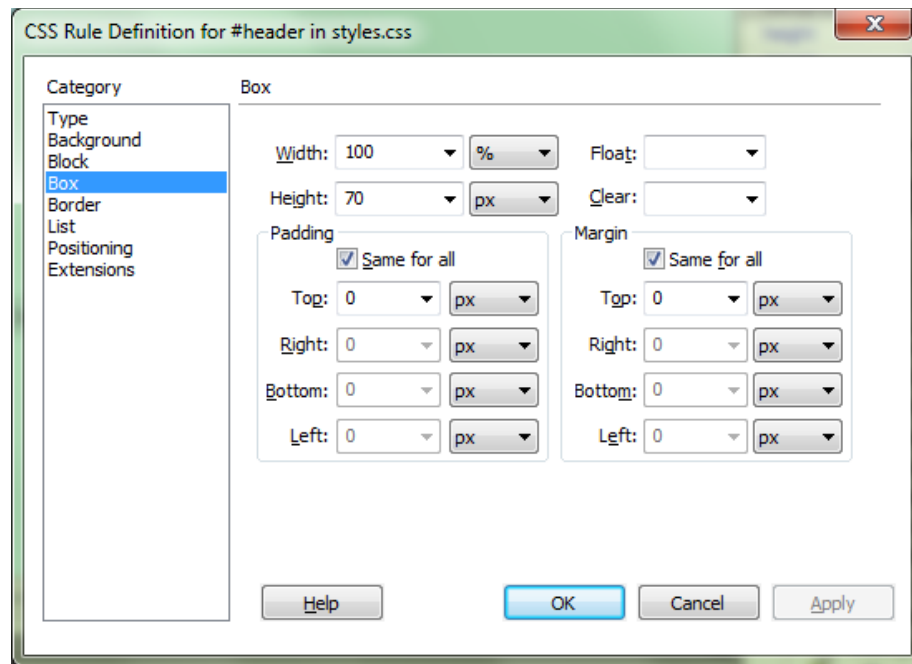
2. Go to Insert → Layout Objects → Div tag.
3. In the Insert Div Tag dialog box, click New CSS Rule.
4. In the New CSS Rule dialog box, select the following options:
  - Selector type: ID
  - Selector name: #header
  - Rule Definition : styles.css
5. Click OK.



6. In the CSS Rule Definition dialog box, select the following Background category options:
- Background color: #FC3



7. Select the following Box category options:
- Width: 100%
  - Height: 70px
  - Padding: 0
  - Margin: 0
8. Click OK.



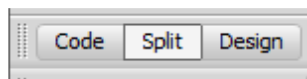
9. In the Insert Div Tag dialog box, make sure the ID field displays header, then click OK.
10. To create the structure within the header, we will use a table. Select the placeholder text and delete it.
11. Go to Insert → Table.
12. In the Table dialog box, select the following options:
  - Rows: 2
  - Columns: 2
  - Table width: 100 percent
  - Border thickness: 0
  - Cell padding: 0
  - Cell spacing: 0
  - Header: None
13. Click OK.
14. Do the following:
  - In the upper left cell, insert the image `hdr_logo.gif`.
  - In the upper right cell, insert the image `hdr_studentclubs.gif`.
  - Select both cells in the upper row and change the cell background color to `#001F5B`.
  - In the lower left cell, type the title “Underwater Basket Weaving Club”.
  - If there is time, create a CSS class rule called `.classtitle` to format the title.



### E. Creating the Main Area

At this point, we have to position this next div tag precisely, within the wrapper section but outside the header section. The best method is to go into the Code view or Split view.

1. In the Document toolbar, click the Split button to view both the design and the code view.



2. In the code view, click between the ending `</div>` tag of the header div and the ending `</div>` tag of the wrapper div. Press Return to create a new blank line.

```
9 <body>
10 <div id="wrapper"
11 <div id="heade
12 <table width
13 cellpadding="0">
14 <tr>
15 <td bgco
16 "images/hdr_logo
17 <td bgco
18 "images/hdr_stud
19 "Student Clubs"
20 </tr>
21 <tr>
22 <td clas
23 Club</td>
24 <td> &
25 </tr>
26 </table>
27 </div>
28 </div>
29 </body>
30 </html>
```

3. Go to Insert → Layout Objects → Div tag.
4. In the Insert Div Tag dialog box, click New CSS Rule.
5. In the New CSS Rule dialog box, select the following options:
  - Selector type: ID
  - Selector name: #main
  - Rule Definition : styles.css
6. Click OK.
7. In the CSS Rule Definition dialog box, select the following Box category options:
  - Width: 100%
  - Padding: 0
  - Margin: 0
8. Click OK.
9. In the Insert Div Tag dialog box, make sure the ID field displays main, then click OK.

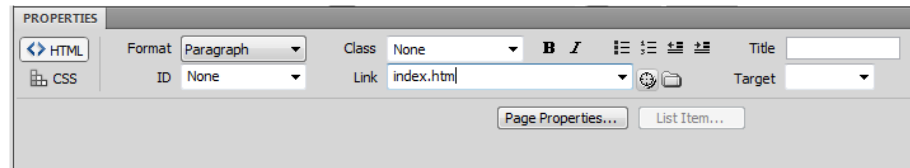
## F. Creating the Navigation Area

1. Select the placeholder text for the id "main" and delete it.
2. Go to Insert → Layout Objects → Div tag.
3. In the Insert Div Tag dialog box, click New CSS Rule.
4. In the New CSS Rule dialog box, select the following options:
  - Selector type: ID
  - Selector name: #nav
  - Rule Definition : styles.css
5. Click OK.
6. In the CSS Rule Definition dialog box, select the following Box category options:
  - Width: 100px
  - Float: left
  - Padding: 5
  - Margin: 0
7. Click OK.
8. In the Insert Div Tag dialog box, make sure the ID field displays nav, then click OK.
9. Select the placeholder text for id "nav", and enter the following text:
  - Home

- Academics
- Officers
- Events
- Join Us

10. Select each text and type the name of the associated HTML file in the Links field of the Property Inspector.

- Home = index.htm
- Academics = academics.htm
- Officers = officers.htm
- Events = events.htm
- Join Us = join.htm



### G. Creating the Content Area

1. In the code view, click between the ending `</div>` tag of the nav div and the ending `</div>` tag of the main div. Press Return to create a new blank line.
2. Go to Insert → Layout Objects → Div tag.
3. In the Insert Div Tag dialog box, click New CSS Rule.

```

23 <div id="main">
24 <div id="nav">
25 <p>Home</p>
26 <p>Academics</p>
27 <p>Members</p>
28 <p>Events</p>
29 <p>Join Us</p>
30 </div>
31 |
32 </div>
33 </div>
34 </body>
35 </html>
36

```

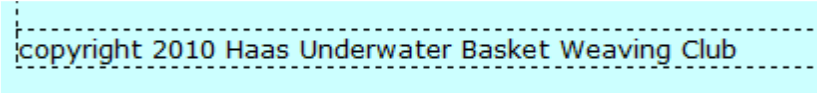
4. In the New CSS Rule dialog box, select the following options:
  - Selector type: ID
  - Selector name: #content
  - Rule Definition : styles.css
5. Click OK.
6. In the CSS Rule Definition dialog box, select the following Box category options:
  - Width: 800px
  - Float: right
  - Padding: 5
  - Margin: 0
7. Click OK.
8. In the Insert Div Tag dialog box, make sure the ID field displays content, then click OK.

### H. Creating the Footer

1. In the code view, click between the ending `</div>` tag of the main div and the ending `</div>` tag of the wrapper div. Press Return to create a new blank line.

```
23 <div id="main">
24 <div id="nav">
25 <p>Home</p>
26 <p>Academics</p>
27 <p>Members</p>
28 <p>Events</p>
29 <p>Join Us</p>
30 </div>
31 <div id="content">Content for id
32 "content" Goes Here</div>
33 </div>
34 </div>
```

2. Go to Insert → Layout Objects → Div tag.
3. In the Insert Div Tag dialog box, click New CSS Rule.
4. In the New CSS Rule dialog box, select the following options:
  - Selector type: ID
  - Selector name: #footer
  - Rule Definition : styles.css
5. Click OK.
6. In the CSS Rule Definition dialog box, select the following Box category options:
  - Width: 100%
  - Height: 50px
  - Clear: both
  - Padding: 5
  - Margin: 0
7. Click OK.
8. In the Insert Div Tag dialog box, make sure the ID field displays content, then click OK.
9. Select the placeholder text and type a copyright statement.



copyright 2010 Haas Underwater Basket Weaving Club

10. Save the file.

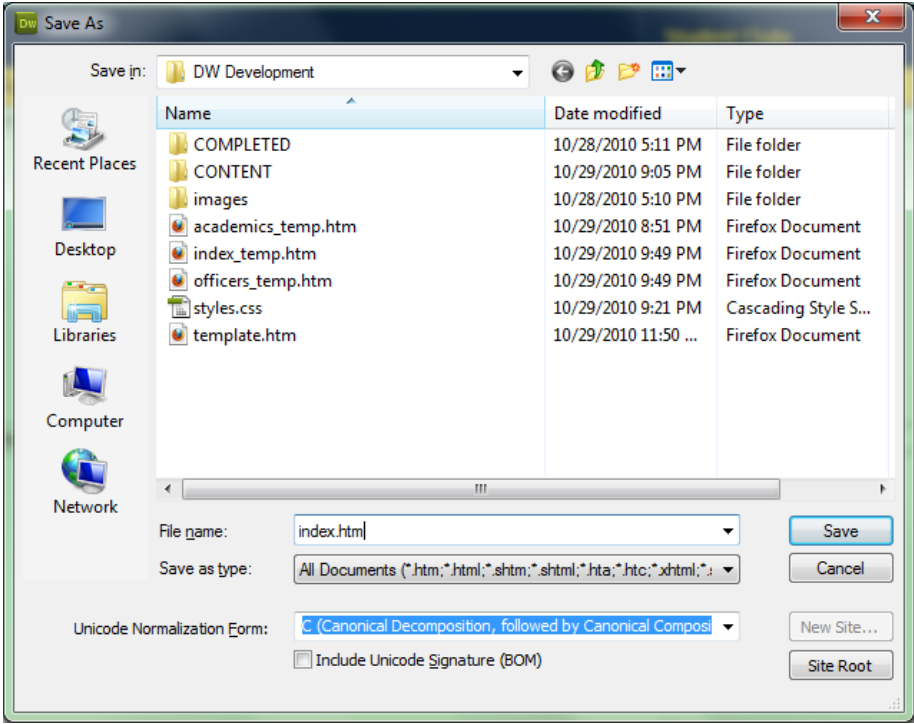
## Creating More Pages

We can use the template that we created in the previous section to create our final pages.

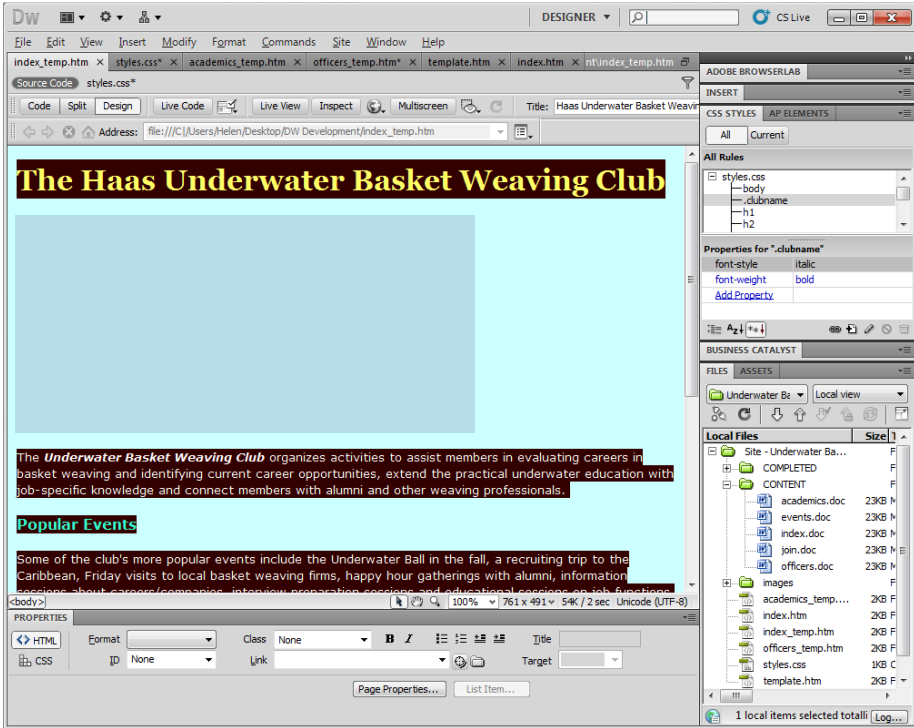
### A. Creating the Home Page

1. In the template.htm page, go to **File** → **Save As**.
2. In the Save As dialog box, make sure the location is the top level of the Local Site folder.
3. For the File name, type index.htm.
4. Click Save.

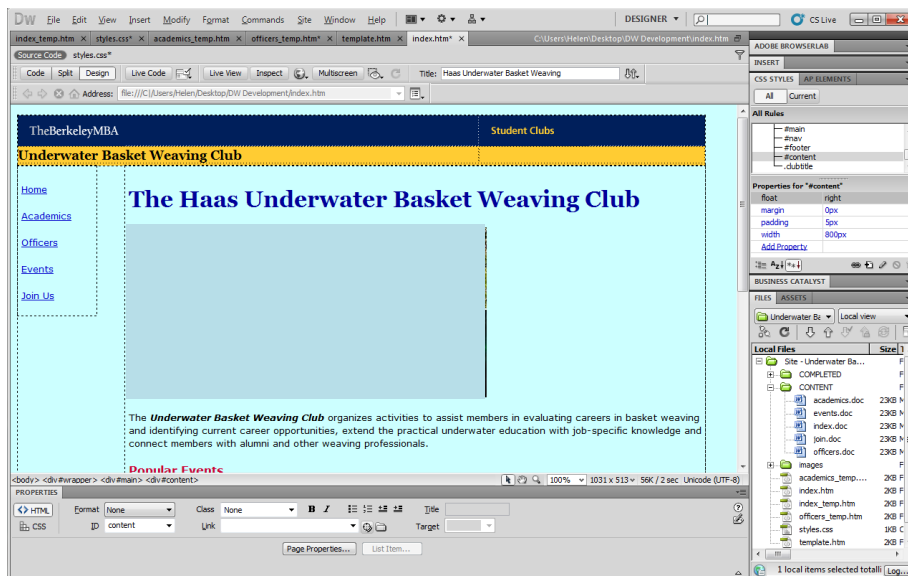




5. Go to the old `index_temp.htm` page.
6. Select all the content and copy it.

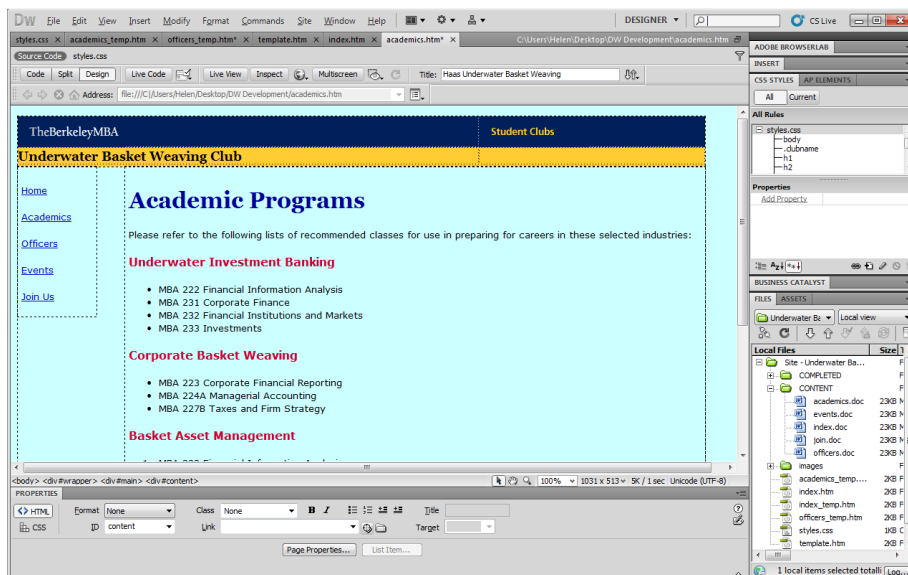


- Go back to the new index.htm page.
- Select the placeholder text for the content area, and delete it.
- Paste the new content into the content area.
- Save the file.



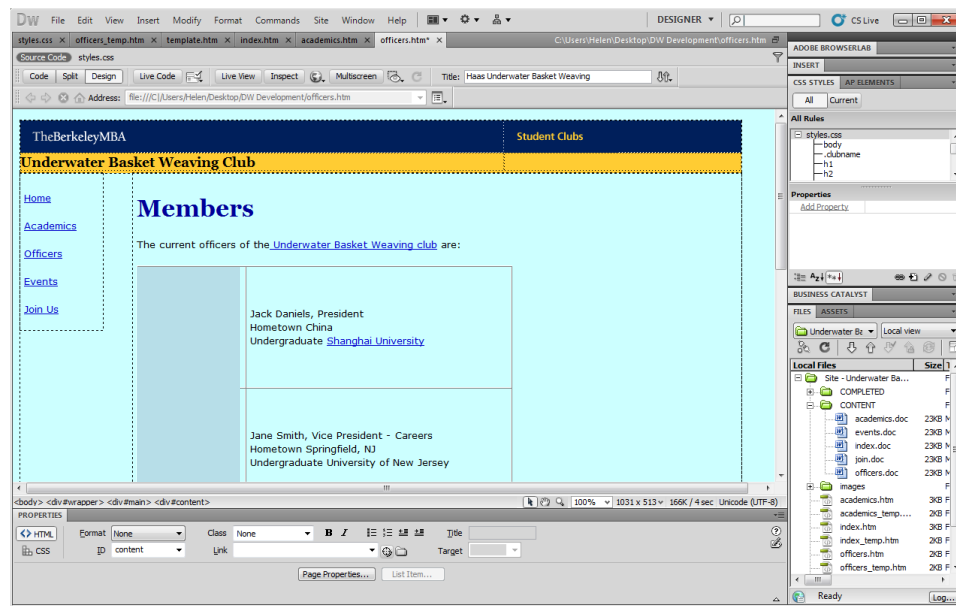
## B. Creating the Academics Page

1. Save another copy of the template.htm file as academics.htm.
2. Copy the old academics\_temp.htm content into the academics.htm file.
3. Save the file



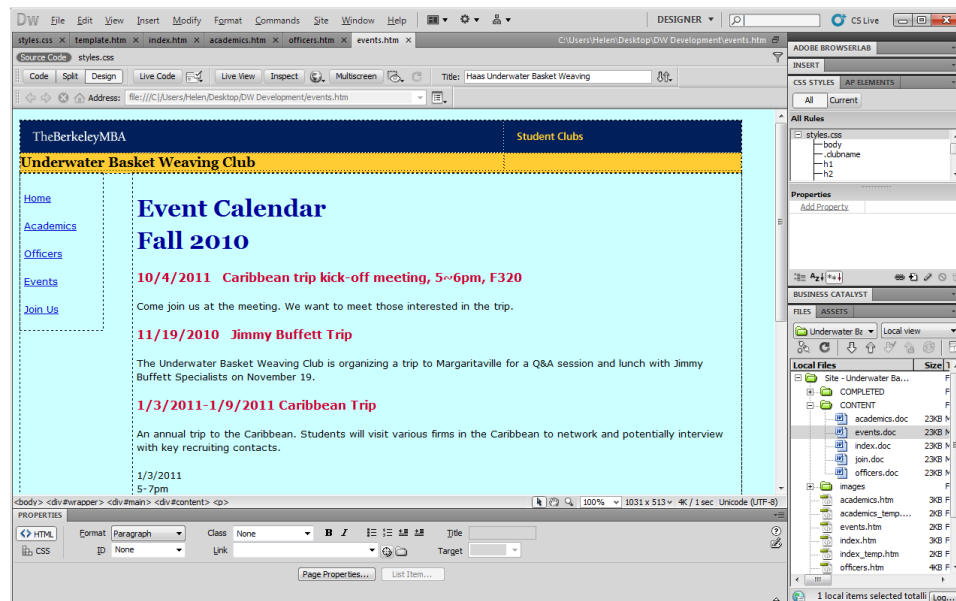
## C. Creating the Officers Page

1. Save another copy of the template.htm file as officers.htm.
2. Copy the old officers\_temp.htm content into the officers.htm file.
3. Save the file



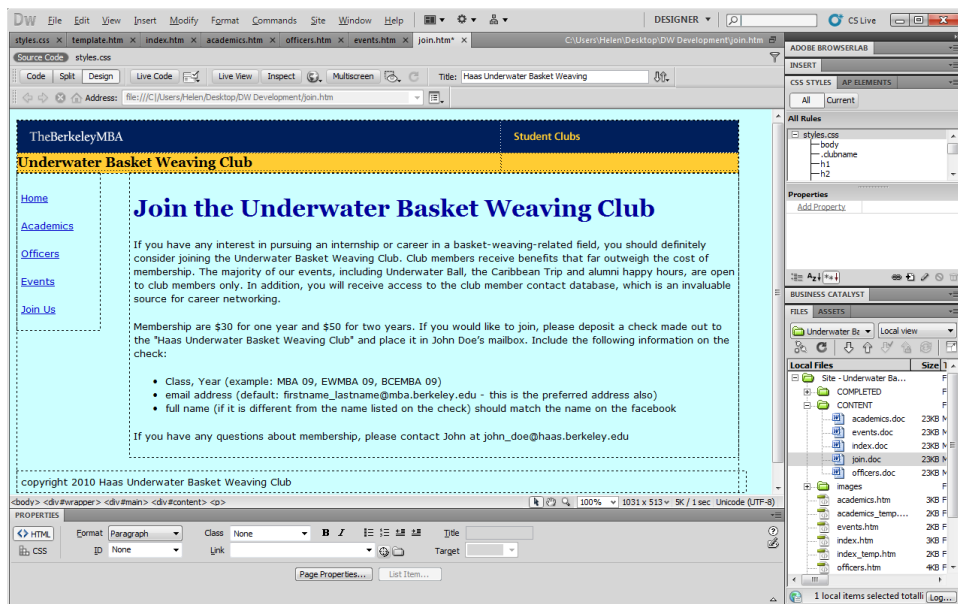
#### D. Creating the Events Page

1. Save another copy of the template.htm file as events.htm.
2. From the File panel, open the events.doc file.
3. Copy text in events.doc into the events.htm file.
4. Save the file.



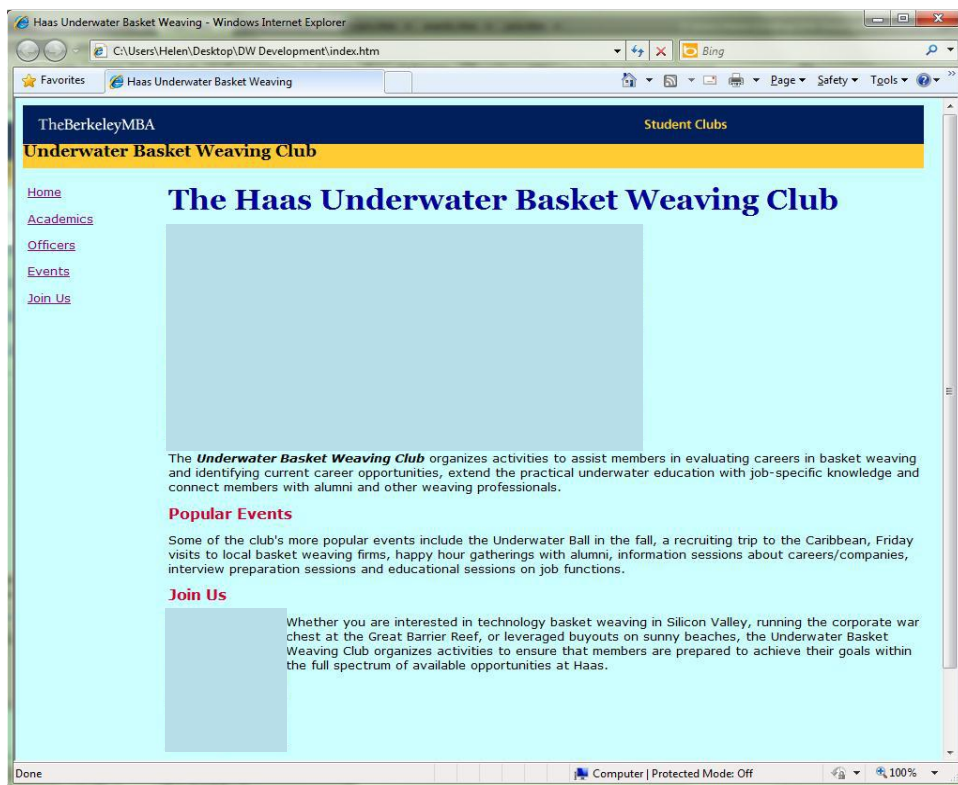
#### E. Creating the Join Us Page

1. Save another copy of the template.htm file as join.htm.
2. From the File panel, open the join.doc file.
3. Copy text from join.doc into the join.htm file.
4. Save the file.



## F. Previewing in a Browser

1. Go to the index.htm file.
2. In the Document toolbar, click the Preview in Browser button and select a browser.
3. Test the links in the navigation area.
4. If there are any problems, come back to Dreamweaver and make changes.



# Learning Unit 2: Implementing Style Sheet (CSS) in a Website

## Overview

In this learning unit, you will learn HTML elements. After completion of this learning unit, you will be able to understand CSS Syntax, Id and Class, Styling of Backgrounds, Text, Fonts, Links, Lists & and Tables, CSS Border, Outline, Margin, Padding, Dimension, Positioning, Floating, Align, Colours, and Colour HEX.

### Do you know!

HTML was not developed for a design purpose of websites. CSS does all design work.

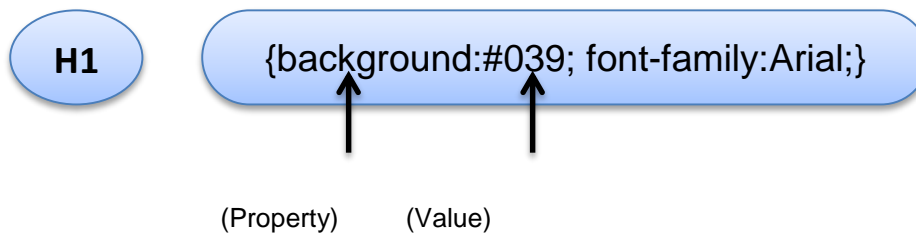
## 1. CSS Syntax

CSS consists of selector and declaration block.

### Selector:

Selector

Declaration



Selectors are the HTML elements/Attributes on which to apply the style.

### Declaration:

Declarative portion of the CSS consists of set of formatting rules.

### CSS

CSS Cascading Style Sheet is used to set look and feel of website.

## 2. Id and Class

The id selector is an id attribute of an HTML element to select a specific element. An id is unique within a page, so the id selector is used to select a single, unique element.

The style rule below will be applied to the HTML element with id="para1":

```
<head>
<style>
 #para1 { text-align: center; color: red;}
</style>
</head>
<p id="p1">Hello World!</p>
```

The class selector selects elements with a specific class attribute.

To select elements with a specific class, write a period character, followed by the name of the class:

In the example all HTML elements with class="left" will be left-aligned:

```
<head>
<style>
.left {
 text-align: left;
 color: red;
}
</style>
</head>
```

```
<h1 class="left">Red and left-aligned heading</h1>
```

```
<p class="left">Red and left-aligned paragraph.</p>
```

### 3. Styling of Backgrounds

CSS background styling properties are used to define the background effects of an elements / whole html page.

Followings are some CSS properties which are used for background effects:

#### **background-color**

The background-color property sets the background color of an element e.g <style>

```
body {
 background-color: #b0c4de;
}
</style>
```

#### **background-image**

The background-image property sets the background image of an element. body {  
background-image: url("background.gif");  
}

#### **background-repeat / no-repeat**

CSS automatically repeats an image horizontally and vertically. But user can set the image repeating values.

e.g.

```
body {
 background-image: url("gradient_bg.png");
 background-repeat: repeat-x;

 background-repeat: repeat-y;
 background-repeat: no-repeat; // this used in case where user don't want repeat the image
}
```

#### **background-attachment**

#### **background-position**

## 4. CSS Text

### Text Color

The color property sets the color of the text.

With CSS, a color is most often identified by:

a HEX value - like "#ff0000"

an RGB value - like "rgb(255,0,0)"

a color name - like "red"

The default color for a page is defined in the body selector.

### Example

```
body {
 color: blue;
}
h1 {
 color: #00ff00;
}
h2 {
 color: rgb(255,0,0);
}
```

### Text Alignment

The text-align property sets the horizontal alignment of a text.

Text can be centered, or aligned to the left or right, or justified.

When text-align is set to "justify", each line is stretched so that every line has equal width, and the left and right margins are straight (like in magazines and newspapers).

### Example

```
h1 {
 text-align: center;
}
p.date {
 text-align: right;
}
p.main {
 text-align: justify;
}
```

### Text Decoration

The text-decoration property sets or removes decorations from text.

The text-decoration property is mostly used to remove underlines from links for design purposes:

**Example**

```
a {
 text-decoration: none;
}
It can also be used to decorate text:
Example
h1 {
 text-decoration: overline;
}
h2 {
 text-decoration: line-through;
}
h3 {
 text-decoration: underline;
}
```

**Remember**

If the name of a font family is more than one word, it must be in quotation marks, like: "Times New Roman".

**Text Transformation**

The text-transform property specifies uppercase and lowercase letters in a text.

It can be used to change everything into uppercase or lowercase letters, or capitalize the first letter of each word.

**Example**

```
p.uppercase {
 text-transform: uppercase;
}
p.lowercase {
 text-transform: lowercase;
}
p.capitalize {
 text-transform: capitalize;
}
```

**Text Indentation**

The text-indent property specifies the indentation of the first line of a text.

**Example**

```
p {
 text-indent: 50px;
}
```

## 5. Fonts

CSS font properties define the font family, boldness, size, and the style of a text.





In CSS, there are two types of font family names:

**Generic Family** - a group of font families with a similar look (like "Serif" or "Monospace")

**Font Family** - a specific font family (like "Times New Roman" or "Arial")

### Font Family

The font family of a text is set with the font-family property.

**The font-family property should hold several font names as a "fallback" system. If the browser does not support the first font, it tries the next font.**

Start with the font and end with a generic family, to let the browser pick a similar font in the generic family, if no other fonts are available.

More than one font family is specified in a comma-separated list:

### Example

```
p {
 font-family: "Times New Roman", Times, serif;
}
```

### Font Style

The font-style property specifies italic text.

This property has three values:

normal - The text is shown normally

italic - The text is shown in italics

oblique - The text is "leaning" (oblique is very similar to italic, but less supported)

### Example

```
p.normal {
 font-style: normal;
}
p.italic {
 font-style: italic;
}
p.oblique {
 font-style: oblique;
}
```

## Font Size

The font-size property is used to set the size of the text. Being able to manage the text size is important in web design. Always use the proper HTML tags, like <h1> - <h6> for headings and <p> for paragraphs.

The font-size value can be an absolute, or relative size.

### Absolute Size:

Sets the text to a specified size. Does not allow a user to change the text size in all browsers (bad for accessibility reasons). Absolute size is useful when the physical size of the output is known

### Relative size:

Sets the size relative to surrounding elements. Allows a user to change the text size in browsers

### Set Font Size With Pixels

Setting the text size with pixels

#### Example

```
h1 {
 font-size: 40px;
}
h2 {
 font-size: 30px;
}
p {
 font-size: 14px;
}
```

### Set Font Size With Em

To allow users to resize the text (in the browser menu), many developers use em instead of pixels.

The em size unit is recommended by the W3C.

1em is equal to the current font size. The default text size in browsers is 16px. So, the default size of 1em is 16px.

The size can be calculated from pixels to em using this formula: pixels/16=em

#### Example

```
h1 {
 font-size: 2.5em; /* 40px/16=2.5em */
}
h2 {
 font-size: 1.875em; /* 30px/16=1.875em */
}
p {
 font-size: 0.875em; /* 14px/16=0.875em */
}
```

## Use a Combination of Percent and Em

The solution that works in all browsers, is to set a default font-size in percent for the <body> element:

### Example

```
body {
 font-size: 100%;
}
h1 {
 font-size: 2.5em;
}
h2 {
 font-size: 1.875em;
}
p {
 font-size: 0.875em;
}
```

## 6. Links

Links can be styled in different ways.

### Styling Links

Links can be styled with any CSS property (e.g. color, font-family, background, etc.).

### Example

```
a {
 color: #FF0000;
}
```

In addition, links can be styled differently depending on what state they are in.

The four links states are:

**a:link** - a normal, unvisited link

**a:visited** - a link the user has visited

**a:hover** - a link when the user mouse's over it

**a:active** - a link the moment it is clicked

### Example

```
/* unvisited link */
a:link {
 color: #FF0000;
}
/* visited link */
a:visited {
 color: #00FF00;
}
/* mouse over link */
a:hover {
```

```
color: #FF00FF;
}
/* selected link */
a:active {
 color: #0000FF;
}
```

When setting the style for several link states, there are some order rules:

**a:hover** MUST come after a:link and a:visited

**a:active** MUST come after a:hover

### Common Link Styles

In the example above the link changes color depending on what state it is in.

Let's go through some of the other common ways to style links:

### Text Decoration

The text-decoration property is mostly used to remove underlines from links:

#### Example

```
a:link {
 text-decoration: none;
}
a:visited {
 text-decoration: none;
}
a:hover {
 text-decoration: underline;
}
a:active {
 text-decoration: underline;
}
```

#### Remember

Do not start an id and class names with a number.

### Background Color

The background-color property specifies the background color for links:

#### Example

```
a:link {
 background-color: #B2FF99;
}
a:visited {
 background-color: #FFFF85;
}
a:hover {
 background-color: #FF704D;
}
a:active {
 background-color: #FF704D;
}
```

## 7. Lists

The CSS list properties allow to:

- Set different list item markers for ordered lists
- Set different list item markers for unordered lists
- Set an image as the list item marker

### List

In HTML, there are two types of lists:

- unordered lists (<ul>) - the list items are marked with bullets
- ordered lists (<ol>) - the list items are marked with numbers or letters

With CSS, lists can be styled further, and images can be used as the list item marker.

### Different List Item Markers

The type of list item marker is specified with the list-style-type property:

#### Example

```
ul.a {
 list-style-type: circle;
}
ul.b {
 list-style-type: square;
}
ol.c {
 list-style-type: upper-roman;
}
ol.d {
 list-style-type: lower-alpha;
}
```

Some of the values are for unordered lists, and some for ordered lists.

### An Image as The List Item Marker

To specify an image as the list item marker, use the list-style-image property:

#### Example

```
ul {
 list-style-image: url('sqpurple.gif');
}
```

The example above does not display equally in all browsers. IE and Opera will display the image-marker a little bit higher than Firefox, Chrome, and Safari.

Image-marker is placed equally in all browsers, a crossbrowser solution is explained below.

### Crossbrowser Solution

The following example displays the image-marker equally in all browsers:

### Example

```
ul {
 list-style-type: none;
 padding: 0px;
 margin: 0px;
}

ul li {
 background-image: url(sqpurple.gif);
 background-repeat: no-repeat;
 background-position: 0px center;
 padding-left: 15px;
}
```

### Example Explained:

For <ul>:

Set the list-style-type to none to remove the list item marker

Set both padding and margin to 0px (for cross-browser compatibility)

For all <li> in <ul>:

Set the URL of the image, and show it only once (no-repeat)

Position the image (left 0px and vertical value: center)

Position the text in the list with padding-left

### List - Shorthand Property

The list-style property is a shorthand property. It is used to set all the list properties in one declaration:

### Example

```
ul {
 list-style: square inside url("sqpurple.gif");
}
```

When using the shorthand property, the order of the property values are:

- list-style-type (if a list-style-image is specified, the value of this property will be displayed if the image for some reason cannot be displayed)
- list-style-position (specifies whether the list-item markers should appear inside or outside the content flow)
- list-style-image (specifies an image as the list item marker)

If one of the property values above are missing, the default value for the missing property will be inserted, if any.

## 8. Tables

The look of an HTML table can be greatly improved with CSS.

Company	Contact	Country
Alfreds Futterkiste	Maria Anders	Germany
Berglunds snabbköp	Christina Berglund	Sweden
Centro comercial Moctezuma	Francisco Chang	Mexico
Ernst Handel	Roland Mendel	Austria
Island Trading	Helen Bennett	UK
Königlich Essen	Philip Cramer	Germany
Laughing Bacchus Winecellars	Yoshi Tannamuri	Canada
Magazzini Alimentari Riuniti	Giovanni Rovelli	Italy
North/South	Simon Crowther	UK
Paris spécialités	Marie Bertrand	France
The Big Cheese	Liz Nixon	USA
Vaffeljernet	Palle Ibsen	Denmark

### Table Borders

To specify table borders in CSS, use the border property.

The example below specifies a black border for <table>, <th>, and <td> elements:

#### Example

```
table, th, td {
 border: 1px solid black;
}
```

Notice that the table in the example above has double borders. This is because both the table and the <th>/<td> elements have separate borders.

To display a single border for the table, use the border-collapse property.

### Collapse Borders

The border-collapse property sets whether the table borders are collapsed into a single border or separated:

#### Example

```
table {
 border-collapse: collapse;
}
table, th, td {
 border: 1px solid black;
}
```

### Table Width and Height

Width and height of a table is defined by the width and height properties.

The example below sets the width of the table to 100%, and the height of the <th> elements to 50px:

#### Example

```
table {
 width: 100%;
}
```

```
}
th {
 height: 50px;
}
```

### Horizontal Text Alignment

The text-align property sets the horizontal alignment, like left, right, or center.

By default, the text in <th> elements are center-aligned and the text in <td> elements are left-aligned.

The following example left-aligns the text in <th> elements:

#### Example

```
th {
 text-align: left;
}
```

### Vertical Text Alignment

The vertical-align property sets the vertical alignment, like top, bottom, or middle.

By default, the vertical alignment of text in a table is middle (for both <th> and <td> elements).

#### Example

```
td {
 height: 50px;
 vertical-align: bottom;
}
```

### Table Padding

To control the space between the border and content in a table, use the padding property on <td> and <th> elements:

#### Example

```
td {
 padding: 15px;
}
```

### Table Color

The example below specifies the color of the borders, and the text and background color of <th> elements:

#### Example

```
table, td, th {
 border: 1px solid green;
}
th {
 background-color: green;
 color: white;
}
```



## 9. CSS Border

The CSS border properties allow to specify the style, size, and color of an element's border.

### Border Style

The border-style property specifies what kind of border to display.

border-style values:

none: Defines no border
dotted: Defines a dotted border
dashed: Defines a dashed border
solid: Defines a solid border
double: Defines two borders. The width of the two borders are the same as the border-width value
groove: Defines a 3D grooved border. The effect depends on the border-color value
ridge: Defines a 3D ridged border. The effect depends on the border-color value
inset: Defines a 3D inset border. The effect depends on the border-color value
outset: Defines a 3D outset border. The effect depends on the border-color value

### Border Width

The border-width property is used to set the width of the border.

The width is set in pixels, or by using one of the three pre-defined values: thin, medium, or thick.

### Example

```
p.one {
 border-style: solid;
 border-width: 5px;
}

p.two {
 border-style: solid;
 border-width: medium;
}
```

### Border Color

The border-color property is used to set the color of the border. The color can be set by:

- name - specify a color name, like "red"
- RGB - specify a RGB value, like "rgb(255,0,0)"
- Hex - specify a hex value, like "#ff0000"

Set the border color to "transparent".

If the border color is not set it is inherited from the color property of the element.

**Note:** The "border-color" property does not work if it is used alone. Use the "border-style" property to set the borders first.

### Example

```
p.one {
 border-style: solid;
 border-color: red;
}

p.two {
 border-style: solid;
 border-color: #98bf21;
}
```

### Border - Individual sides

In CSS it is possible to specify different borders for different sides:

### Example

```
p {
 border-top-style: dotted;
 border-right-style: solid;
 border-bottom-style: dotted;
 border-left-style: solid;
}
```

The example above can also be set with a single property:

### Example

```
p {
 border-style: dotted solid;
}
```

The border-style property can have from one to four values.

- **Border-Style: Dotted Solid Double Dashed;**

- top border is dotted
- right border is solid
- bottom border is double
- left border is dashed

- **Border-Style: Dotted Solid Double;**

- top border is dotted
- right and left borders are solid
- bottom border is double

- **Border-Style: Dotted Solid;**
  - top and bottom borders are dotted
  - right and left borders are solid
- **Border-Style: Dotted;**
  - all four borders are dotted

The border-style property is used in the example above. However, it also works with border-width and border-color.

### Border - Shorthand Property

There are many properties to consider when dealing with borders.

To shorten the code, it is also possible to specify all the individual border properties in one property. This is called a shorthand property.

The border property is a shorthand for the following individual border properties:

- border-width
- border-style (required)
- border-color

### Example

```
p {
 border: 5px solid red;
}
```

## 10. Outline

An outline is a line that is drawn around elements (outside the borders) to make the element "stand out".

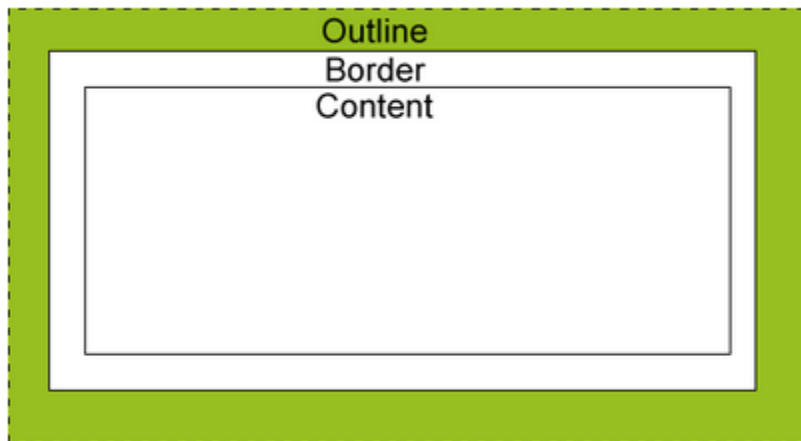
The outline properties specify the style, color, and width of an outline.

### CSS Outline

An outline is a line that is drawn around elements (outside the borders) to make the element "stand out".

However, the outline property is different from the border property.

The outline is not a part of an element's dimensions; the element's total width and height is not affected by the width of the outline.



## 11. Margin

The CSS margin properties define the space around elements.

### Margin

#### Remember

Same four value styles can also be used while setting padding in CSS.

The margin clears an area around an element (outside the border). The margin does not have a background color, and is completely transparent.

The top, right, bottom, and left margin can be changed independently using separate properties. A shorthand margin property can also be used, to change all margins at once.

### Possible Values

Value	Description
auto	The browser calculates a margin
<i>length</i>	Specifies a margin in px, pt, cm, etc. Default value is 0px
%	Specifies a margin in percent of the width of the containing element
inherit	Specifies that the margin should be inherited from the parent element

### Margin - Shorthand property

To shorten the code, it is possible to specify all the margin properties in one property. This is called a shorthand property.

The shorthand property for all the margin properties is "margin":

### Example

```
p {
 margin: 100px 50px;
}
```

The margin property can have from one to four values:-

1. margin: 25px 50px 75px 100px;
  - top margin is 25px
  - right margin is 50px
  - bottom margin is 75px
  - left margin is 100px
2. margin: 25px 50px 75px;
  - top margin is 25px
  - right and left margins are 50px
  - bottom margin is 75px
3. margin: 25px 50px;
  - top and bottom margins are 25px
  - right and left margins are 50px
4. margin: 25px;
  - all four margins are 25px

## 12. Padding

The CSS padding properties define the space between the element border and the element content.

### Padding

The padding clears an area around the content (inside the border) of an element. The padding is affected by the background color of the element.

The top, right, bottom, and left padding can be changed independently using separate properties. A shorthand padding property can also be used, to change all paddings at once.

### Possible Values

Value	Description
<i>length</i>	Defines a fixed padding (in pixels, pt, em, etc.)
%	Defines a padding in % of the containing element

### Padding - Individual Sides

In CSS, it is possible to specify different padding for different sides:

### Example

```
p {
 padding-top: 25px;
 padding-right: 50px;
 padding-bottom: 25px;
 padding-left: 50px;
}
```

### Padding - Shorthand Property

To shorten the code, it is possible to specify all the padding properties in one property. This is called a shorthand property.

The shorthand property for all the padding properties is "padding":

#### Example

```
p {
 padding: 25px 50px;
}
```

The padding property can have from one to four values.

1. padding: 25px 50px 75px 100px;
2. padding: 25px 50px 75px;
3. padding: 25px 50px;
4. padding: 25px;

## 13.Dimension

The CSS dimension properties allow to control the height and width of an element.

### Dimension Properties

Property	Description	Values
Height	Sets the height of an element	auto <i>length</i> % inherit
max-height	Sets the maximum height of an element	none <i>length</i> % inherit
max-width	Sets the maximum width of an element	none <i>length</i> % inherit
min-height	Sets the minimum height of an element	<i>length</i> % inherit
min-width	Sets the minimum width of an element	<i>length</i> % inherit
Width	Sets the width of an element	auto <i>length</i> % inherit

## 14. Positioning

The CSS positioning properties allow to position an element. It can also place an element behind another, and specify what should happen when an element's content is too big.

Elements can be positioned using the top, bottom, left, and right properties. However, these properties will not work unless the position property is set first. They also work differently depending on the positioning method.

There are four different positioning methods.

### Static Positioning

HTML elements are positioned static by default. A static positioned element is always positioned according to the normal flow of the page.

Static positioned elements are not affected by the top, bottom, left, and right properties.

### Fixed Positioning

An element with a fixed position is positioned relative to the browser window, and will not move even if the window is scrolled:

#### Example

```
p.pos_fixed {
 position: fixed;
 top: 30px;
 right: 5px;
}
```

Fixed positioned elements are removed from the normal flow. The document and other elements behave like the fixed positioned element does not exist.

Fixed positioned elements can overlap other elements.

### Relative Positioning

A relative positioned element is positioned relative to its normal position:

#### Example

```
h2.pos_left {
 position: relative;
 left: -20px;
}
h2.pos_right {
 position: relative;
 left: 20px;
}
```

The content of relatively positioned elements can be moved and overlap other elements, but the reserved space for the element is still preserved in the normal flow.

#### Example

```
h2.pos_top {
 position: relative;
```

```
top: -50px;
}
```

Relatively positioned elements are often used as container blocks for absolutely positioned elements.

### Absolute Positioning

An absolute position element is positioned relative to the first parent element that has a position other than static. If no such element is found, the containing block is <html>:

#### Example

```
h2 {
 position: absolute;
 left: 100px;
 top: 150px;
}
```

Absolutely positioned elements are removed from the normal flow. The document and other elements behave like the absolutely positioned element does not exist.

Absolutely positioned elements can overlap other elements.

### Overlapping Elements

When elements are positioned outside the normal flow, they can overlap other elements.

The z-index property specifies the stack order of an element (which element should be placed in front of, or behind, the others).

An element can have a positive or negative stack order:

#### Example

```
img {
 position: absolute;
 left: 0px;
 top: 0px;
 z-index: -1;
}
```

## 15.CSS Float

With CSS float, an element can be pushed to the left or right, allowing other elements to wrap around it.

Float is often used with images, but it is also useful when working with layouts.

### How Elements Float

Elements are floated horizontally, this means that an element can only be floated left or right, not up or down.

A floated element will move as far to the left or right as it can. Usually this means all the way to the left or right of the containing element.

1. The elements after the floating element will flow around it.
2. The elements before the floating element will not be affected



3. If an image is floated to the right, a following text flows around it, to the left.

### Example

```
img {
 float: right;
}
```

### Floating Elements Next to Each Other

Place several floating elements after each other, they will float next to each other if there is room.

Made an image gallery using the float property:

### Example

```
.thumbnail {
 float: left;
 width: 110px;
 height: 90px;
 margin: 5px;
}
```

### Turning off Float - Using Clear

Elements after the floating element will flow around it. To avoid this, use the clear property.

The clear property specifies which sides of an element other floating elements are not allowed.

Add a text line into the image gallery, using the clear property:

### Example

```
.text_line {
 clear: both;
}
```

## 16. Align

### Aligning Block Elements

A block element is an element that takes up the full width available, and has a line break before and after it.

Examples of block elements:

- <h1>
- <p>
- <div>

### Center Aligning Using the margin Property

Block elements can be center-aligned by setting the left and right margins to "auto".

Setting the left and right margins to auto specifies that they should split the available margin equally. The result is a centered element:

### Example

```
.center {
 margin-left: auto;
 margin-right: auto;
 width: 70%;
 background-color: #b0e0e6;
}
```

### Cross browser Compatibility Issues

When aligning elements like this, it is always a good idea to predefine margin and padding for the <body> element. This is to avoid visual differences in different browsers.

There is a problem with IE8 and earlier, when using the position property. If a container element (in our case <div class="container">) has a specified width, and the!DOCTYPE declaration is missing, IE8 and earlier versions will add a 17px margin on the right side. This seems to be space reserved for a scrollbar. Always set the !DOCTYPE declaration when using the position property:

### Example

```
body {
 margin: 0;
 padding: 0;
}
.container {

 position: relative;
 width: 100%;
}
.right {
 position: absolute;
 right: 0px;
 width: 300px;
 background-color: #b0e0e6;
}
```

### Left and Right Aligning Using the Float Property

One method of aligning elements is to use the float property:

### Example

```
.right {
 float: right;
 width: 300px;
 background-color: #b0e0e6;
}
```

## 17.CSS3

CSS3 is the latest standard for CSS.

CSS3 is completely backwards-compatible with earlier versions of CSS.

## CSS3 Modules

CSS3 has been split into "modules". It contains the "old CSS specification" (which has been split into smaller pieces). In addition, new modules are added.

Some of the most important CSS3 modules are:

- Selectors
- Box Model
- Backgrounds and Borders
- Image Values and Replaced Content
- Text Effects
- 2D/3D Transformations
- Animations
- Multiple Column Layout
- User Interface

## CSS3 Recommendation

Most of the CSS3 Modules are W3C Recommendations, and most of the new **CSS3** properties are already implemented in modern browsers.

## Procedure to Create an Image Gallery in CSS

Write the following code in editor

```
<html>
<head>
<style>
div.img {
 margin: 5px;
 padding: 5px;
 border: 1px solid #0000ff;
 height: auto;
 width: auto;
 float: left;
 text-align: center;
}

div.img img {
 display: inline;
 margin: 5px;
 border: 1px solid #ffffff;
}

div.img a:hover img {
 border: 1px solid #0000ff;
}

div.desc {
 text-align: center;
 font-weight: normal;
 width: 120px;
 margin: 5px;
}
</style>
</head>
<body>
```

```

<div class="img">

 <div class="desc">Add a description of the image here</div>
</div>
<div class="img">

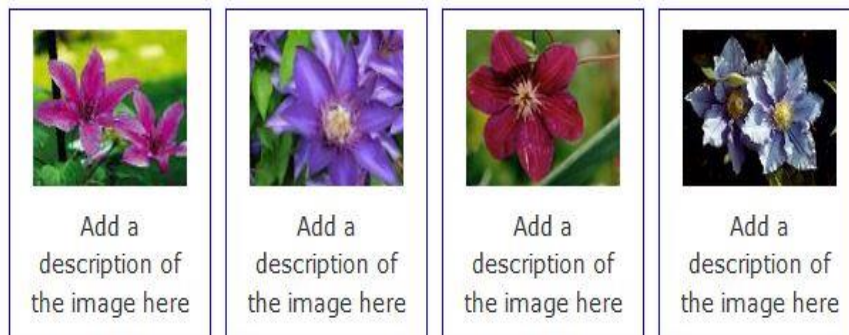
 <div class="desc">Add a description of the image here</div>
</div>
<div class="img">

 <div class="desc">Add a description of the image here</div>
</div>
<div class="img">

 <div class="desc">Add a description of the image here</div>
</div>
</body>
</html>

```

### Output of CSS



### Procedure to Set Layout in CSS

Write the follow code in editor to set the layout

```

<!DOCTYPE html>
<html>
<head>
<title>HTML Layouts using DIV, SPAN</title>
<style>
*{
 padding: 0;
 margin: 0;
 -moz-box-sizing: border-box;
 -webkit-box-sizing: border-box;
 box-sizing: border-box;
}
html, body
{

```

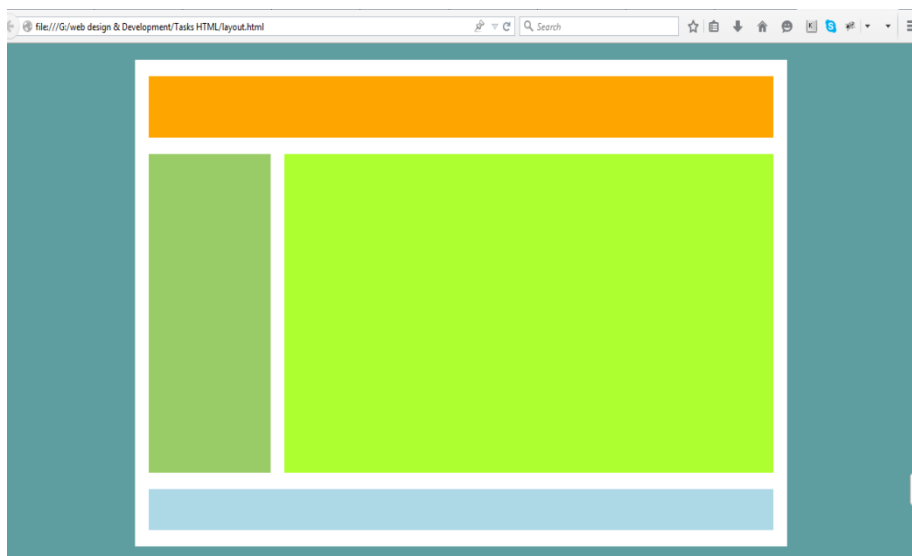
```

 height: 100%;
}
body
{
 padding: 20px 0;
 background-color: cadetblue;
}
#Container
{
 width: 70%; /* or: any fixed width that required */
 height: 100%;
 margin: 0 auto;
 padding: 20px 0;
 background-color: white;
}
#Header
{
 height: 75px; /* or: any fixed height that required*/
 background-color: orange;
 margin: 0 20px;
}
#Page
{
 height: calc(100% - 125px); /* 100% - (Header.height + Footer.height) */
 width: 100%;
 display: table;
 border-spacing: 20px;
}
#SideBar
{
 display: table-cell;
 background-color: #9C6;
 width: 20%; /* or: any fixed width that fits you */
}
#Content
{
 display: table-cell;
 background-color: greenyellow;
}
#Footer
{
 height: 50px; /* or: any fixed height that fits you */
 background-color: lightblue;
 margin: 0 20px;
}
</style>
</head>
<body>
<div id="Container">
 <div id="Header">
 </div>
 <div id="Page">
 <div id="SideBar">
 </div>
 <div id="Content"></div>
 </div>
 <div id="Footer"></div>
</div>
</body>

```

```
</html>
```

### Output of CSS



# Learning Unit 3: Use JavaScript in a Website

## Overview

In this learning unit you will learn JavaScript concepts such as JavaScript Statements, Objects, Output, Comments, Variables, Data Types, Functions, Operators, Comparisons, Conditions, Switch, For Loop, While Loop, Breaks, Errors and Validation. After completion of this learning unit you will be able to apply JavaScript validation on various part of web pages.

### Remember

JavaScript is not the same thing as Java. Which is just a programming language.

## 1. Definition of Client Side Scripting Language

Client-side scripting usually refers to the class of computer programs on the web that are executed client-side, by the web browser, instead of server side (on the web server).

### Do you know!

JavaScript was released by Netscape and Sun Microsystems in 1995.

## 2. Definition of JavaScript

JavaScript is a programming language.

JavaScript statements are separated by semicolons.

### Example

```
<p id="demo"></p>
<script>
var x = 5;
var y = 6;
var z = x + y;
document.getElementById("demo").innerHTML = z;
```

### Computer Program

A computer program is a list of "instructions" to be "executed" by the computer. In a programming language, these program instructions are called statements.

## 3. Implementation of the Basic JavaScript Concepts

JavaScript code written in different 03 ways:

- Inline JavaScript
- Internal javascript
- External javascript

JavaScript can be placed in the <body> or <head> of an HTML page.

### The <script> Tag

JavaScript code must be inserted between <script> and </script> tags

```
<script>
document.getElementById("demo").innerHTML = "My First JavaScript";
</script>
```

## 4. Function and Event

A JavaScript **“function”** is a block of JavaScript code that can be executed when "asked" for. For example, a function can be executed when an event occurs, like when the user clicks a button.

## 5. Outputs

JavaScript can display output data in different ways:

- Alert box, using `window.alert()`.
- HTML output using `document.write()`.
- HTML element, using `innerHTML`.
- In browser console, using `console.log()`.

### window.alert()

Use an alert box to display message

```
<!DOCTYPE html>
<html>
<body>
<h1>My First Web Page</h1>
<p>My first paragraph.</p>
<script>
window.alert(5 + 6);
</script>
</body>
</html>
```

### document.write()

For testing of values , it is easy to use **document.write()**:

#### Do you know?

Document Object Model DOM is used to select element is Javascript.

```
<h1>My First Web Page</h1>
<p>My first paragraph.</p>
<script>
document.write(7 + 9);
</script>
```

### innerHTML

To access an HTML element, JavaScript can use the **document.getElementById(id)** method.

The **id** attribute defines the HTML element. The **innerHTML** property defines the HTML content: `<h1>My First Web Page</h1>`



```
<p>My First Paragraph</p>
<p id="demo"></p>
<script>
document.getElementById("demo").innerHTML = 5 + 6;
</script>
```

### console.log()

In browser, use the console.log() method to display data. Activate the browser console with F12, and select "Console" in the menu.

```
<h1>My First Web Page</h1>
<p>My first paragraph.</p>
<script>
console.log(5 + 6);
</script>
```

## 6. Statements

JavaScript statements are collection of: Values, Operators, Expressions, Keywords, and Comments.

## 7. Values

The JavaScript syntax defines two types of values: Fixed values and variable values. Fixed values are called **literals**. Variable values are called **variables**.

## 8. Literals

The rules for writing fixed values are:

**Numbers** are written with or without decimals:

```
<p id="demo"></p>
<script>
document.getElementById("demo").innerHTML = 10.50;
</script>
```

**Strings** are text, written within double or single quotes:

"Ahmad ", "Rabia"

**Expressions** can also represent fixed values: 10 + 22, 54 \* 44;

## 9. Variables

Variables are container to store data var keyword is used to declare the variable. var x; x=10;

## 10. Operators

Operators are used to perform arithmetic on numbers (literals or variables).

Operator	Description	Operator	Description
+	Addition	/	Division

-	Subtraction	%	Modulus
*	Multiplication	++	Increment

### Assignment Operators

Assignment operators assign values to JavaScript variables.

Operator	Example	Same As
=	x = y	x = y
+=	x += y	x = x + y
-=	x -= y	x = x - y
*=	x *= y	x = x * y
/=	x /= y	x = x / y
%=	x %= y	x = x % y

The assignment operator (=) assigns a value to a variable.

The **addition assignment** operator (+=) adds a value to a variable.

```
var x = 10;
x += 5;
```

### Comparison and Logical Operators

Operator	Description
==	equal to
===	equal value and equal type
!=	not equal
!==	not equal value or not equal type
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to

## 11. JavaScript Data Types

JavaScript variables have many **data types**: numbers, strings, arrays, objects and more

```
var length = 16; // Number
var lastName = "Johnson"; // String
var cars = ["Saab", "Volvo", "BMW"]; // Array
var x = {firstName:"John", lastName:"Doe"}; // Object
```

## JavaScript Arrays

JavaScript arrays are written with square brackets. Array items are separated by commas. The following code declares (creates) an array called cars, containing three items (car names):

```
<p id="demo"></p>
<script>
var cars = ["Saab","Volvo","BMW"];
document.getElementById("demo").innerHTML = cars[2];</script>
```

## 12. JavaScript Objects

JavaScript objects are written with curly braces.

Object properties are written as name: value pairs, separated by commas.

```
<p id="demo"></p>
<script>
var person = {
 firstName : "Khalid",
 lastName : "Hussain",
 age : 50,
 eyeColor : "blue"
};
document.getElementById("demo").innerHTML =
person.firstName + " is " + person.age + " years old.";
</script>
```

## 13. JavaScript Function

A JavaScript function is a block of code designed to perform a particular task. A JavaScript function is executed when "something" invokes it (calls it).

```
function myFunction(p1, p2) {
 return p1 * p2; // The function returns the product of p1 and p2
}
```

### Function Syntax

A JavaScript function is defined with the function keyword, followed by a name, followed by parentheses ().

Function names can contain letters, digits, underscores, and dollar signs (same rules as variables).

The parentheses may include parameter names separated by commas: (parameter1, parameter2, ...)

The code to be executed, by the function, is placed inside curly brackets: {}

```
function name(parameter1, parameter2, parameter3) {
 code to be executed
```

### Function Invocation

The code inside the function will execute when "something" **invokes** (calls) the function:

- When an event occurs (when a user clicks a button)

- When it is invoked (called) from JavaScript code
- Automatically (self-invoked)

### Function Return

When JavaScript reaches a **return statement**, the function will stop executing.

If the function was invoked from a statement, JavaScript will "return" to execute the code after the invoking statement.

Functions often compute a **return value**. The return value is "returned" back to the "caller":

```
var x = myFunction(4, 3); // Function is called, return value will end up in x

function myFunction(a, b) {
 return a * b; // Function returns the product of a and b
}
```

## 14. Comments

JavaScript comments can be used to explain JavaScript code, and to make it more readable.

JavaScript comments can also be used to prevent execution, when testing alternative code.

**Single line comments** start with `//` text which will be comment within single line.

**Multi-line comments** start with `/*` (text of multiline will be comment) and end with `*/`

## 15. Comparison and Logical Operators

Comparison operators are used in logical statements to determine equality or difference between variables or values.

Given that `x = 5`, the table below explains the comparison operators:

Operator	Description	Comparing	Returns
==	equal to	<code>x == 8</code>	false
		<code>x == 5</code>	true
===	equal value and equal type	<code>x === "5"</code>	false
		<code>x === 5</code>	true
!=	not equal	<code>x != 8</code>	true
		<code>x != "5"</code>	true
!==	not equal value or not equal type	<code>x !== 5</code>	false
>	greater than	<code>x &gt; 8</code>	false
<	less than	<code>x &lt; 8</code>	true
>=	greater than or equal to	<code>x &gt;= 8</code>	false
<=	less than or equal to	<code>x &lt;= 8</code>	true

## Logical Operators

Logical operators are used to determine the logic between variables or values. Given that **x = 6** and **y = 3**, the table below explains the logical operators:

Operator	Description	Example
&&	And	(x < 10 && y > 1) is true
	Or	(x == 5    y == 5) is false
!	Not	!(x == y) is true

## 16. Conditional Statements

Conditional statements are used to perform different actions based on different conditions.

In JavaScript we have the following conditional statements:

- Use **if** to specify a block of code to be executed, if a specified condition is true
- Use **else** to specify a block of code to be executed, if the same condition is false
- Use **else if** to specify a new condition to test, if the first condition is false
- Use **switch** to specify many alternative blocks of code to be executed

If statement

Use the **if** statement to specify a block of JavaScript code to be executed if a condition is true.

### Syntax

```
if (condition) {
 block of code to be executed if the condition is true
}
```

### else Statement

Use the **else** statement to specify a block of code to be executed if the condition is false.

```
if (condition) {
 block of code to be executed if the condition is true
} else {
 block of code to be executed if the condition is false
}
```

### Example

If the hour is less than 18, create a "Good day" greeting, otherwise "Good evening":

```
if (hour < 18) {
 greeting = "Good day";
} else {
 greeting = "Good evening";
}
```

## The else if Statement

Use the **else if** statement to specify a new condition if the first condition is false.

### Syntax

```
if (condition1) {
 block of code to be executed if condition1 is true
} else if (condition2) {
 block of code to be executed if the condition1 is false and condition2 is true
} else {
 block of code to be executed if the condition1 is false and condition2 is false
}
```

### Example

If time is less than 10:00, create a "Good morning" greeting, if not, but time is less than 20:00, create a "Good day" greeting, otherwise a "Good evening":

```
if (time < 10) {
 greeting = "Good morning";
} else if (time < 20) {
 greeting = "Good day";
} else {
 greeting = "Good evening";
}
```

The result of greeting will be:

Good day

## 17. Switch Statements

The switch statement is used to perform different actions based on different conditions.

### The JavaScript Switch Statement

Use the switch statement to select one of many blocks of code to be executed.

### Syntax

```
switch(expression) {
 case n:
 code block
 break;
 case n:
 code block
 break;
 default:
 default code block
}
```

This is how it works:

- The switch expression is evaluated once.
- The value of the expression is compared with the values of each case.

- If there is a match, the associated block of code is executed.

### Example

The `getDay()` method returns the weekday as a number between 0 and 6. (Sunday=0, Monday=1, Tuesday=2 ..)

Use the weekday number to calculate weekday name:

```
switch (new Date().getDay()) {
 case 0:
 day = "Sunday";
 break;
 case 1:
 day = "Monday";
 break;
 case 2:
 day = "Tuesday";
 break;
 case 3:
 day = "Wednesday";
 break;
 case 4:
 day = "Thursday";
 break;
 case 5:
 day = "Friday";
 break;
 case 6:
 day = "Saturday";
 break;
}
```

## 18. For Loop

Loops can execute a block of code a number of times.

### Instead of Writing:

```
text += cars[0] + "
";
text += cars[1] + "
";
text += cars[2] + "
";
text += cars[3] + "
";
text += cars[4] + "
";
text += cars[5] + "
";
```

write the below command:

```
for (i = 0; i < cars.length; i++) {
 text += cars[i] + "
";}
```

### Different Kinds of Loops

JavaScript supports different kinds of loops:

**for - loops** through a block of code a number of times

**for/in - loops** through the properties of an object

**while - loops** through a block of code while a specified condition is true

**do/while** - also loops through a block of code while a specified condition is true

### The For Loop

The for loop is often the tool use when need to create a loop.

The for loop has the following syntax:

```
for (statement 1; statement 2; statement 3) {
 code block to be executed
}
```

**Statement 1** is executed before the loop (the code block) starts.

**Statement 2** defines the condition for running the loop (the code block).

**Statement 3** is executed each time after the loop (the code block) has been executed.

### Example

```
for (i = 0; i < 5; i++) {
 text += "The number is " + i + "
";
}
```

## 19. While Loop

The while loop loops through a block of code as long as a specified condition is true.

### Syntax

```
while (condition) {
 code block to be executed
}
```

### Example

In the following example, the code in the loop will run, over and over again, as long as a variable (i) is less than 10:

### Example

```
while (i < 10) {
 text += "The number is " + i;
 i++;
}
```

### Do/While Loop

The do/while loop is a variant of the while loop. This loop will execute the code block once, before checking if the condition is true, then it will repeat the loop as long as the condition is true.



## Syntax

```
do {
 code block to be executed
}
while (condition);
```

## Example

The example below uses a do/while loop. The loop will always be executed at least once, even if the condition is false, because the code block is executed before the condition is tested:

## Example

```
do {
 text += "The number is " + i;
 i++;
}
while (i < 10);
```

## Comparing For and While

The for loop, discover that a while loop is much the same as a for loop, with statement 1 and statement 3 omitted.

The loop in this example uses a **for loop** to collect the car names from the cars array:

## Example

```
var cars = ["BMW", "Volvo", "Saab", "Ford"];
var i = 0;
var text = "";

for (;cars[i];) {
 text += cars[i] + "
";
 i++;
}
```

The loop in this example uses a **while loop** to collect the car names from the cars array:

## Example

```
var cars = ["BMW", "Volvo", "Saab", "Ford"];
var i = 0;
var text = "";

while (cars[i]) {
 text += cars[i] + "
";
 i++;
}
```

## 20. Break and Continue

The break statement "jumps out" of a loop.

The continue statement "jumps over" one iteration in the loop.

### The Break Statement

It was used to "jump out" of a switch() statement.

The break statement can also be used to jump out of a loop.

The **break statement** breaks the loop and continues executing the code after the loop (if any):

#### Example

```
for (i = 0; i < 10; i++) {
 if (i === 3) { break; }
 text += "The number is " + i + "
";
}
```

### The Continue Statement

The **continue statement** breaks one iteration (in the loop), if a specified condition occurs, and continues with the next iteration in the loop.

This example skips the value of 3:

#### Example

```
for (i = 0; i < 10; i++) {
 if (i === 3) { continue; }
 text += "The number is " + i + "
";
}
```

## 21.Errors Handling - Throw and Try to Catch

The **try** statement lets test a block of code for errors.

The **catch** statement lets handle the error.

The **throw** statement lets create custom errors.

The **finally** statement lets execute code, after try and catch, regardless of the result.

### JavaScript try and Catch

The try statement allows to define a block of code to be tested for errors while it is being executed.

The catch statement allows to define a block of code to be executed, if an error occurs in the try block.

The JavaScript statements try and catch come in pairs:

```
try {
 Block of code to try
}
catch(err) {
 Block of code to handle errors
}
```

## JavaScript Throws Errors

When an error occurs, JavaScript will normally stop, and generate an error message.

The technical term for this is: JavaScript will throw an error.

### The throw Statement

The throw statement allows to create a custom error.

The technical term for this is: throw an exception.

The exception can be a JavaScript String, a Number, a Boolean or an Object:

```
throw "Too big"; // throw a text
throw 500; // throw a number
```

Use throw together with try and catch & control program flow and generate custom error messages.

## 22. Form Validation

### Task 1. Write a JavaScript Program to Display the Current Day and Time.

#### 01: Write the follow Code in Editor:

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
<title>JavaScript current day and time</title>
</head>
<body></body>
</html>
```

#### 02- Write the JavaScript code in header of page.

```
var today = new Date();
var day = today.getDay();
var daylist = ["Sunday", "Monday", "Tuesday", "Wednesday ", "Thursday", "Friday", "Saturday"];
console.log("Today is : " + daylist[day] + ".");
var hour = today.getHours();
var minute = today.getMinutes();
var second = today.getSeconds();
var prepand = (hour >= 12)? " PM ":" AM ";
hour = (hour >= 12)? hour - 12: hour;
if (hour===0 && prepand===' PM ')
{
if (minute===0 && second===0)
{
hour=12;
prepand=' Noon';
}
else
{
hour=12;
prepand=' PM';
}
}
```

```

}
if (hour===0 && prepand===' AM ')
{
if (minute===0 && second===0)
{
hour=12;
prepand=' Midnight';
}

```

**else**

```

{
hour=12;
prepand=' AM';
}
}
console.log("Current Time : "+hour + prepand + " : " + minute + " : " + second);

```

### 03- Out Put of Program

```

Sample Output : Today is : Friday.
Current time is : 4 PM : 50 : 22

```

## Task 2. Write a JavaScript Program to Print the Contents of the Current Window

### 01- Write the follow Code in Editor:

```

<!DOCTYPE html>
<html>
<head>
<meta charset=utf-8 />
<title>Print the current page.</title>
</head>
<body>
<p></p>
<p>Click the button to print the current page.</p>
<button onclick="print_current_page()">Print this page</button>
</body>
</html>

```

### 02- Write following JavaScript Code

```

function print_current_page()
{
window.print();
}

```

### 03- Output of Program

Click the button to print the current page.

Print this page

**Task 3. Write a JavaScript Program to get the Current Date****01: Write the follow Code in Editor:**

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
<title>Write a JavaScript program to get the current date.</title>
</head>
<body>
</body>
</html>
```

**02- Write the follow Code in JavaScript**

```
var today = new Date();
var dd = today.getDate();
//The value returned by getMonth is an integer between 0 and 11, referring 0 to January, 1 to February, and so on.
var mm = today.getMonth()+1;
var yyyy = today.getFullYear();
if(dd<10)
{
 dd='0'+dd;
}

if(mm<10)
{
 mm='0'+mm;
}
today = mm+'-'+dd+'-'+yyyy;
alert(today);
today = mm+'/'+dd+'/'+yyyy;
alert(today);
today = dd+'-'+mm+'-'+yyyy;
alert(today);
today = dd+'/'+mm+'/'+yyyy;
alert(today);
```

**03- Program Output**

Expected Output :

mm-dd-yyyy, mm/dd/yyyy or dd-mm-yyyy, dd/mm/yyyy

**04- Write a JavaScript Program to Calculate Multiplication and Division of two Numbers (input from user)****01- Write the follow Code in Editor:**

```
<!DOCTYPE html>
<html>
<head>
<meta charset=utf-8 />
<title>JavaScript program to calculate multiplication and division of two numbers </title>
<style type="text/css">
```

```

body {margin: 30px;}
</style>
</head>
<body>
<form>
1st Number : <input type="text" id="firstNumber" />

2nd Number: <input type="text" id="secondNumber" />

<input type="button" onClick="multiplyBy()" Value="Multiply" />
<input type="button" onClick="divideBy()" Value="Divide" />
</form>
<p>The Result is :

</p>
</body>
</html>

```

## 02- Write the follow Code in javaScript

```

function multiplyBy()
{
 num1 = document.getElementById("firstNumber").value;
 num2 = document.getElementById("secondNumber").value;
 document.getElementById("result").innerHTML = num1 * num2;
}
function divideBy()
{
 num1 = document.getElementById("firstNumber").value;
 num2 = document.getElementById("secondNumber").value;
 document.getElementById("result").innerHTML = num1 / num2;
}

```

## 03- Program Output

Sample Form:

1st Number :

2nd Number:

The Result Is :  
120

## Task 4. JavaScript Form Validation using a Sample Registration Form

HTML form validation can be done by a JavaScript.

If a form field (fname) is empty, this function alerts a message, and returns false, to prevent the form from being submitted:

### JavaScript Example

```

function validateForm() {
 var x = document.forms["myForm"]["fname"].value;
 if (x == null || x == "") {

```

```

 alert("Name must be filled out");
 return false;
}
}

```

The function can be called when the form is submitted:

### HTML Form Example

```

<form name="myForm" action="demo_form.asp" onsubmit="return validateForm()" method="post">
Name: <input type="text" name="fname">
<input type="submit" value="Submit">
</form>

```

#### 01: Write the follow Code in Editor:

```

<!DOCTYPE html>
<html lang="en"><head>
<meta charset="utf-8">
<title>JavaScript Form Validation using a sample registration form</title>
<meta name="keywords" content="example, JavaScript Form Validation, Sample registration form" />
<meta name="description" content="This document is an example of JavaScript Form Validation using a sample
registration form. " />
<link rel="stylesheet" href="js-form-validation.css" type="text/css" />
<script src="sample-registration-form-validation.js"></script>
</head>
<body onload="document.registration.userid.focus();">
<h1>Registration Form</h1>
<p>Use tab keys to move from one input field to the next.</p>
<form name="registration" onSubmit="return formValidation();">

<label for="userid">User id:</label>
<input type="text" name="userid" size="12" />
<label for="passid">Password:</label>
<input type="password" name="passid" size="12" />
<label for="username">Name:</label>
<input type="text" name="username" size="50" />
<label for="address">Address:</label>
<input type="text" name="address" size="50" />
<label for="country">Country:</label>
<select name="country">
<option selected="" value="Default">(Please select a country)</option>
<option value="AF">Australia</option>
<option value="AL">Canada</option>
<option value="DZ">India</option>
<option value="AS">Russia</option>
<option value="AD">USA</option>
</select>
<label for="zip">ZIP Code:</label>
<input type="text" name="zip" />
<label for="email">Email:</label>
<input type="text" name="email" size="50" />
<label id="gender">Sex:</label>
<input type="radio" name="msex" value="Male" />Male
<input type="radio" name="fsex" value="Female" />Female
<label>Language:</label>
<input type="checkbox" name="en" value="en" checked />English
<input type="checkbox" name="nonen" value="noen" />Non English
<label for="desc">About:</label>

```

```

<textarea name="desc" id="desc"></textarea>
<input type="submit" name="submit" value="Submit" />

</form>
</body>
</html>

```

## 02- Style Sheet

```

h1 {
margin-left: 70px;
}
form li {
list-style: none;
margin-bottom: 5px;
}
form ul li label{
float: left;
clear: left;
width: 100px;
text-align: right;
margin-right: 10px;
font-family: Verdana, Arial, Helvetica, sans-serif;
font-size: 14px;
}
form ul li input, select, span {
float: left;
margin-bottom: 10px;
}
form textarea {
float: left;
width: 350px;
height: 150px;
}
[type="submit"] {
clear: left;
margin: 20px 0 0 230px;
font-size: 18px;
}
p {
margin-left: 70px;
font-weight: bold;
}
02- Write the follow code in javaScript
function formValidation()
{
var uid = document.registration.userid;
var passid = document.registration.passid;
var uname = document.registration.username;
var uadd = document.registration.address;
var ucountry = document.registration.country;
var uzip = document.registration.zip;
var uemail = document.registration.email;
var umsex = document.registration.msex;
var ufsex = document.registration.fsex; if(userid_validation(uid,5,12))
{
if(passid_validation(passid,7,12))
{
if(allLetter(uname))

```



```

{
if(alphanumeric(uadd))
{
if(countryselect(ucountry))
{
if(allnumeric(uzip))
{
if(ValidateEmail(uemail))
{
if(validsex(umsex,ufsex))
{
}
}
}
}
}
}
}
}
return false;

} function userid_validation(uid,mx,my)
{
var uid_len = uid.value.length;
if (uid_len == 0 || uid_len >= my || uid_len < mx)
{
alert("User Id should not be empty / length be between "+mx+" to "+my);
uid.focus();
return false;
}
return true;
}
function passid_validation(passid,mx,my)
{
var passid_len = passid.value.length;
if (passid_len == 0 || passid_len >= my || passid_len < mx)
{
alert("Password should not be empty / length be between "+mx+" to "+my);
passid.focus();
return false;
}
return true;
}
function allLetter(uname)
{
var letters = /^[A-Za-z]+$/.test(uname.value);
if(uname.value.match(letters))
{
return true;
}
else
{
alert("Username must have alphabet characters only");
uname.focus();
return false;
}
}
function alphanumeric(uadd)
{

```

```
var letters = /^[0-9a-zA-Z]+$/;
if(uadd.value.match(letters))
{
 return true;
}
else
{
 alert("User address must have alphanumeric characters only");
 uadd.focus();
 return false;
}
}
function countryselect(ucountry)
{
 if(ucountry.value == "Default")
 {
 alert("Select the country from the list");
 ucountry.focus();
 return false;
 }
 else
 {
 return true;
 }
}
function allnumeric(uzip)
{
 var numbers = /^[0-9]+$/;
 if(uzip.value.match(numbers))
 {
 return true;
 }
 else
 {
 alert("ZIP code must have numeric characters only");
 uzip.focus();
 return false;
 }
}
function ValidateEmail(uemail)
{
 var mailformat = /^[w+([\.-]?w+)*@w+([\.-]?w+)*(\.lw{2,3})+$/;
 if(uemail.value.match(mailformat))
 {
 return true;
 }
 else
 {
 alert("Entered an invalid email address!");
 uemail.focus();
 return false;
 }
}
function validsex(umsex,ufsex)
{
 x=0;

 if(umsex.checked)
 {
 x++;
 }
}
```

```
} if(ufsex.checked)
{
x++;
}
if(x==0)
{
alert('Select Male/Female');
umsex.focus();
return false;
}
else
{
alert('Form Succesfully Submitted');
window.location.reload()
return true;
}
}
```

### 03- Program Output

## Registration Form

Use tab keys to move from one input field to the next.

User id:

Password:

Name:

Address:

Country:

ZIP Code:

Email:

Sex: ☐ Male ☐ Female

Language: ☒ English ☐ Non English

About:

## Summary of Module

- HTML is the universal markup language for the Web. HTML lets format text, add graphics, create links. It also lets input forms, frames and tables, etc., and save it all in a text file that any browser can read and display. The key to HTML is the tags, which indicates what content is coming up.
- CSS is used to control the style and layout of multiple Web pages all at once. With CSS, all formatting can be removed from the HTML document and stored in a separate file. CSS gives total control of the layout, without messing up the document content.
- JavaScript can make web site more dynamic. A static web site is nice when just want to show flat content, but a dynamic web site can react to events and allow user interaction. JavaScript is the most popular scripting language on the internet and it works with all major browsers.

## Frequently Asked Questions (FAQs)

FAQ 1: What does DOCTYPE mean?

Answer The term DOCTYPE tells the browser which type of HTML is used on a webpage. In turn, the browsers use DOCTYPE to determine how to render a page. Failing to use DOCTYPE or using a wrong DOCTYPE may load the page in Quirks Mode. See example:  
`<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">`

FAQ 2: How many HTML tags are should be used for the most simple of web pages?

Answer 8 total. 4 pairs of tags.  
`<HTML>`  
`<HEAD>`  
`<TITLE>Simplest page ever!</TITLE>`  
`</HEAD>`  
`<BODY>`  
*Doesn't get simpler than this.*  
`</BODY>`  
`</HTML>`

FAQ 3: How do you make comments without text being picked up by the browser?

Answer Comments are used to explain and clarify code or to prevent code from being recognized by the browser. Comments start with "`*<!--`" and end with "`-->`".  
`<!-- Insert comment here. -->`

FAQ 4: What can be done with style sheets that cannot be accomplished with regular HTML?

Answer Many of the recent extensions to HTML have been tentative and somewhat crude attempts to control document layout. A style sheet goes several steps beyond, and introduces complex border, margin and spacing control to most HTML elements. It also extends the capabilities introduced by most of the existing HTML browser extensions. Background colors or images can now be assigned to ANY HTML element instead of just the BODY element and borders can now be applied to any element instead of just to tables. For more information on the possible properties in CSS, see the Index DOT CSS Property Index.

FAQ 5: Why use Style Sheets?

Answer Style sheets allow a much greater degree of layout and display control than has ever been possible thus far in HTML.

FAQ 6: How to change the background color of website?

Answer To change the background color of the website, search for the "background-color" property for the appropriate CSS class. Then modify its value to the desired color. If the background color is not set yet, you can add the following line to the CSS file: `body {background-color: silver}` it can change "silver" to the HTML code of the desired color.

FAQ 7: Who defines the CSS standard? Is it one person? A company?

Answer The W3C (the organization in charge of defining the HTML standards) creates and develops the CSS specifications with public input from the W3C www-style mailing list discussion forum and feedback from the member companies that comprise the W3C Consortium (which include companies such as Apple, Microsoft, and Netscape along with over 150 others.)

FAQ 8: Between JavaScript and an ASP script, which is faster?

Answer JavaScript is faster. JavaScript is a client-side language and thus it does not need the assistance of the web server to execute. On the other hand, ASP is a server-side language and hence is always slower than JavaScript.

FAQ 9: Is it possible to break JavaScript Code into several lines?

Answer Breaking within a string statement can be done by the use of a backslash, '\', at the end of the first line

FAQ 10: What is a prompt box in JavaScript?

Answer A prompt box is a box which allows the user to enter input by providing a text box. Label and box will be provided to enter the text or number.

## Test Yourself!

Please mark the correct one from the given options.

1. **A webpage displays a picture. What tag was used to display that picture?**
  - a. picture
  - b. image
  - c. img
  - d. src
2. **<b> tag makes the enclosed text bold. What is other tag to make text bold?**
  - a. <strong>
  - b. <dar>
  - c. <black>
  - d. <emp>
3. **Tags and text that are not directly displayed on the page are written in \_\_\_\_\_ section.**
  - a. <html>
  - b. <head>
  - c. <title>
  - d. <body>
4. **Which tag inserts a line horizontally on the web page?**
  - a. <hr>
  - b. <line>
  - c. <line direction="horizontal">
  - d. <tr>
5. **What should be the first tag in any HTML document?**
  - a. <head>
  - b. <title>
  - c. <html>
  - d. <document>
6. **How can make a bulleted list?**
  - a. <list>
  - b. <nl>
  - c. <ul>
  - d. <ol>
7. **Choose the correct HTML tag for the smallest size heading?**
  - a. <heading>
  - b. <h6>
  - c. <h1>
  - d. <head>
8. **The \_\_\_\_\_ selector is used to specify a style for a single, unique element**
  - a. Id
  - b. class
  - c. text
  - d. Bit





## Answer Key

MCQ Number	Correct Answer
1	c
2	a
3	b
4	a
5	c
6	c
7	b
8	a
9	b
10	d
11	d
12	c



# Module 7: Develop Website Using Server Side Scripting Languages

## Learning Outcomes

After completion of this learning module, the you will be able to:

- Develop a Website using ASP Dot Net
- Develop a Website using PHP



# Learning Unit 1: Develop a Website using ASP Dot Net

## Overview

In this learning unit, you will be introduced about the basics of ASP.Net and will able to develop website using ASP.Net. After the completion of this unit, you will be able to understand: how to install visual studio dot Net, share detail of dot Net framework, environment of visual studio, visual studio toolbar and window of visual studio.net, illustration the design view, source view, code view of web pages. You will also learn HTML controls and how to execute application of Server controls such as button, textbox, hyperlink, radio button, calendar, panel etc. You will also learn how to implement data server control such as GridView, DetailView, FormView, SqlDataSource Access, Datasource etc. You will also learn how to use validation controls such as required field validator, Range validator, Validation summary, Creation of navigation control such as menu, Tree view etc.

### Remember

**Signalr** supports two way communications between server and client.

## 1. ASP.NET

The Active Server Pages (ASP), which also known as Classic ASP, was introduced by Microsoft in 1998 as first server side scripting language for web servers.

The ASP.NET has following new features:

- It's a new generation of old classic ASP.
- Its pages are faster than old ASP.
- It supports better **GUI** controls, XML-based components and integrated user authentication.
- It pages have extension .aspx

### GUI Elements

Buttons, textboxes, lists, combo box from status bar

It supports android, iPhone and Windows phone using **SignalR**

## 2. Install Visual Studio.NET

### Procedure for Installing Visual Studio

#### 1) System Requirements:

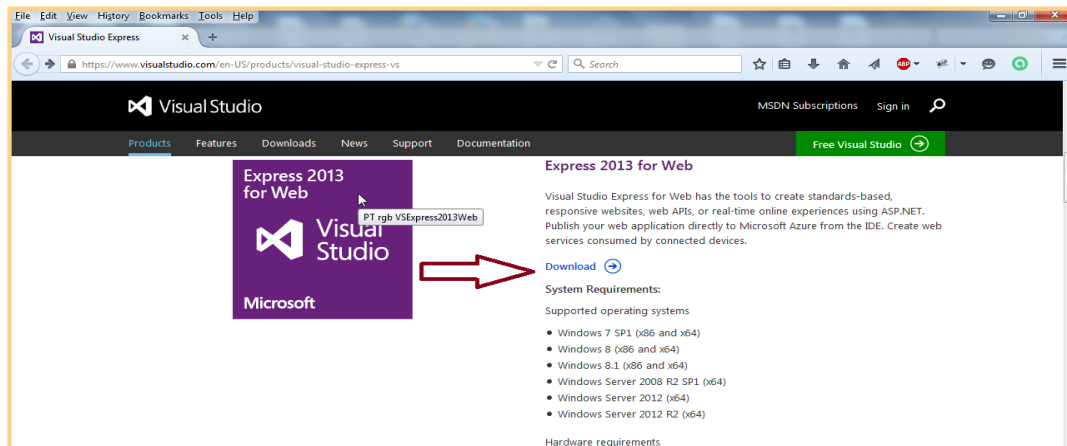
- a) Operating systems
  - i) Windows 7 with service pack 1(x86 and x64)
  - ii) Windows 8 or higher (x86 and x64)
- b) Hardware requirements
  - i) Minimum processor 1.6 Giga hz
  - ii) Minimum 1 GB Ram
  - iii) 4 GB Disk space

c) Additional requirements

- i) This version of Visual Studio works best with Internet Explorer 10 or higher. If Internet Explorer 10 is not installed on computer, some features might not work as expected.

### STEP BY STEP Installing Visual Studio Express 2013 for Web

1. Start Browsing to [www.microsoft.com/express](http://www.microsoft.com/express) and follow the instruction to download visual studio express for web 2013. It can be installed directly by choosing the **Download** and then the **Install Now** link or can be downloaded an **ISO** file to burn on a **DVD** or mount on windows as a virtual drive. Make sure to download visual studio express for Web and not one of the other free Express editions or older versions. If this link ever change then directly search the web for “**install visual studio express 2013 for web**” and it will take to a download page where installation can start.



2. When the download completes, start the **installer**. See a screen similar to **Figure 1-1**. Check the checkbox for the license terms and privacy Policy. If installing the full version of Visual Studio, Click the **Next** button that appeared when “I agreed to the license terms”. Similar to **Figure 1-2**. Make sure to select at least the **Microsoft Web Developer Tools option**.
3. In both cases, click the install button to start the installation process.

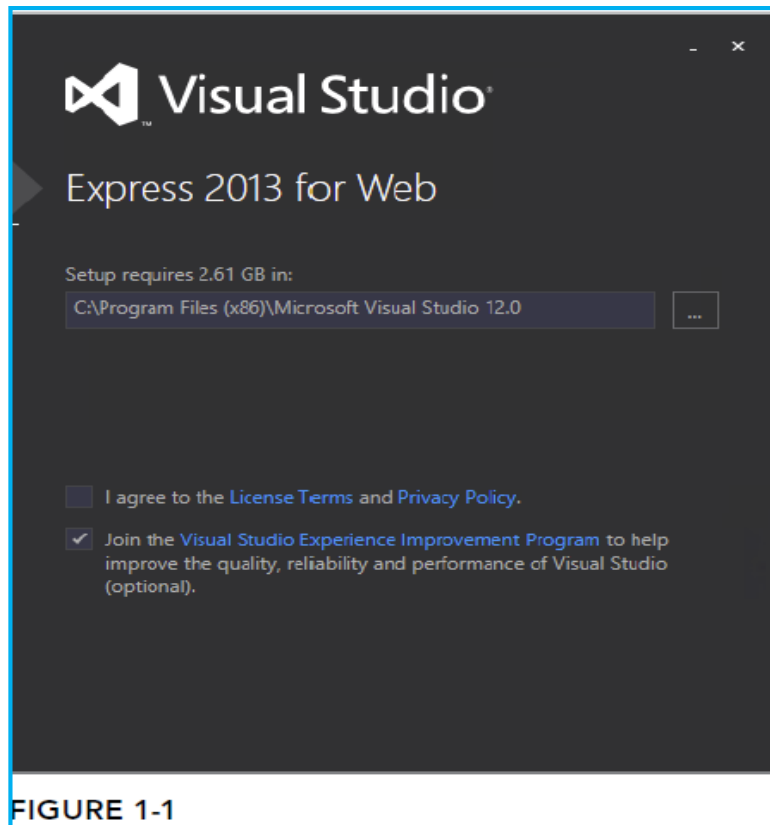


FIGURE 1-1

4. After a while a message comes indicating that visual studio has been installed successfully. The installer may need to restart computer during or after the installation. Once when the installer has finished, visual studio is ready to use.



FIGURE 1-2

### 3. Details of Dot Net Framework


#### Remember

The .NET library has number of built-in functions which can be simultaneously used by different languages like Visual BASIC.NET, C#.NET etc.

#### What is .NET?

- The Microsoft .net is a complete framework for creating windows-based and web-based applications for clients.
- The Microsoft .NET is not a language but a supportive runtime library for writing and executing written programs in any language.

### STEP BY STEP Creating First Asp.Net Website

1. Start visual studio from the window **start menu** . On the menu item it is called visual studio Express 2013 for Web. If one have Microsoft account then will be able to use multiple support of visual studio team.
2. Once **VS** is fully configured, the main screen appears as shown in **figure 1**. All configurations of windows, toolbar, panels, and menu is in next coming section now just focus is on creating first new website.

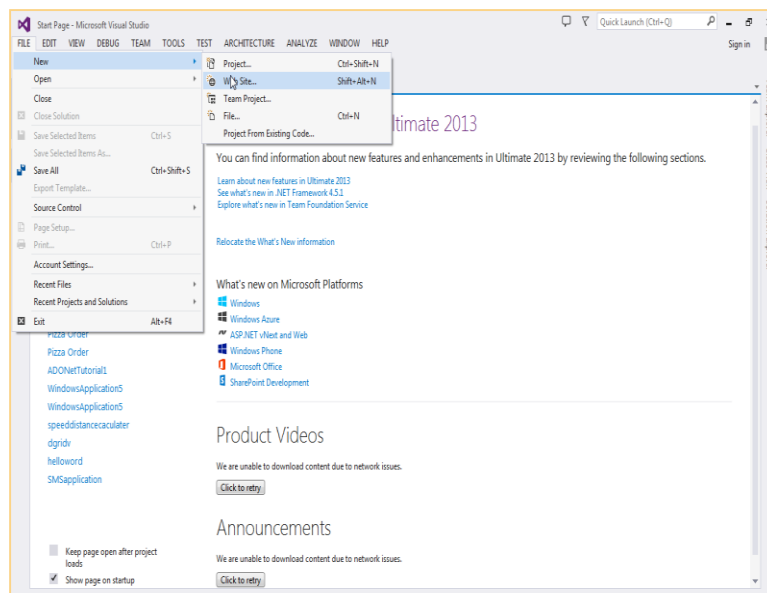


Figure 1



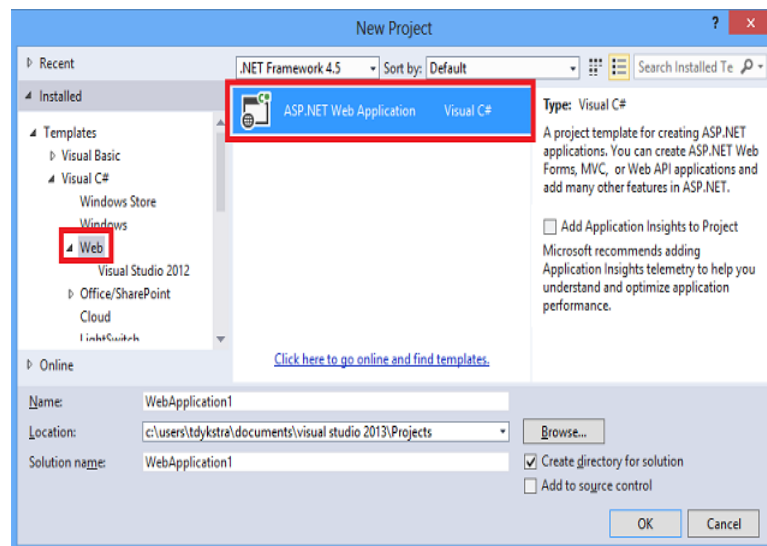


Figure 2

3. The New website dialog box appears as shown in **Figure2** also select destination Web folder where application store and then type application name in this tutorial **WebApplication1** is default name.

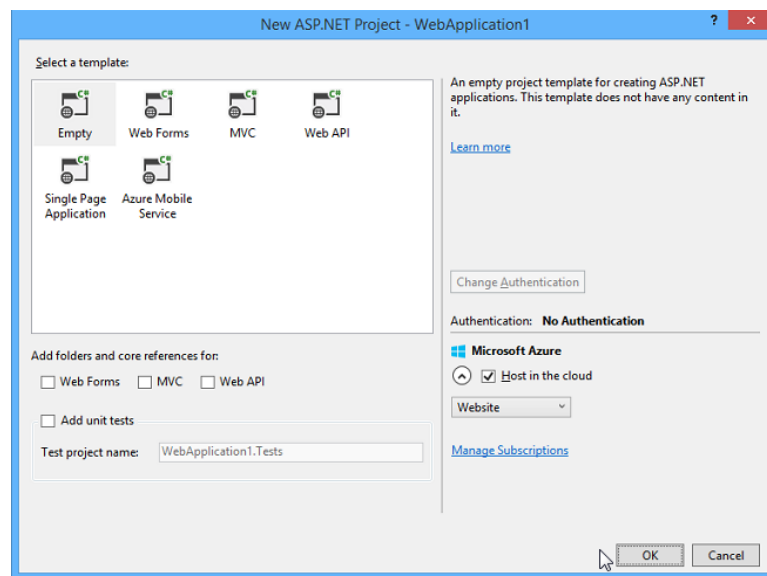


Figure 3

4. In the middle of the dialog, above list of available templates, select .NET Framework 4.5.1 from the drop-down list. Then on left section choose a programming language to use for site. In This TLM all example are shown in Visual C#.
5. In the list of templates click ASP.NET Web Form Site also verify the location where user want.
6. Click **OK**. **VS** creates a new website that includes a numbers of file and folders (see **Figure4**) to jump start website.
7. Open the default.aspx file and double click it and remove all the code inside the <asp:content> block that has it **ID** set to bodycontent then (it start with <div> at line 5 and ends with </div>) all the way at bottom replace it with the following bold code:

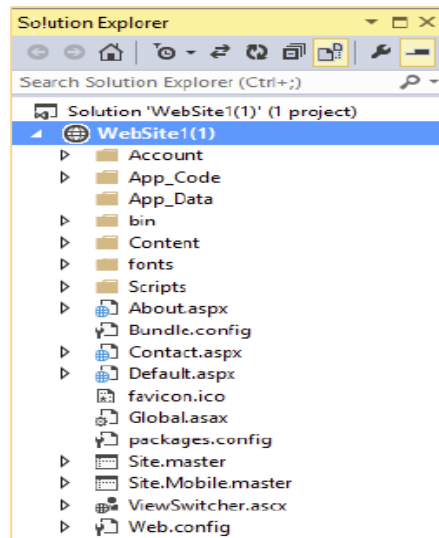



Figure 4

```
<asp:Content runat="server" ID="BodyContent" ContentPlaceHolderID="MainContent">
```

```
<h2>Hello student in programming World</h2>
```

```
<p>We love pakistan </p></asp:Content>
```

8. Press **CTRL+5** or click on  button to open the page on default web browser to see a page similar to the one which show below

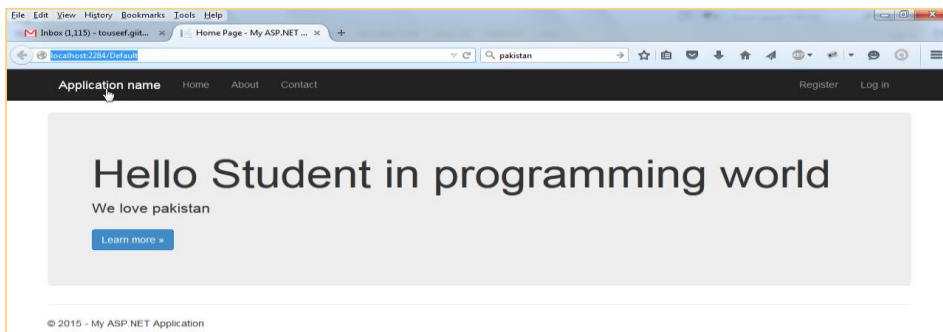


Figure 5

9. Notice how a small icon representing **IIS Express 1.5** has appeared in the tray bar of Windows visible in figure. This icon is belonging to build in server called IIS Express this web server started automatically when visual studio starts.

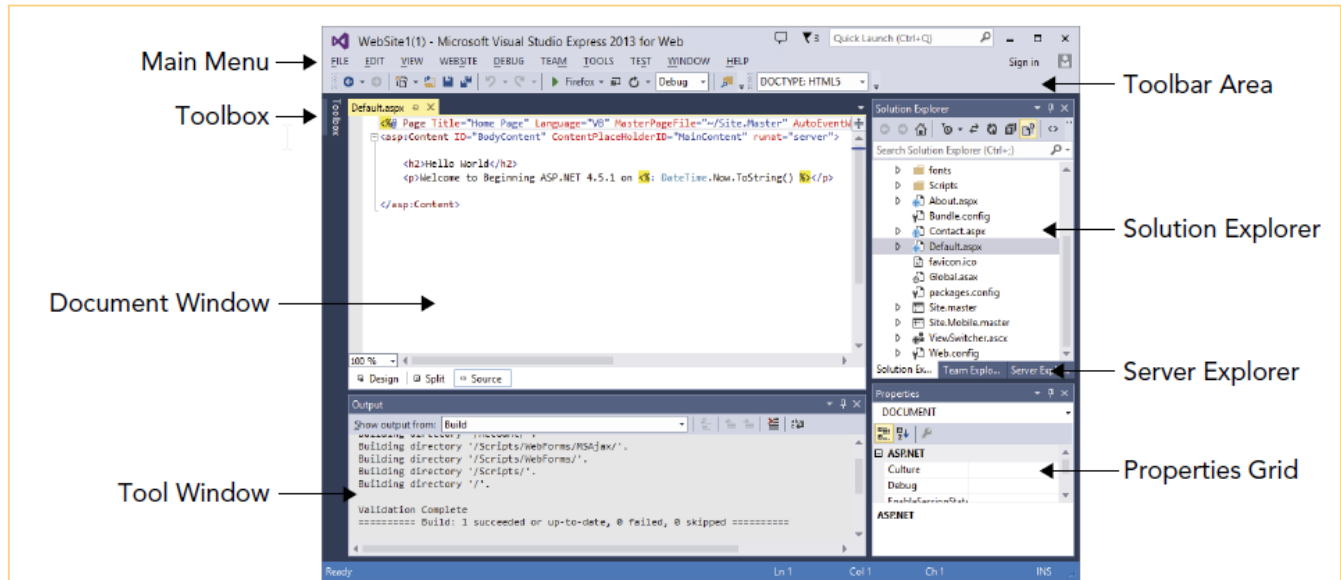
## 4. Environment of Visual Studio.NET

### IDE

IDE separate all tool you need to build complex website and web application are integrated in single environment

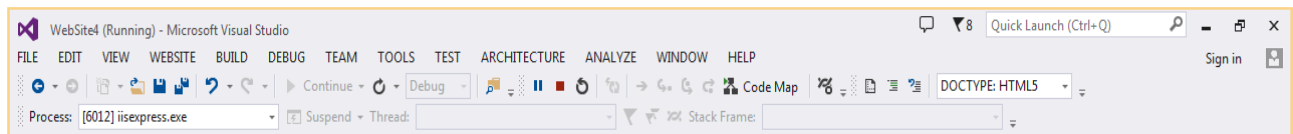
Visual studio is the most expensive and rich in feature **IDE** (Integrated Development Environment). Instead of writing code in text editor, compiling code in command line, writing HTML and Css code in separate application and managing **database**. VS enable to perform the entire task and more in same environment.

## 1. The Main Development Area



## 2. The Main Menu

At the top application below the title bar is the main menu. This menu bar contains many familiar items to find in much other window application. Like **File**, **Edit** and **help** menus.

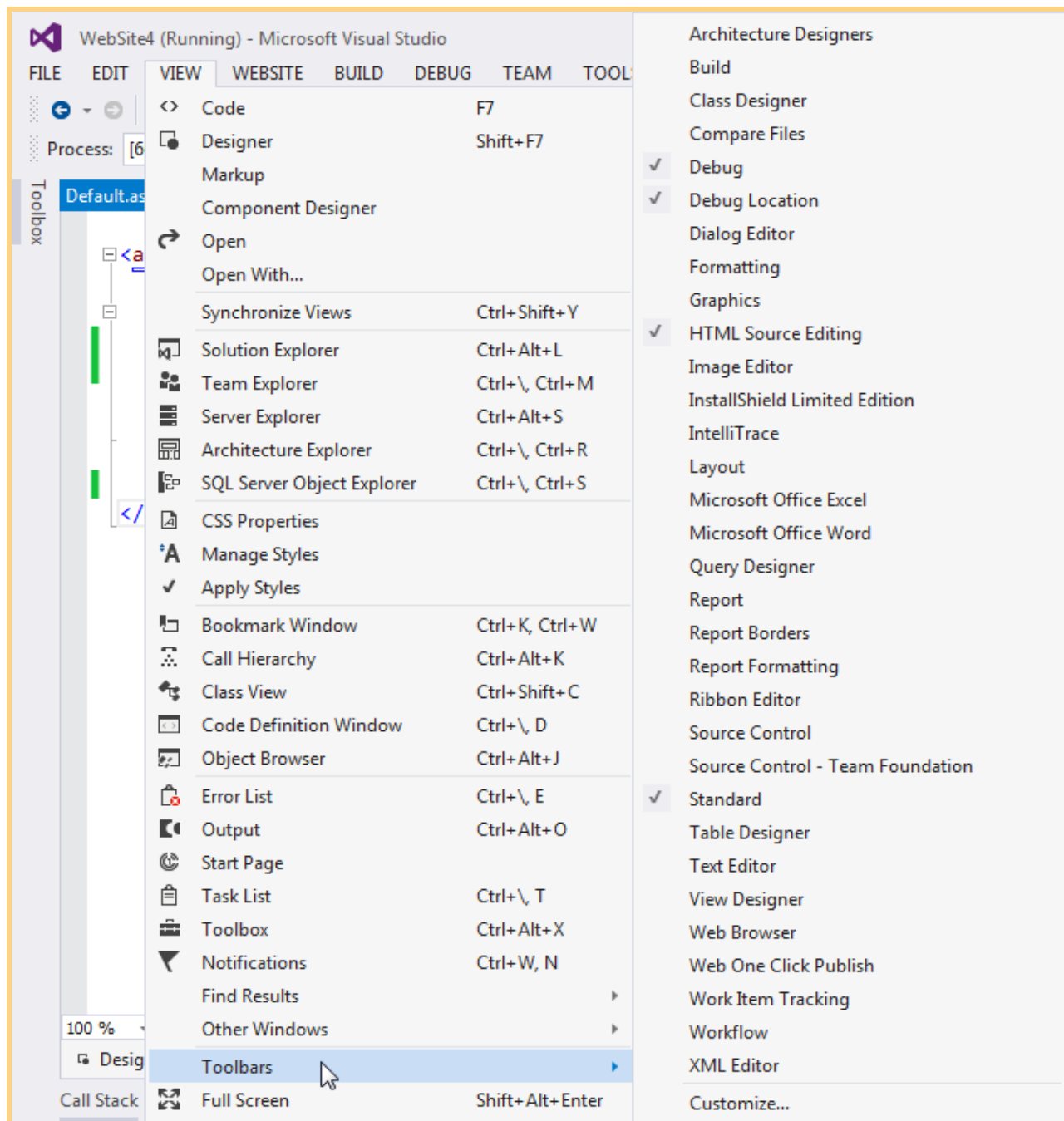


## 3. The Toolbar Area

Right below the menu, see the toolbar area that give quick access to the most common functions in **VS**. Some toolbars appear automatically while working on a task that requires a particular toolbar's presence, but there is option to enable and disable toolbars to liking. To enable or disable a toolbar, **right-click** an existing toolbar or the menu bar and choose the toolbar from the menu that appears.

## 4. The Toolbox

On the left of the main screen push away at the border of VS, the tab for the Toolbox is appeared. If clicked the tab, the Toolbox folds out, giving a chance to see what it contains. If clicked the little pin icon in the upper-right corner of the Toolbox (or any of the other panels that have this pin icon), it gets pinned to the IDE so it remains open.



If the **Toolbox** is not visible on-screen, press **Ctrl+Alt+X** to open it or choose **View ->Toolbox**, provided and have chosen the Expert Settings option in the **Tools -> Settings** menu.

## 5. The Solution Explorer

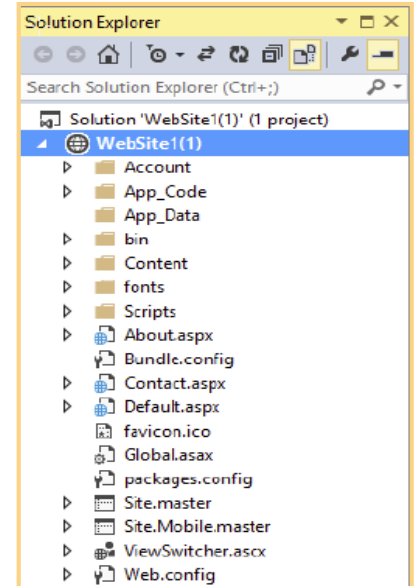
At the right of the screen, see the Solution Explorer. The Solution Explorer is an important window because it gives an overview of the files that contain website. Instead of placing all files in one big folder, the Solution Explorer enables to store files in separate folders, creating a logical and organized site structure.

Solution Explorer can:-

- Add new files to site
- Move existing files around using drag and drop or cut and paste
- Rename files
- Delete them from the project

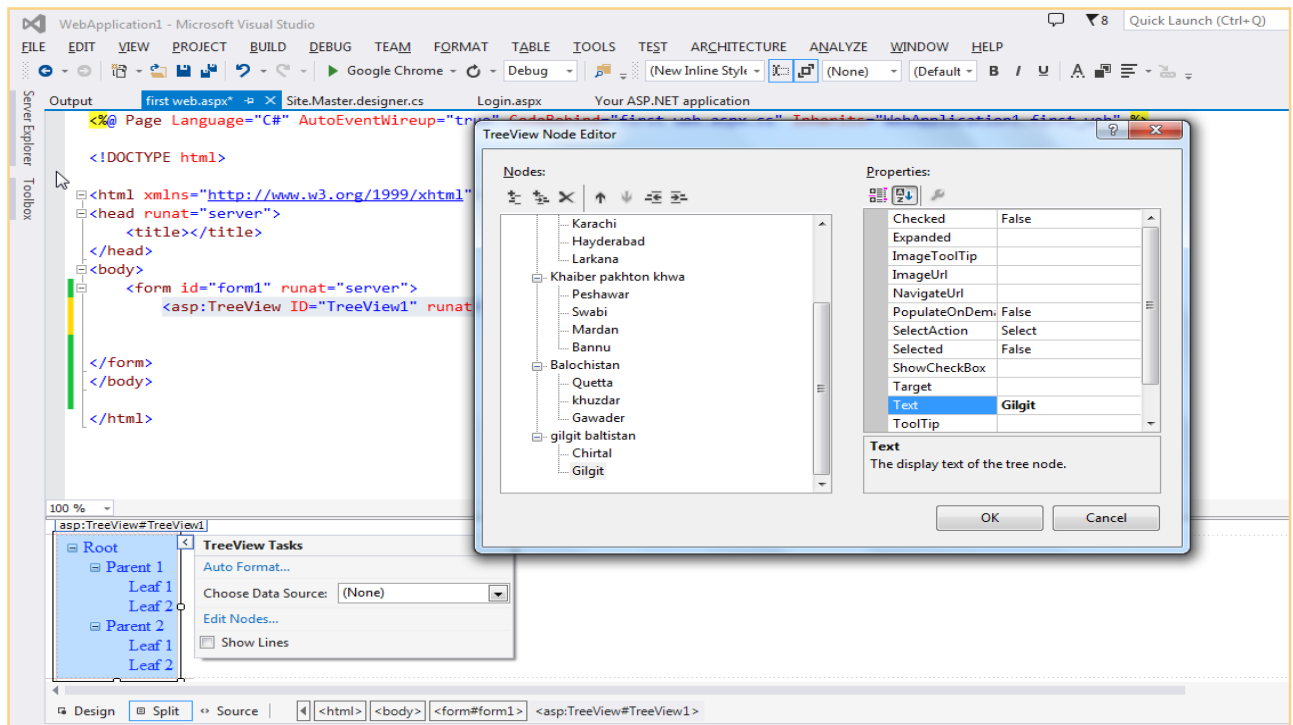
Much of the functionality of the **Solution Explorer** is hidden behind its right-click menu, which changes depending on the item **right-click**.

One can access the Solution Explorer by choosing **View -> Solution Explorer** from the main menu or by pressing **Ctrl+Alt+L**.



## 6. The Properties Grid

Proper Grid enables to view and edit the properties of many items in Visual Studio, including files in the Solution Explorer, controls on a web page, properties of the page itself, and much more. The window constantly updates itself to reflect the selected item. Shortcut to open the Properties Grid and force the Properties Grid to show the details of a selected item is **F4**.



## 7. The Document Window

Navigation through different document of project is easy. To switch between documents, press **Ctrl+Tab**, click the tab for the document to see, or click the down arrow in the upper-right corner of the Document Window, next to the **Solution Explorer**.

## 8. The Start Page

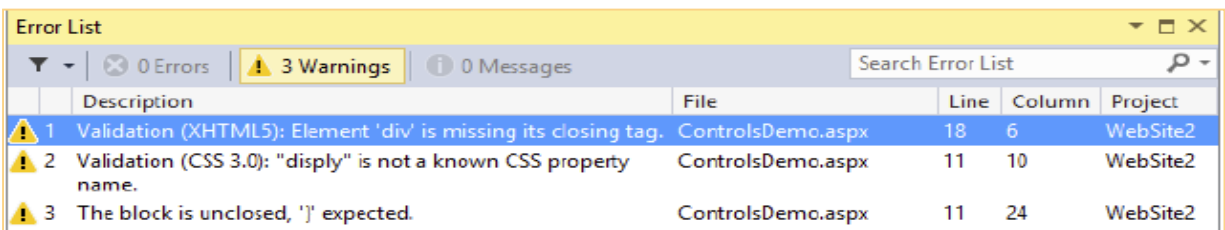
Whenever **VS** starts up, the Start Page is loaded in the Document Window. Start Page provides option to quickly create new and open existing websites and other projects. The Start Page also provides a number of links to related news and information about web development. To pin favorite projects to the Start Page, click the pin icon to the left of the project name in the list with recent projects. To unpin a project, **right-click** it and choose Remove from List. To reopen the Start Page, choose **View -> Start Page**.

## 1. Informational Windows

The windows that are visible by default when starting **VS**, many more windows are available.

### The Error List

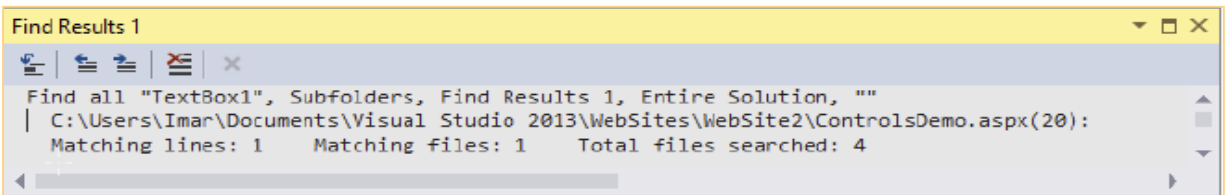
The Error List gives a list of the things that are currently somehow broken in site, including incorrect markup in ASPX or HTML files and programming errors in **VB** or **C#** files. This window can even show errors in **XML** and **CSS** files. The Error List shows its messages in three categories — Errors, Warnings, and Messages — that signify the severity of the problem. Figure below shows the Error List for a page that has some problems with its **CSS** and **XHTML**.



	Description	File	Line	Column	Project
1	Validation (XHTML5): Element 'div' is missing its closing tag.	ControlsDemo.aspx	18	6	WebSite2
2	Validation (CSS 3.0): "disply" is not a known CSS property name.	ControlsDemo.aspx	11	10	WebSite2
3	The block is unclosed, ']' expected.	ControlsDemo.aspx	11	24	WebSite2

- **The Find Results Window**

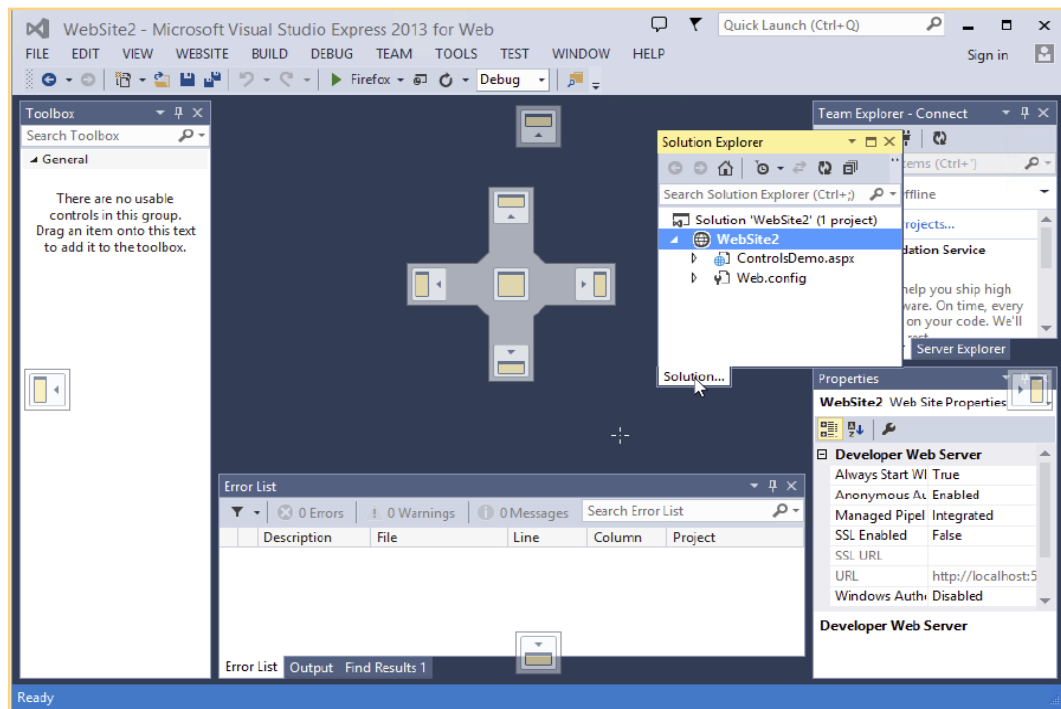
The Find and Replace features of **VS** are invaluable tools when it comes to managing the content of site. Often there is need to replace some text in the current document or even in the entire site. Find in Files (**Ctrl+Shift+F**) and Replace in Files (**Ctrl+Shift+H**) both output their results in the Find Results window, as shown in Figure below.



- **Customizing the IDE**

Although the standard setup of Visual Studio and its tool windows is pretty useful, there's a fair chance to want to customize the **IDE** to liking. Some of the windows can be moved to a location where they are easier to reach, or it can be open additional windows that are frequently used. **Visual Studio** is fully customizable and enables to tweak every little detail of the IDE.

**Rearranging Windows** give each window the location it deserves; drag and drop in the main **IDE** can be done. Simply drag window title bar or its bottom tab and **drag** into the direction of new location.



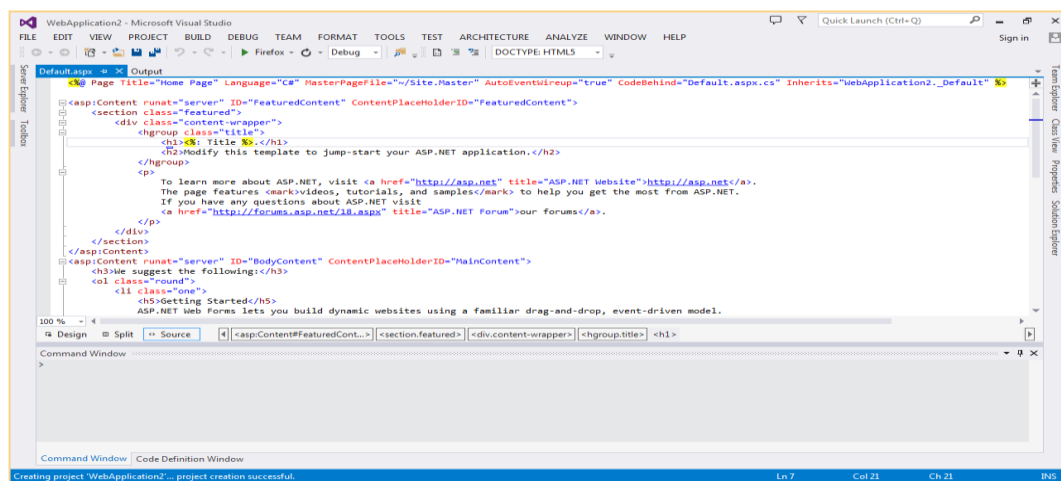
## 5. Source View, Design View, and Split View

### 1. Source View

VS enables to look at Web Form from a few different angles. When a file with markup — like a Web Form, three buttons at the bottom-left corner of the window are shown. With these buttons, visible in Figure below, one can switch between the different views.

#### STEP BY STEP Source View

1. Open **WebApplication1** in visual Studio
2. Click on **Source View**

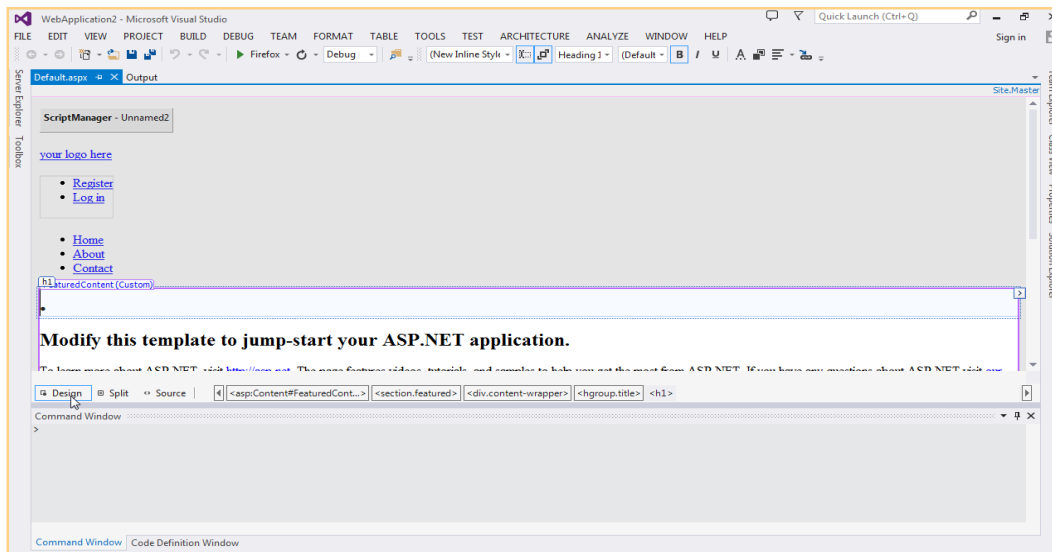


### 2. Design View

With design view one can add html and html form tags by drag and drop.

### STEP BY STEP Design View

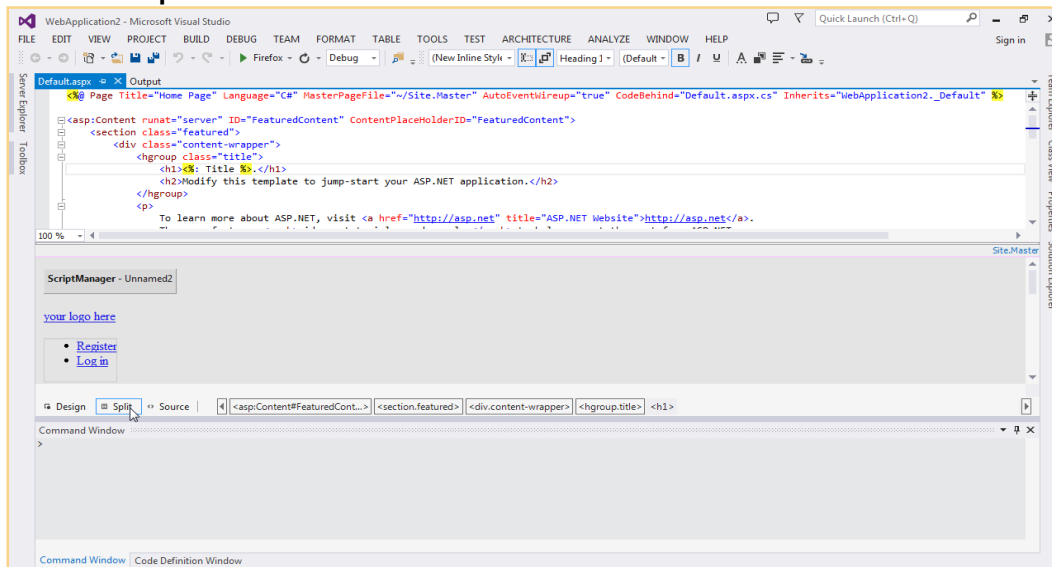
1. Open **WebApplication1** in visual Studio
2. Click on **DesignView**



3. **Split View**  
Split view shows source code as well as design of project.

### STEP BY STEP Split View

1. Open **WebApplication1** in visual Studio
2. Click on **SplitView**



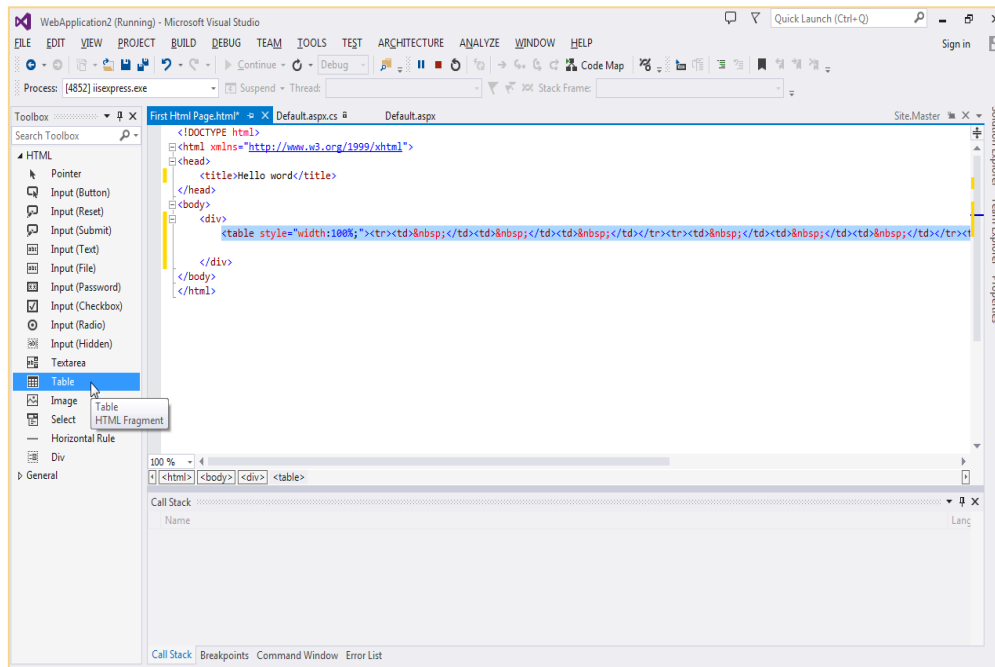
## 6. HTML Controls

1. **Table**
  - a. Two method for adding table in web page
    - i. Drag and drop table tag from toolbar



**STEP BY STEP Table Creation by Drag and Drop/ by Coding**

1. Open **WebApplication1** in visual Studio
2. Click on toolbar and drag and drop it on **first HtmlPage.Html**

**HTML Controls**

HTML controls are  
Table, Div, Image,  
Text area

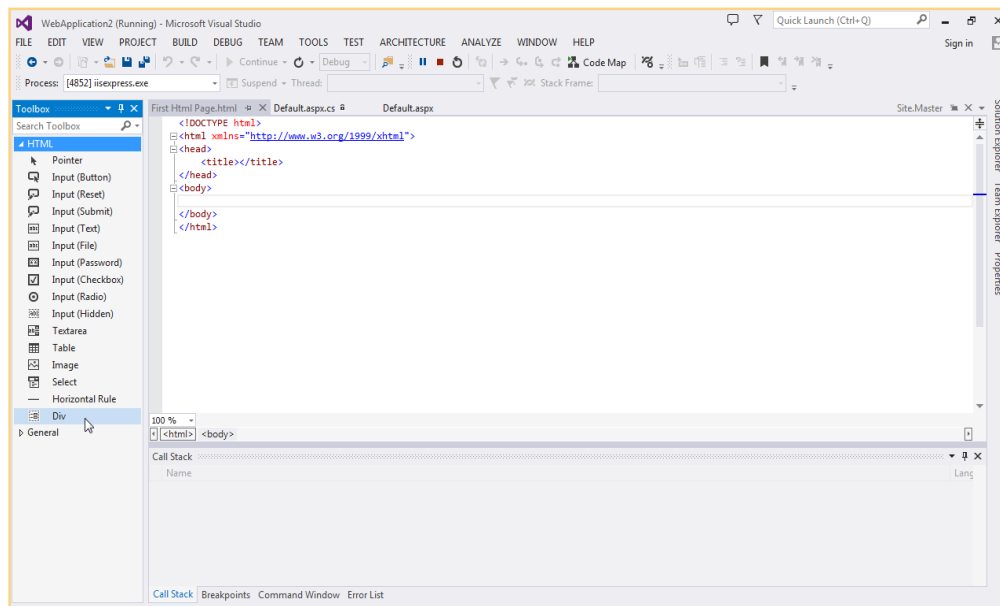
- ii. Type the code directly in code editor

**2. Div**

Div tag in html is use for setting layout of the web page. In asp.net following steps to insert div tag in webpage

**STEP BY STEP Inserting Div from Toolbar/ by Coding**

1. Open **WebApplication1** in visual Studio
2. Click on toolbar and drag and drop it on **first HtmlPage.Html**



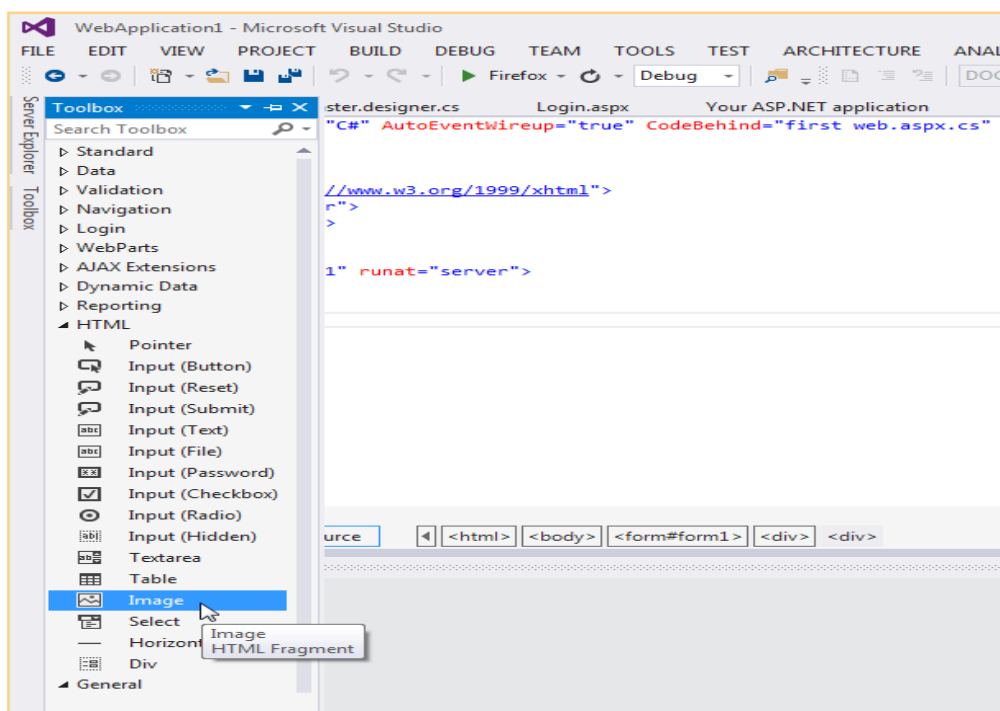
1. Open **WebApplication1** in visual Studio
2. Open **first HtmlPage.Html** and type the code in figure below



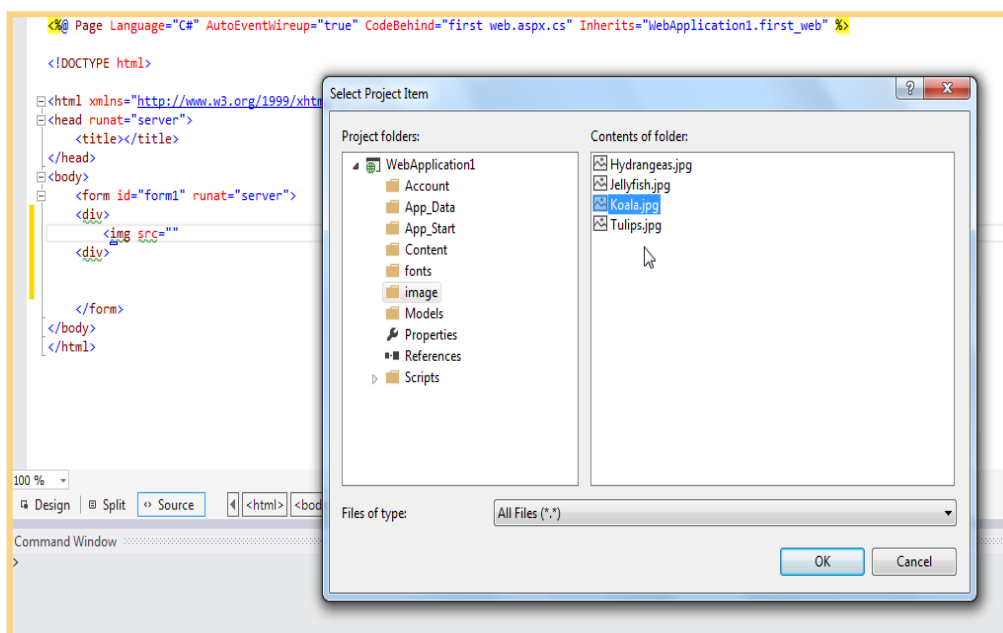
### 3. Image

#### STEP BY STEP Inserting Image from Toolbar/Coding

1. Open **WebApplication1** in visual Studio
2. Open **first HtmlPage.Html** drag image tag from toolbar see figure below



1. Open **WebApplication1** in visual Studio
2. Open **first HtmlPage.html** type the code in figure below.



## Learner's Activity

1. Create a webpage titled htmlcontrols
2. Insert div tag and set css for width and height
3. Inside div tag insert table with heading row

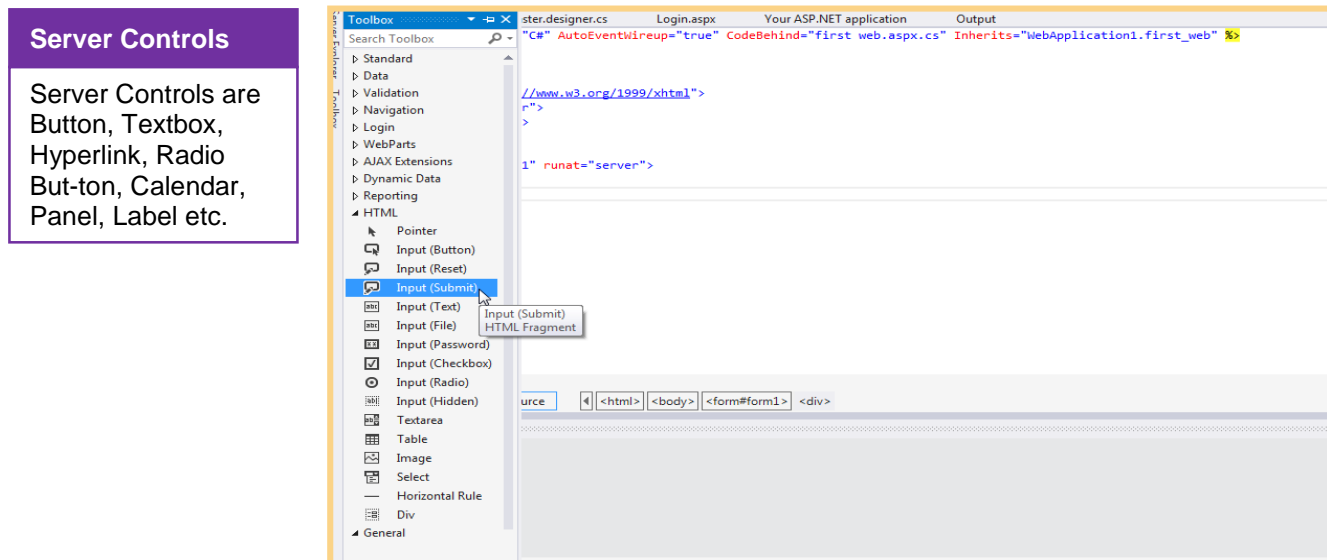
4. Insert image below the table
5. Insert text area below the image

## 7. Server Controls

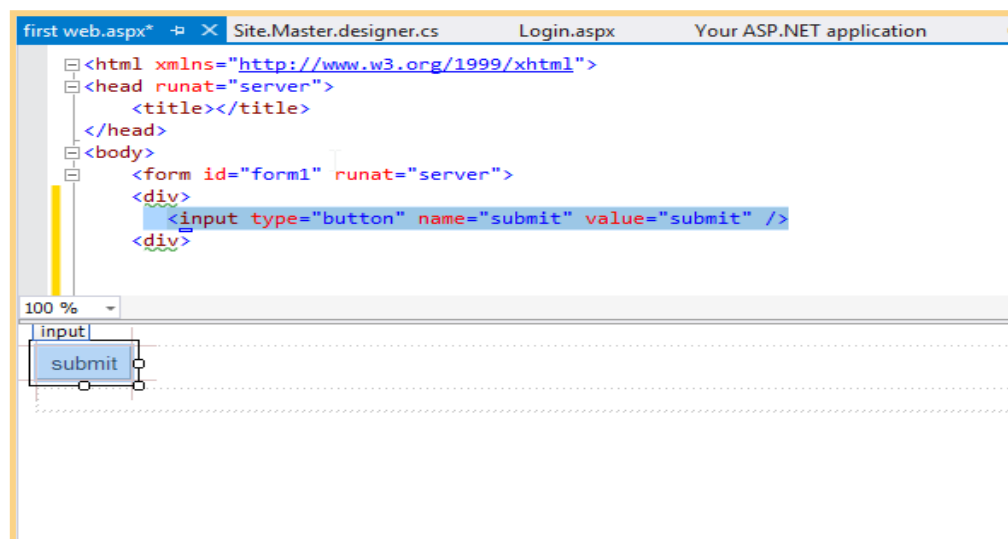
### 1. Buttons

#### STEP BY STEP Button form Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx.Html** drag button from toolbar see figure below



1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type cod in figure 1.2



## 2. Textbox

### STEP BY STEP Textbox form Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first HtmlPage.Html** drag it from toolbar in figure below

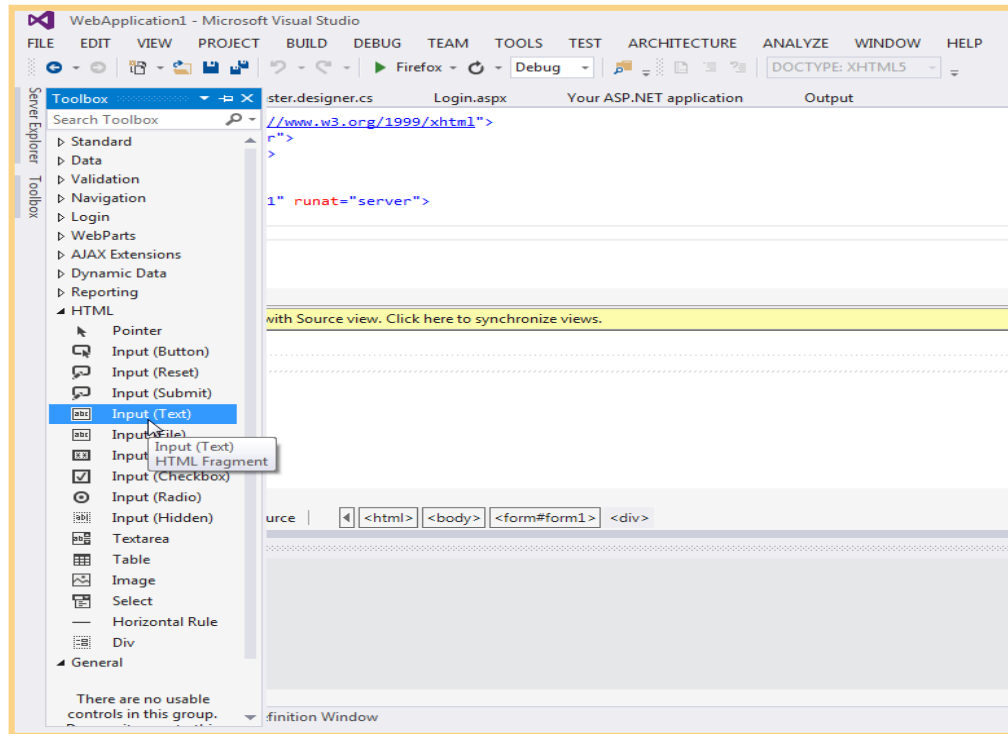


Figure 1.1

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure 1.2

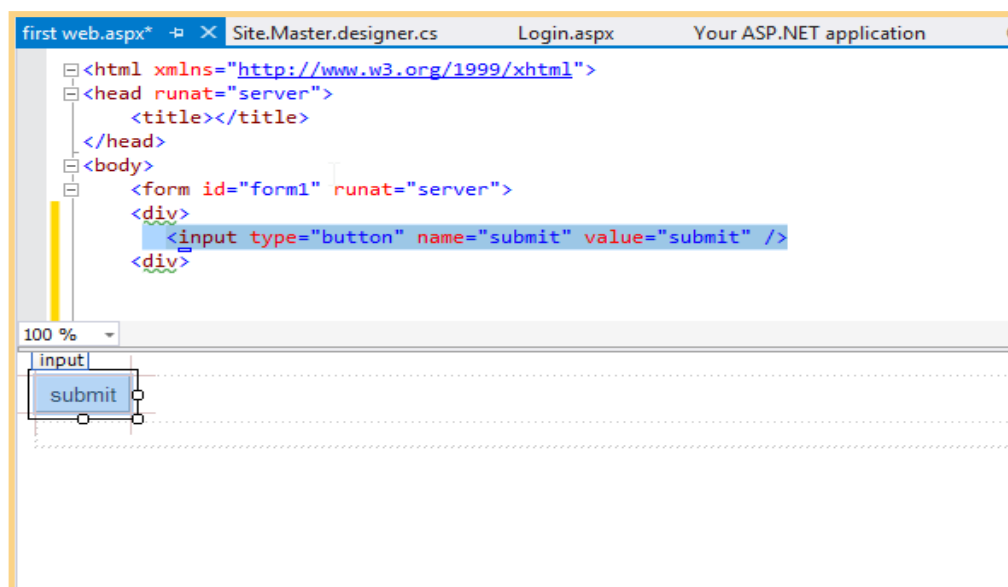
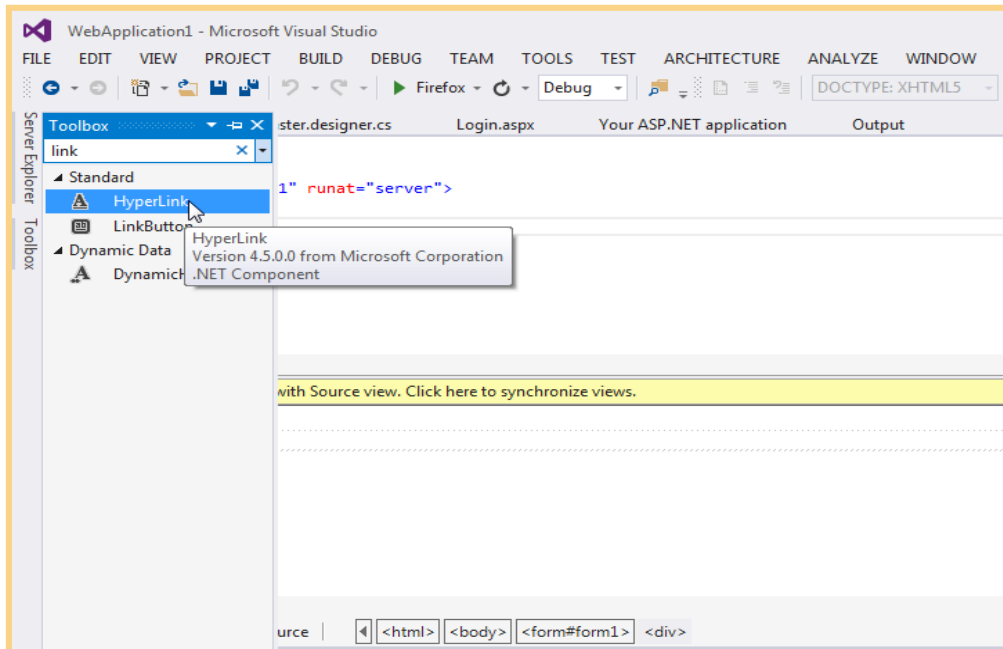


Figure 1.2

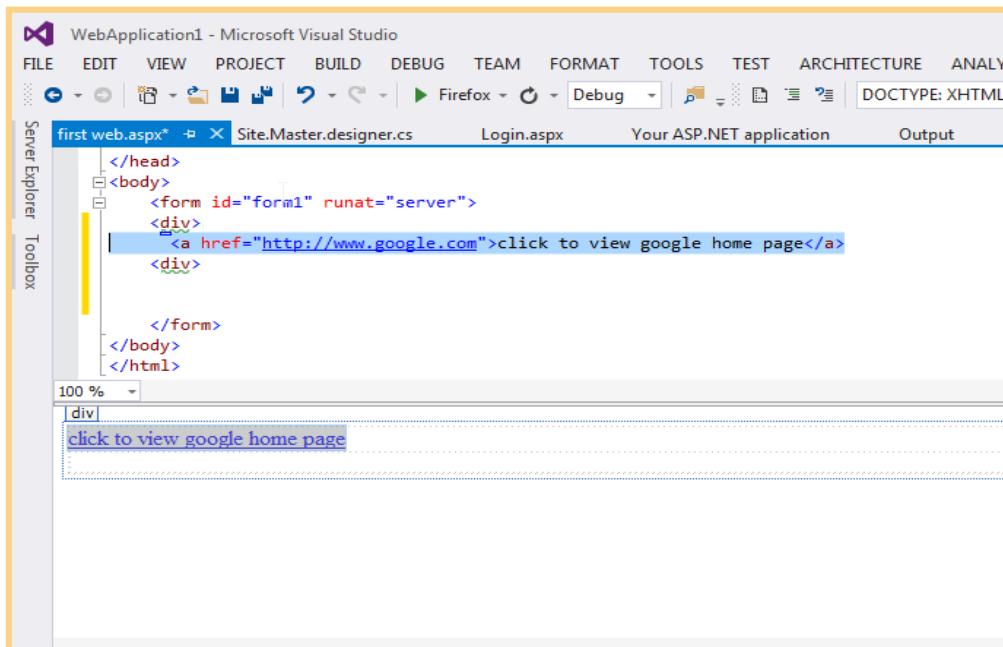
### 3. Hyperlink

#### STEP BY STEP Hyperlink form Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first HtmlPage.Html** drag it from toolbar in figure below



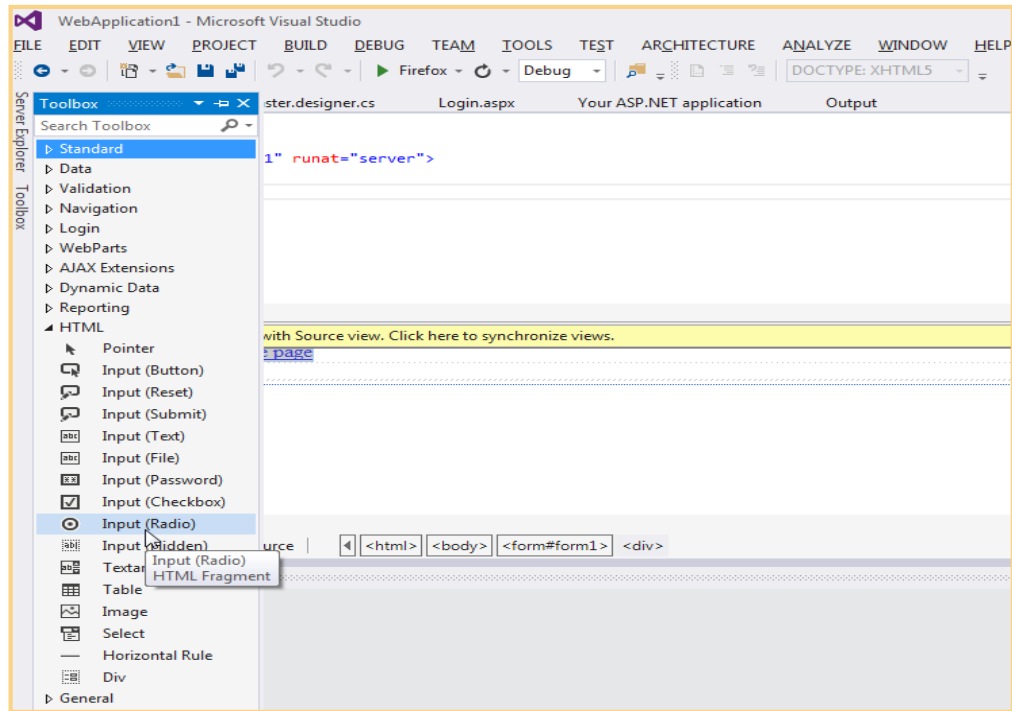
1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



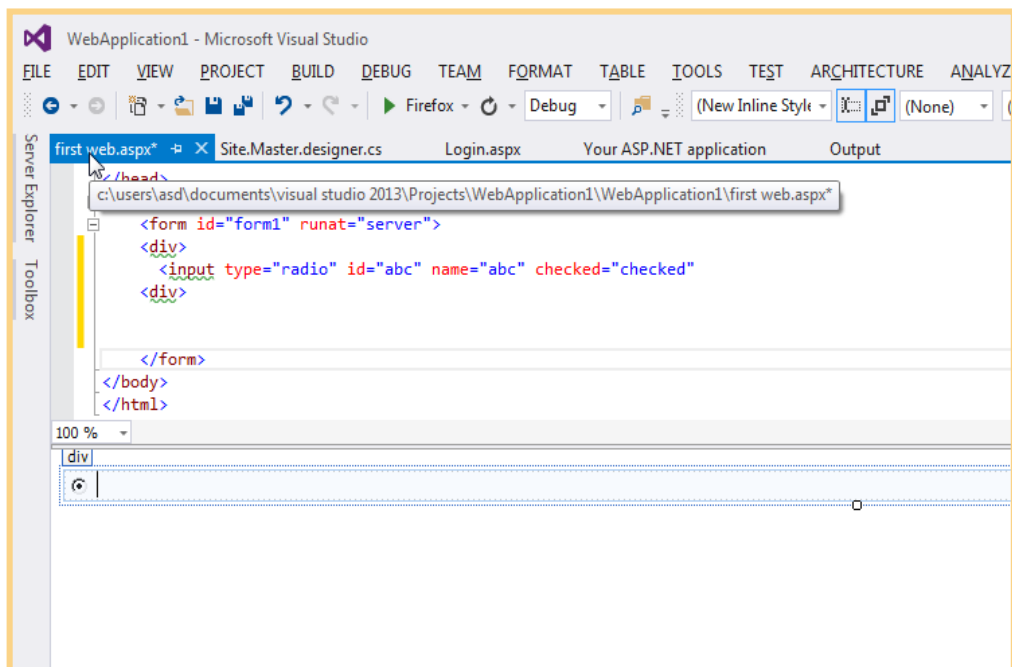
#### 4. Radio Button

##### STEP BY STEP Radio Button form Toolbar/Code

1. Open **WebApplication1** in visual Studio
2. Open **first HtmlPage.Html** drag it from toolbar in figure below



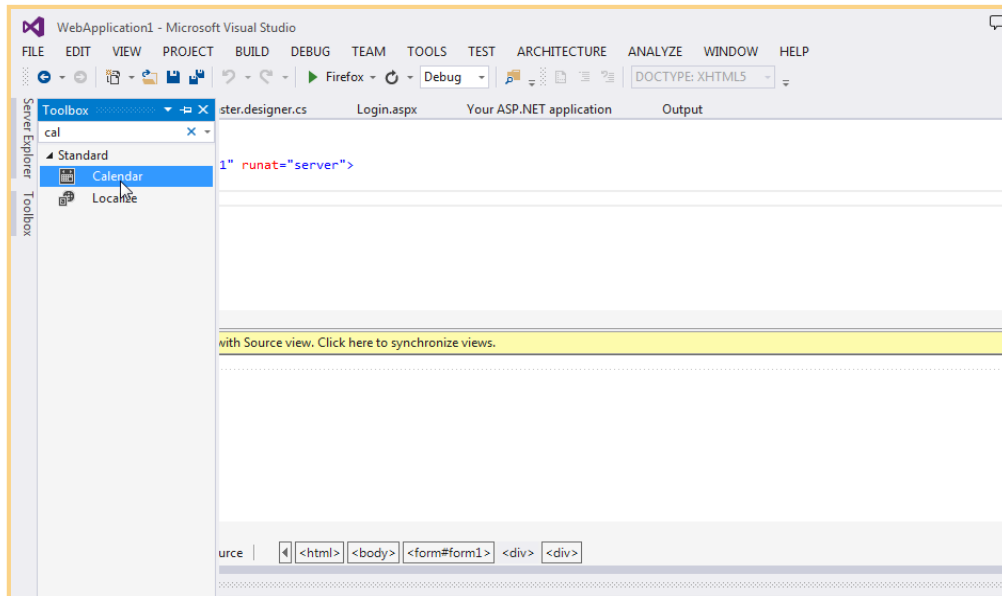
1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



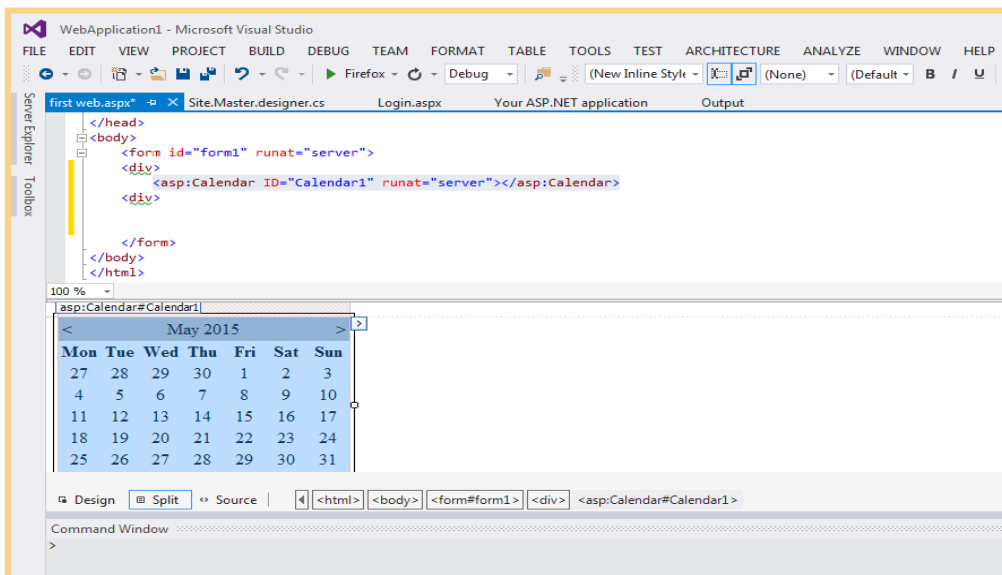
## 5. Calendar

### STEP BY STEP Calendar from Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below



1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below

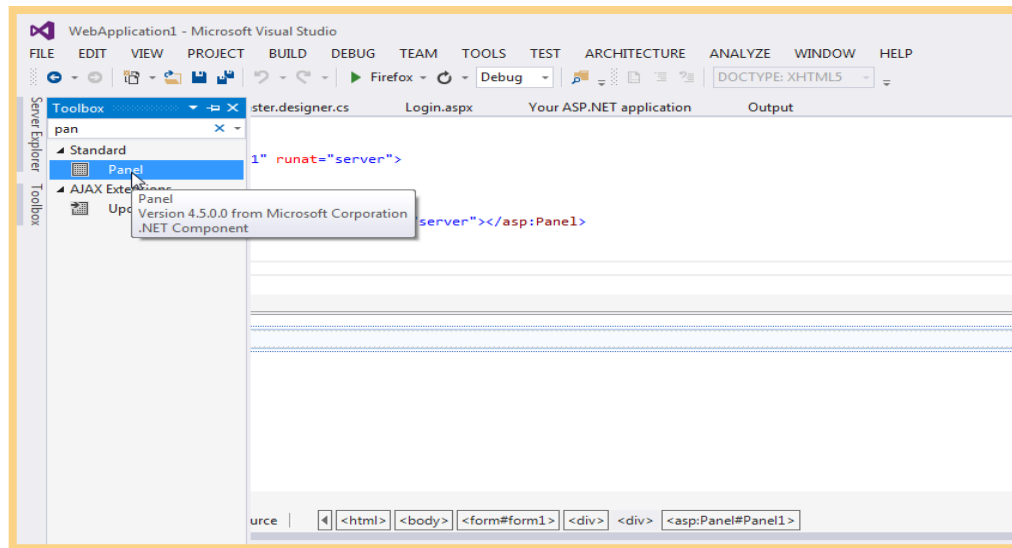


## 6. Panel

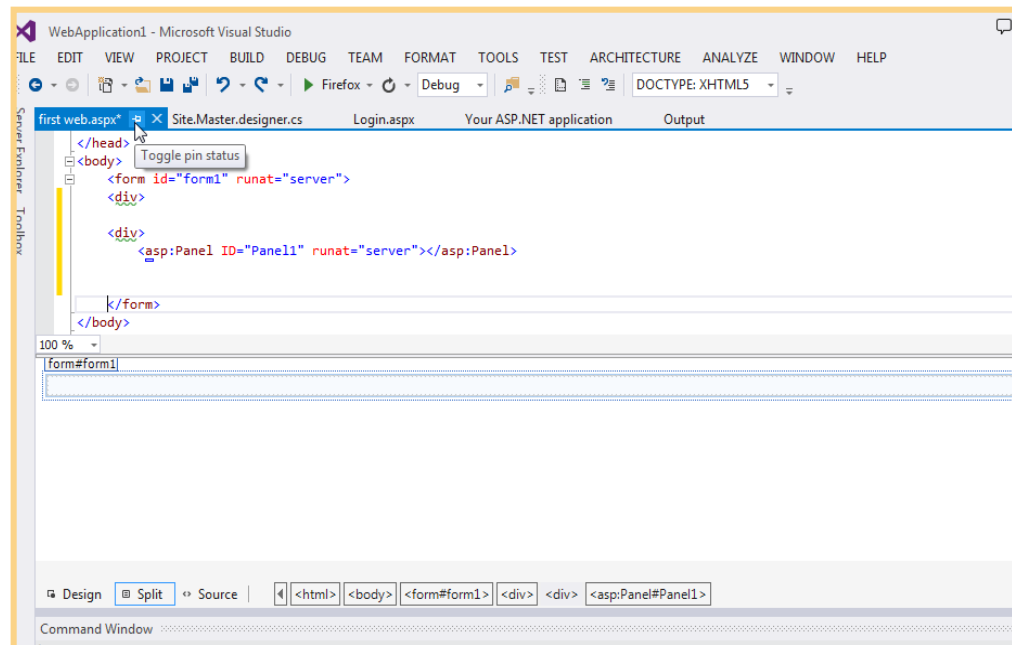
### STEP BY STEP Panel from Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below





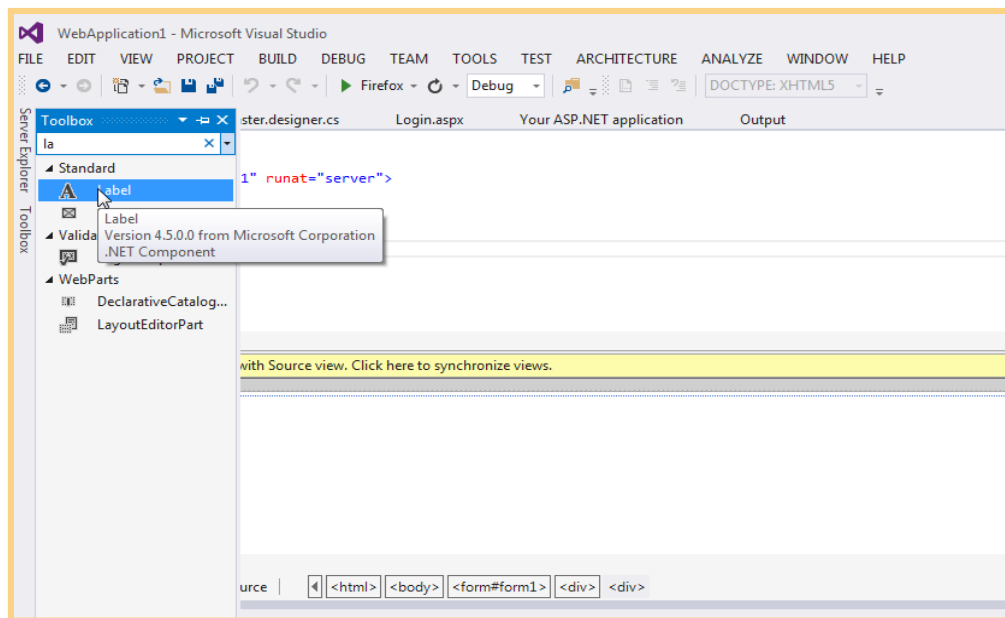
1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



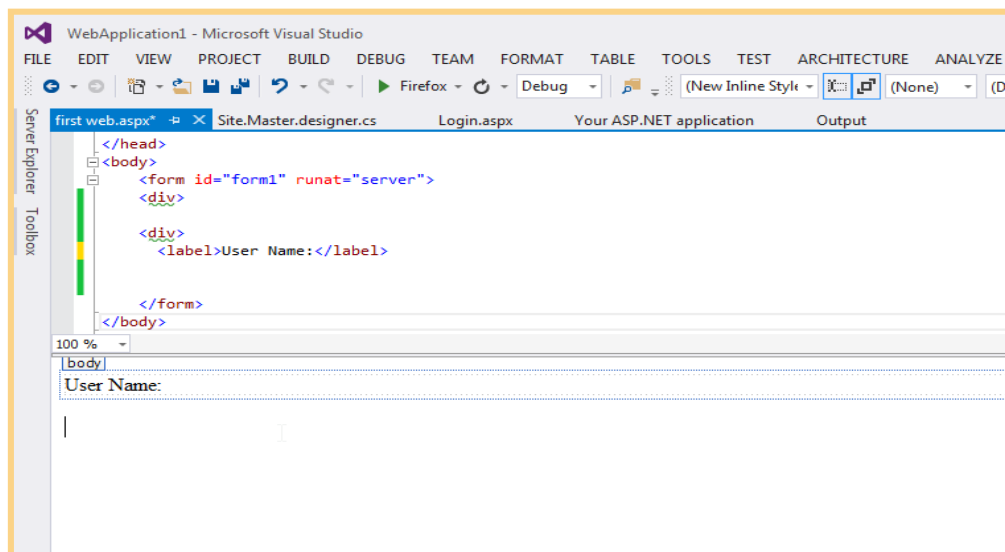
## 7. Label

## STEP BY STEP Label from Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below



1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



## Learner's Activity

1. Create webpage titled server controls
2. Insert Div tag of main class and type code in point 3
3. {width:100%; min-height:500px; background-color:#ff3842;}
4. Insert panel
5. In panel Insert 4 label
6. In front of 4 label there is 4 textbox
7. Below text box and label insert radio button for selecting gender
8. Insert age field with the help of label, textbox and calendar
9. Insert button for submit
10. Insert link and set all state CSS like a: hover, link, visited, activ

## 8. Data Server Controls

### Data source and data-bound controls working together

The **SqlDataSource** control enables quickly to create functional, database-driven web pages. Without writing a whole lot of code, web pages are created that enable to perform all four operations of the CRUD acronym: Create Read, Update, and Delete data. Although its name may seem to imply that the control can access only Microsoft's **SQL** Server, that's not the case. The control can access other databases, such as **Oracle** or **MySQL**, as well.

#### Data Server Controls

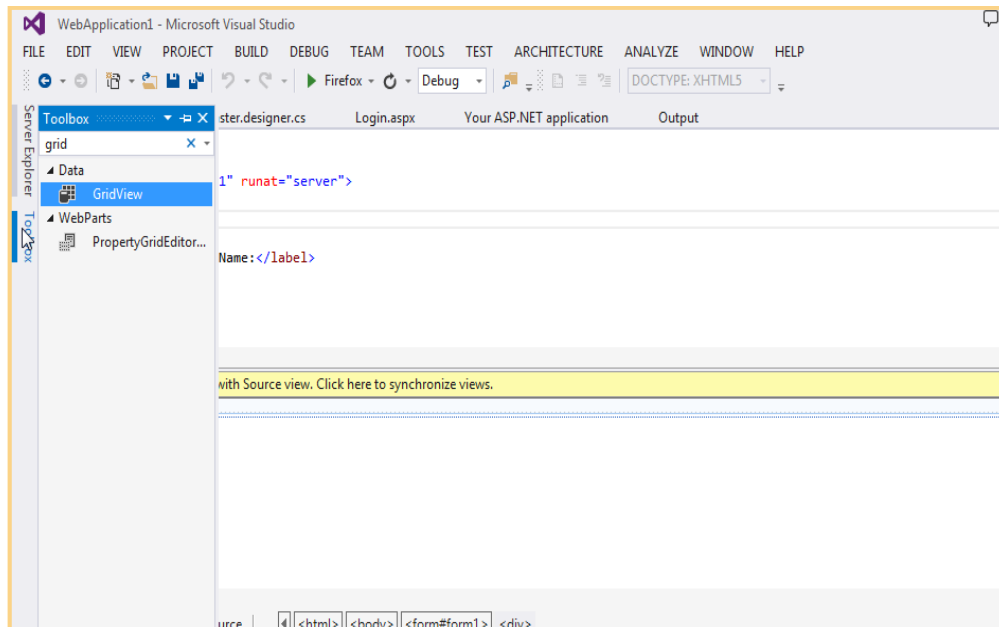
Server Controls are as Grid View, Details View, Form View, SqlDataSource, AccessDataSource etc.

### 1. Grid View

In Asp.net **Grid View** is a control which enables developers to represent data in the form of spreadsheet like rows and column to select, sort and edit these items. To give an idea of how the **SqlDataSource** control works in conjunction with the **databoundcontrols**.

### STEP BY STEP GridView with SqlDataSource from Toolbar/Code

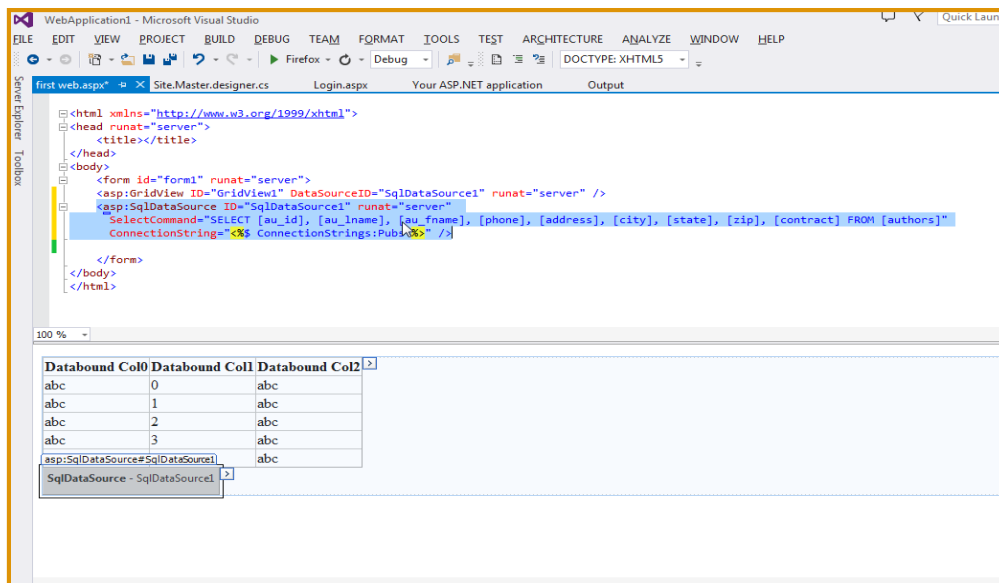
1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below



#### Remember

MS Access is a DBMS application in which you can create database as well as frontend like form and reports

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



## 2. Details View

Just as displaying, updating, and deleting data with the **GridView** are pretty easy, so is inserting data with the **DetailsView** control. The **DetailsView** supports a number of templates that enables to customize the look and feel of the control in different modes. For example, the control has a **<HeaderTemplate>**, a **<FooterTemplate>**, and a **<PagerTemplate>** element that enables to define the look of the top and bottom parts of the control. In addition, the control has a **<Fields>** element that enables to define the rows that should appear in the control, much like the **<Columns>** element of the **GridView**

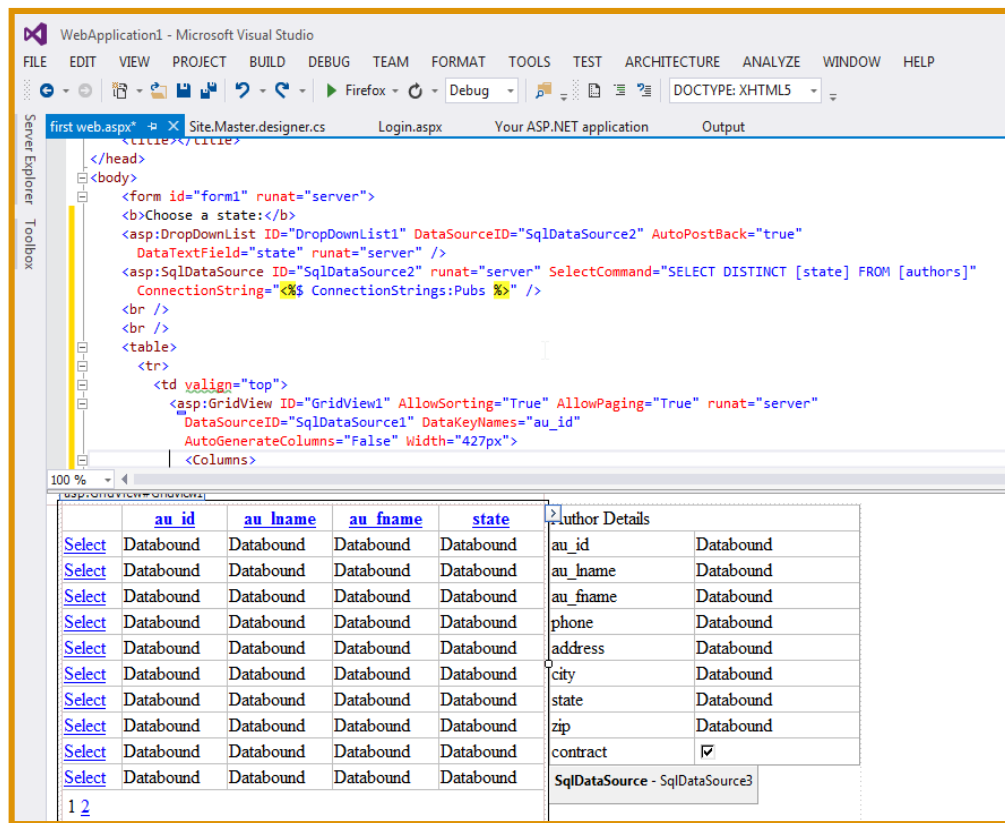
### STEP BY STEP DetailView with SqlDataSource from Toolbar and by Typing Code

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below

### ODBC

ODBC (open database connectivity) is standard programming language. It is middle ware API for accessing database management system

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



### 3. Form View

It is similar to the **DetailsView** control, except that it requires the user to define the rendering of each item using templates, instead of using data control fields.

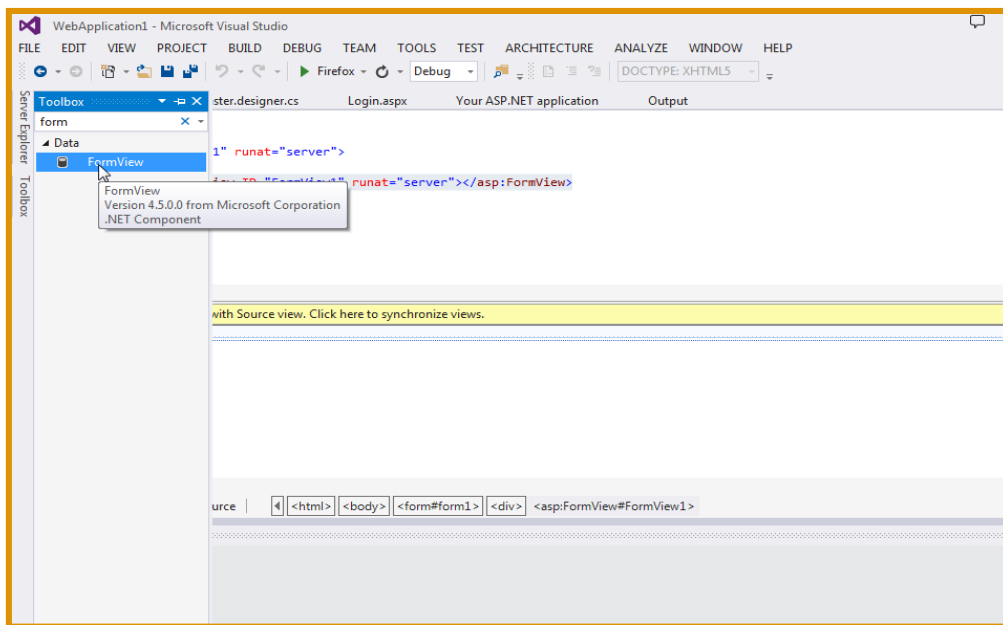
The main difference between **DetailsView** and **FormView** is that **DetailsView** has a built-in tabular rendering, whereas **FormView** requires a user-defined template for its rendering. The **FormView** and **DetailsView** object model are very similar otherwise.

#### Responsive Design

Responsive Website or web application gives response on any screen or media type

#### STEP BY STEP GridView with SqlDataSource from Toolbar

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below



### ADO.Net

ADO.NET stands for ActiveX Data Object. ADO is programming interface which is use to access databases like (sql server, MS Access , Oracle etc.

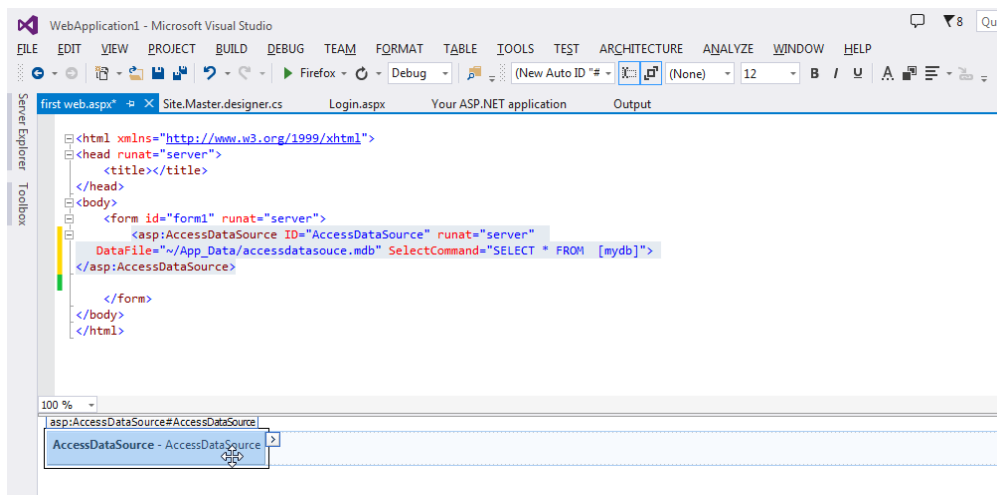
#### 4. AccessDataSource

The AccessDataSource control represents a connection to an Access database. It is based on the SqlDataSource control and provides simpler programming interface.

The AccessDataSource control opens the database in read-only mode. However, it can also be used for performing insert, update, or delete operations. This is done using the ADO.NET commands and parameter collection.

### STEP BY STEP AccessDataSource

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below



## Learner's Activity

1. Open visual studio create new website
2. In server explorer create new database titled dataservercontrol
3. Create table country table which have c-id and c-name field
4. Create province table which have p-id,p-name,c-id field
5. Create relationship of both table with the help of keys
6. Insert data of the above tables
7. Create new webpage in website titled dataservercontrol
8. Retrieve all data from database using **GridView**, **DetailView**, and **FormView**

## 9. Share Details of and Implementation

**Validation controls** enables to rapidly create Web Forms with validation rules that prohibit users from entering invalid data. For example, force users to enter values for required fields and check whether the entered data matches a specific format like a valid date or a number between 1 and 10. They even allow to write custom code to create validation routines that are not covered by the standard controls. The beauty of the validation controls is that they can execute both on the client and the server, enabling to create responsive and secure web applications.

**ASP.NET 4.5.1** has six controls to perform validation in website. Five of them are used to perform the actual validation, whereas the final control — **ValidationSummary** — is used to provide feedback to the user about any errors made in the page. **Figure 1.1** shows the available controls in the Validation category of the Toolbox.

### Importance of validation controls

These controls are extremely helpful in validating the data that a user enters in the system. They can easily be hooked to other controls like the **TextBox** or a **DropDownList**; however, they also support custom validation scenarios. Figure 1.2 demonstrates two of the validation controls **RequiredFieldValidator** and **RangeValidator** — at work to prevent a user from submitting the form without entering required and valid data.

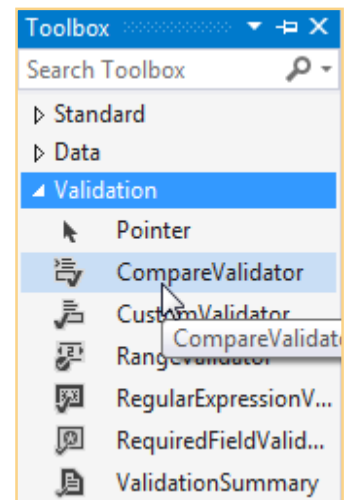


Figure 1.1

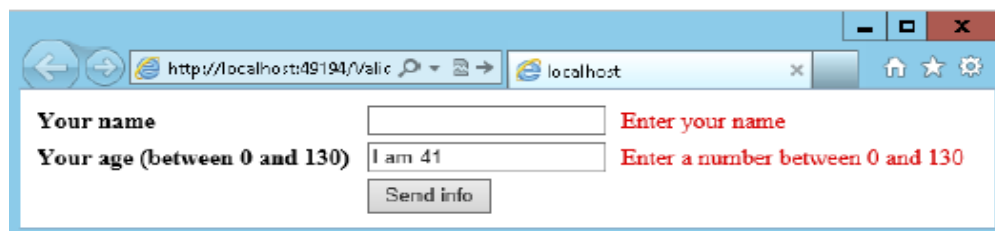


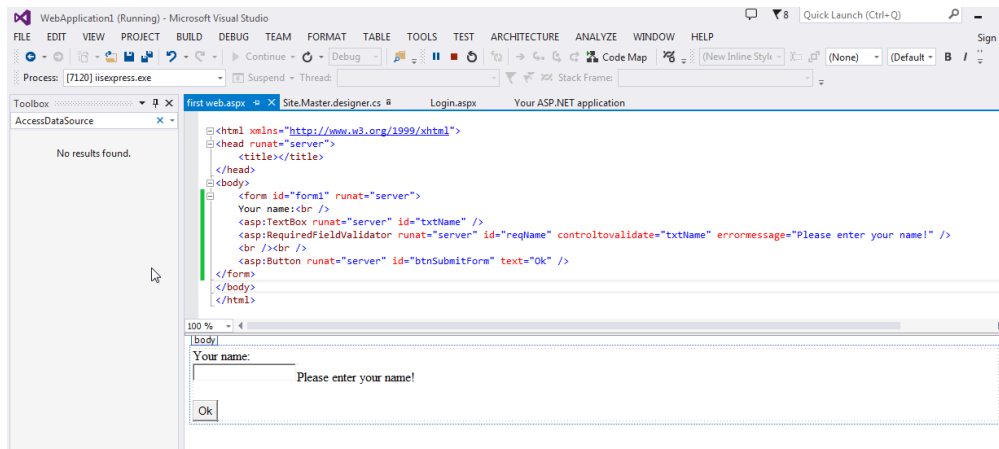
Figure 1.2

## 1. Using the RequiredFieldValidator

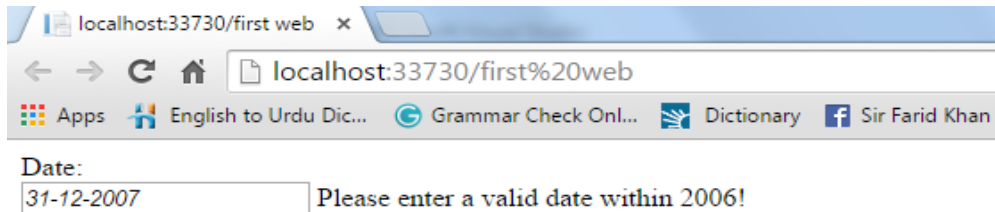
The **RequiredFieldValidator** is actually very simple, and yet very useful. It can be used to make sure that the user has entered something in a TextBox control. Let's give it a try, and add a RequiredFieldValidator to page. Also add a TextBox to validate, as well as a button to submit the form with.

### STEP BY STEP RequiredFieldValidator

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** drag it from toolbar in figure below



Out put:



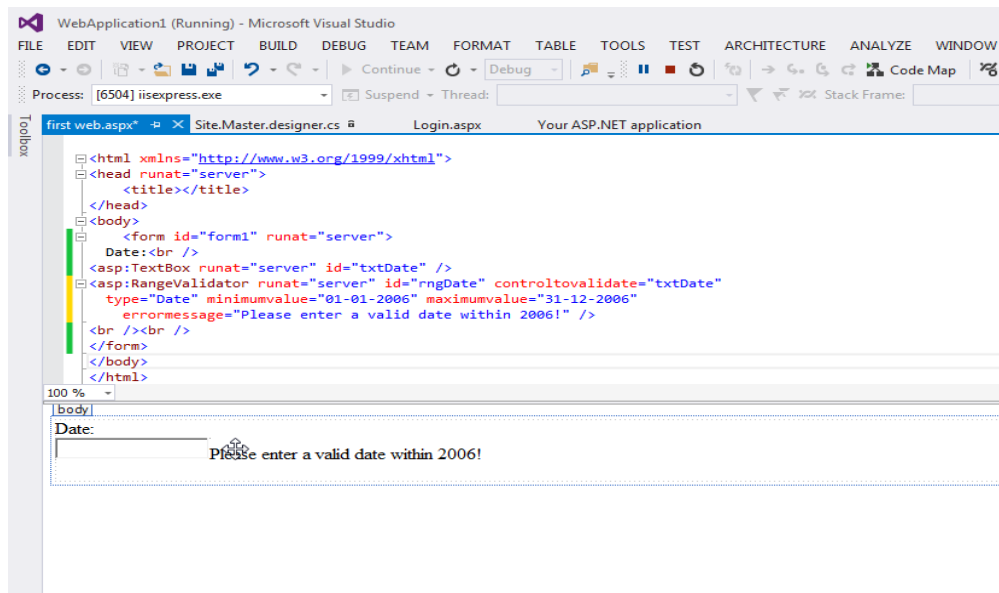
## 2. Range Validator

Range validator does exactly likes its name it make sure that the user input must be within the range. Developer can use it to validate number, strings, date and time.

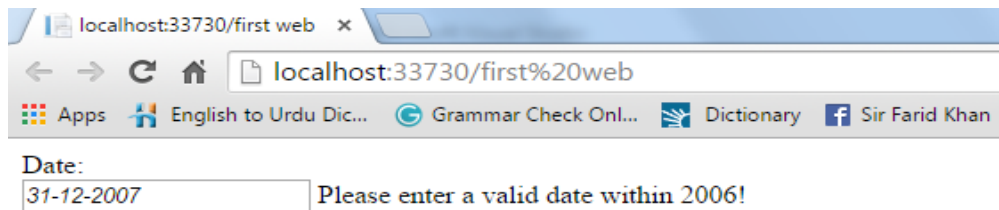
### STEP BY STEP Range Validator

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below





Output:



### 3. Validation Summary

It does not perform any validation but show a summary of all errors in the page. The summary display the value of error messages. The ValidationSummary control provides the user with a list of errors that it retrieves from the individual validation control's ErrorMessage properties.

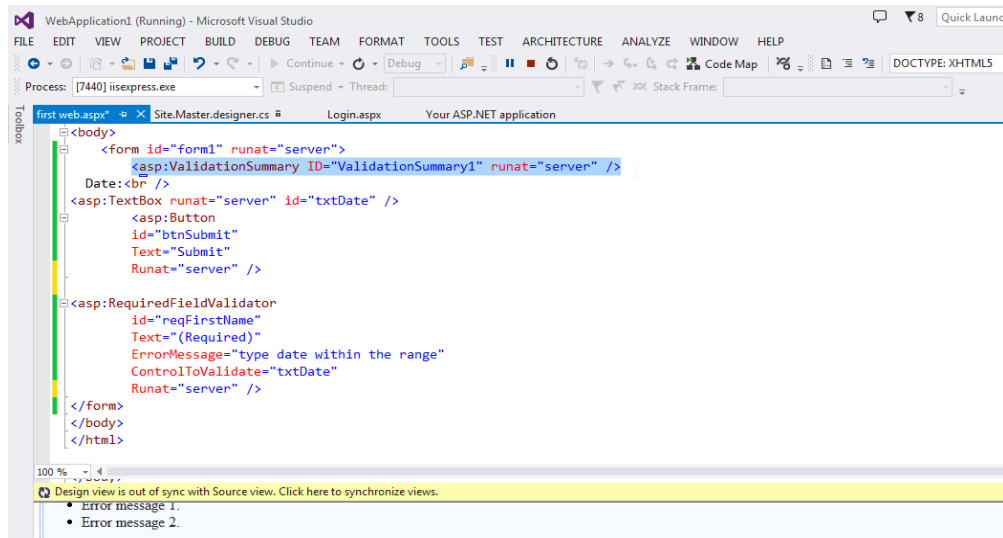
#### STEP BY STEP Validation Summary

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** type code in figure below

#### Error Display Ways

Errors are displayed in three different ways:

- list embedded in the page
- JavaScript alert box
- both at the same time



```
<body>
 <form id="form1" runat="server">
 <asp:ValidationSummary ID="ValidationSummary1" runat="server" />
 Date:

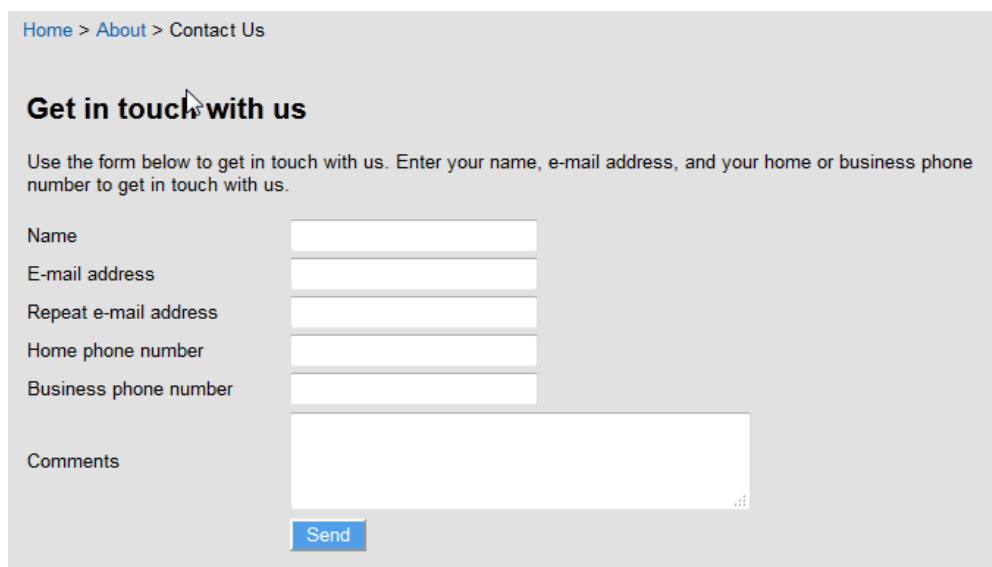
 <asp:TextBox runat="server" id="txtDate" />
 <asp:Button
 id="btnSubmit"
 Text="Submit"
 Runat="server" />
 <asp:RequiredFieldValidator
 id="reqFirstName"
 Text="(Required)"
 ErrorMessage="type date within the range"
 ControlToValidate="txtDate"
 Runat="server" />
 </form>
</body>
</html>
```

Output:



## Learner's Activity

1. Open **WebApplication1** in visual Studio
2. Create new webpage titled **contactform.aspx**
3. Type the code for **figure below**



4. Apply **RequiredFieldValidator**, **RangeValidator**, and **ValidationSummary**
5. The output in browser should look like figure below

[Home](#) > [About](#) > [Contact Us](#)

### Get in touch with us

Use the form below to get in touch with us. Enter your name, e-mail address, and your home or business phone number to get in touch with us.

Name  \*

E-mail address  \*

Repeat e-mail address  \*

Home phone number  \*


Business phone number  \*

Comments  \*

Please correct the following errors:

- Enter your name
- Enter an e-mail address
- Confirm the e-mail address
- Enter your home or business phone number
- Enter a comment

**Erro summary look like this**



## 10. Navigation Controls

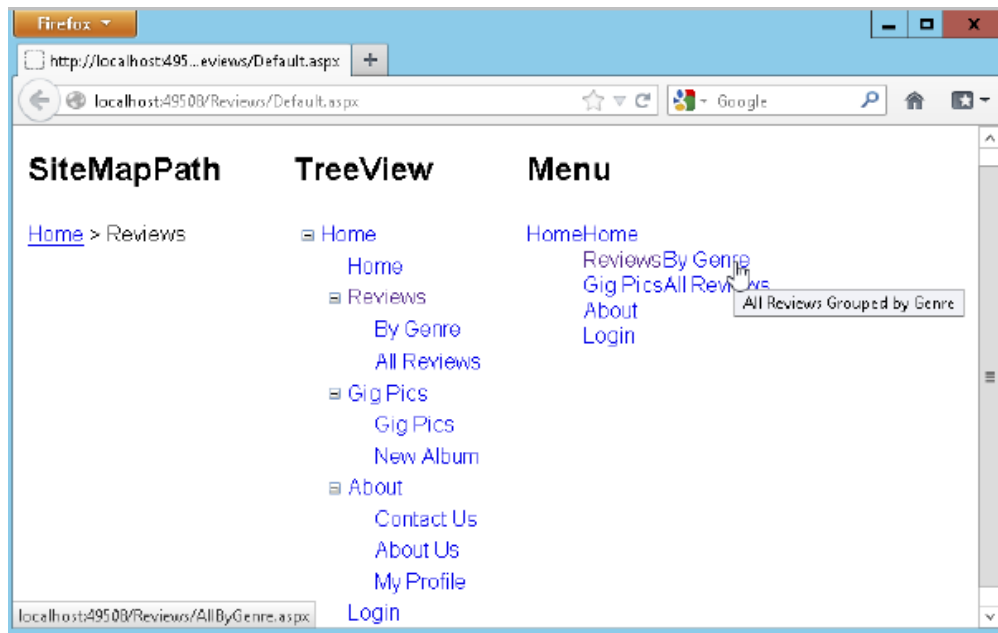
### Navigation Controls

The controls found under the Navigation category of the **Toolbox** are used to let users find their way through site. The **TreeView** control presents a hierarchical display of data and can be used to show the structure of site, giving easy access to all the pages in the site. The Menu control does a similar thing and provides options for horizontal and vertical fold-out menus.

The **SiteMapPath** control creates a “breadcrumb trail” in web pages that enables users to easily find their way up in the hierarchy of pages in site. Figure below demonstrate three navigation controls without applying any styling.

#### Do you know!

Sitemap show complete hierarchy of website pages. Usually show in the footer section of the web page

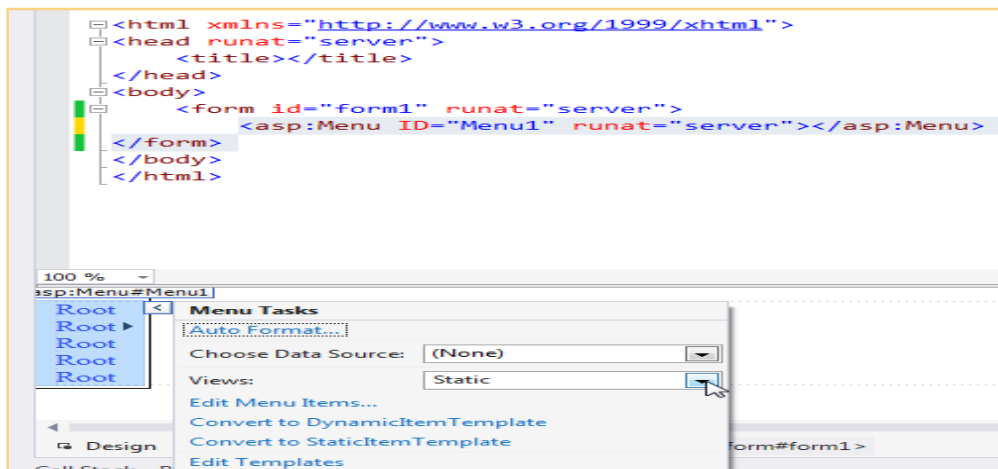


## 1. Menu

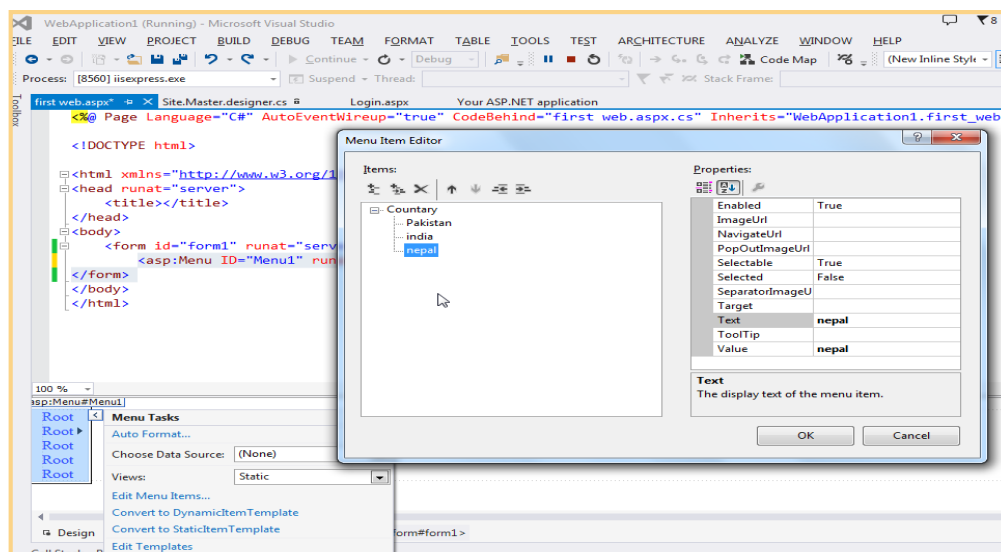
Menu control is a navigation control used to display site navigation information. This can be used to show website structure horizontally or vertically. Menu control can be used as two types **static** and **dynamic**.

### STEP BY STEP Static Menu

1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** page
3. Add a new **web form** in solution explorer
4. Drag and drop **menu** control on the form from toolbar
5. Select View=**Static** as shown in figure below



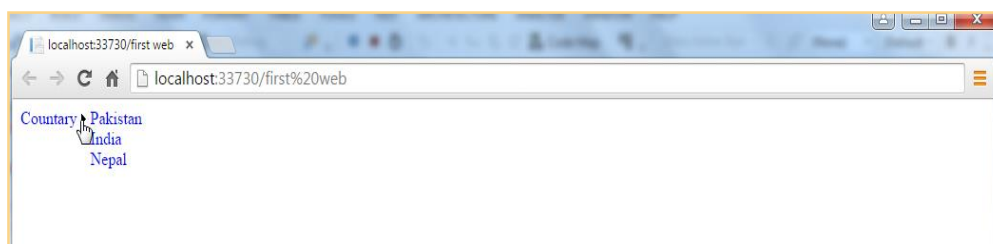
6. Now click Edit Menu Items...Add **parent** and **child** nodes as shown in figure below



## XML

XML stand for (EXtensible Markup Language) it is a hardware and software independent tool for carrying information

7. See the output in browser shown in figure below



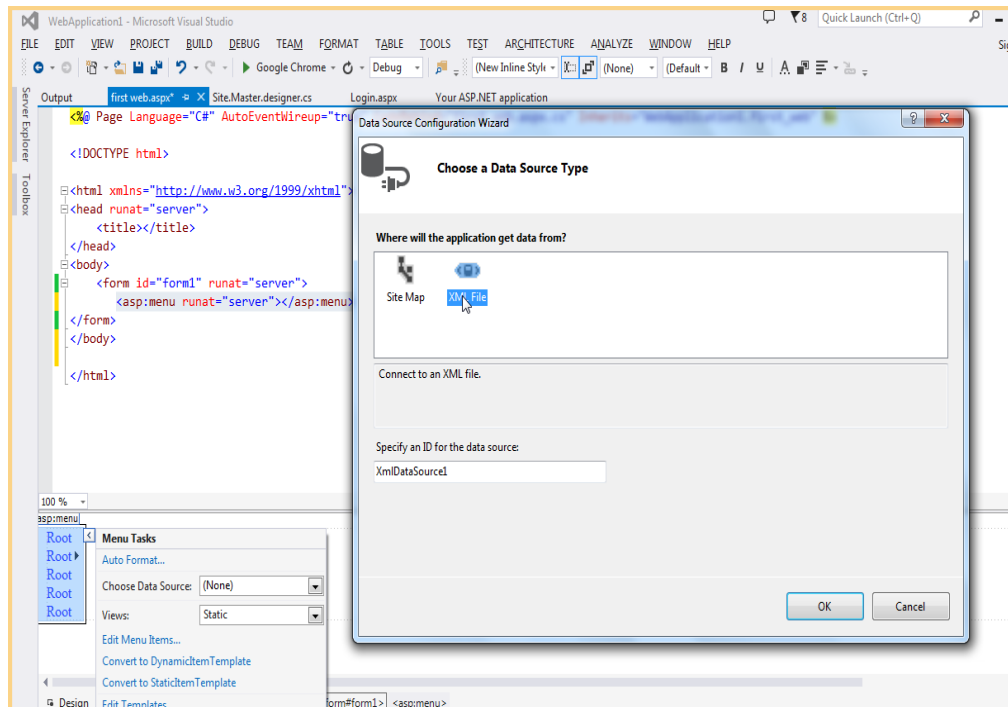
## STEP BY STEP

### Dynamic Menu

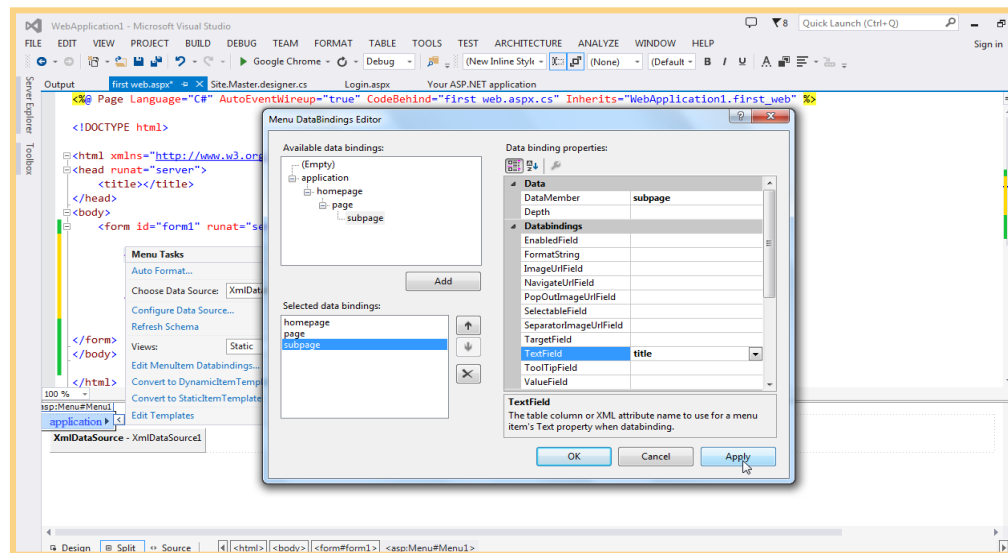
1. Open **WebApplication1** in visual Studio
2. Open **first web.aspx** page
3. Add a new **web form** in solution explorer
4. Drag and drop **menu** control on the form
5. Select **Datasource**
6. Select **XML File** in figure below and press **OK**

### Do you know!

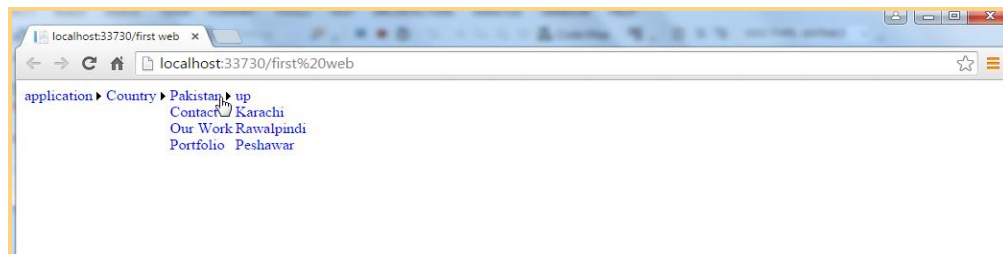
Database is an organize collection of related data which is store in organize and compact manner



- Now click **Edit Multiple Databinding** → Select each page one by one → and click **Add** button → set **TextField = title** from right side for each page → click **Apply** as shown in figure below



- Output in Browser

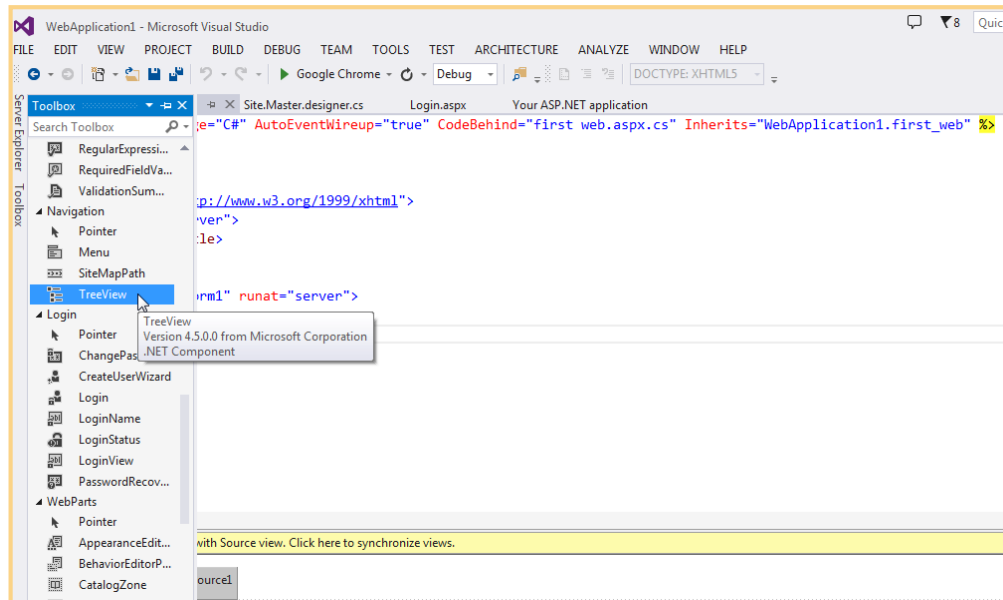


## 2. TreeView

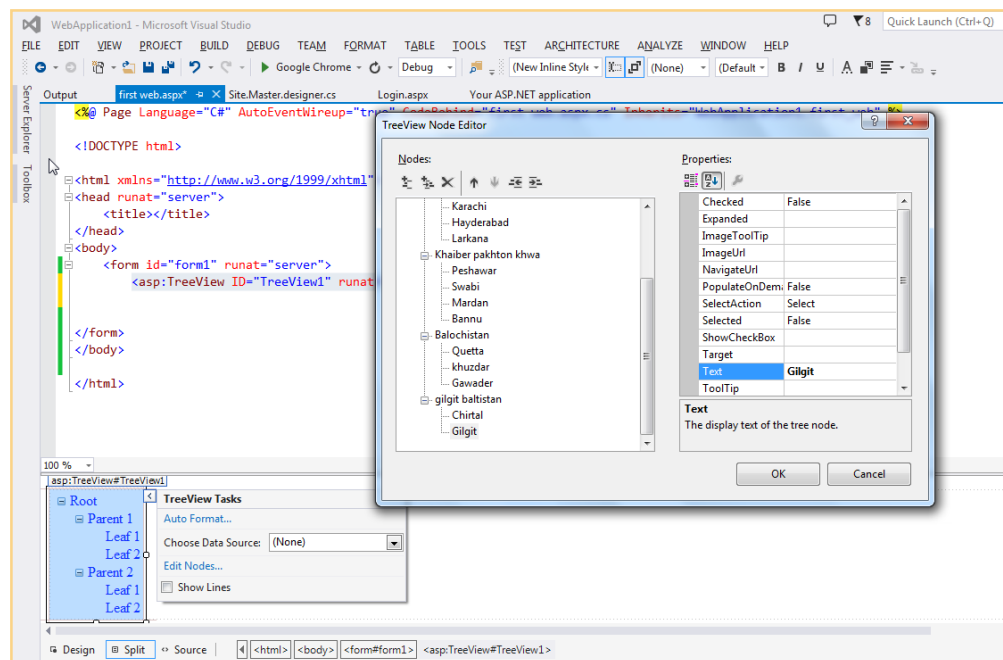
Tree View structure is use to display data logically in hierarchal manner. Developer can use it to display file and folder structure on the Web Pages as well as XML document, Web, **Sitemap** and **database** records. Items can be expanded and collapsed with the small plus and minus icons in front of items that contain child elements.

### STEP BY STEP TreeView

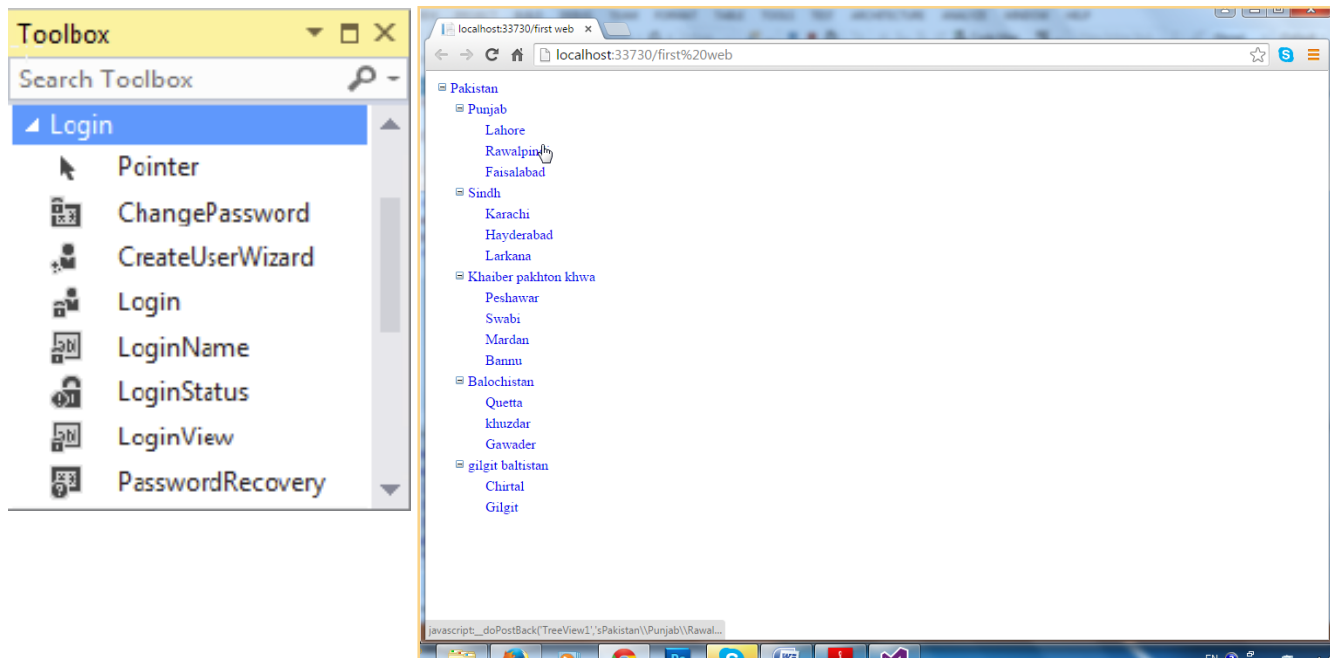
1. Open visual studio→**File**→**New**→**Website**→Select ASP.NET Empty Website →**OK**→**open** solution explorer→**Add New Web Form**→Drag and Drop **TreeView** control from Toolbox as shown in figure below



2. Now go to **properties** of TreeView control→Click **Nodes**→Add Root and child Node as shown in figure 1.2

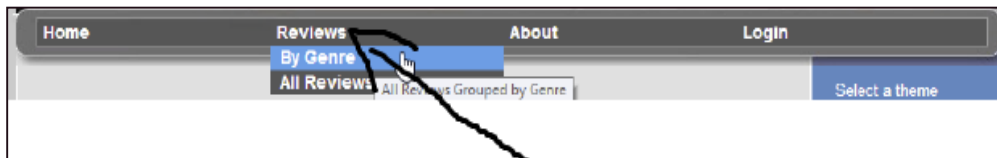


3. Now Run the Program(press F5) and see the output



## Learner's Activity

1. Create New website in Visual Studio titled Navpractice
2. Create 4 to 5 pages with subpages in above website
3. Apply css style with javascript effect on navigation
4. Apply treeview controls on submenu item and should look like in figure below



## 11. Implement Login Controls

### Introducing security

#### Implement Login Controls

Server Controls are Login, Login View, Login Name, Login Status and Password Recovery etc.

Although security can be quite a complex subject, it often revolves around three straightforward questions:

1. Who are you?
2. How can you prove that?
3. What are you allowed to do in the system?



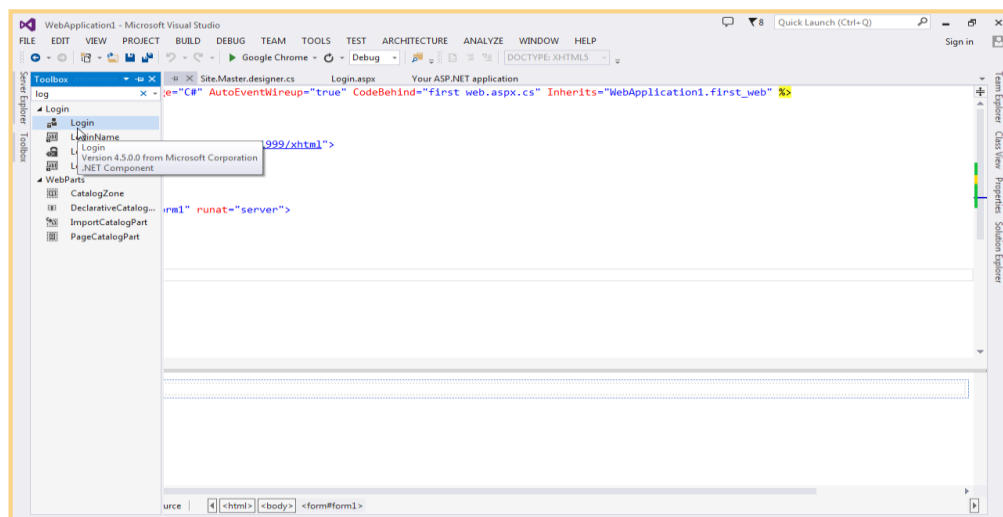
**Identity:** Who Are You? An identity is what makes you, *you*. The answer to what an identity is depends on the context it is used in. As a citizen of a country, your identity revolves around your person, your official name and birth date, and maybe even a social security number

ASP.NET login controls provides very easy way to implement complex login system without coding. It provides you to a ready-to-use interface and quires where the username and password from the user and offer the login button for login. It also provides login view, login name, and login status also password recovery is handy feature in login controls.

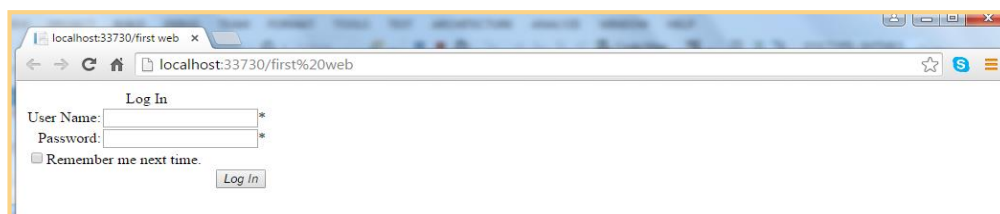
ASP.NET 4.5.1 ships with seven login controls, each serving a distinct purpose. **Figure 1.1** shows the Toolbox with the seven login controls (the pointer is present in all Toolbox categories and is not a login control).

## STEP BY STEP Login

1. Open visual studio→**File**→**New**→**Website**→Select ASP.NET Empty Website →**OK**→**open** solution explorer→**Add New Web Form**→Drag and Drop **Login** control from Toolbox in figure below



2. Now Run the Program(press F5) and see the output



## 2. LoginView

The **LoginView** is a handy control that display different data to different users. It enables to differentiate between anonymous and logged-in users, and even differentiate between users in different roles. The following table describes the two main templates and the special **RoleGroups** element.

Template	Description
AnonymousTemplate	The content in this template is shown to unauthenticated users only.
LoggedInTemplate	The content in this template is shown to logged-in users only. This template is mutually exclusive with the AnonymousTemplate. Only one of the two can be visible at any time.

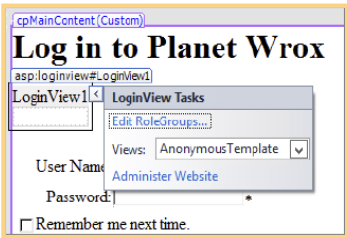
RoleGroups	This control can contain one or more RoleGroup elements that, in turn, contain a ContentTemplate element that defines the content for the specified role. The role or roles that are allowed to see the content are defined in the Roles attribute, which takes a comma-separated list of roles. The RoleGroups element is mutually exclusive with the LoggedInTemplate. That means that if a user is a member of one of the roles for the RoleGroup, the content in the LoggedInTemplate is not visible. Additionally, only content for the first RoleGroup that matches the user's roles is shown.
------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The login view control itself doesn't output any markup other than the content define in the Various child elements of the control, which means, can easily embed it between a pair of HTML Tags like <h1>and </h1> to create customized headings or list items. The following code snippet shows a login view control that defines content for three different users:

Anonymous visitors to the site, logged-in users, and users that have logged in *and* are members of the Manager's role:

```
<asp:LoginView ID="LoginView1" runat="server">
<AnonymousTemplate>
Hi there visitor. Would you be interested in signing up for an account?
</AnonymousTemplate>
<LoggedInTemplate>
Hi there visitor and welcome back to PlanetWrox.com.
</LoggedInTemplate>
<RoleGroups>
<asp:RoleGroup Roles="Managers">
<ContentTemplate>
Hi there manager. You can proceed to the Management section.
</ContentTemplate>
</asp:RoleGroup>
</RoleGroups>
</asp:LoginView>
```

3. LoginStatus



As demonstrated in the previous **Step By Step**, the **LoginStatus** control provides information about the current status of the user. It provides a Login link when the user is not authenticated and a **Logout** link when the user is already logged in. It controls the actual text being displayed by setting the **LoginText** and **LogoutText** properties.

Alternatively, it used to set the **LoginImageUrl** and **LogoutImageUrl** properties to display an image instead of text. When setting both an image and a text, the image is shown and the text is used as the alternative text for the image.

Finally, set the **LogoutAction** property to determine whether the current page refreshes if the user logs out, or whether the user is taken to another page after logging out. User determine this destination page by setting the **LogoutPageUrl**. Besides these properties, the control is capable of raising two events, **LoggingOut** and **LoggedOut**, which fire right before and after the user is logged out.

4. LoginName

**LoginName** is an extremely simple control. All it does is display the name of the logged-in user. To embed the user's name in some text, such as "You are logged in as lmar", use the **FormatString** property. If included {0} in this format string, it will be replaced with the user's name.

STEP BY STEP	LoginName
--------------	-----------

This method hides the Login control on the Login.aspx page when the user is already logged in and display a message instead. Additionally, add text to the footer of the page that displays the name of the user together with an option to log out again.

1. Open **Login.aspx** and switch to **Design View**. From the Login category of the Toolbox, drag a new **LoginView** control on top of the **Login** control so it's placed right above it in the page.
2. Open the Smart Tasks panel of the **LoginView** control and make sure that **AnonymousTemplate** is selected in the Views drop-down list, visible in Figure 1.1.
3. Any content put in the control is placed in the **AnonymousTemplate** area, because that is now the active template for the control in Design View.
4. Click the Login control once to select it and then press **Ctrl+X** to cut it to the clipboard. Click inside the small white rectangle that represents the **LoginView** to position the cursor in the control, and then press **Ctrl+V** to paste the Login control into **LoginView**.
5. Open the Smart Tasks panel of the **LoginView** again and switch to the **LoggedInTemplate** using the Views **drop-down** list. Click inside the small white rectangle of the control again and type the text "**You are already logged in**".
6. Switch to Markup View and look at the code. The Login control should be placed inside the AnonymousTemplate, and the text typed should be displayed within the LoggedInTemplate tags:

```
<asp:LoginView ID="LoginView1" runat="server">
 <AnonymousTemplate>
 <asp:Login ID="Login1" runat="server" CreateUserUrl="SignUp.aspx"
 DestinationPageUrl="~/Default.aspx"
 CreateUserText="Sign Up for a New Account at Planet Wrox">
 </asp:Login>
</AnonymousTemplate>
<LoggedInTemplate>
 You are already logged in.
</LoggedInTemplate>
</asp:LoginView>
```

7. Save and close the page now.
8. Open the master page Frontend.master in Markup View and locate the <footer> element at the bottom of the page. Remove the text Footer Goes Here and replace it with a new LoginName control by dragging it from the Toolbox into the <footer> element. Set its FormatString property to Logged in as {0} by typing in the code directly: <asp:LoginName ID="LoginName1" runat="server" FormatString="Logged in as {0}" />
9. From the Toolbox, drag a new LoginView control and drop it below the LoginName control, but still in the <footer> element. Switch to Design View, and on the Smart Tasks panel of the LoginView, choose LoggedInTemplate from the Views drop-down list. Then in the white rectangle for the active LoggedInTemplate, drag and drop a new LoginStatus control.
10. Switch to Markup View again and wrap the code for the LoginStatus in a pair of parentheses. Now end up with the following code:



Figure 1.2

```
<footer>
```

```
<asp:LoginName ID="LoginName1" runat="server" FormatString="Logged in as {0}" />
<asp:LoginView ID="LoginView1" runat="server">
 <LoggedInTemplate>
 (<asp:LoginStatus ID="LoginStatus1" runat="server" />)
 </LoggedInTemplate>
</asp:LoginView>
</footer>
```

11. Open the Web.config file and modify the <authentication> element so it points the loginUrl to ~/Login/ like this:

```
<authentication mode="Forms">
 <forms loginUrl="~/Login"/>
</authentication>
```

12. Save all changes and request Login.aspx in browser. Log in with the account and password created in a previous exercise (log out first by clicking the Logout link if needed). If no need to recall the username and password, simply click the Sign Up link to create a new account. Note that as soon as logged in, the footer displays the text visible in **Figure 1.2**.
13. Click the Login item in the Menu or TreeView to go to the Login page. Instead of the Login control, a message appears indicating that "You are already logged in".
14. Click the Logout link in the footer at the bottom of the page. The page refreshes and displays the Login control again. Additionally, the text from the footer has now disappeared.

## PasswordRecovery

The PasswordRecovery control enables users to retrieve their existing passwords (when the system supports it) or to get a new auto-generated password. In both cases, the password is sent to the e-mail address that the user entered when signing up for an account.

### PasswordRecovery Properties:

#### Text properties:

- GeneralFailureText (shown when the password could not be recovered)
- SuccessText, that enable to set the text that is displayed by the control.
- ButtonType, ButtonText, and ButtonImageUrl, which enables to change the look and behavior of the various action buttons of the control.

SuccessPageUrl are set to a page in site to send the user to another page when password recovery succeeds.

As with the CreateUserWizard, the PasswordRecovery control also has a MailDefinition element that can point to a file that user want to send as the mail body. Same placeholders can be used for the username and password to customize the message. If user leave out the MailDefinition, the control uses a default mail body.

## ChangePassword

The **ChangePassword** control enables existing and logged-in users to change their passwords. It has a host of properties to change things like text, error messages, and buttons, similar to the **CreateUserWizard** and **PasswordRecovery** controls. It also has a **MailDefinition** element that enables to send a confirmation of the new password to the user's e-mail address.

### STEP BY STEP PasswordRecovery and ChangePassword

This **STEP BY STEP** add **PasswordRecovery** and **ChangePassword** controls to the website to enable users to change and recover their passwords. Because changing a password makes sense only for logged-in users, add the **ChangePassword** control to its own page. In the next chapter, protect this page so only authenticated users can access it.

1. Open up **Login.aspx** in Markup View and locate the closing **</asp:Login>** tag inside the **<AnonymousTemplate>**. Right after it, type two **<br />** elements (use the br code snippet and press Tab to complete the element) to create some room below the Login control.
2. Drag a **PasswordRecovery** control from the Toolbox into the code editor, right after the two **<br />** elements added in step 1.
3. Between the opening and closing tags of the PasswordRecovery control, add **<MailDefinition>** element and then set the Subject of the e-mail to **Your New Password for website1**. Code should now look like this:

```
</asp:Login>

<asp:PasswordRecovery ID="PasswordRecovery1" runat="server">
 <MailDefinition Subject="Your New Password for PlanetWrox.com"></MailDefinition>
</asp:PasswordRecovery>
```

4. Save changes and close the file.
5. In the root of site, create a new Web Form based on custom template and call it **MyProfile.aspx**. Set the Title of the page to **My Profile**.
6. Make sure Markup View selected and in the **cpMainContent** content placeholder, create an **<h1>** element (type h1 followed by the Tab key) with its contents set to **My Profile**. Right below the heading, type some text that explains that the My Profile page is used for things like changing passwords. Wrap the text in a pair of **<p>** tags to denote a paragraph.
7. Drag a **ChangePassword** control from the Toolbox and drop it after the closing **</p>** tag. End up with something like this:
- 8.

```
<asp:Content ID="Content2" ContentPlaceHolderID="cpMainContent" runat="Server">
 <h1>My Profile</h1>
 <p>The My Profile page allows you to make changes to your personal profile.
 For now, all you can do is change your password below.</p>
 <asp:ChangePassword ID="ChangePassword1" runat="server"></asp:ChangePassword>
```

9. Open the Web.sitemap file from the Solution Explorer and add a new element in the about section. Let the URL point to **~/MyProfile** and set the title and description to **My Profile**. End up with this code:

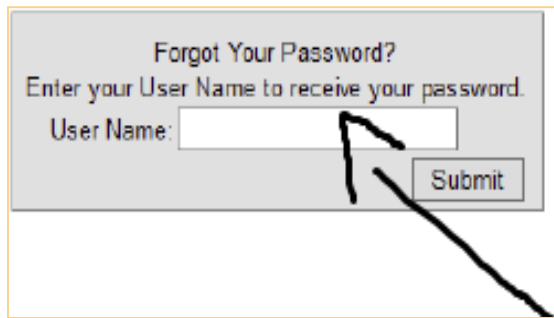


Figure 1.1

```
<siteMapNode url="~/About/Default" title="About"
description="About this site">
<siteMapNode url="~/About/Contact" title="Contact Us"
description="Contact Us" />
<siteMapNode url="~/About/AboutUs" title="About Us"
description="About Us" />
<siteMapNode url="~/MyProfile" title="My Profile"
description="My Profile" />
</siteMapNode>
```

10. Save all changes and close all open files. Right-click Login.aspx in the Solution Explorer and choose View in Browser. Below the Login control, now see the **PasswordRecovery** control, visible in **Figure 1.1**

Note that if already logged in, user need to click the Logout link first.

11. Enter username in the **PasswordRecovery** control and click the Submit button. User should get an e-mail message with new, auto-generated password.
12. Use this new password to log in to the site. When user logged in, choose About => My Profile from the Menu or the **TreeView**. The **ChangePassword** control visible in **Figure 1.2** appears.

Figure 1.2

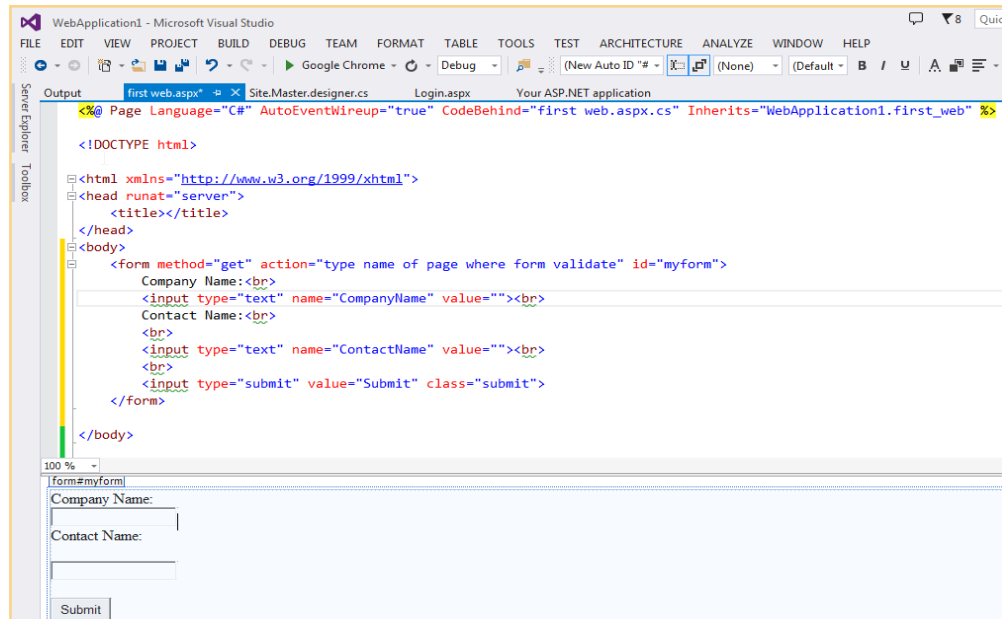
13. Enter the auto-generated password that was sent by **e-mail**, type a new password that is easier to remember, and then retype the same password. Finally, **click** Change Password. From now on, user can log in to the site using new password.

## 12. Web Form, Master Page, Web User Control, HTML Page and Style Sheet

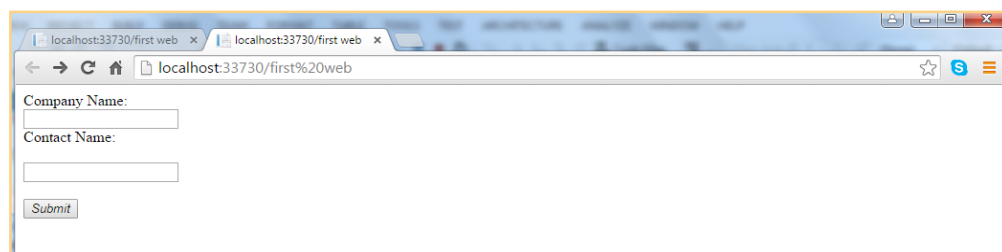
### 1. Web Form

Web form is used to take the input from users in frontend and we can store it in database as well as for validation and checking variable values from one page to another. In asp.net all server controls must appear within a **<form>** tag and the form tag must contain **runat="server"** attribute. The code look like this after creation

```
<form name="name of form" method="post or Get" action="page.aspx" id="type id here">
...some code
</form>
```



Now Run the Program (press F5) and see the output



### 2. Master Page:

Master page allows to create consistent design of website/web application. It provide template for other pages with shared functionality and layout. Master page define **placeholder** for the content which can be easily overridden in every page. The output consist of master page and child pages contents. Every website or Web Application consist of some area which is same in every pages like header, navigation, footer, and sidebar so master gives the advantage to not type same code again and again.

## STEP BY STEP Creating Master Pages

1. Open the **WebApplication1** project in Visual Studio if it is not open already.



2. Create a folder called **MasterPages** to hold master pages and then added a single master page to that folder. To do this, create the **MasterPages** folder in the root of the site, right-click the new folder, choose Add -> **Add New Item**, and select the Master Page item. Make sure that the master page uses Code Behind and that it is using the programming language selected for the site. Name the master page **Frontend.master**. Finally, click **Add**.
3. Add the following highlighted code between the **<form>** tags of the master page, replacing the **<div>** tags and the **ContentPlaceHolder** that VS added when created the master page. Note that this is almost the same code added in previous example **<asp:ContentPlaceHolder>** element and the **<a>** element within the Header **<div>**. The **<a>** element takes the user back to the homepage, and will be styled later.

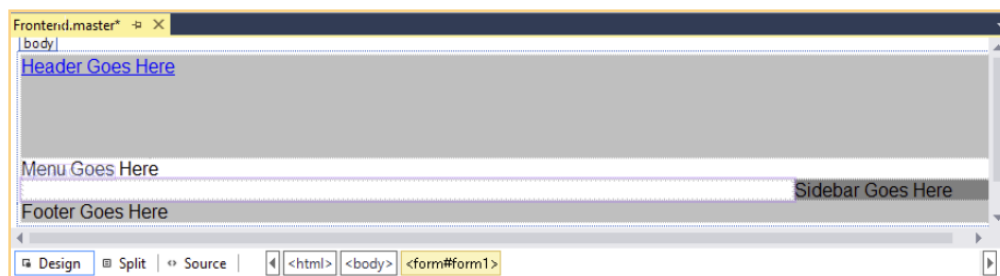
```
<form id="form1" runat="server">
 <div id="PageWrapper">
 <header>Header Goes Here</header>
 <nav>Menu Goes Here</nav>
 <section id="MainContent">
 <asp:ContentPlaceHolder ID="cpMainContent" runat="server">
 </asp:ContentPlaceHolder>
 </section>
 <aside id="Sidebar">Sidebar Goes Here</aside>
 <footer>Footer Goes Here</footer>
 </div>
</form>
```

Make sure to have the ContentPlaceHolder within the MainContent **<section>** tags. Drag one from the Toolbox onto the page or enter the code directly, using IntelliSense's helpful hints. In both cases give the control an ID of **cpMainContent**.

4. Next, switch the **master page** into Design View and then drag **Styles.css** from the Styles folder in the Solution Explorer onto the master page. As soon as drop the file, VS updates the Design View and shows the layout for the site that created. If the design doesn't change, switch to Markup View and ensure there's a **<link>** tag in the head of the page pointing to **CSS** file:

```
<asp:ContentPlaceHolder ID="head" runat="server">
</asp:ContentPlaceHolder>
<link href="../../Styles/Styles.css" rel="stylesheet" type="text/css" />
</head>
```

The page should now look like Figure below in Design View.



Note the area with the purple border around it between the menu and the footer region in Design View. This is the **ContentPlaceHolder** control that is used by the content pages.

5. Save and close the master page now.



## Creating Content Pages

A master page is useless without a content page that uses it. Generally, there are only a few master pages, whereas many content pages are in site. To base a content page on a master page, check the **Select Master Page** option at the bottom right of the **Add New Item** dialog box when adding a new **Web Form** to site. Alternatively, set the **MasterPageFile** attribute on the page directly in the Markup View of the page.

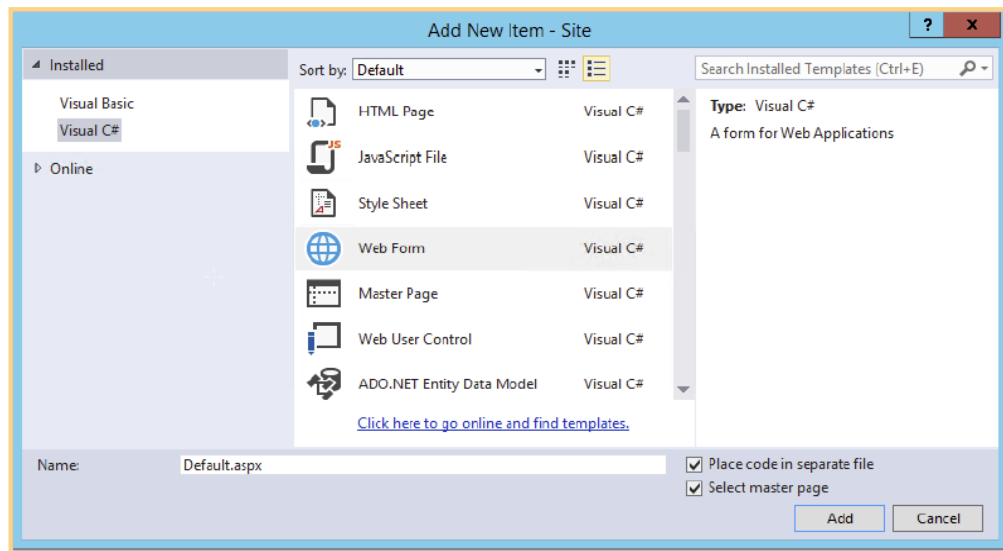
@ **Page directive** shown earlier in this chapter when master and content pages were introduced. Content pages can only directly contain Content controls that each map to a ContentPlaceholder control in the master page. These content controls in turn can contain standard markup like HTML and server control declarations.

Because the entire markup in a content page needs to be wrapped by <asp:Content> tags, it's not easy to turn an existing ASPX page into a content page. Usually the easiest thing to do is copy the content that want to keep to the clipboard, delete the old page, and then add a new page based on the master page to the website. Once the page is added, paste the markup within the <asp:Content> tags.

### STEP BY STEP Adding a Content Page

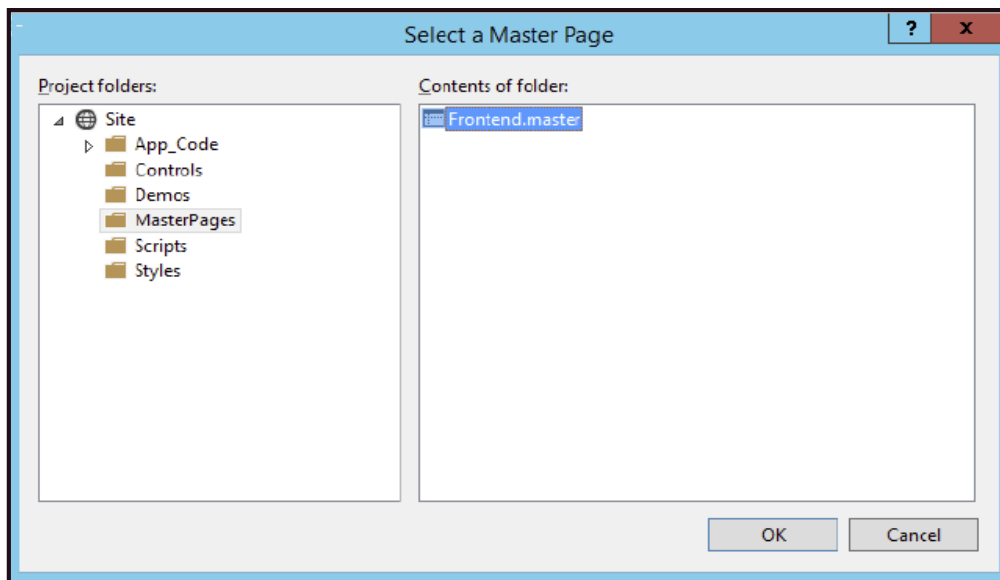
In this **STEP BY STEP** see how to add a content page to the site that is based on the master page created earlier. Once the page is added, add content to the <asp:Content> regions.

In previous exercises added standard ASPX pages to project, which should now be “upgraded” to make use of the new master page. If want to keep the welcome text added to Default.aspx earlier, copy all the HTML between the MainContent <section> tags to the clipboard <h1> and the two <p> elements that created earlier) and then delete the Default.aspx page from the Solution Explorer. Next, right-click the website in the Solution Explorer and choose Add -> Add New Item. Select the correct programming language, click Web Form, name the page Default.aspx, and then, at the bottom of the dialog box, select the check boxes for Place Code in Separate File and Select Master Page, as shown in Figure below.



Finally, click the Add button.

2. In the Select a Master Page dialog box (see Figure below), click the **MasterPages** folder in the lefthand pane, and then in the area at the right, click Frontend.master.

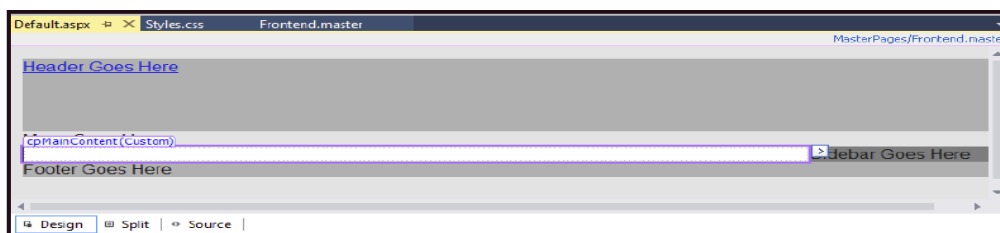


Click OK to add the page to website.

Instead of getting a full page with HTML as got with standard ASPX pages, now only get two **<asp:Content>** placeholders as shown in this VB.NET example:

```
<%@ Page Title="" Language="VB" MasterPageFile="~/MasterPages/Frontend.master"
AutoEventWireup="false" CodeFile="Default.aspx.vb" Inherits="_Default" %>
<asp:Content ID="Content1" ContentPlaceHolderID="head" runat="Server">
</asp:Content>
<asp:Content ID="Content2" ContentPlaceHolderID="cpMainContent" runat="Server">
</asp:Content>
```

- Switch to Design View and note that everything is grayed out and read-only, except for the **<asp:Content>** region for **cpMainContent**. Figure 6-5 shows how the page should look. Also note that VS conveniently lists the master page that this page is based on in the top-right corner of Design View, visible in Figure 1.3. Clicking the name opens the master page in the editor.
- If still have the old markup from the **Default.aspx** on the clipboard, click once inside the **cpMainContent** placeholder and press **Ctrl+V**. (Note: this can be done both in Design View and in Markup View). This adds the markup to the page, right between the **<asp:Content>** tags.
- Save changes by pressing **Ctrl+S** and press **Ctrl+F5** to open the page in browser. The browser should display the page very closely to what saw in Design View (see Figure below).



- Now take a look at the HTML for the page in the browser. Do this by right-clicking the page and choosing View Source or View Page Source. Note that the source of the final page in the browser is a combination of the source of the master page and the content page:

```
<div id="PageWrapper">
<header>Header Goes Here</header>
```

```

<nav>Menu Goes Here</nav>
<section id="MainContent">
h1>Hi there visitor and welcome to Planet Wrox
<p class="Introduction">
We're glad you're paying a visit to
www.PlanetWrox.com, the coolest music community site on the Internet.
</p>

```

The first four lines come from the master page and the bolded lines of HTML code come from the content page.

- Switch back to **VS** and create a new page called **Login.aspx** in the root of the site based on the **master page**. Notice how **VS** remembered last settings with regard to the master page and Code Behind (make sure both are checked in case unchecked them earlier). Switch to Markup View and create an **<h1>** element inside the **cpMainContent** placeholder with the text **Log in to our site**.
- Go back to **Default.aspx** and switch to Design View. Beneath the welcome text with the header and two **<p>** elements, create a new paragraph (press Enter in Design View) and type some text (for example, **can log in here**). Notice how this new paragraph has a class attribute called **Introduction** because **VS** applies the previous class to new paragraphs automatically. Remove this class using the Clear Styles option of the Apply Styles window, or manually remove it from the code in Markup View.
- Highlight the words "log in" in Design View and choose Format -> Convert to Hyperlink from the main menu. In the dialog box that follows, click the Browse button and select the **Login.aspx** page that just created. Click **OK** twice.
- Save all changes and press **Ctrl+F5** again to view **Default.aspx** in the browser. Then click the link created in the preceding step. It should take to **Login.aspx**. Note that the general layout, like the header and the sidebar, is maintained. The only thing that changes when go from page to page is the content in the main content area.

### Web User Controls

User control is separate reusable part of a page we can put a piece of page in a user control and then can reuse in different location in website. It just like a regular page with an optional code behind file. User control can be included on multiple pages while a page can't.

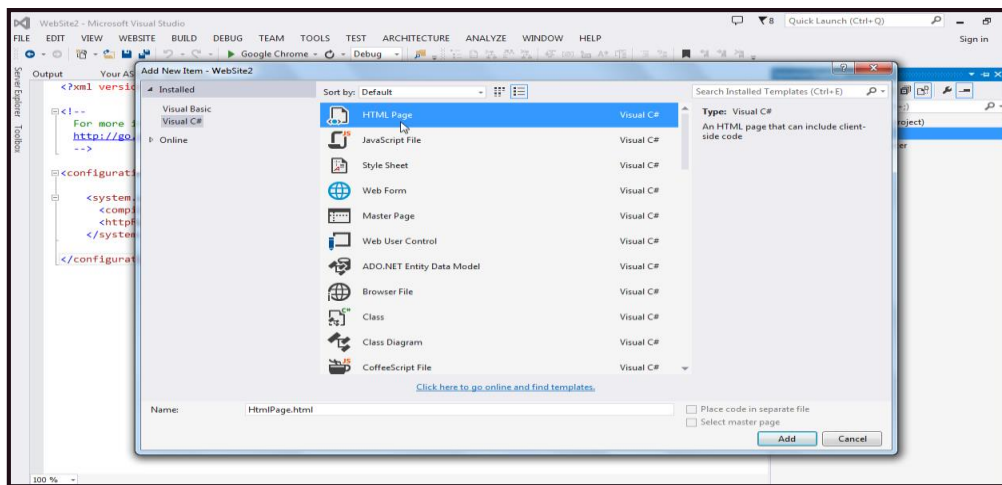
### HTML page and Style Sheet

In asp.net is complete framework to develop websites and web pages with html, CSS, JavaScript and server scripting. Web pages are the simplest programming model for developing asp.net web pages.

#### STEP BY STEP

#### HTML Page

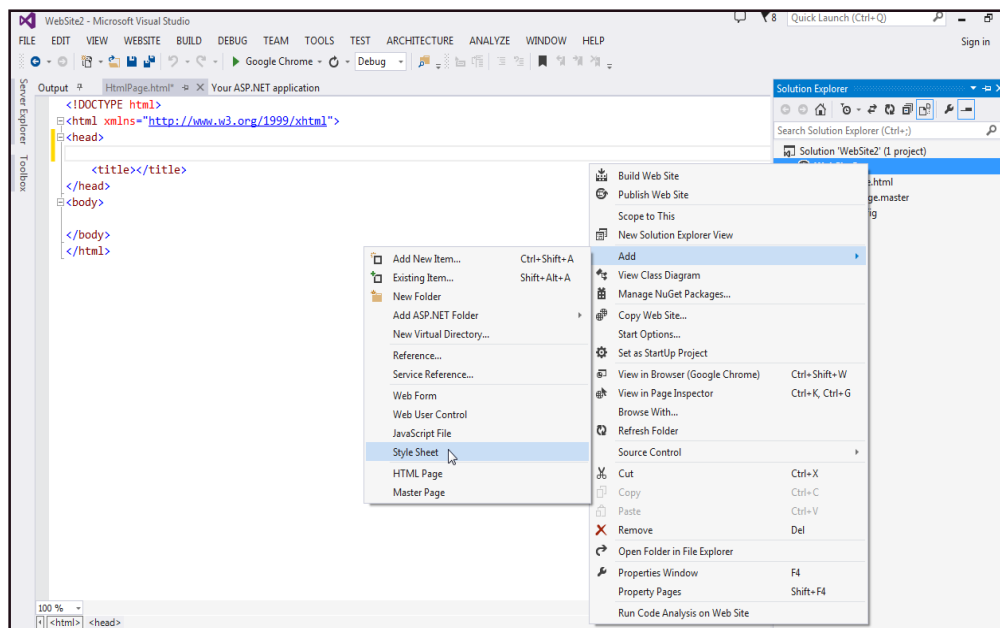
- Open **Solution Explorer** and right click on website name
- Click on **Add** button → on popup window click on HTML page and press **OK**



### STEP BY STEP

### Adding CSS

1. Open **Solution Explorer** and right click on website name  
Click on **Add** button → Click **style sheet**



## Learning Unit 2: Develop a Website using PHP

### Overview

In this module you will learn the definition and detail about php also how to install the php editor such as Macromedia Dreamweaver to computer. You will also learn the communication detail of the php environment and syntax. You will be also learning how to recognize the variable, apply the php constant, operator types, decision making in php, php loop type, php GET and POST method also how to upload php files and php function.

You will also learn that how to implement php cookies and session, send php Email, upload php file, demonstrate php coding standards, php pre-define variable, php Regular expression etc. You will also learn how to handle php error, php built-in function as well as how to install and configure mysql database with php website also how to create dynamic web pages in php.

#### PHP

PHP stands for Hypertext Preprocessor. It is a server-side scripting language.

### 1. Introduction of PHP

PHP is a versatile **server-side programming language** that works hand-in-hand with front-end Web languages such as **HTML** and **JavaScript**. PHP can be used to create all types of dynamic web interfaces, and because of its **open-source** robustness, has become one of the most widely used programming languages for the Internet.

PHP started out as a small open source project that evolved as more and more people found out how useful it was. **RasmusLerdorf** unleashed the first version of PHP way back in **1994**.

- PHP is a recursive acronym for "**PHP: Hypertext Preprocessor**".
- PHP is a server side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire e-commerce sites.
- It is integrated with a number of popular databases, including MySQL, PostgreSQL, Oracle, Sybase, Informix, and Microsoft SQL Server.
- PHP is pleasingly zippy in its execution, especially when compiled as an Apache module on the UNIX side. The MySQL server, once started, executes even very complex queries with huge result sets in record-setting time.
- PHP supports a large number of major protocols such as POP3, IMAP, and LDAP. PHP4 added support for Java and distributed object architectures (COM and CORBA), making n-tier development a possibility for the first time.
- PHP is forgiving: PHP language tries to be as forgiving as possible.
- PHP Syntax is C-Like.

#### Do you know!

##### XAMPP?

Everything you need to set up a web server – server application (Apache), database (MySQL), and scripting language (PHP) – is included in a simple extractable file called a XAMPP.

### Common Uses of PHP

The PHP has following new features:

- PHP performs system functions, i.e. from files on a system it can create, open, read, write, and close them.
- PHP can handle forms, i.e. gather data from files, save data to a file, email, send data, return data to the user.
- It add, delete, modify elements within database using PHP.
- Access cookies variables and set cookies.

- Using PHP, restrict users to access some pages of website.
- It can encrypt data.

### Characteristics of PHP

Five important characteristics make PHP's practical nature possible:

- Simplicity
- Efficiency
- Security
- Flexibility
- Familiarity

### PHP - Environment Setup

#### Procedure for installing XAMPP

- **System Requirements:**
  - Operating systems
    - Windows 7 with service pack 1 (x86 and x64)
    - Windows 8 or higher (x86 and x64)
  - **Hardware requirements**
    - Minimum processor 1.6 Giga hz
    - Minimum 1 GB Ram
    - 4 GB Disk space

## 2. Installing Adobe Dreamweaver as a PHP Editor

We already cover installation Dreamweaver in module 3

## 3. Downloading and Configuring PHP with XAMPP Server

To begin working with PHP access to either one of the following is necessary:

In order to develop and run PHP Web pages three vital components need to be installed on computer system.

1. **Web Server** - PHP will work with virtually all Web Server software, including Microsoft's Internet Information Server (IIS) but then most often used is freely available Apache Server. Download Apache for free here: <http://httpd.apache.org/download.cgi>
2. **Database** - PHP will work with virtually all database software, including Oracle and Sybase but most commonly used is freely available MySQL database. Download MySQL for free here: <http://www.mysql.com/downloads/index.html>

3. **PHP Parser** - In order to process PHP script instructions a parser must be installed to generate HTML output that can be sent to the Web Browser. This tutorial will guide how to install PHP parser on computer.

## INTRODUCTION OF XAMPP

- **What is XAMPP Server?**

**XAMPP** stands for Cross-Platform (X), Apache (A), MySQL (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing purposes. Everything need to set up a web server – server application (Apache), database (MySQL), and scripting language (PHP) – is included in a single and simple extractable file.

- **Why use XAMPP Server?**

**XAMPP is also cross-platform**, which means it works equally well on Linux, Mac and Windows. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server is extremely easy as well. Web development using XAMPP is especially for beginners to learn and use efficiently.

## Details of XAMPP Server?

**XAMPP has following primary components.**

These are:

1. **X:** For X-OS. **X-OS** means it can be used for any operating systems. This is an open source platform. XAMPP for major operating system including **windows, mac, Linux**.
2. **Apache:** Apache is the actual web server application that processes and delivers web content to a computer. Apache is the most popular web server online, powering nearly 54% of all websites.
3. **MySQL:** Every web application, howsoever simple or complicated, requires a database for storing collected data. MySQL, which is open source, is the world's most popular database management system. It powers everything from hobbyist websites to professional platforms like WordPress.
4. **PHP:** PHP stands for Hypertext Preprocessor. It is a server-side scripting language that powers some of the most popular websites in the world, including WordPress and Facebook. It is open source, relatively easy to learn, and works perfectly with MySQL, making it a popular choice for web developers.
5. **Perl:** Perl is a high-level, dynamic programming language used extensively in network programming, system admin, etc. Although less popular for web development purposes, Perl has a lot of niche applications.

**XAMPP** comes with additional features including support of **perl, filezilla, mercury** mail and some scripts.

Different versions of XAMPP may have additional components such as phpMyAdmin, OpenSSL, etc. to create full-fledged web servers.

## Why PHP

- PHP runs on various platforms (Windows, Linux, UNIX, Mac OS X, etc.)
- PHP is compatible with almost all servers used today (Apache, IIS, etc.)

- PHP supports a wide range of databases
- PHP is free. Download it from the official PHP resource: [www.php.net](http://www.php.net)
- PHP is easy to learn and runs efficiently on the server side

### 4. Details of PHP Environment and Syntax

Since PHP is an open source, so it does not has any proper environment to work. To develop php programs we use either notepad or any other IDE for web like, Dreamweaver, notepad++ etc.

#### STEP BY STEP Writing PHP Program

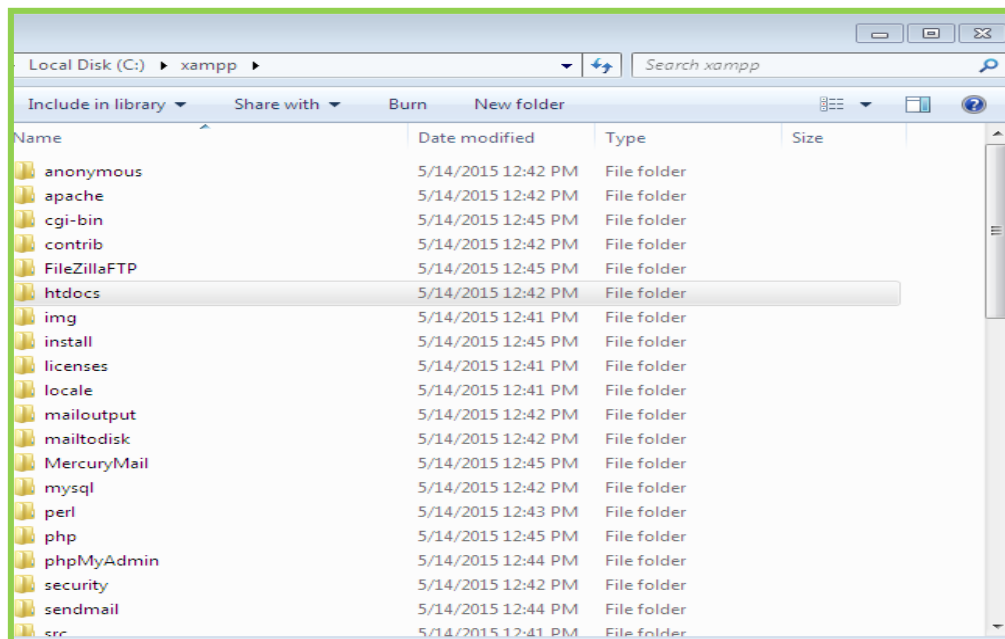
**Step 1:** Click **Start** then **All Programs** then click on **XAMPP** then **XAMPP CONTROL PANEL**

**Step 2:** In XAMPP server we have a folder named “**htdocs**”, which contains all PHP web pages.

“**htdocs**” can be opened by clicking on “Explorer” in XAMPP control panel.



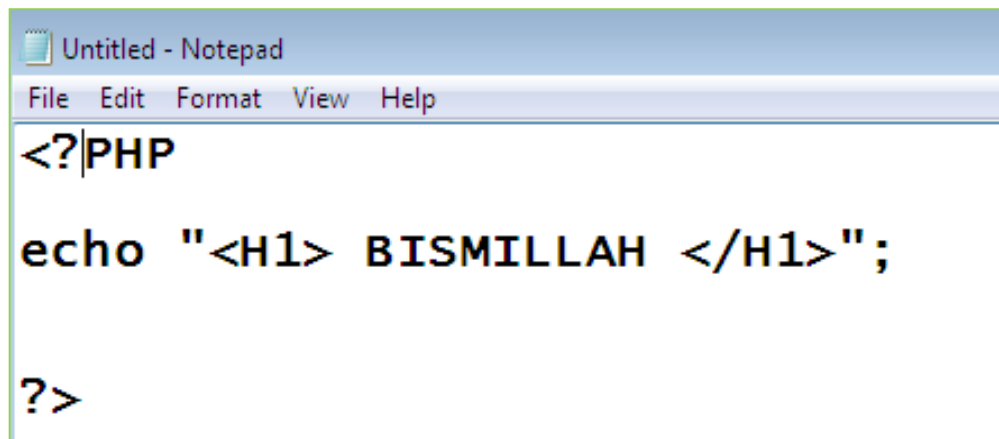
The explorer shows all XAMPP folders, see “**htdocs**” folder



**Step 3:** save .php files in htdocs folder.

**Step 4:** open Notepad, and type first PHP Program.



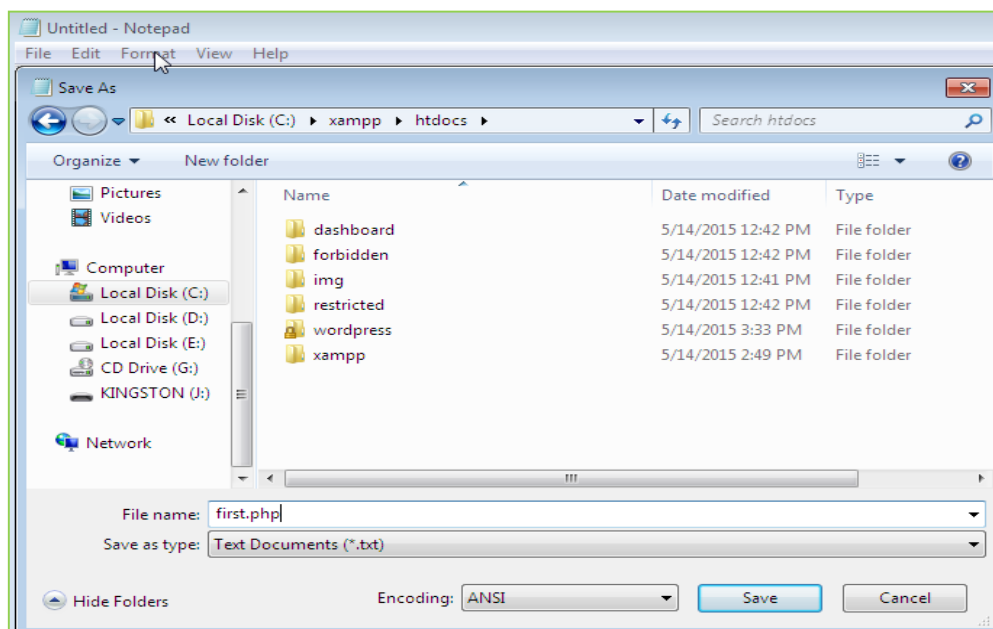


```
<?PHP

echo "<H1> BISMILLAH </H1>";

?>
```

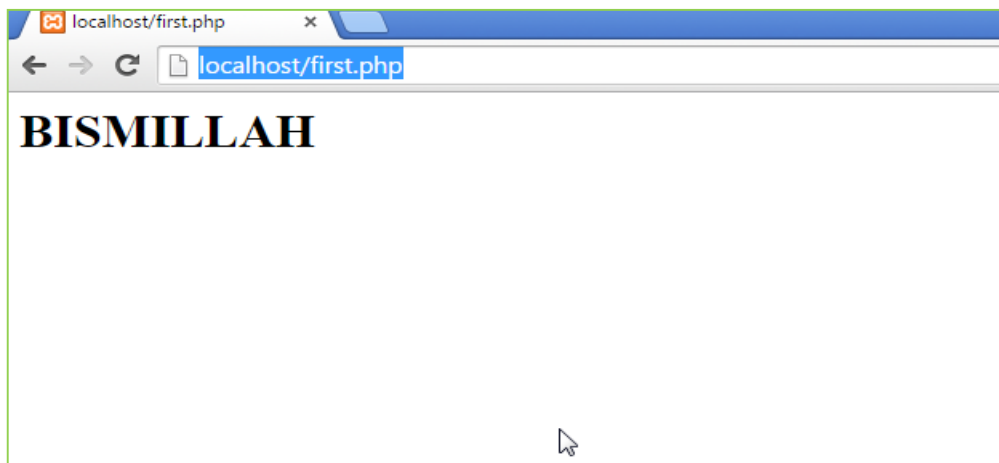
**Step 5:** Now save this file in “htdocs” folder with .php extension.



### Remember

If using the MAMP default ports, use `http://localhost:8888/` for the URL. SPECIFYING A WORKING FOLDER

**Step 6:** now open web browser and in address bar type “localhost/first.php”, and see the result of first PHP code.



#### 4.1. Defining a PHP site in Adobe Dreamweaver CS5

Because PHP files need to be processed by a web server, there is need to tell Dreamweaver where the testing server is located. Also need to tell Dreamweaver the correct URL to use when testing files. The following instructions assume having established a local testing environment on computer as described in the preceding sections.

##### Identifying the Server Document Root

The document root is the top-level folder where the server looks for web pages. Its location depends on where and how installed PHP testing environment.

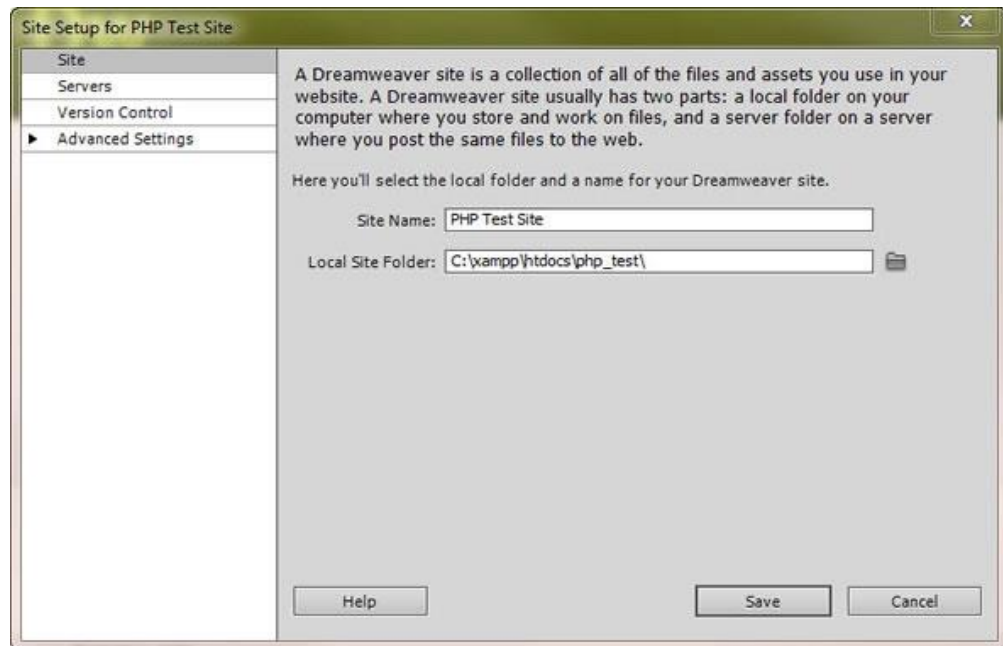
Here are the default locations for **Common PHP Setups**:

- XAMPP: C:\xampp\htdocs
- IIS: C:\inetpub\wwwroot
- WampServer: C:\wamp\www
- MAMP: /Applications/MAMP/htdocs

The URL for the document root is **http://localhost/**.

##### To Specify a Working Folder:

- In Dreamweaver, **select Site > New Site**.
- In the Site Name text box, type the name of site, for example, **PHP Test Site**. This name identifies the project in Dreamweaver.
- Click the folder icon next to the Local Site Folder text box and browse to testing server's document root.
- Create a subfolder of the document root called **php\_test**, and select it.
- Click Open and then Select.
- Verify the settings in the Site Setup dialog box (**see Figure 4.1**) and **click Save**. (The location of the Local Site Folder will depend on how it installed PHP).



### Verify the Basic Settings for the PHP Test Site.

That's all need to do to define a site in Dreamweaver.

### Specifying a Testing Server for Dreamweaver

To specify a testing server:

1. Select Servers in the column on the left of the Site Setup dialog box.
2. Click the plus (+) button at the bottom left of the dialog box to add a new server.
3. In the dialog box that opens, make sure that the Basic button is selected, and select Local/Network from the Connect Using list.
4. Give the server a name, such as **Local Testing**.
5. Set the Server Folder to the folder specified as the Local Site Folder; in this example, `php_test` inside server's document root.
6. For the Web URL, type the URL would use to get to the `php_test` folder inside the server's document root. Since the document root is the equivalent of <http://localhost/>, need to type [http://localhost/php\\_test/](http://localhost/php_test/) in the Web URL text field (**see Figure below**)

**Remember**

The folder name should not include any spaces or special characters. You should never use spaces or special characters in folder or file names for a website, because they cause problems on most PHP servers

The screenshot shows a dialog box with two tabs: 'Basic' and 'Advanced'. The 'Basic' tab is selected. It contains the following fields:

- Server Name: Local Testing
- Connect using: Local/Network (dropdown menu)
- Server Folder: C:\xampp\htdocs\php\_test (with a folder icon)
- Web URL: http://localhost/php\_test/

At the bottom, there are three buttons: 'Help', 'Save', and 'Cancel'.

The basic settings for the testing server include the Server Folder and the Web URL.

**Note:** If using the MAMP default ports, the Web URL should be [http://localhost:8888/php\\_test/](http://localhost:8888/php_test/).

7. Select the Advanced button at the top of the dialog box. This reveals the options for both a remote server and a testing server.
8. For the Server Model (in the Testing Server section) select PHP MySQL (see Figure below).

**Remember**

PHP statements end with a semicolon (;).

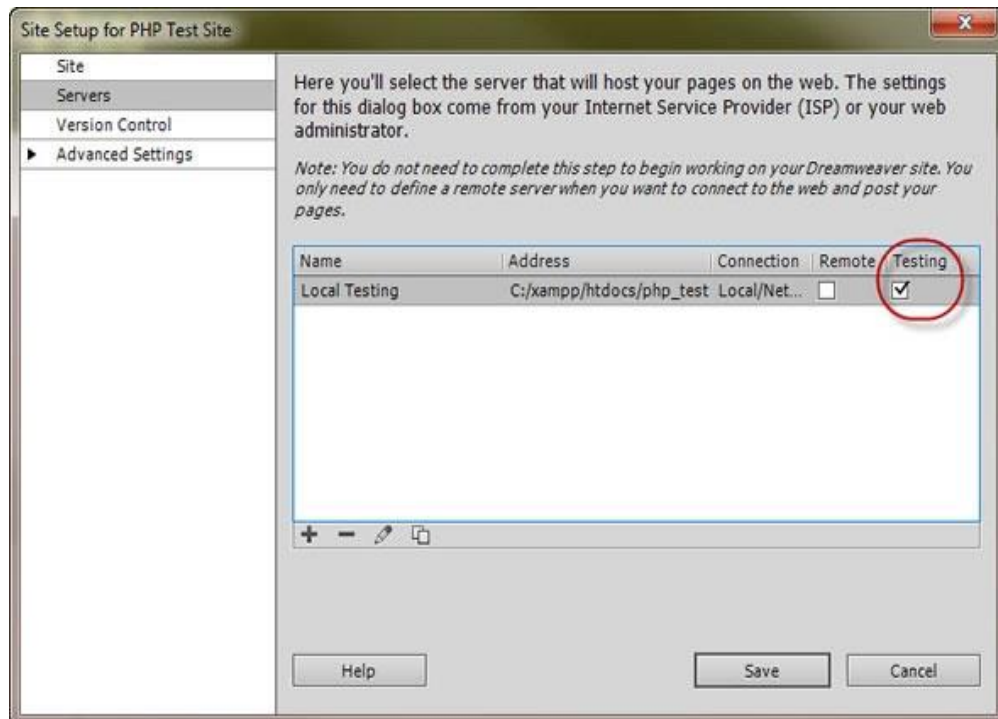
The screenshot shows the 'Advanced' tab of the same dialog box. It is divided into two sections:

- Remote Server:**
  - ☒ Maintain synchronization information
  - ☐ Automatically upload files to server on Save
  - ☐ Enable file check-out
  - ☒ Check out files when opening
  - Check-out Name: (empty text field)
  - Email Address: (empty text field)
- Testing Server:**
  - Server Model: PHP MySQL (dropdown menu, highlighted with a red oval)

At the bottom, there are three buttons: 'Help', 'Save', and 'Cancel'.

Set the Server Model for the testing server to PHP MySQL.

9. Click Save.
10. This is a testing server, so make sure the Testing check box is selected in the Site Setup dialog box. If necessary, deselect the Remote check box (**see Figure below**).



Make sure the Testing check box is selected.

11. Click Save to save the changes being made.

## Making First PHP Program Using Dreamweaver

### PHP Syntax

A PHP script is executed on the server, and the plain HTML result is sent back to the browser.

### Basic PHP Syntax

A PHP script can be placed anywhere in the document.

A PHP script starts with **<?php** and ends with **?>**:

```
<?php
// PHP code goes here
?>
```

The default file extension for PHP files is **".php"**.

A PHP file normally contains HTML tags, and some PHP scripting code.

Below, an example of a simple PHP file, with a PHP script that uses a built-in PHP function **"echo"** to output the text **"BISMILLA"** on a web page:

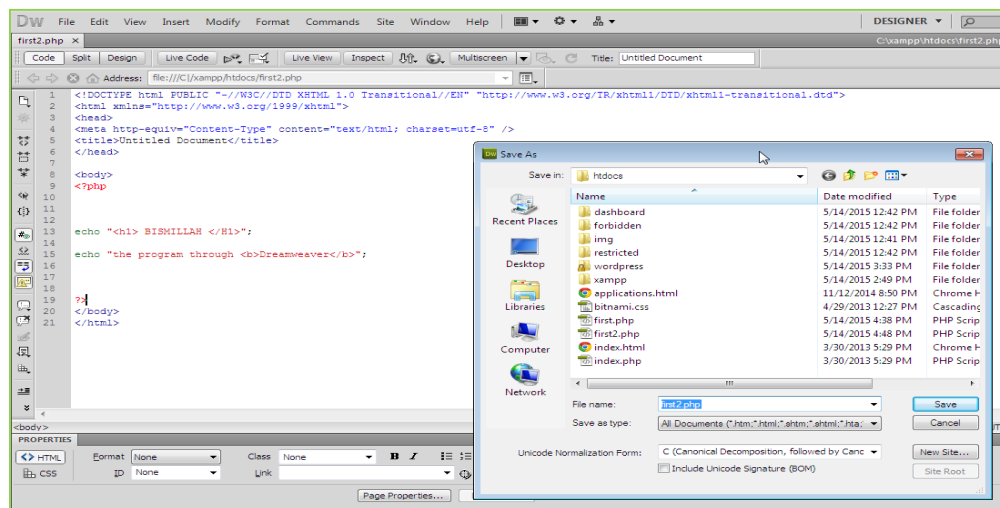
### STEP BY STEP PHP Program in Dreamweaver

**Step 1: Open "Dreamweaver" and click on "PHP"**



**Step 2: In code view type php code same as typed above then save the file in the same "htdocs" folder of XAMPP.**

**Step 3: save the file with "first2".**



**CODE:**

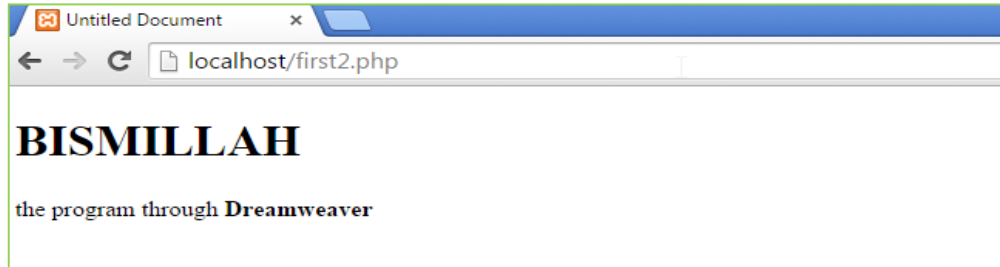
```
<!DOCTYPE html>
<html>
<body>
<?php
```

```
echo "<h1>BISMILLAH</h1>";
?>

echo "the program through Dreamweaver";

</body>
</html>
```

**Step 4:** Open web browser, in address bar enter “localhost/first2.php” and press enter.



## Comments in PHP

A comment in PHP code is a line that is not read/executed as part of the program. Its only purpose is to be read by someone who is looking at the code.

Comments can be used to:

- Let others understand what is being done.
- Reminder of written text - Most programmers have experienced coming back to their own work a year or two later and having to re-figure out what they did. Comments can remind programmers of what they were thinking when they wrote the code

PHP supports several ways of commenting:

**EXAMPLE**

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf
<title>Untitled Document</title>
</head>

<body>

<?php
// This is a single-line comment

This is also a single-line comment

/*
This is a multiple-lines comment block
that spans over multiple
lines
*/

// You can also use comments to leave out parts of a code line
$x = 5 /* + 15 */ + 5;
echo $x;
?>

</body>
```

**PHP Case Sensitivity****Do you know?**

Keywords are not case-sensitive but all variable names are case-sensitive.

In PHP, **all keywords** (e.g. if, else, while, echo, etc.), classes, functions, and user-defined functions are NOT case-sensitive.

In the example below, all three echo statements below are legal (and equal):

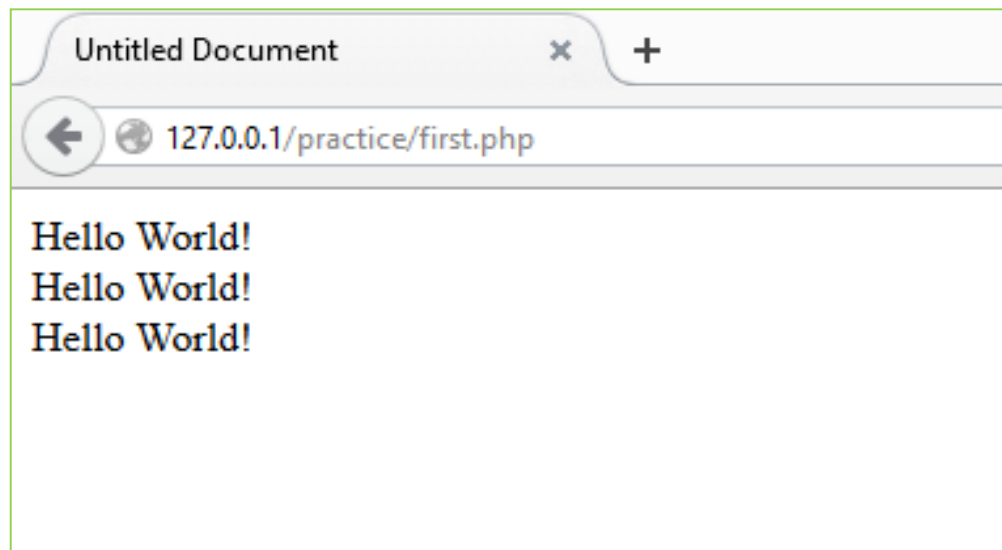


## Example



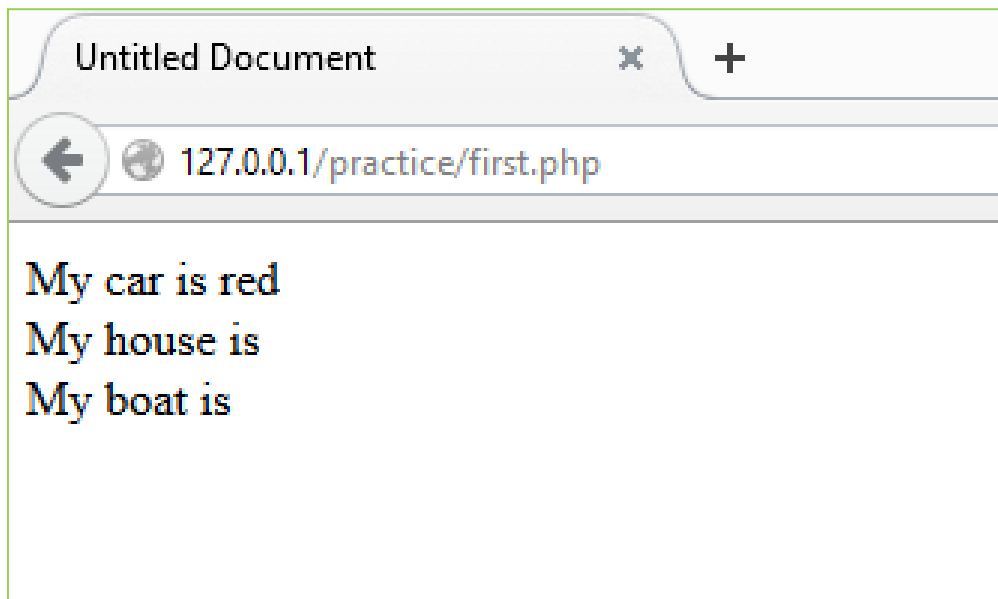
```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9
10 <?php
11 ECHO "Hello World!
";
12 echo "Hello World!
";
13 EcHo "Hello World!
";
14 ?>
15
16 </body>
17 </html>
```

## RESULT:



However; all variable names are case-sensitive.

In the example below, only the first statement will display the value of the **\$color** variable (this is because **\$color**, **\$COLOR**, and **\$coLOR** are treated as three different variables):



## 5. PHP Variables

Variables are "containers" for storing information.

A variable can have a short name (like x and y) or a more descriptive name (age, carname, total\_volume).

### Rules for PHP variables:

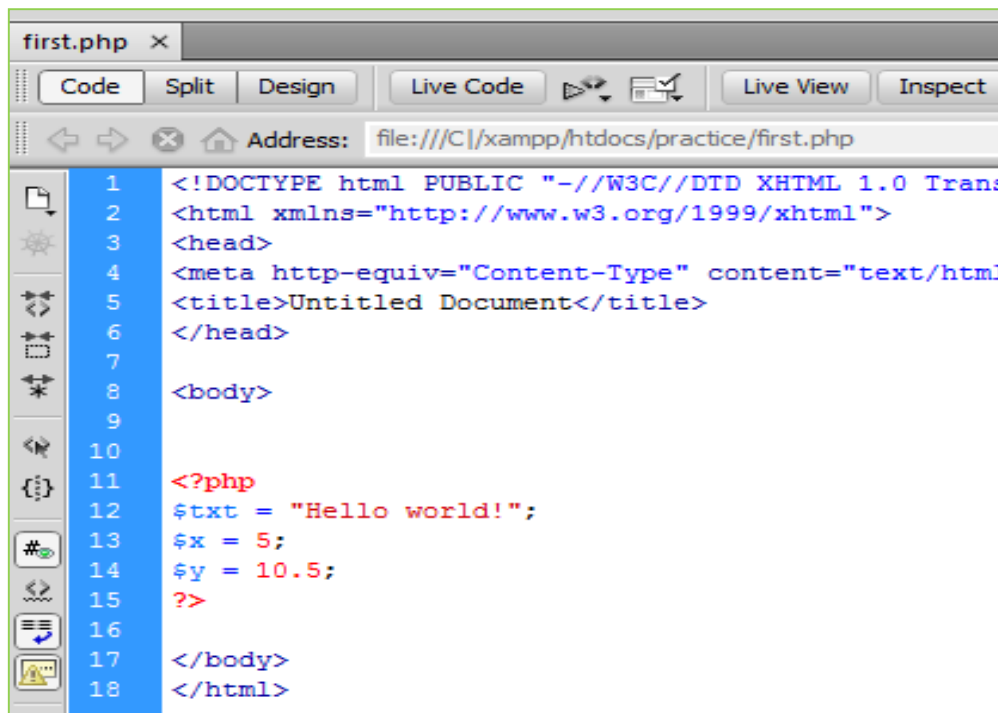
- A variable starts with the \$ sign, followed by the name of the variable
- A variable name must start with a letter or the underscore character
- A variable name cannot start with a number
- A variable name can only contain alpha-numeric characters and underscores (A-z, 0-9, and \_ )
- Variable names are case-sensitive (\$age and \$AGE are two different variables)

### Creating (Declaring) PHP Variables

In PHP, a variable starts with the \$ sign, followed by the name of the variable:

#### Remember

When you assign a text value to a variable, put quotes around the value.



```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Trans
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9
10
11 <?php
12 $txt = "Hello world!";
13 $x = 5;
14 $y = 10.5;
15 ?>
16
17 </body>
18 </html>

```

**Remember**

Unlike other programming languages, PHP has no command for declaring a variable. It is created the moment you first assign a value to it.

After the execution of the statements above, the variable **\$txt** will hold the value **Hello world!**, the variable **\$x** will hold the value **5**, and the variable **\$y** will hold the value **10.5**.

## PHP is a Loosely Typed Language

PHP automatically converts the variable to the correct data type, depending on its value.

In other languages such as C, C++, and Java, the programmer must declare the name and type of the variable before using it.

### Example:

**\$abc= "hello"**

PHP automatically converts \$abc to string data type

## PHP Variables Scope

In PHP, variables can be declared anywhere in the script.

The scope of a variable is the part of the script where the variable can be referenced/used.

PHP has three different variable scopes:

- Global
- Local
- Static

**Global Variable:** A global variable is accessible to all the scripts in an application.

**Local Variable:** A local variable is only accessible to the script that it was defined in.

**Static Variable:** A static variable exists only in a local function scope, but it does not lose its value when program execution leaves this scope.

## PHP Data Types

### Remember

Unlike variables, constants are automatically global across the entire script.

Variables can store data of different types, and different data types can do different things.

PHP has a total of eight data types which are used to construct our variables:

- **Integers:** are whole numbers, without a decimal point, like 4195.
- **Doubles:** are floating-point numbers, like 3.14159 or 49.1.
- **Booleans:** have only two possible values either true or false.
- **NULL:** is a special type that only has one value: NULL.
- **Strings:** are sequences of characters, like 'PHP supports string operations.'
- **Arrays:** are named and indexed collections of other values.
- **Objects:** are instances of programmer-defined classes, which can package up both other kinds of values and functions that are specific to the class.
- **Resources:** are special variables that hold references to resources external to PHP (such as database connections).

The first five are *simple types*, and the next two (arrays and objects) are compound - the compound types can package up other arbitrary values of arbitrary type, whereas the simple types cannot.

## 6. PHP Constants

- A constant is a name or an identifier for a simple value.
- A constant value cannot change during the execution of the script. By default a constant is case-sensitive.
- By convention, constant identifiers are always uppercase.
- A constant name starts with a letter or underscore, followed by any number of letters, numbers, or underscores.
- If already defined a constant, it can never be changed or undefined.

### Create a PHP Constant

To create a constant, use the define () function.

### Syntax

```
define(name, value, case-insensitive)
```

Parameters:

- **name:** Specifies the name of the constant
- **value:** Specifies the value of the constant
- **Case-insensitive:** Specifies whether the constant name should be case-insensitive. Default is false

## 7. PHP - Operator Types

**What is Operator?** Simple answer can be given using expression *4 + 5 is equal to 9*. Here 4 and 5 are called operands and + is called operator. PHP language supports following type of operators.

- Arithmetic Operators
- Comparison Operators
- Logical (or Relational) Operators
- Assignment Operators
- Conditional (or Ternary) Operators
- String Operators
- Array Operators

Let's have a look on all operators one by one.

### Arithmetic Operators

There are following arithmetic operators supported by PHP language:

Assume variable A holds 10 and variable B holds 20 then:

#### Example

##### Addition Operator +

Adds two operands

A + B will give 30

##### Subtraction Operator -

Subtracts second operand from the first

A - B will give -10

##### Multiplication Operator \*

Multiply both operands

A \* B will give 200

##### Division Operator /

Divide numerator by denominator

B / A will give 2

**Modulus Operator      %**

Modulus Operator and remainder of after an integer division

B % A will give 0

**Increment Operator    ++**

Increment operator, increases integer value by one

A++ will give 11

**Decrement Operator    --**

Decrement operator, decreases integer value by one

A-- Will give 9

## Comparison Operators

There are following comparison operators supported by PHP language

Assume variable A holds 10 and variable B holds 20 then

**Equal to Operator            ==**

Check if the value of two operands is equal or not, if yes then condition becomes true.

(A == B) is not true.

**Not Equal to Operator        !=**

Check if the value of two operands is equal or not, if values are not equal then condition becomes true.

(A != B) is true.

**Greater than Operator        >**

Check if the value of left operand is greater than the value of right operand, if yes then condition becomes true.

(A > B) is not true.

**Less than Operator            <**

Check if the value of left operand is less than the value of right operand, if yes then condition becomes true.

(A < B) is true.

**Greater than Equal to        >=**

Check if the value of left operand is greater than or equal to the value of right operand, if yes then condition becomes true.

(A >= B) is not true.

### **Less than Equal to                      <=**

Check if the value of left operand is less than or equal to the value of right operand, if yes then condition becomes true.

(A <= B) is true.

## **Logical Operators**

There are following logical operators supported by PHP language

Assume variable a holds 10 and variable B holds 20 then:

### **Example**

#### **AND Operator &&**

Called Logical AND operator. If all the condition are true then condition becomes true.

(A && B) is true.

#### **OR Operator                      ||**

Called Logical OR Operator. If one condition is true than all condition becomes true.

(A || B) is true.

#### **NOT Operator                      !**

Called Logical NOT Operator. Use to reverse the logical state of its operand. If a condition is true then Logical NOT operator will make false.

!(A && B) is false.

## **Assignment Operators**

There are following assignment operators supported by PHP language:

### **Example**

#### **Assignment Operator                      =**

Simple assignment operator, Assigns values from right side operands to left side operand

C = A + B will assign value of A + B into C

#### **Add and assignment Operator                      +=**

Add AND assignment operator, It adds right operand to the left operand and assign the result to left operand

C += A is equivalent to C = C + A

### **Subtract and Assignment Operator    -=**

Subtract AND assignment operator, It subtracts right operand from the left operand and assign the result to left operand

$C -= A$  is equivalent to  $C = C - A$

### **Multiply and assignment Operator                      \*=**

Multiply AND assignment operator, It multiplies right operand with the left operand and assign the result to left operand

$C *= A$  is equivalent to  $C = C * A$

### **Divide and assignment Operator                      /=**

Divide AND assignment operator, It divides left operand with the right operand and assign the result to left operand

$C /= A$  is equivalent to  $C = C / A$

### **Modulus AND assignment Operator    %=**

Modulus AND assignment operator, It takes modulus using two operands and assign the result to left operand

$C \% = A$  is equivalent to  $C = C \% A$

## **Operators Categories**

All the operators we have discussed above can be categorized into four categories:

1. Unary prefix operators, which precede a single operand.
2. Binary operators, which take two operands and perform a variety of arithmetic and logical operations.
3. The conditional operator (a ternary operator), which takes three operands and evaluates either the second or third expression, depending on the evaluation of the first expression.
4. Assignment operators, which assign a value to a variable.

## **Precedence of PHP Operators**

Operator precedence determines the grouping of terms in an expression. This affects how an expression is evaluated. Certain operators have higher precedence than others; for example, the multiplication operator has higher precedence than the addition operator:

**For example**  $x = 7 + 3 * 2$ ; Here x is assigned 13, not 20 because operator \* has higher precedence than + so it first get multiplied with  $3*2$  and then adds into 7.

Here operators with the highest precedence appear at the top of the table, those with the lowest appear at the bottom. Within an expression, higher precedence operators will be evaluated first.



## **Unary**

**! ++ --**

Right to left

## **Multiplicative**

**\* / %**

Left to right

## **Additive**

**+ -**

Left to right

## **Relational**

**<<= >>=**

Left to right

## **Equality**

**== !=**

Left to right

## **Logical AND**

**&&**

Left to right

## **Logical OR**

**||**

Left to right

## **Conditional**

**?:**

Right to left

## **Assignment**

**= += -= \*= /= %=**

Right to left

## 8. PHP Decision Making

Sometimes when writing code, different actions are to be performed for different decisions. Conditional statements are used in code to do this. PHP allows to choose what action to take based upon the result of a condition. This condition can be anything to choose, and can combine conditions together to make for actions that are more complicated.

The if, elseif ...else and switch statements are used to take decision based on the different condition.

Conditional statements are used in code to make decisions. PHP supports following three decision making statements:

- **if...else statement** - use this statement to execute a set of code when a condition is true and another if the condition is not true
- **elseif statement** - is used with the if...else statement to execute a set of code if **one** of several condition are true
- **switch statement** - is used to select one of many blocks of code to be executed, use the Switch statement. The switch statement is used to avoid long blocks of if..elseif..else code.

### The If...Else Statement

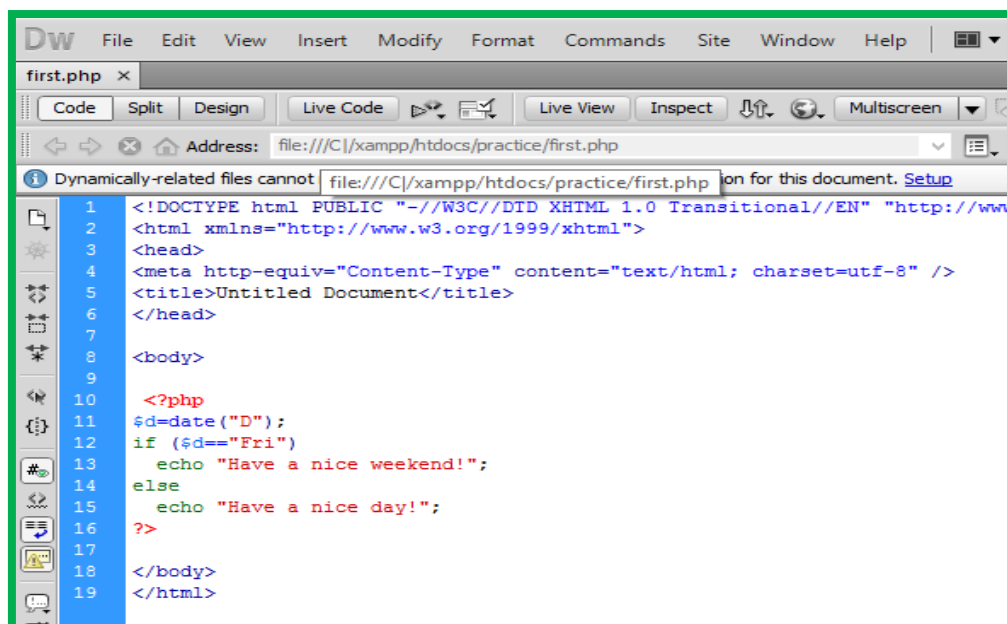
To execute some code if a condition is true and another code if a condition is false, use the if....else statement.

### Syntax

```
if (condition)
 code to be executed if condition is true;
else
 code to be executed if condition is false;
```

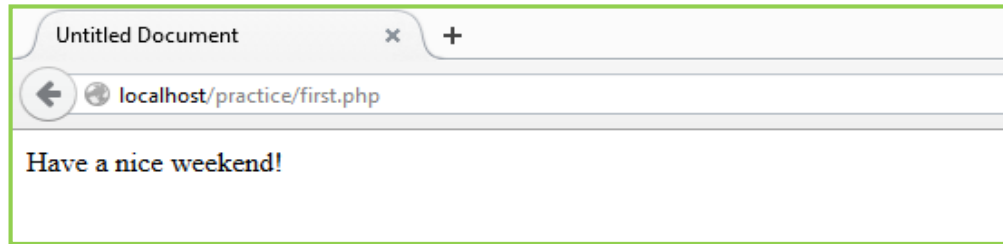
### Example

The following example will output "Have a nice weekend!" if the current day is Friday, otherwise it will output "Have a nice day!":

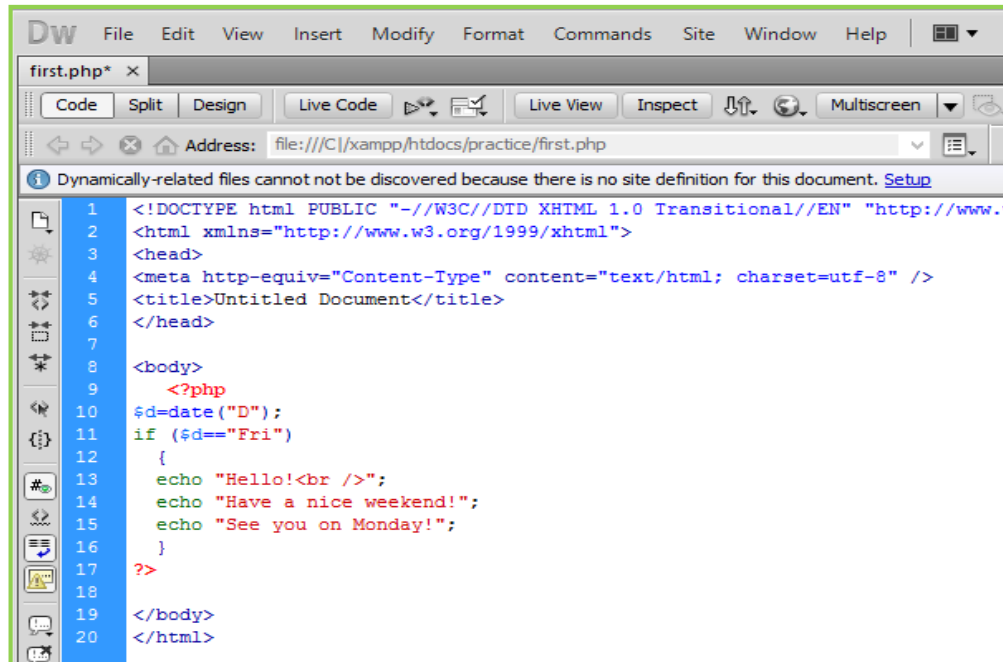


```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9
10 <?php
11 $d=date("D");
12 if ($d=="Fri")
13 echo "Have a nice weekend!";
14 else
15 echo "Have a nice day!";
16 ?>
17
18 </body>
19 </html>
```

**OUTPUT:**

If more than one line should be executed if a condition is true/false, the lines should be enclosed within curly braces:

**The Elself Statement**

To execute some code if one of several conditions are true, use the elseif statement

**Syntax**

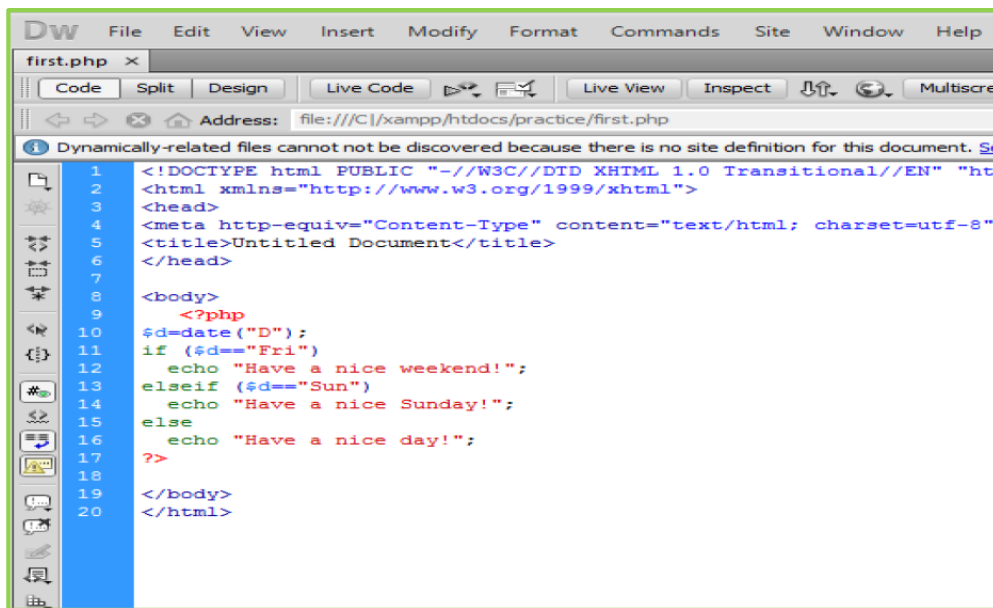
```

if (condition)
 code to be executed if condition is true;
elseif (condition)
 code to be executed if condition is true;
else
 code to be executed if condition is false;

```

**Example**

The following example will output "Have a nice weekend!" if the current day is Friday, and "Have a nice Sunday!" if the current day is Sunday. Otherwise it will output "Have a nice day!":



## The Switch Statement

To select one of many blocks of code to be executed, use the Switch statement. The switch statement is used to avoid long blocks of if..elseif..else code.

### Syntax

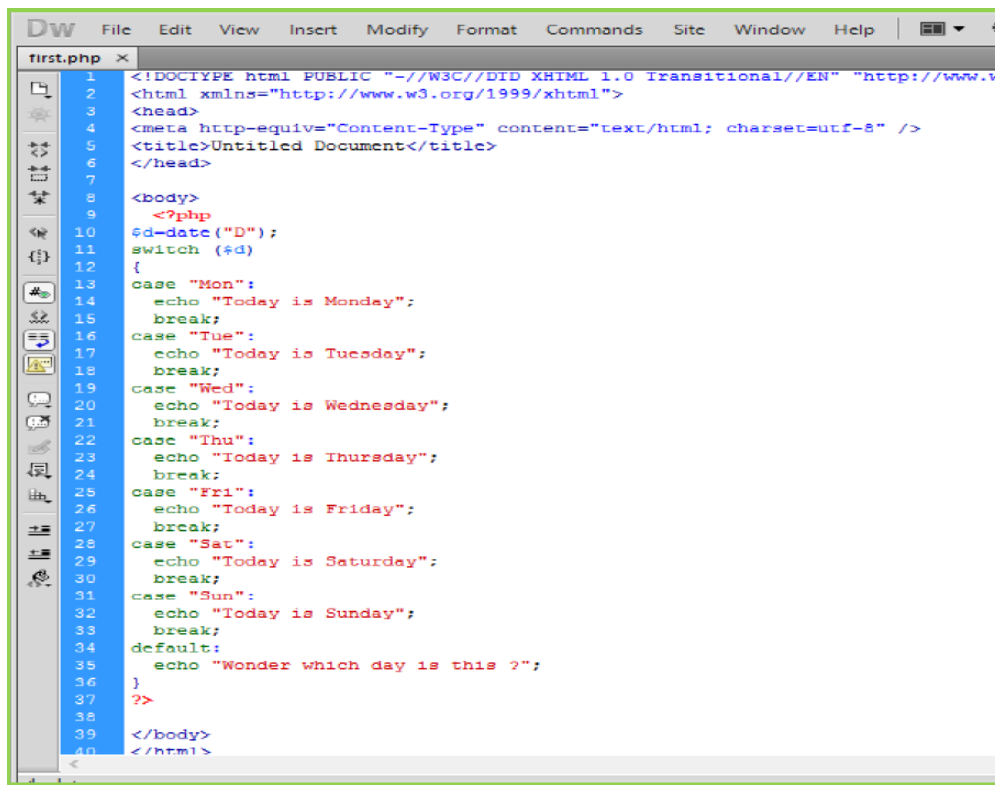
```

switch (expression)
{
case label1:
code to be executed if expression = label1;
break;
case label2:
code to be executed if expression = label2;
break;
default:
code to be executed
if expression is different
from both label1 and label2;
}

```

### Example

The *switch* statement works in an unusual way. First it evaluates given expression then seeks a label to match the resulting value. If a matching value is found then the code associated with the matching label will be executed or if none of the labels match then statement will execute any specified default code.

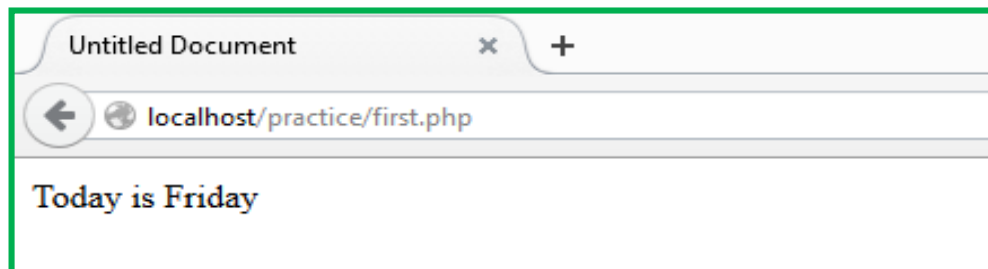


```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 $d=date("D");
11 switch ($d)
12 {
13 case "Mon":
14 echo "Today is Monday";
15 break;
16 case "Tue":
17 echo "Today is Tuesday";
18 break;
19 case "Wed":
20 echo "Today is Wednesday";
21 break;
22 case "Thu":
23 echo "Today is Thursday";
24 break;
25 case "Fri":
26 echo "Today is Friday";
27 break;
28 case "Sat":
29 echo "Today is Saturday";
30 break;
31 case "Sun":
32 echo "Today is Sunday";
33 break;
34 default:
35 echo "Wonder which day is this ?";
36 }
37 ?>
38
39 </body>
40 </html>

```

### Output



## 9. PHP - Loop Types

Loops in PHP are used to execute the same block of code a specified number of times. PHP supports following four loop types.

1. **for** - loops through a block of code a specified number of times.
2. **while** - loops through a block of code if and as long as a specified condition is true.
3. **do...while** - loops through a block of code once, and then repeats the loop as long as a special condition is true.
4. **foreach** - loops through a block of code for each element in an array.

### The PHP for Loop

The for-loop is used to run the script for predetermined times.

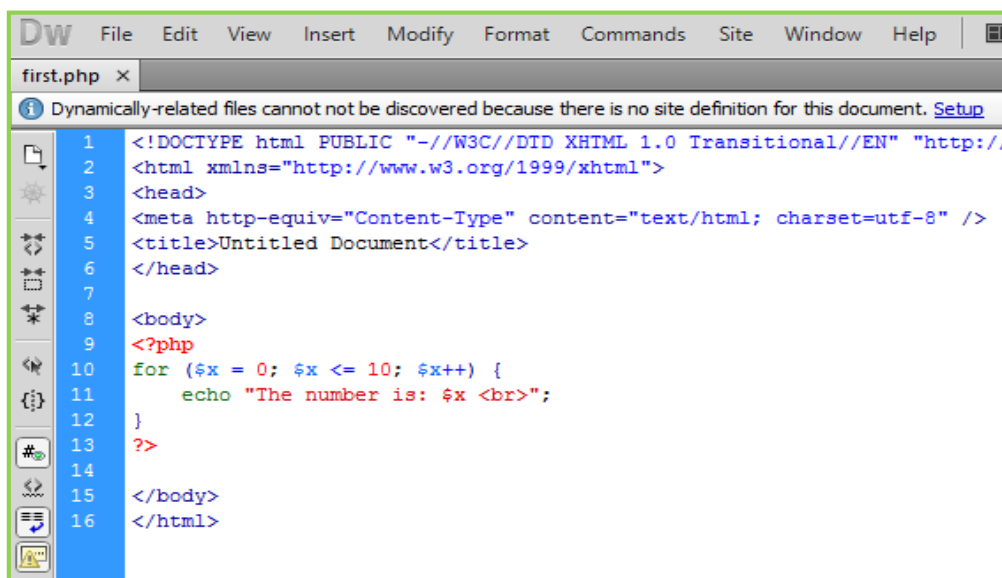
## Syntax

```
for { init counter; test counter; increment counter) code to be executed;
}
```

### Parameters:

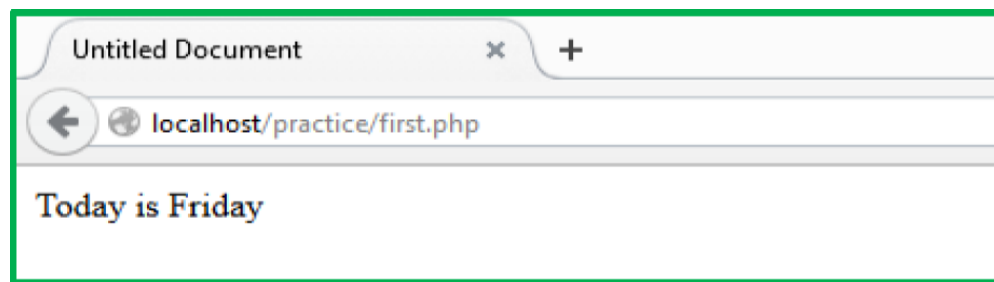
- *init counter*: Initialize the loop counter value
- *Test counter*: Evaluated for each loop iteration. If it evaluates to TRUE, the loop continues. If it evaluates to FALSE, the loop ends.
- *increment counter*: Increases the loop counter value

The example below displays the numbers from 0 to 10:



```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 for ($x = 0; $x <= 10; $x++) {
11 echo "The number is: $x
";
12 }
13 ?>
14
15 </body>
16 </html>
```

### Output of Above Code



## The PHP while Loop

The while loop executes a block of code as long as the specified condition is true.

### Syntax

```
While (conditions true) {
 code to be executed;
}
```

The example below first sets a variable \$x to 1 (\$x = 1). Then, the while loop will continue to run as long as \$x is less than, or equal to 5 (\$x <= 5). \$x will increase by 1 each time the loop runs (\$x++):



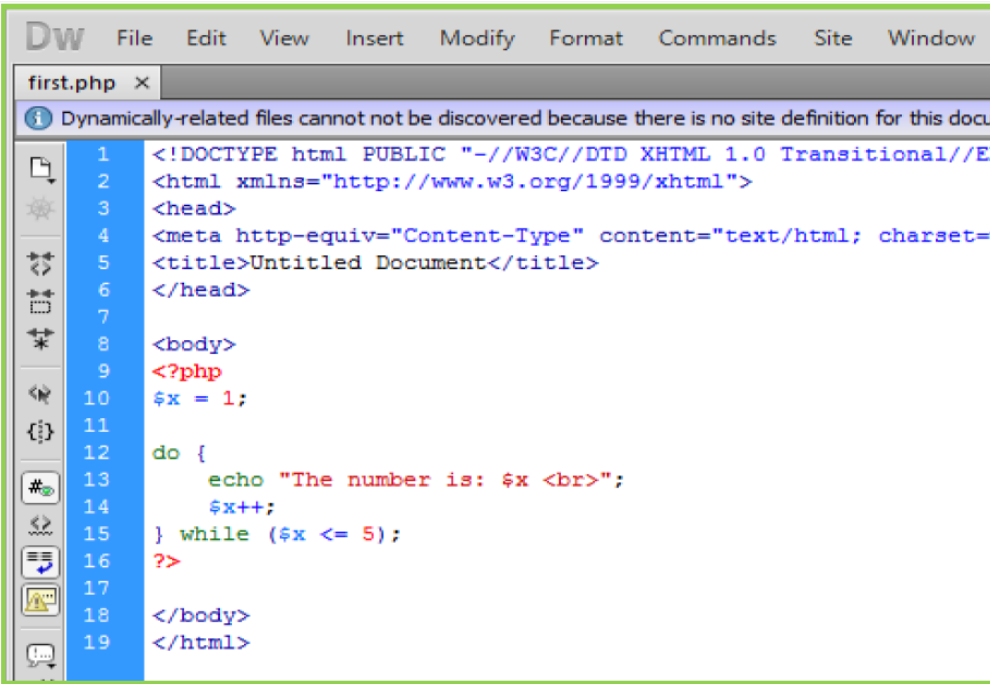
## The PHP do...while Loop

The do...while loop will always execute the block of code once, it will then check the condition, and repeat the loop while the specified condition is true.

### Syntax

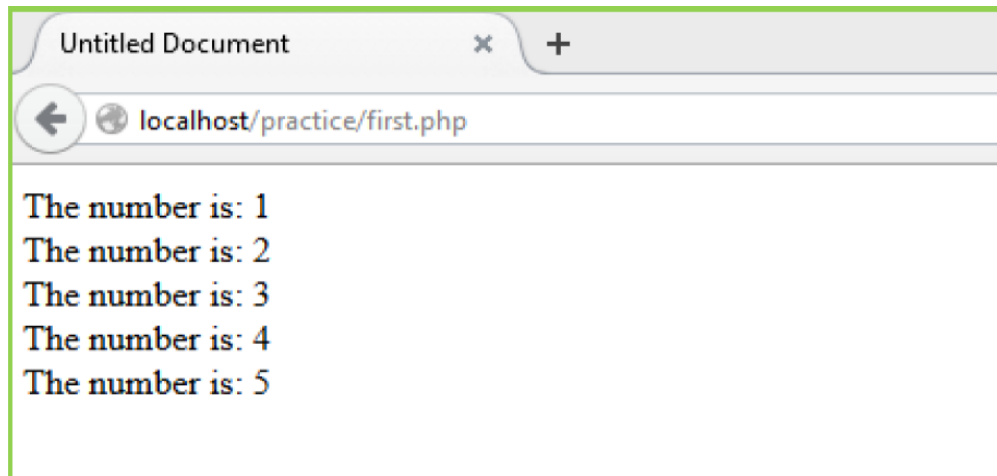
```
do{
 code to be executed;
} while (condition is true);
```

The example below first sets a variable \$x to 1 (\$x = 1). Then, the do while loop will write some output, and then increment the variable \$x with 1. Then the condition is checked (is \$x less than, or equal to 5?), and the loop will continue to run as long as \$x is less than, or equal to 5:



```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 $x = 1;
11
12 do {
13 echo "The number is: $x
";
14 $x++;
15 } while ($x <= 5);
16 ?>
17
18 </body>
19 </html>
```

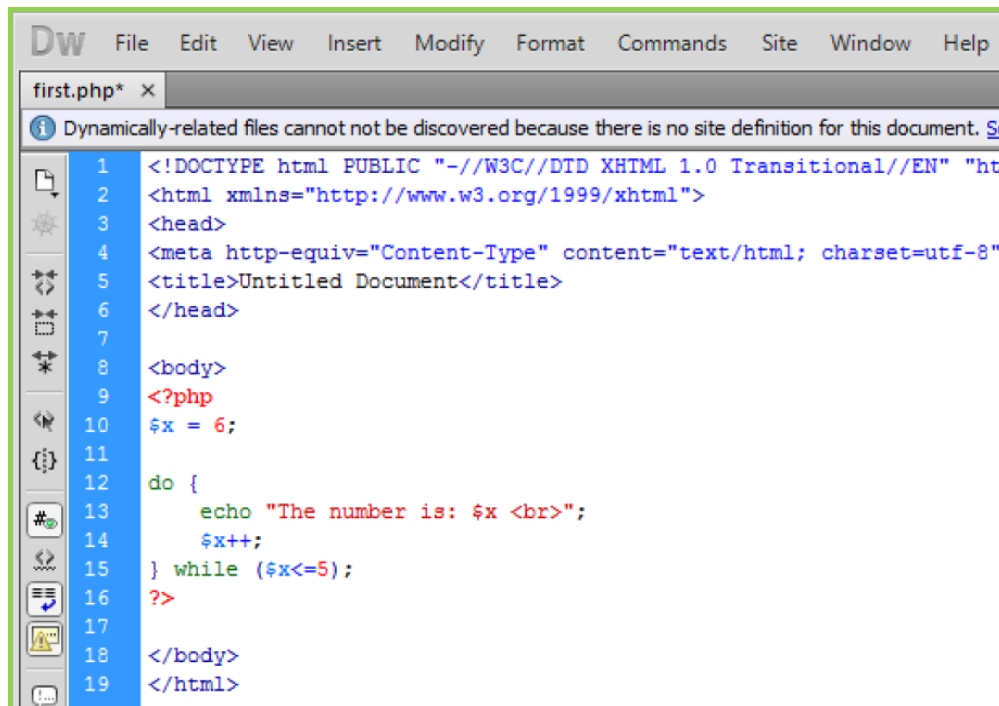
### Output



**Notice:** that in a do while loop the condition is tested AFTER executing the statements within the loop. This means that the do while loop would execute its statements at least once, even if the condition is false the first time.

The example below sets the \$x variable to 6, then it runs the loop, **and then the condition is checked:**





## The foreach Loop Statement

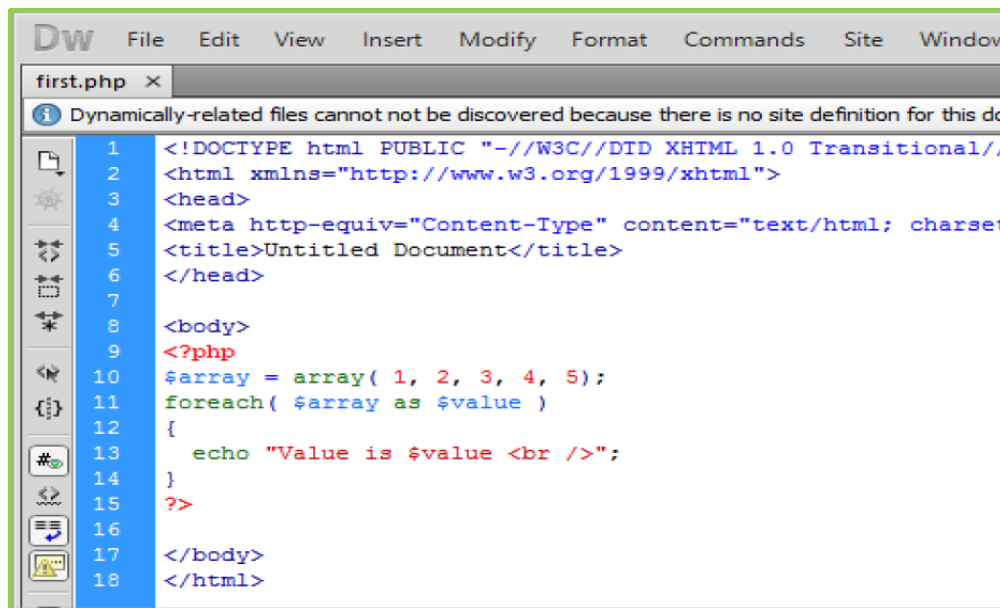
The **foreach** statement is used to loop through arrays. For each pass the value of the current array element is assigned to `$value` and the array pointer is moved by one and in the next pass next element will be processed.

### Syntax

```
foreach (array as value)
{
 code to be executed;
}
```

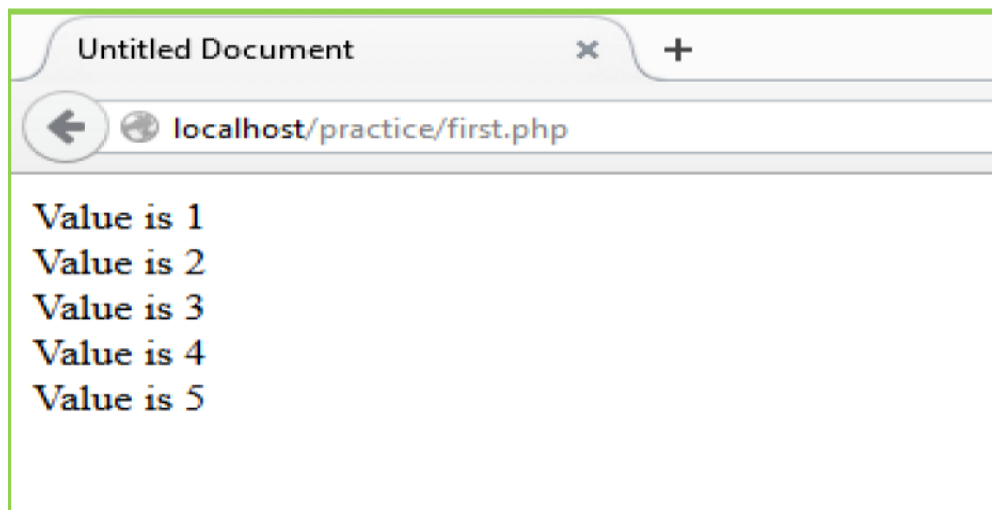
### Example

Try out following example to list out the values of an array.



```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 $array = array(1, 2, 3, 4, 5);
11 foreach($array as $value)
12 {
13 echo "Value is $value
";
14 }
15 ?>
16
17 </body>
18 </html>
```

### Output



### The Break Statement

The PHP **break** keyword is used to terminate the execution of a loop prematurely.

The **break** statement is situated inside the statement block. It gives full control and whenever there is need to exit from the loop to come out, then immediate statement to the loop will be executed.

### Example

In the following example condition statement becomes true when the counter value reaches 3 and loop terminates.

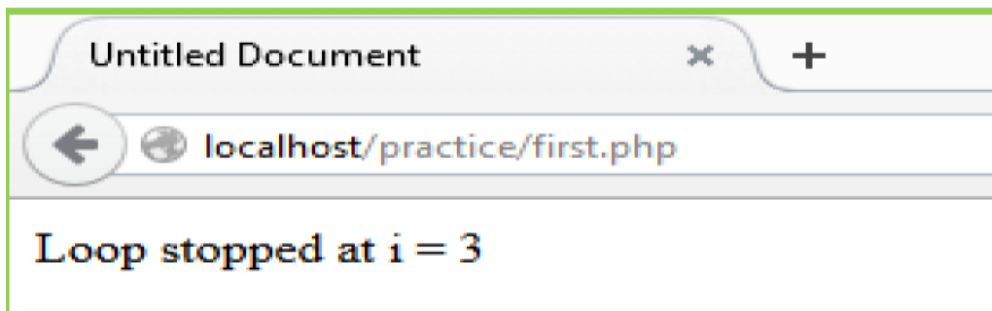


```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 $i = 0;
11
12 while($i < 10)
13 {
14 $i++;
15 if($i == 3)break;
16 }
17 echo ("Loop stopped at i = $i");
18 ?>
19 </body>
20 </html>

```

### Output



## The Continue Statement

The PHP **continue** keyword is used to halt the current iteration of a loop but it does not terminate the loop.

Just like the **break** statement the **continue** statement is situated inside the statement block containing the code that the loop executes, preceded by a conditional test. For the pass encountering **continue** statement, rest of the loop code is skipped and next pass starts.

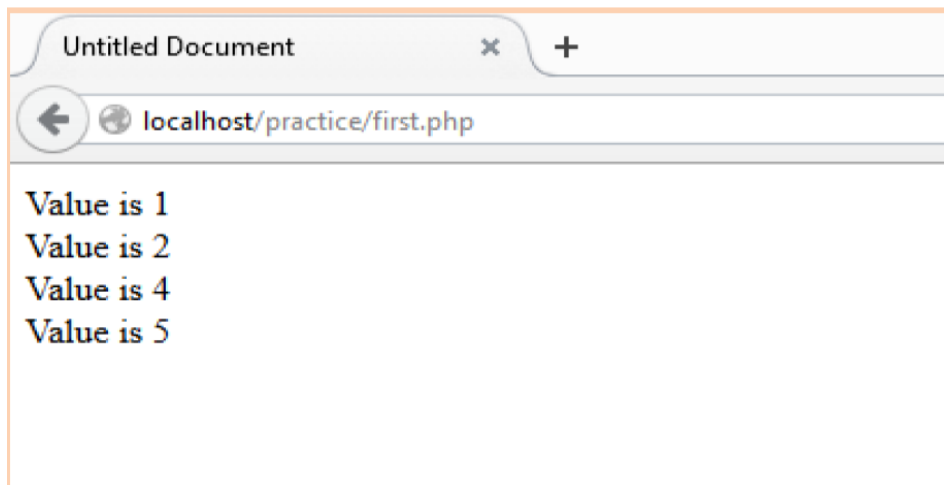
### Example

In the following example loop prints the value of array but for which condition becomes true it just skips the code and next value is printed.



```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 $array = array(1, 2, 3, 4, 5);
11 foreach($array as $value)
12 {
13 if($value == 3)continue;
14 echo "Value is $value
";
15 }
16 ?>
17 </body>
18 </html>
```

### Output of the Above Code



## 10. PHP Array (What is an Array)

An array is a data structure that stores one or more similar type of values in a single value. For example to store 100 numbers then instead of defining 100 variables it's easy to define an array of 100 lengths.

There are three different kinds of arrays and each array value is accessed using an ID c which is called array index.

1. **Numeric array** - An array with a numeric index. Values are stored and accessed in linear fashion
2. **Associative array** - An array with strings as index. This stores element values in association with key values rather than in a strict linear index order.
3. **Multi Dimensional array** - An array containing one or more arrays and values are accessed using multiple indices

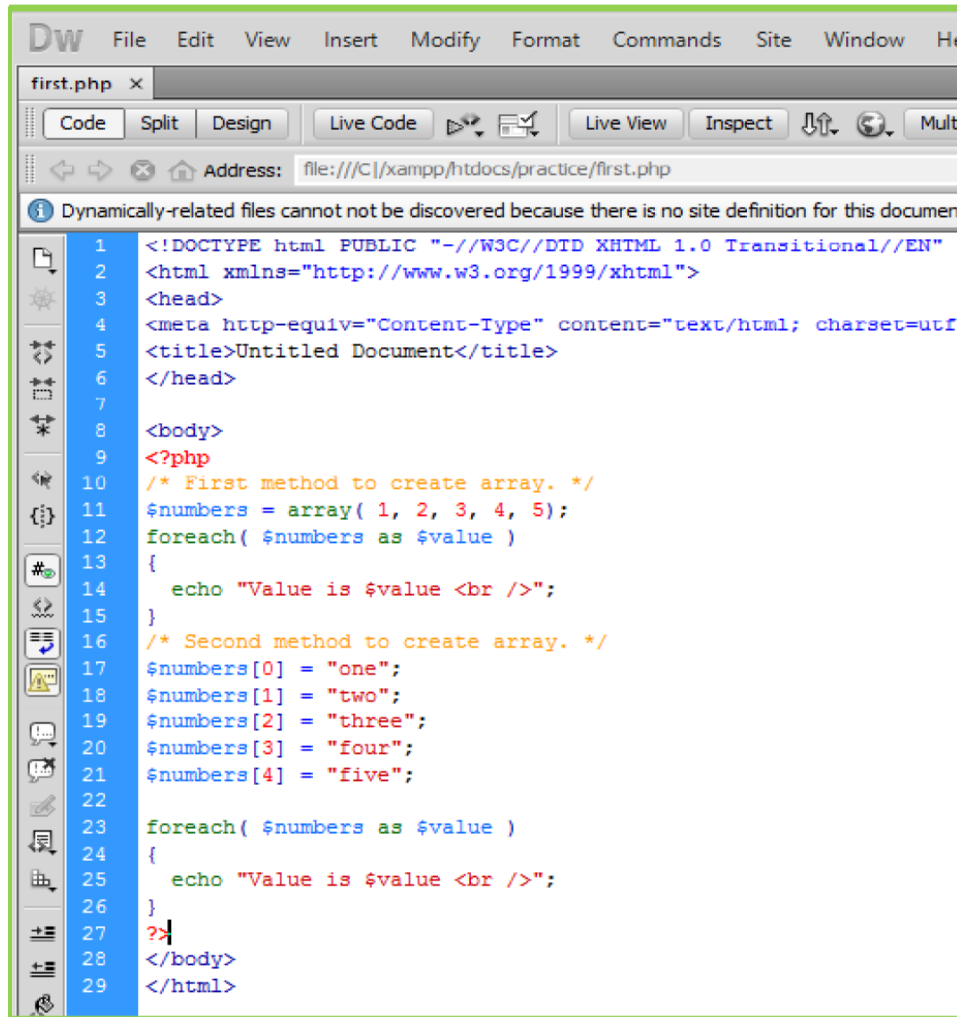
### Numeric Array

These arrays can store numbers, strings and any object but their index will be pre-presented by numbers. By default array index starts from zero.

### Example

Following is the example showing how to create and access numeric arrays.

Here we have used **array ()** function to create array. This function is explained in function reference.



```

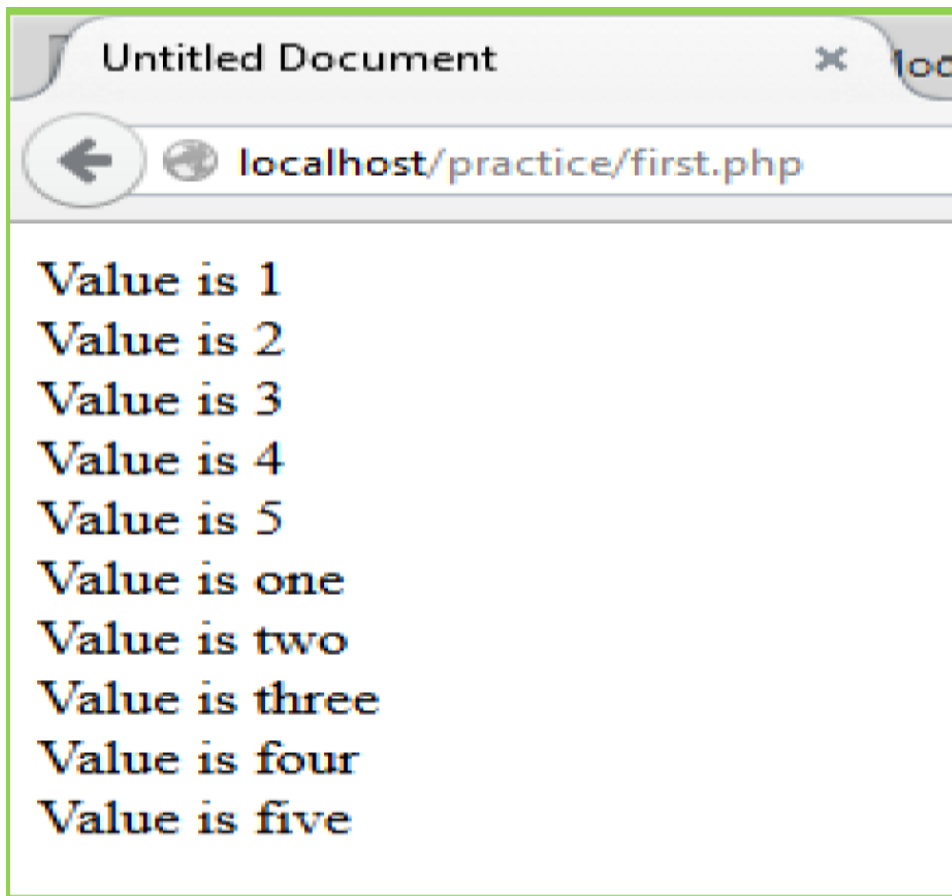
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 /* First method to create array. */
11 $numbers = array(1, 2, 3, 4, 5);
12 foreach($numbers as $value)
13 {
14 echo "Value is $value
";
15 }
16 /* Second method to create array. */
17 $numbers[0] = "one";
18 $numbers[1] = "two";
19 $numbers[2] = "three";
20 $numbers[3] = "four";
21 $numbers[4] = "five";
22
23 foreach($numbers as $value)
24 {
25 echo "Value is $value
";
26 }
27 ?>
28 </body>
29 </html>

```

### Remember

Don't keep associative array inside double quote while printing otherwise it would not return any value.

### Output



## Associative Arrays

The associative arrays are very similar to numeric arrays in term of functionality but they are different in terms of their index. Associative array will have their index as string so that can be established a strong association between key and values.

**Example:** To store the salaries of employees in an array, a numerically indexed array would not be the best choice. Instead, we could use the employees names as the keys in our associative array, and the value would be their respective salary.

There are two ways to create an associative array:

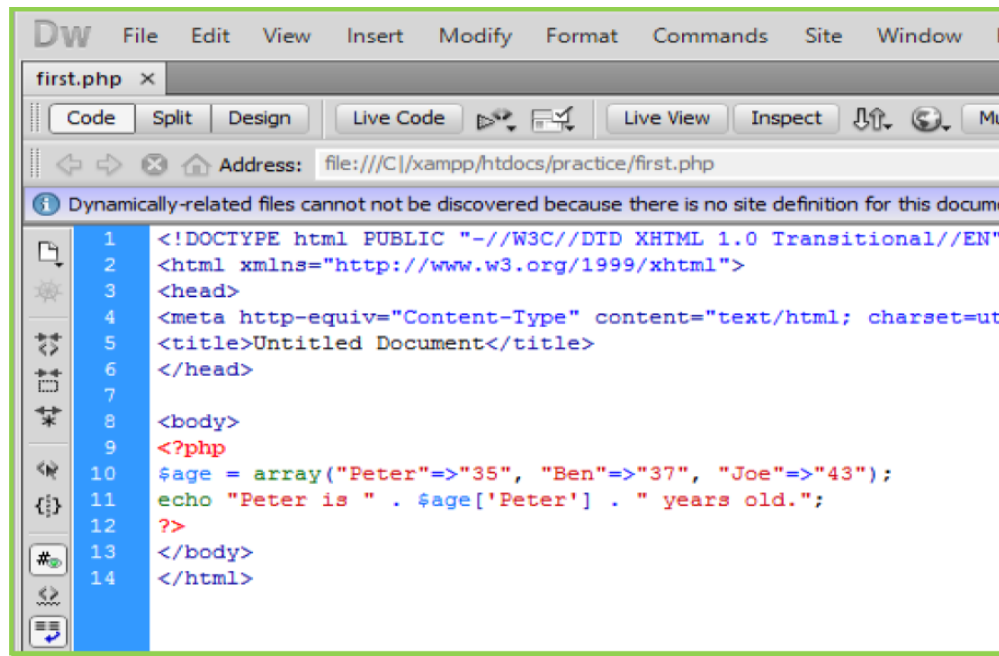
```
$age = array("Peter"=>"35", "Ben"=>"37", "Joe"=>"43");
```

or:

```
$age["Peter"] = "35";
$age["Ben"] = "37";
$age["Joe"] = "43";
```

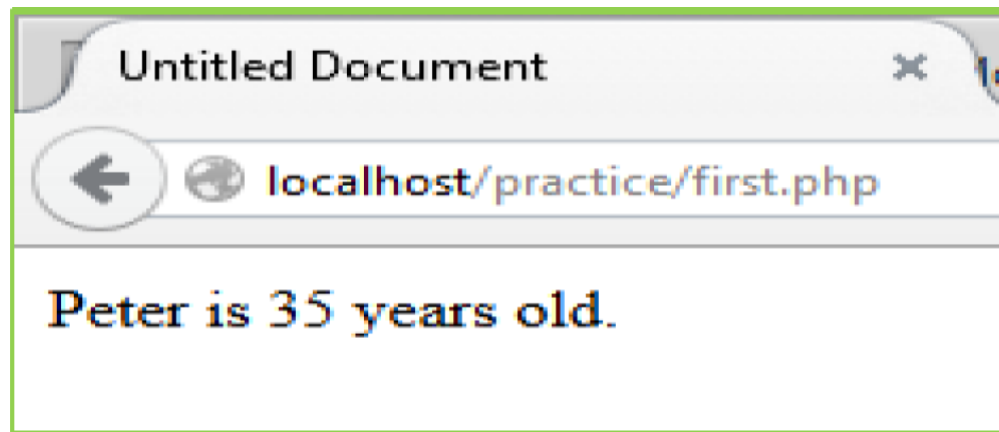
The named keys can then be used in a script:

### Example



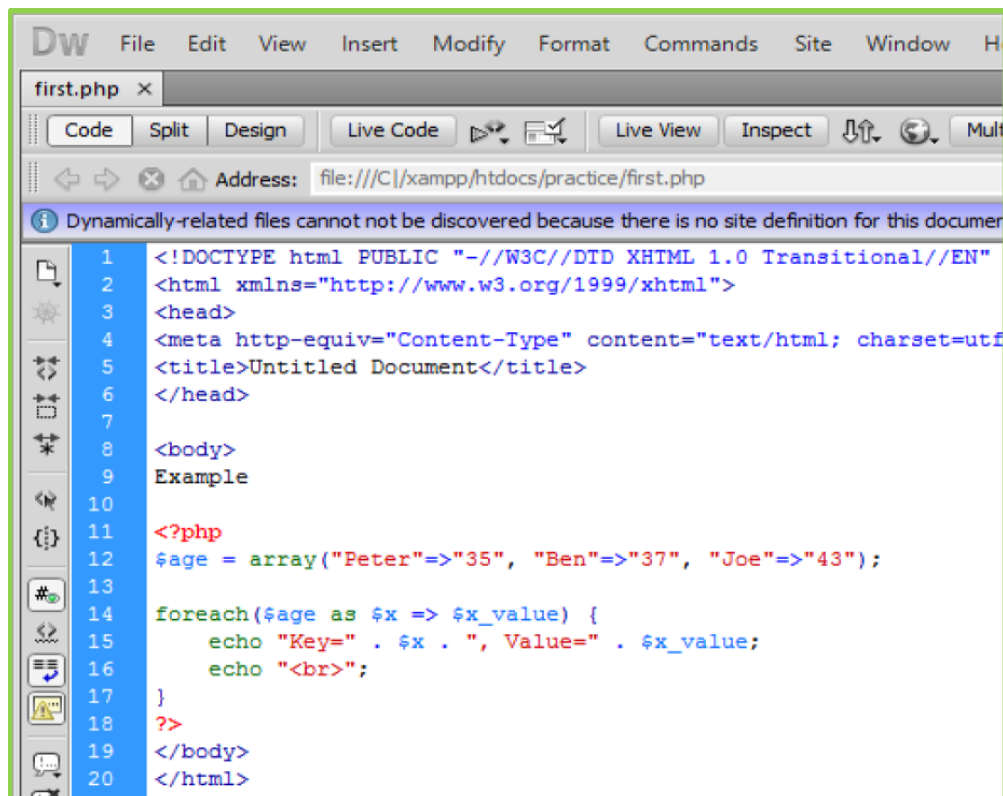
```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 <?php
10 $age = array("Peter"=>"35", "Ben"=>"37", "Joe"=>"43");
11 echo "Peter is " . $age['Peter'] . " years old.";
12 ?>
13 </body>
14 </html>
```

Output of the above code



### Loop Through an Associative Array

To loop through and print all the values of an associative array, foreach loop could be used a, like this:



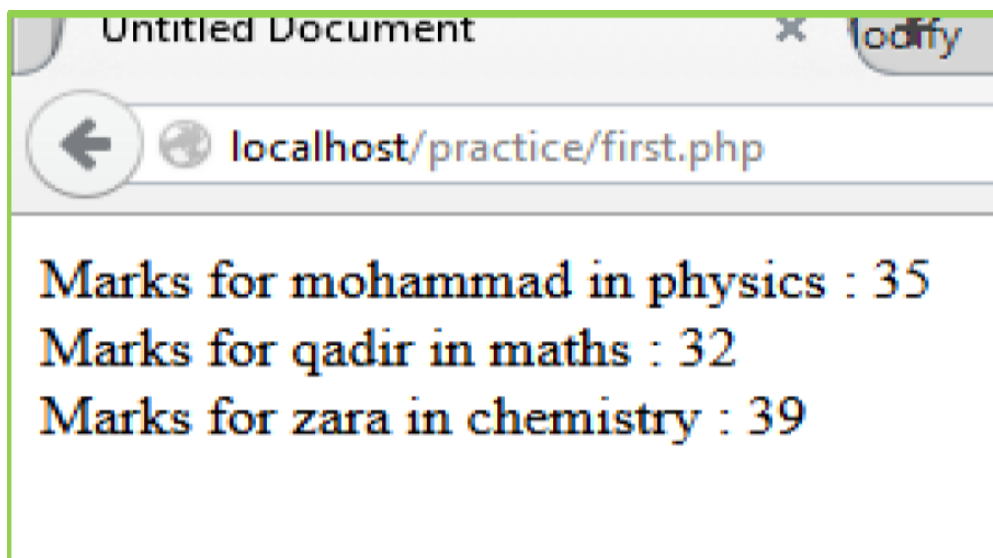
```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8"/>
5 <title>Untitled Document</title>
6 </head>
7
8 <body>
9 Example
10
11 <?php
12 $age = array("Peter"=>"35", "Ben"=>"37", "Joe"=>"43");
13
14 foreach($age as $x => $x_value) {
15 echo "Key=" . $x . ", Value=" . $x_value;
16 echo "
";
17 }
18 ?>
19 </body>
20 </html>
```

## Multidimensional Arrays

A multi-dimensional array each element in the main array can also be an array. And each element in the sub-array can be an array, and so on. Values in the multi-dimensional array are accessed using multiple indexes.

### Example

In this example we create a two dimensional array to store marks of three students in three subjects:





## 11. PHP - Strings

A string is a sequence of characters, like "Hello world!".

### PHP String Functions

In this section defines commonly used functions to manipulate strings.

#### Get the Length of a String

The PHP strlen() function returns the length of a string (number of characters).

The example below returns the length of the string "Hello world!":

```

1 <html>
2 <head>
3 <title>String</title>
4 </head>
5 <body>
6 <?php
7 echo strlen("Hello world!"); // outputs 12
8 ?>
9 </body>
10 </html>

```

#### Do you know?

The first character position in a string is 0 (not 1).

The output of the code above will be: **12**

#### Count the Number of Words in a String

The PHP str\_word\_count() function counts the number of words in a string:

```

1 <html>
2 <head>
3 <title>String</title>
4 </head>
5 <body>
6 <?php
7 echo str_word_count("Hello world!"); // outputs 2
8 ?>
9 </body>
10 </html>

```

The output of the code above will be: **2**

#### Reverse a String

The PHP strrev() function reverses a string:

```
1 <html>
2 <head>
3 <title>String</title>
4 </head>
5 <body>
6 <?php
7 echo strrev("Hello world!"); // outputs !dlrow olleH
8 ?>
9 </html>
```

The output of the code above will be: **!dlrow olleH**.

### Search for a Specific Text within a String

The PHP strpos() function searches for a specific text within a string.

If a match is found, the function returns the character position of the first match. If no match is found, it will return FALSE.

The example below searches for the text "world" in the string "Hello world!":

```
1 <html>
2 <head>
3 <title>String</title>
4 </head>
5 <body>
6 <?php
7 echo strpos("Hello world!", "world"); // outputs 6
8 ?>
9 </body>
10 </html>
11
```

The output of the code is: **6**.

### Replace Text within a String

The PHP str\_replace() function replaces some characters with some other characters in a string.

The example below replaces the text "world" with "Dolly":

```
1 <html>
2 <head>
3 <title>String</title>
4 </head>
5 <body>
6 <?php
7 echo str_replace("world", "Dolly", "Hello world!"); // outputs Hello Dolly!
8 ?>
9 </body>
10 </html>
11
```

The output of the code is: **Hello Dolly!**

## 12.PHP - GET & POST Methods

There are two ways the browser client can send information to the web server.

- The GET Method
- The POST Method

### The GET Method

The GET method sends the encoded user information appended to the page request. The page and the encoded information are separated by the “?” Character.

*http://www.test.com/index.htm?name1=value1&name2=value2*

- The GET method produces a long string that appears in server logs, in the browser's Location: box.
- The GET method is restricted to send up to 1024 characters only.
- Never use GET method for password or other sensitive information to be sent to the server.
- GET can't be used to send binary data, like images or word documents, to the server.
- The data sent by GET method can be accessed using QUERY\_STRING environment variable.
- The PHP provides `$_GET` associative array to access all the sent information using GET method.

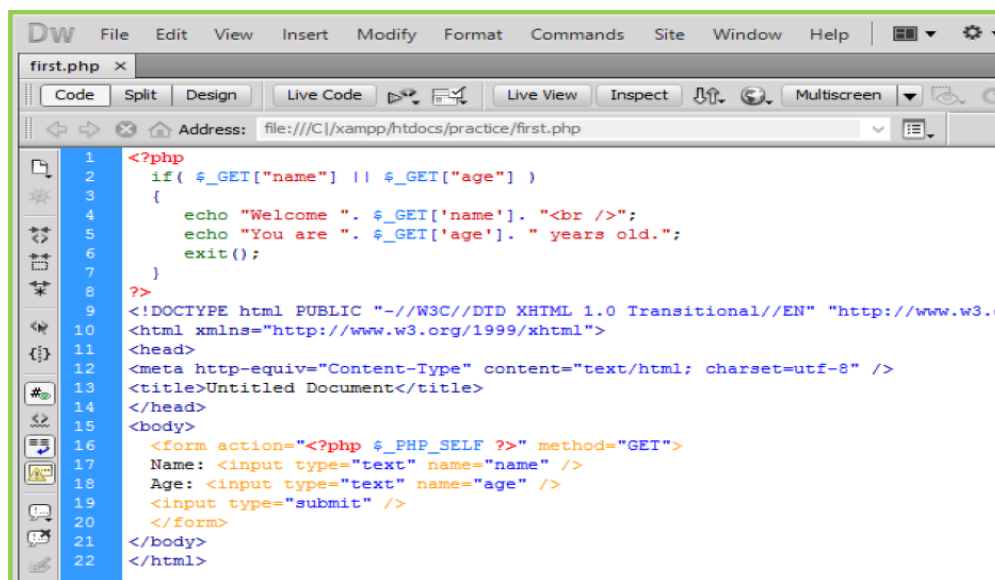
#### Do you know?

Before the browser sends the information, it encodes it using a scheme called URL encoding.

#### Remember

In GET method, name/value pairs are joined with equal signs and different pairs are separated by the ampersand.

Try out following example by putting the source code in test.php script.



```

1 <?php
2 if($_GET["name"] || $_GET["age"])
3 {
4 echo "Welcome ". $_GET['name']. "
";
5 echo "You are ". $_GET['age']. " years old.";
6 exit();
7 }
8
9 ?>
10 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
11 <html xmlns="http://www.w3.org/1999/xhtml">
12 <head>
13 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
14 <title>Untitled Document</title>
15 </head>
16 <body>
17 <form action="<?php $_PHP_SELF ?>" method="GET">
18 Name: <input type="text" name="name" />
19 Age: <input type="text" name="age" />
20 <input type="submit" />
21 </form>
22 </body>
23 </html>

```

Outputs step by step figure 12.1

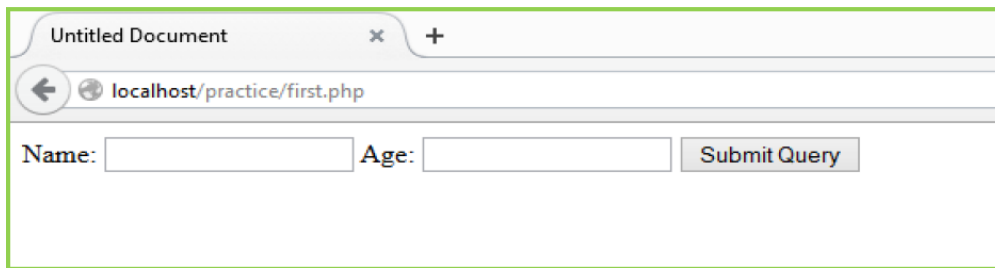


Figure 12.2

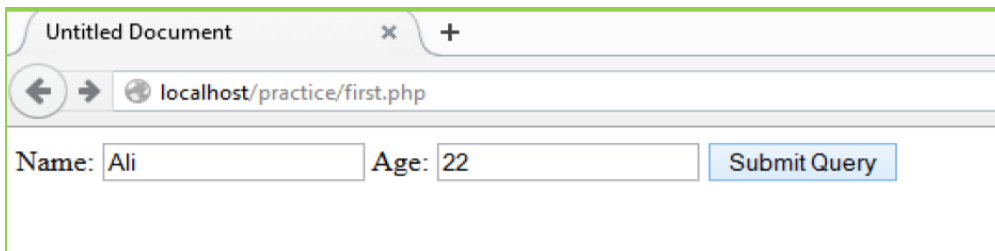
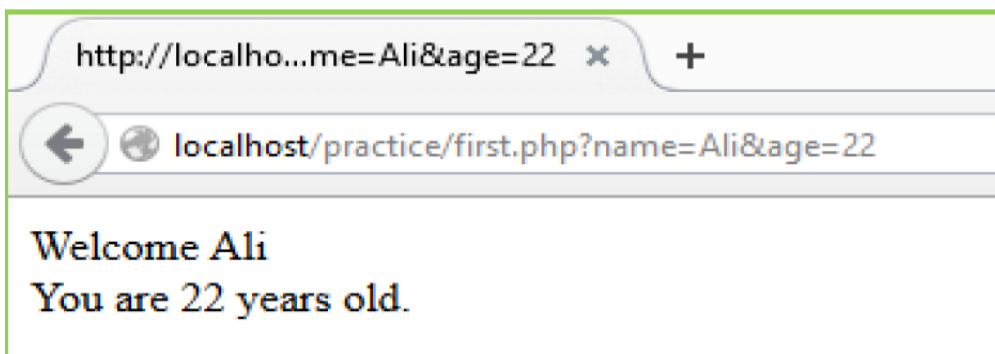


Figure 12.3

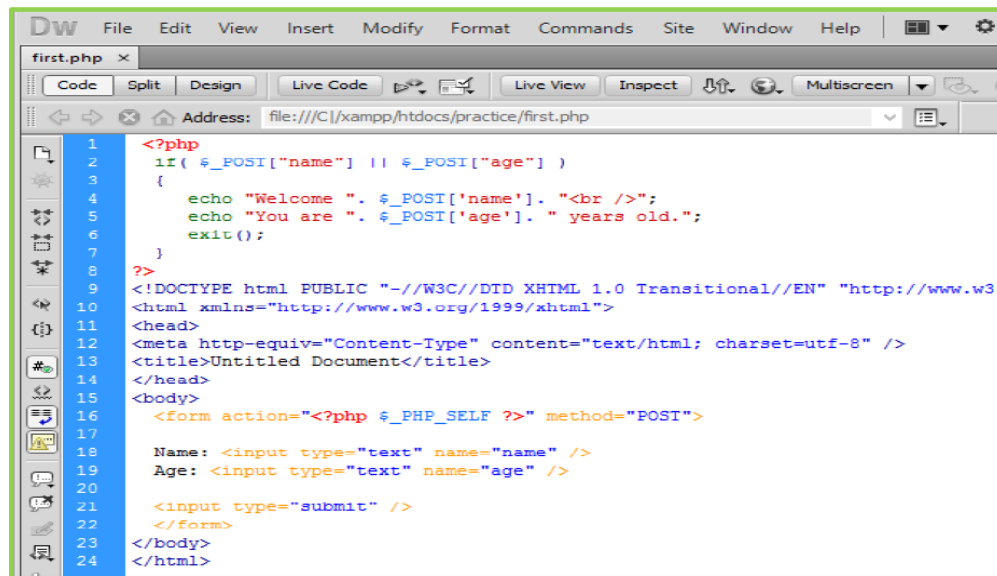


## The POST Method

The POST method transfers information via HTTP headers. The information is encoded as described in case of GET method and put into a header called QUERY\_STRING.

- The POST method does not have any restriction on data size to be sent.
- The POST method can be used to send ASCII as well as binary data.
- The data sent by POST method goes through HTTP header so security depends on HTTP protocol. Secure HTTP make sure that information is secure.
- The PHP provides **\$\_POST** associative array to access all the sent information using POST method.

Try out following example by putting the source code in test.php script.



```

1 <?php
2 if($_POST["name"] || $_POST["age"])
3 {
4 echo "Welcome ". $_POST['name']. "
";
5 echo "You are ". $_POST['age']. " years old.";
6 exit();
7 }
8 ?>
9 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.
10 <html xmlns="http://www.w3.org/1999/xhtml">
11 <head>
12 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
13 <title>Untitled Document</title>
14 </head>
15 <body>
16 <form action="<?php $_PHP_SELF ?>" method="POST">
17
18 Name: <input type="text" name="name" />
19 Age: <input type="text" name="age" />
20
21 <input type="submit" />
22 </form>
23 </body>
24 </html>

```

Figure 1

Output of above code is.

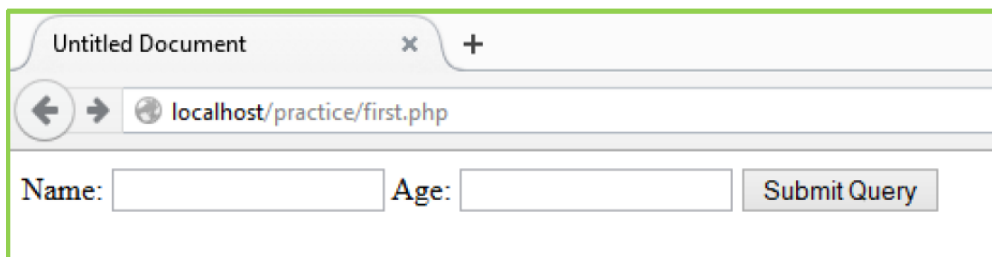


Figure 2

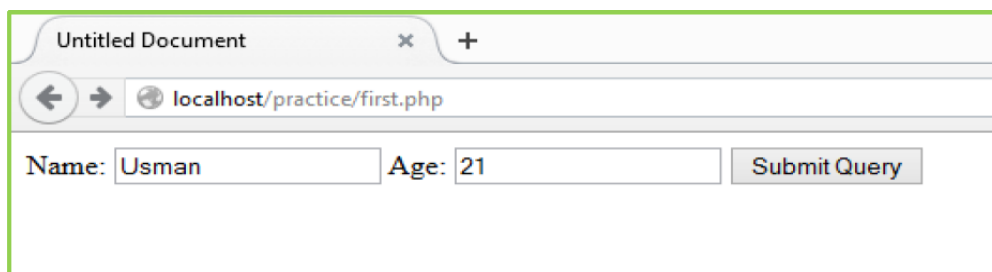


Figure 3

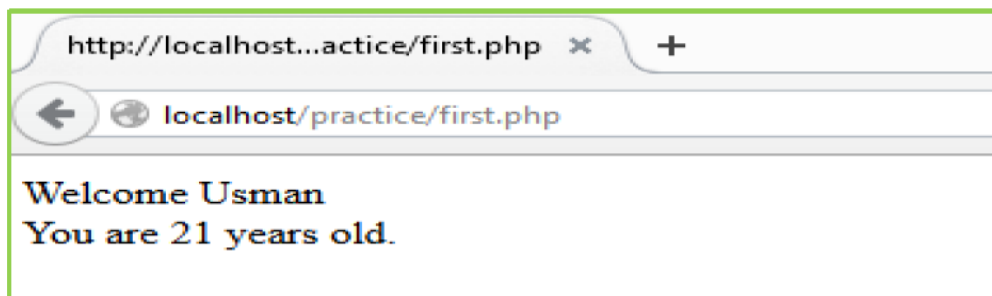
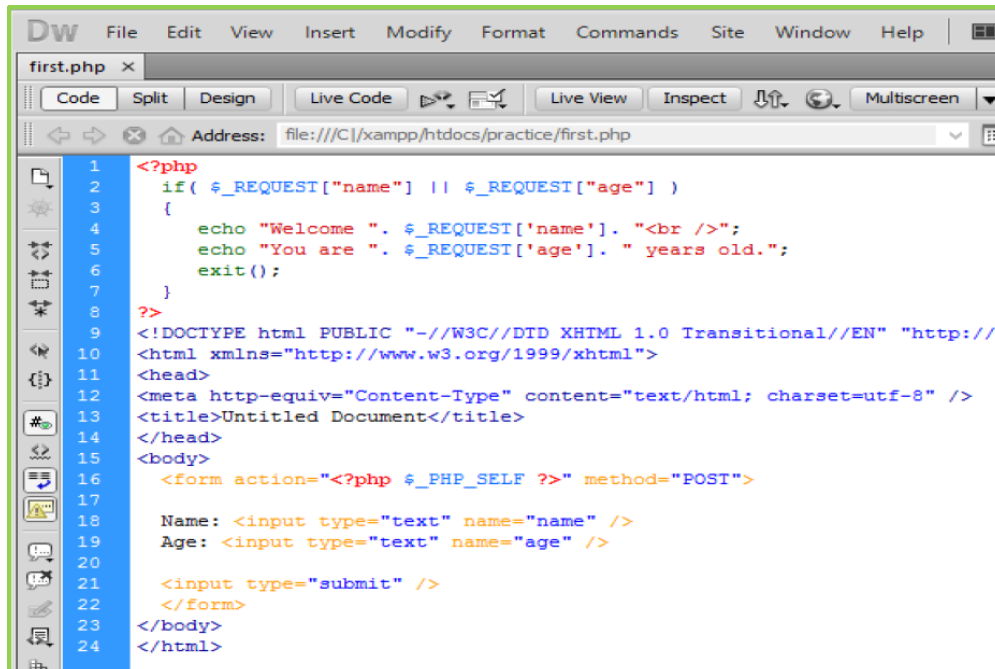


Figure 4

## The \$\_REQUEST variable

The **PHP \$\_REQUEST** variable contains the contents of both **\$\_GET**, **\$\_POST**, and **\$\_COOKIE**. The PHP **\$\_REQUEST** variable can be used to get the result from form data sent with both the **GET** and **POST** methods.

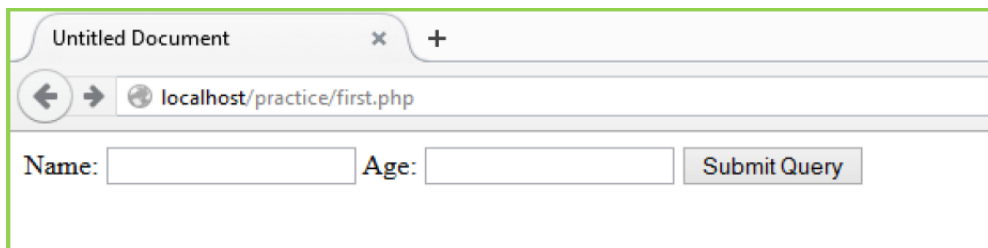
Try out following example by putting the source code in test.php script.



```
1 <?php
2 if($_REQUEST["name"] || $_REQUEST["age"])
3 {
4 echo "Welcome ". $_REQUEST['name']. "
";
5 echo "You are ". $_REQUEST['age']. " years old.";
6 exit();
7 }
8
9 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://v
10 <html xmlns="http://www.w3.org/1999/xhtml">
11 <head>
12 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
13 <title>Untitled Document</title>
14 </head>
15 <body>
16 <form action="<?php $_PHP_SELF ?>" method="POST">
17
18 Name: <input type="text" name="name" />
19 Age: <input type="text" name="age" />
20
21 <input type="submit" />
22 </form>
23 </body>
24 </html>
```

Figure 1.1

Output figure 1.1

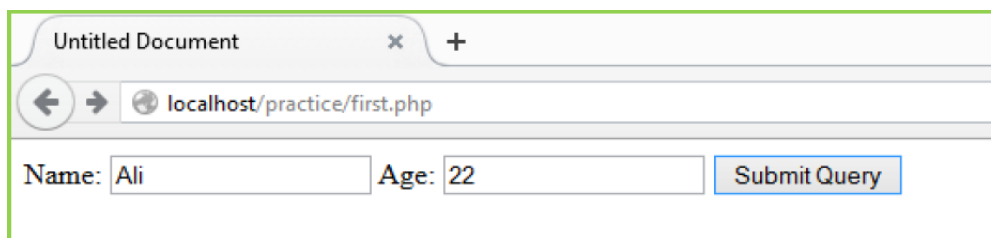


Untitled Document

localhost/practice/first.php

Name:  Age:

Figure 1.2



Untitled Document

localhost/practice/first.php

Name: Ali Age: 22

Figure 1.3

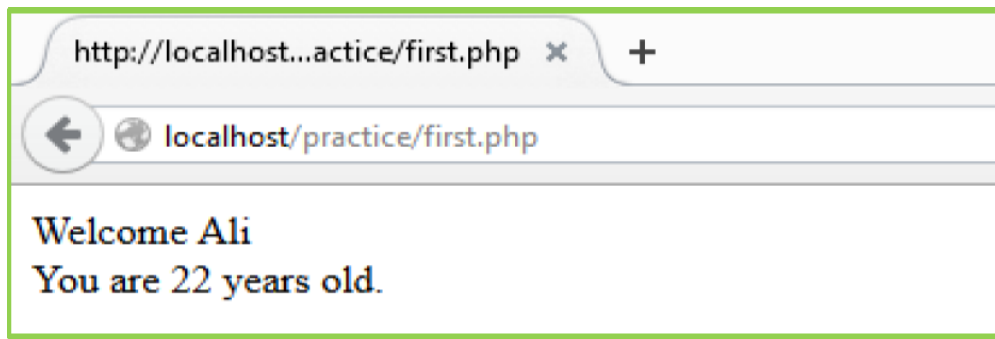


Figure 1.4

### 13. PHP - File Inclusion

This function include the content of a PHP file into another PHP file before the server executes it. There are two PHP functions which can be used to include one PHP file into another PHP file.

1. The include() Function
2. The require() Function

This is a strong point of PHP which helps in creating functions, headers, footers, or elements that can be reused on multiple pages.

#### Remember

File Inclusion help developers to change code of included files instead changing all pages of website.

#### The include() Function

The include() function takes all the text in a specified file and copies it into the file that uses the include function. If there is any problem in loading a file then the **include()** function generates a warning but the script will continue execution.

To build a common menu for your website, create a file menu.php with the following content.

```

6 </head>
7 <body>
8 Home
9 Php Tutorials
10 Contact - |

11 </body>
12 </html>

```

Figure 1.1

Now create as many pages as needed and include this file to create header. For example now test.php file can have following content.

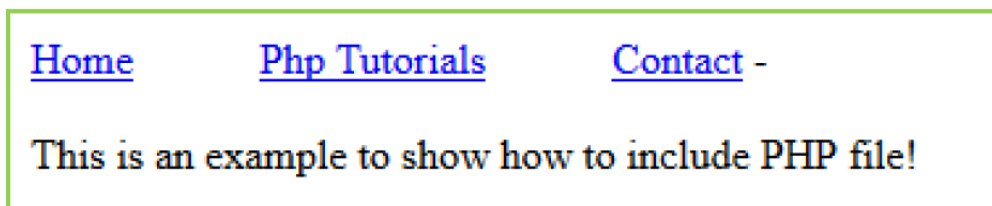
**Remember**

You may get plain warning messages or fatal error messages or nothing at all. This depends on your PHP Server configuration.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Untitled Document</title>
</head>
<body>
<?php include("menu.php"); ?>
<p>This is an example to show how to include PHP file!</p>
</body>
</html>
```

**Figure 1.2**

This will produce following result

**Figure 1.3****Remember**

It is recommended to use the `require()` function instead of `include()`, because scripts should not continue executing if files are missing or misnamed

**The require() Function**

The `require()` function works same as `include()`. But If there is any problem in loading a file then the **require()** function generates a **fatal error** and halt the execution of the script. Error handling is the difference between `require()` and `include()` functions.

Above example can be created with `require()` function and it will generate same result. But with following two examples where file does not exist then it will get different results.

```
</html>

<body>

<?php include("xxmenu.php");?>

<p>This is an example to show how to include wrong PHP file!</p>

</body>

</html>
```

This will produce following result

This is an example to show how to include wrong PHP file!

Now let's try same example with `require()` function.

```
</html>
```



```

<body>

<?php require("xxmenu.php");?>

<p>This is an example to show how to include wrong PHP file!</p>

</body>

</html>

```

This time file execution halts and nothing is displayed.

## 14. PHP - Functions

PHP functions are similar to other programming languages.

Function like **fopen()** and **fread()** are built-in functions but PHP gives option to create own functions as well.

There are two parts which should be clear:

1. Creating a PHP Function
2. Calling a PHP Function

### Function

A function is a piece of code which takes one more in-put in the form of parameter and does some processing and returns a value.

In fact own created PHP functions are hardly used because built-in function are always available to call according to requirement.

### Creating PHP Function

It's very easy to create own PHP function. Following example creates a function called `writeMessage()` and then calls it just after creating it.

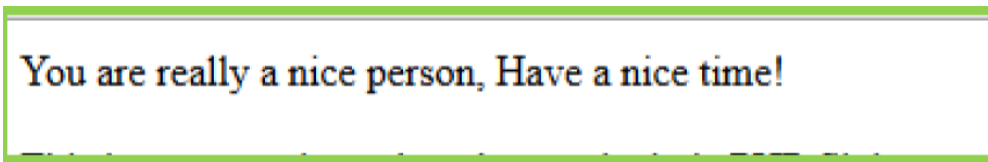
Note that while creating a function its name should start with keyword **function** and all the PHP code should be put inside { and } braces as shown in the following example below:

```

1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>PHP</title>
6 </head>
7
8 <body>
9 <?php
10 /* Defining a PHP Function */
11 function writeMessage()
12 {
13 echo "You are really a nice person, Have a nice time!";
14 }
15 /* Calling a PHP Function */
16 writeMessage();
17 ?>
18 </body>
19 </html>

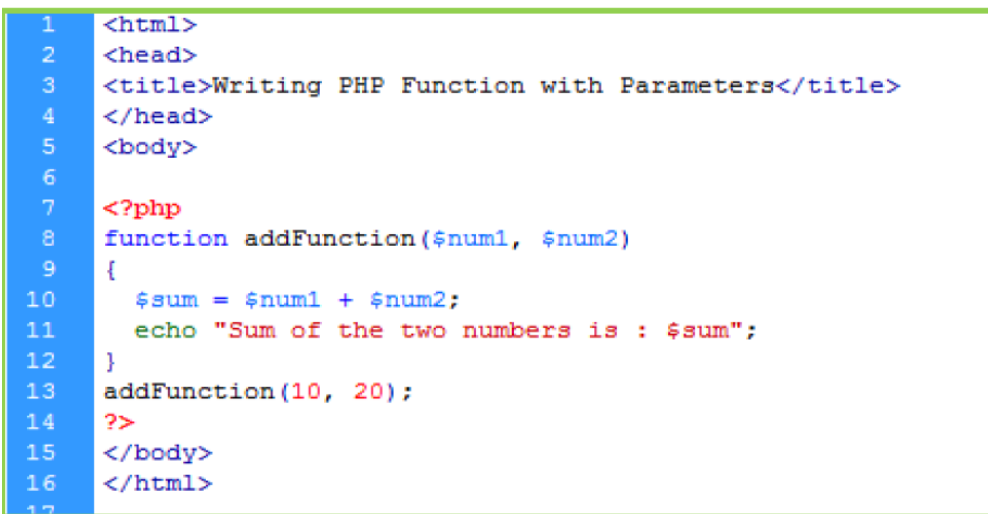
```

Figure 1.1

**Output figure 1.1**A screenshot of a web browser displaying the text "You are really a nice person, Have a nice time!". The text is rendered in a serif font, with "You" in blue, "are" in red, "really" in green, "a" in blue, "nice" in red, "person," in green, "Have" in blue, "a" in red, "nice" in green, and "time!" in blue. The entire text is enclosed in a thin green rectangular border.

## PHP Functions with Parameters

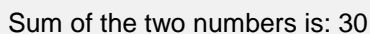
PHP gives option to pass parameters inside a function. As many as parameters can be passed to functions. These parameters work like variables inside function. Following example takes two integer parameters and add them together and then print them.

A screenshot of a code editor showing PHP code. The code is as follows:

```
1 <html>
2 <head>
3 <title>Writing PHP Function with Parameters</title>
4 </head>
5 <body>
6
7 <?php
8 function addFunction($num1, $num2)
9 {
10 $sum = $num1 + $num2;
11 echo "Sum of the two numbers is : $sum";
12 }
13 addFunction(10, 20);
14 ?>
15 </body>
16 </html>
17
```

The code is highlighted with a blue background and a green border.**Figure 1.1**

This will display following result:

A screenshot of a web browser displaying the text "Sum of the two numbers is: 30". The text is rendered in a serif font and is enclosed in a light gray rectangular border.

## Passing Arguments by Reference

It is possible to pass arguments to functions by reference. This means that a reference to the variable is manipulated by the function rather than a copy of the variable's value.

Any changes made to an argument in these cases will change the value of the original variable. An argument can be passed by reference by adding an ampersand to the variable name in either the function call or the function definition.

Following example depicts both the cases.

```

1 <html>
2 <head>
3 <title>Passing Argument by Reference</title>
4 </head>
5 <body>
6 <?php
7 function addFive($num)
8 {
9 $num += 5;
10 }
11
12 function addSix(&$num)
13 {
14 $num += 6;
15 }
16 $orignum = 10;
17 addFive($orignum);
18 echo "Original Value is $orignum
";
19 addSix($orignum);
20 echo "Original Value is $orignum
";
21 ?>
22 </body>
23 </html>

```

Figure 6

This will display following result:

Original Value is 10

Original Value is 16

## PHP Functions Returning Value

A function can return a value using the **return** statement in conjunction with a value or object. Return stops the execution of the function and sends the value back to the calling code.

More than one value can be returned from a function using **return array(1,2,3,4)**.

Following example takes two integer parameters and add them together and then returns their sum to the calling program. Note that **return** keyword is used to return a value from a function.

```

1 <html>
2 <head>
3 <title>Writing PHP Function which returns value</title>
4 </head>
5 <body>
6
7 <?php
8 function addFunction($num1, $num2)
9 {
10 $sum = $num1 + $num2;
11 return $sum;
12 }
13 $return_value = addFunction(10, 20);
14 echo "Returned value from the function : $return_value";
15 ?>
16 </body>
17 </html>
18

```

Figure 1.1

This will display following result:

Returned value from the function: 30

## Setting Default Values for Function Parameters

A parameter can be set to have a default value if the function's caller doesn't pass it.

Following function prints NULL in case use does not pass any value to this function.

```
1 <html>
2 <head>
3 <title>Writing PHP Function which returns value</title>
4 </head>
5 <body>
6
7 <?php
8 function printMe($param = NULL)
9 {
10 print $param;
11 }
12 printMe("This is test");
13 printMe();
14 ?>
15
16 </body>
17 </html>
```

Figure 1.1

This will produce following result:

This is test

## Dynamic Function Calls

It is possible to assign function names as strings to variables and then treat these variables exactly as function name itself. Following example depicts this behavior.

```
1 <html>
2 <head>
3 <title>Dynamic Function Calls</title>
4 </head>
5 <body>
6
7 <?php
8 function sayHello()
9 {
10 echo "Hello
";
11 }
12 $function_holder = "sayHello";
13 $function_holder();
14 ?>
15
16 </body>
17 </html>
```

Figure 1.1

This will display following result:

Hello

## 15. PHP - Cookies and Sessions

### Cookies

A cookie is used to identify a user. A cookie is a small file that the server embeds on the user's computer. Each time the same computer requests a page with a browser, it will send the cookie too. With PHP create and retrieve cookie values.

Syntax `setcookie("mycookie","somevalue",time()+3600);`

In the above statement **mycookie** is the name of cookie **somevalue** is the value of cookie and **time()+3600** is the expiry time of cookie.

### How to get cookie value

There is a super global variable called **\$\_COOKIE**. This function can access all value of cookies

Syntax `$cookie['mycookie'];`

### How to remove cookie

Cookie automatically expire when its time complete but to remove cookie use the past time like below code than cookie expired immediately.

Syntax: `setcookie("mycookie","somevalue",time()-99999);`

### STEP BY STEP Cookies Example

1. Open Dreamweaver create php file titled firstcookie
2. Type the code below

```
<?php
$cookie_name = "pakistan";
$cookie_value = "zindabad";
//setcookie($cookie_name, $cookie_value, time() + (86400 * 30), "/"); // 86400 = 1 day
//setcookie($cookie_name, "", time()-99999);
?>
<html>
<body>
<?php
if(!isset($_COOKIE[$cookie_name])) {
echo "Cookie named '" . $cookie_name . "' is not set!";
} else {
echo "Cookie '" . $cookie_name . "' is set!
";
echo "Value is: " . $_COOKIE[$cookie_name];
}
?>
<p>Note:please relode the page to see the cookie value.</p>
```

```
</body>
</html>
```

- run the program on Firefox
- The output should look like figure 1.1

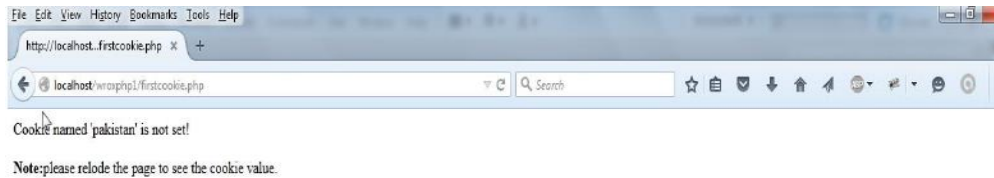


Figure 1.1

- Now reload the page and the result should look like figure 1.2

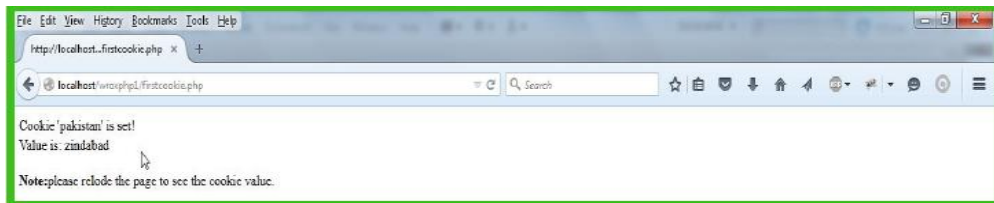


Figure 1.2

## 16. Sessions

Session is also a way to store information in variables to be used across multiple pages. Unlike a cookie, the information is not stored on the user's computer.

While working with an application, open it, do some changes, and then close it. This is much like a Session. The computer knows who is using. It knows when user start the application and when to end. But on the internet there is one problem: the web server does not know who you are or what you do, because the HTTP address doesn't maintain state.

Session variables solve this problem by storing user information to be used across multiple pages (e.g. username, favorite color, etc). By default, session variables last until the user closes the browser.

### How to create Session

Session can be easily created by php built in function **session\_start()**. But this function also written before the html code like cookies. To send any data before this function then php processor shows warning message

### How to get session variable value

By using **\$\_session[ ]** super global variable it can easily access session value

## STEP BY STEP

### Session Example

- Open **Dreamweaver** and create php file **session1.php**
- Type the code below

```
<?php
Session_start();
Echo "welcome to our page";
$_SESSION['user'] = 'Touseef';
```

```
$_SESSION['pwd'] = 'abc';
$_SESSION['time'] = time();
//work if session cookie was accepted
Echo '
page 2';
//or maybe pass along the session id, if needed
Echo '
 page 2
?>
```

3. Now create another file **session2.php**
4. Type the code below

```
<?php
Session_start();
Echo "welcome to our page number 2";
Echo $_SESSION['user'] . "
";
Echo $_SESSION['pwd'] . "
";
Echo date('y m d H:i:s' , $session['time']);
Echo '
 page 1
?>
```

5. Now see the output in browser

### How to destroy session

It can destroy session by using **session\_destroy()** function which destroy all session variables. But this function not remove **\$\_SESSION[]** array values. If want to completely remove the value in array then simply assign blank array to **\$\_SESSION** like below code.

```
Session_start();
$_SESSION['test']=5;
Session_destroy();
$_SESSION=array();
Print $_SESSION['test'];
```

## 17.PHP - Sending Emails

PHP also send emails. If sendmail is not used, or if Apache is installed on a Windows server, then there are couple of choices. Existing SMTP service, or installed an e-mail server such as Mailtraq on computer, can be used. When server e-mail is up and running, there are a couple of parameters that need to modify in your php.ini file. Of course, when using a hosting service, then provider should already have these parameters set up.

### Sending an E-mail

The actual method of sending an e-mail is quite simple. Of course, it can be made much more complex by sending HTML and images.

#### SMTP

**SMTP** stands for Simple Mail Transfer Protocol. SMTP is used when email is delivered from an email client, such as Outlook Express, to an email server or when email is delivered from one email server to another. SMTP uses port 25.

**STEP BY STEP      Sending Simple E-mail**

1. Open **Dreamweaver**, and enter the following code (make sure to put own e - mail address in as the first parameter):

```
< ?php
mail('myaddress@example.com', 'Hello pakistan',
'Hi, pakistan. Prepare for our arrival. We are starving!');
? >
```

**PHP.INI**

**Php.ini** is the main configuration file which has all important setting to setup php server

2. Save the file as **firstmail.php**, and load it in browser. There will be a blank page and receive an e-mail shortly at the address entered as the first parameter to mail() .

**STEP BY STEP      Collecting Data and Sending E-mail**

1. Open Dreamweaver and enter the following code:

```
< html >
< head >
< title > Enter E-mail Data < /title >
< style type="text/css" > td { vertical-align: top; }
< /style >
< /head >
< body >
< form method="post" action="sendmail.php" >
< table >
< tr >
< td > To: < /td >
< td > < input type="text" name="to_address" size="40" / > < /td >
< /tr > < tr >
< td > From: < /td >
< td > < input type="text" name="from_address" size="40" / > < /td >
< /tr > < tr >
< td > Subject: < /td >
< td > < input type="text" name="subject" size="40" / > < /td >
< /tr > < tr >
< td valign="top" > Message: < /td >
< td >
< textarea cols="60" rows="10"
name="message" > Enter your message here. < /textarea >
< /td >
< /tr > < tr >
< td > < /td >
< td >
< input type="submit" value="Send" / >
< input type="reset" value="Reset" / >
< /td >
< /tr >
< /table >
< /form >
< /body >
< /html >
```

2. Save the page as **postcard.php**. Note that **postcard.php** does not actually contain any PHP code in it. It simply collects the required data in an HTML form. Give it a .php extension because it will add PHP code to it later.



3. Start a new text document, and enter the following code:

```
< ?php
$to_address = $_POST['to_address'];
$from_address = $_POST['from_address'];
$subject = $_POST['subject'];
$message = $_POST['message'];
$headers = 'From: ' . $from_address . "\n";
? >
< html >
< head >
< title > Mail Sent! < /title >
< /head >
< body >
< ?php
$success = mail($to_address, $subject, $message, $headers);
if ($success) {
echo ' < h1 > Congratulations! < /h1 > ';
echo ' < p > The following message has been sent: < br / > < br / > ';
echo ' < b > To: < /b > ' . $to_address . ' < br / > ';
echo ' < b > From: < /b > ' . $from_address . ' < br / > ';
echo ' < b > Subject: < /b > ' . $subject . ' < br / > ';
echo ' < b > Message: < /b > < /p > ';
echo nl2br($message);
} else {
echo ' < p > < strong > There was an error sending your message. < /strong > < /p > ';
}
? >
< /body >
< /html >
```

4. Save this page as **sendmail.php** . This second page will take the values entered into the first page and send them in an e - mail.
5. Load up the first page, **postcard.php** , in browser and enter some data. Make sure to use a valid e - mail address so that can verify the e-mail's receipt. It should look like Figure 1.1

Figure 1.1

- Click the Send button. A second page appears, similar to the one shown in Figure 1.2

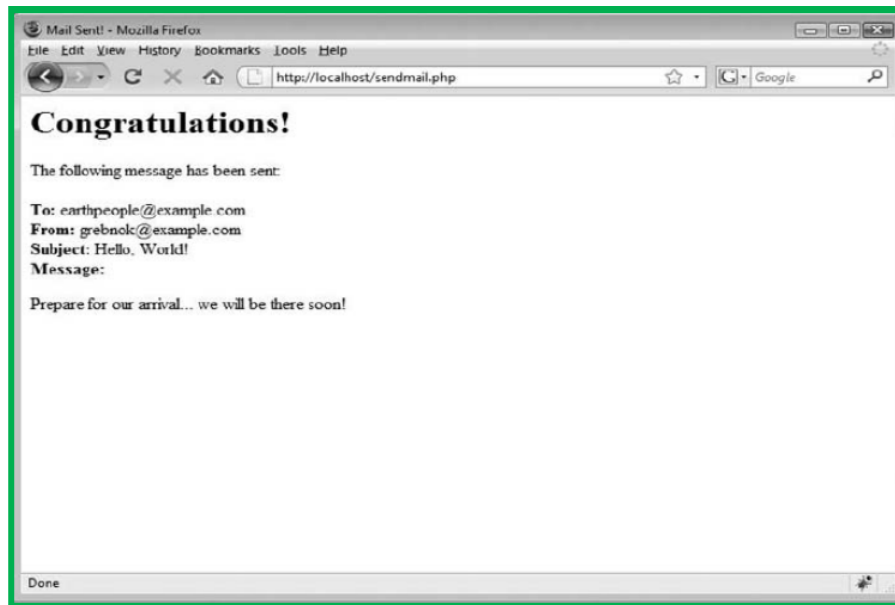


Figure 1.2

- Open e-mail client, and check e-mail. Find the e-mail message, as shown in Figure 1.3

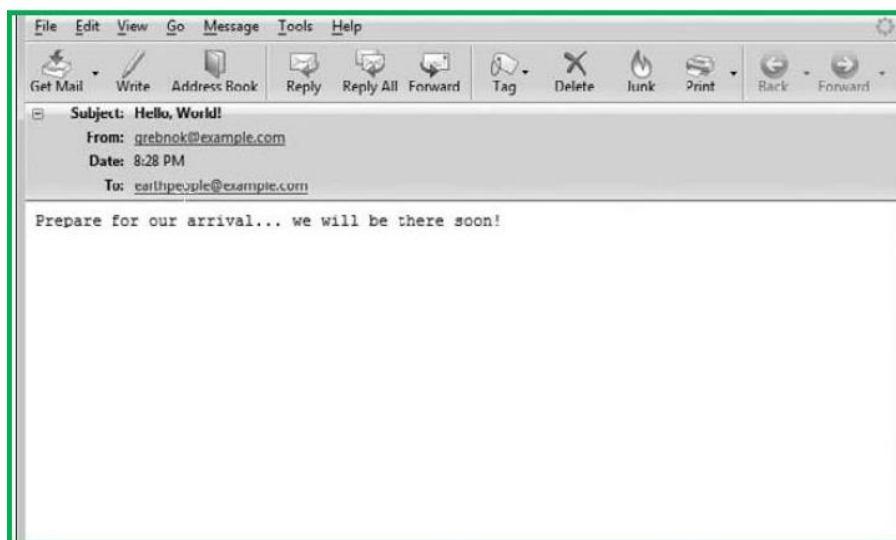


Figure 1.3

## 18.PHP - File Uploading Study and Demonstrate

- PHP Coding Standard

### Single and Double Quotes

```
echo 'Link name';
echo "$linkname";
```

### Indentation

```
[tab]$foo = 'somevalue';
[tab]$foo2 = 'somevalue2';
[tab]$foo34 = 'somevalue3';
```

```
[tab]$foo5 = 'somevalue4';

$my_array = array(
[tab]'foo' => 'somevalue',
[tab]'foo2' => 'somevalue2',
[tab]'foo3' => 'somevalue3',
[tab]'foo34' => 'somevalue3',
);
```

### Brace Style

```
if (condition) {
 action1();
 action2();
} elseif (condition2 && condition3) {
 action3();
 action4();
} else {
 defaultaction();
}
```

### Just another Style

```
<?php if (have_posts()) : ?>
 <div class="hfeed">
 <?php while (have_posts()) : the_post(); ?>
 <article id="post-<?php the_ID() ?>" class="<?php post_class() ?>">
 <!-- ... -->
 </article>
 <?php endwhile; ?>
 </div>
<?php endif; ?>
```

### No Shorthand PHP Tag

Correct:

```
<?php ... ?>
<?php echo $var; ?>
```

Incorrect:

```
<? ... ?>
<?= $var ?>
```

### Remove Trailing Spaces

Remove trailing whitespace at the end of each line of code. Omitting the closing PHP tag at the end of a file is preferred. After setting tag, make sure you remove trailing whitespace.

### Space Usage

```
x == 23
foo && bar
!foo
array(1, 2, 3)
$baz . '-5'
$term .= 'X'
```

### Just another Style

```
$x = $foo["bar"]; // correct
$x = $foo['bar']; // incorrect

$x = $foo[0]; // correct
$x = $foo[0]; // incorrect

$x = $foo[$bar]; // correct
$x = $foo[$bar]; // incorrect
```

### Ternary Operator

```
// (if statement is true) ? (do this) : (else, do this);
$musictype = ('jazz' == $music) ? 'cool' : 'blah';
// (if field is not empty) ? (do this) : (else, do this);
```

### Yoda Conditions

```
if (true == $the_force) {
 $victorious = you_will($be);
}
```

### Clever Code

```
isset($var) || $var = some_function();
if (! isset($var)) {
 $var = some_function();
}
```

## PHP - Predefined Variables

PHP provides a large number of predefined variables to any script which it runs. PHP provides an additional set of predefined arrays containing variables from the web server the environment, and user input. These new arrays are called **superglobals**:

All the following variables are automatically available in every scope.

### PHP Superglobals

Variable	Description
\$GLOBALS	Contains a reference to every variable which is currently available within the global scope of the script. The keys of this array are the names of the global variables.
\$_SERVER	This is an array containing information such as headers, paths, and script locations. The entries in this array are created by the web server. There is no guarantee that every web server will provide any of these. See next section for a complete list of all the SERVER variables.
\$_GET	An associative array of variables passed to the current script via the HTTP GET method.
\$_POST	An associative array of variables passed to the current script via the HTTP POST method.

<code>\$_FILES</code>	An associative array of items uploaded to the current script via the HTTP POST method.
<code>\$_REQUEST</code>	An associative array consisting of the contents of <code>\$_GET</code> , <code>\$_POST</code> , and <code>\$_COOKIE</code> .
<code>\$_COOKIE</code>	An associative array of variables passed to the current script via HTTP cookies.
<code>\$_SESSION</code>	An associative array containing session variables available to the current script.
<code>\$_PHP_SELF</code>	A string containing PHP script file name in which it is called.
<code>\$php_errormsg</code>	<code>\$php_errormsg</code> is a variable containing the text of the last error message generated by PHP.

## Learner's Activity

1. Create **myform.php** file in Dreamweaver
2. Type the code below code

```
<html>
<head><title>My first form</title></head>
<body>
<form method = "post" action="dataform.php">
please type your name:
<input type = "text" name="txtname" />
<input type="submit" value="say hello" />
</form></body></html>
```

3. Save the code and create another file titled **dataform.php**
4. type the code below

```
<html>
<head><title>My first form</title></head>
<body>
<?php
 //now get form data using post method
$name = $post['txtname'];
Print "hello". $name;
?>
</body></html>
```

5. See the result in browser window
6. Now change the action method to **GET** and see what changes come by using **GET** method

### Server Variables: \$\_SERVER

\$\_SERVER is an array containing information such as headers, paths, and script locations. The entries in this array are created by the web server. There is no guarantee that every web server will provide any of these.

In this learning unit we just put down some of the basic server variable theoretical because we already cover some of the variable in earlier units

Variable	Description
<code>\$_SERVER['PHP_SELF']</code>	The filename of the currently executing script, relative to the document root
<code>\$_SERVER['argv']</code>	Array of arguments passed to the script. When the script is run on the command line, this gives C-style access to the command line parameters. When called via the GET method, this will contain the query string.
<code>\$_SERVER['argc']</code>	Contains the number of command line parameters passed to the script if run on the command line.
<code>\$_SERVER['GATEWAY_INTERFACE']</code>	What revision of the CGI specification the server is using; i.e. 'CGI/1.1'.
<code>\$_SERVER['SERVER_ADDR']</code>	The IP address of the server under which the current script is executing.
<code>\$_SERVER['SERVER_NAME']</code>	The name of the server host under which the current script is executing. If the script is running on a virtual host, this will be the value defined for that virtual host.
<code>\$_SERVER['SERVER_SOFTWARE']</code>	Server identification string, given in the headers when responding to requests.
<code>\$_SERVER['SERVER_PROTOCOL']</code>	Name and revision of the information protocol via which the page was requested; i.e. 'HTTP/1.0';
<code>\$_SERVER['REQUEST_METHOD']</code>	Which request method was used to access the page; i.e. 'GET', 'HEAD', 'POST', 'PUT'.
<code>\$_SERVER['REQUEST_TIME']</code>	The timestamp of the start of the request. Available since PHP 5.1.0.
<code>\$_SERVER['QUERY_STRING']</code>	The query string, if any, via which the page was accessed.
<code>\$_SERVER['DOCUMENT_ROOT']</code>	The document root directory under which the current script is executing, as defined in the server's configuration file.
<code>\$_SERVER['HTTP_ACCEPT']</code>	Contents of the Accept: header from the current request, if there is one.
<code>\$_SERVER['HTTP_ACCEPT_CHARSET']</code>	Contents of the Accept-Charset: header from the current request, if there is one. Example: 'iso-8859-1,*;utf-8'.
<code>\$_SERVER['HTTP_ACCEPT_ENCODING']</code>	Contents of the Accept-Encoding: header from the current request, if there is one. Example: 'gzip'.
<code>\$_SERVER['HTTP_ACCEPT_LANGUAGE']</code>	Contents of the Accept-Language: header from the current request, if there is one. Example: 'en'.
<code>\$_SERVER['HTTP_CONNECTION']</code>	Contents of the Connection: header from the current request, if there is one. Example: 'Keep-Alive'.
<code>\$_SERVER['HTTP_HOST']</code>	Contents of the Host: header from the current request, if there is one.
<code>\$_SERVER['HTTP_REFERER']</code>	The address of the page (if any) which referred the user agent to the current page.

<code>\$_SERVER['HTTP_USER_AGENT']</code>	This is a string denoting the user agent being which is accessing the page. A typical example is: Mozilla/4.5 [en] (X11; U; Linux 2.2.9 i586).
<code>\$_SERVER['HTTPS']</code>	Set to a non-empty value if the script was queried through the HTTPS protocol.
<code>\$_SERVER['REMOTE_ADDR']</code>	The IP address from which the user is viewing the current page.
<code>\$_SERVER['REMOTE_HOST']</code>	The Host name from which the user is viewing the current page. The reverse dns lookup is based off the REMOTE_ADDR of the user.
<code>\$_SERVER['REMOTE_PORT']</code>	The port being used on the user's machine to communicate with the web server.
<code>\$_SERVER['SCRIPT_FILENAME']</code>	The absolute pathname of the currently executing script.
<code>\$_SERVER['SERVER_ADMIN']</code>	The value given to the SERVER_ADMIN (for Apache) directive in the web server configuration file.
<code>\$_SERVER['SERVER_PORT']</code>	The port on the server machine being used by the web server for communication. For default setups, this will be '80'.
<code>\$_SERVER['SERVER_SIGNATURE']</code>	String containing the server version and virtual host name which are added to server-generated pages, if enabled.
<code>\$_SERVER['PATH_TRANSLATED']</code>	Filesystem based path to the current script.
<code>\$_SERVER['SCRIPT_NAME']</code>	Contains the current script's path. This is useful for pages which need to point to themselves.
<code>\$_SERVER['REQUEST_URI']</code>	The URI which was given in order to access this page; for instance, '/index.html'.
<code>\$_SERVER['PHP_AUTH_DIGEST']</code>	When running under Apache as module doing Digest HTTP authentication this variable is set to the 'Authorization' header sent by the client.
<code>\$_SERVER['PHP_AUTH_USER']</code>	When running under Apache or IIS (ISAPI on PHP 5) as module doing HTTP authentication this variable is set to the username provided by the user.
<code>\$_SERVER['PHP_AUTH_PW']</code>	When running under Apache or IIS (ISAPI on PHP 5) as module doing HTTP authentication this variable is set to the password provided by the user.
<code>\$_SERVER['AUTH_TYPE']</code>	When running under Apache as module doing HTTP authenticated this variable is set to the authentication type.



## 19. PHP - Regular Expressions

Regular expressions are nothing more than a sequence or pattern of characters itself. They provide the foundation for pattern-matching functionality.

Using regular expression is used to search a particular string inside another string, it can replace one string by another string and it can split a string into many chunks.

PHP offers functions specific to two sets of regular expression functions, each corresponding to a certain type of regular expression. Use any of them based on comfort.

- POSIX Regular Expressions
- PERL Style Regular Expressions

### Do you know?

Pattern-matching in computer science is a technique where on the basis of specific keywords we can make decision in any programming language

### POSIX Regular Expressions

The structure of a POSIX regular expression is not dissimilar to that of a typical arithmetic expression: various elements (operators) are combined to form more complex expressions.

The simplest regular expression is one that matches a single character, such as g, inside strings such as g, haggie, or bag.

Let's give explanation for few concepts being used in POSIX regular expression.

#### Brackets

Expression	Description
[0-9]	It matches any decimal digit from 0 through 9.
[a-z]	It matches any character from lowercase a through lowercase z.
[A-Z]	It matches any character from uppercase A through uppercase Z.
[a-Z]	It matches any character from lowercase a through uppercase Z.

#### PHP's Regexp POSIX Functions

Function	Description
ereg()	The ereg() function searches a string specified by string for a string specified by pattern, returning true if the pattern is found, and false otherwise.
ereg_replace()	The ereg_replace() function searches for string specified by pattern and replaces pattern with replacement if found.
eregi()	The eregi() function searches throughout a string specified by pattern for a string specified by string. The search is not case sensitive.
eregi_replace()	The eregi_replace() function operates exactly like ereg_replace(), except that the search for pattern in string is not case sensitive.
split()	The split() function will divide a string into various elements, the boundaries of each element based on the occurrence of pattern in string.

spliti()	The spliti() function operates exactly in the same manner as its sibling split(), except that it is not case sensitive.
sql_regcase()	The sql_regcase() function can be thought of as a utility function, converting each character in the input parameter string into a bracketed expression containing two characters.

## Learner's Activity

1. Open Dreamweaver and create a html page titled regxp.html and type the following code and save it

```
<html>
<head>
<title>regxp</title>
</head>
<body>
<form id="form1" method="post" action="regxp.php" > <table width="400" border="1"> <tr><td>Email:</td>
<td><input type="text" name="email" /></td> <td>Please provide valid email </td> </tr> <tr><td>NIC #:</td>
<td><input type="text" name="nic" /></td> <td>xxxxx MICXXXXX-X </td> </tr> <tr><td>Mobile:</td> <td><input
type="text" name="mobile" /></td> <td>222-2222222</td> </tr> <tr><td> & tap; </td> <td><input type="submit"
name="Submit" value="Submit" /></td> <td>inbsp;</td> </tr> </table>
</form>
</body>
</html>
```

2. Then type following code in regex.php

```
<?php $email = trim($_POST['email']); $nic = trim($_POST['nic']); $mobile = trim($_POST['mobile']);
if(preg_match("/^[a-zA-Z0-9_+@-]+@[a-zA-Z0-9-]+\.[a-zA-Z0-9-]+$/", $email)) { echo "Your email is valid
"; }else{ echo "Your email
is invalid
";
}
if(preg_match("/^A\d(5)-\d(7)-\d$/", $nic)) { echo "Your NIC # is valid
"; }else{ echo "Your NIC # is invalid
";
;
}
if(preg_match("/^A\d(3,4)-\d(7)$/", $mobile)) echo "Your mobile is valid
"; }else{ echo "Your mobile is
invalid
";
}
?>
```

3. See output in browser and fill the form with correct as well as wrong data and validate the regular expression function

## 20. PHP - Error Handling

The error handling is the catch-up increases fault of program and then take appropriate action. After handling errors properly, it can lead to many unexpected penalty. Quite simply in PHP in error handling.

### How the Apache Web Server Deals with Errors

Apache has a directive, the **ErrorDocument** that can configure in the **httpd.conf** file to create custom error pages with PHP, so visitors to site do not see the default server – based error pages, which may not be as helpful or descriptive as customized error messages.

#### STEP BY STEP Using Apache's ErrorDocument Method

First of all, make some changes to the httpd.conf file to allow developers to create a custom error page. Apache is usually set up by default to go to its own internal error pages, but that can't be used. If need to set Apache to go to custom error page, no matter what error has occurred. To do this, just change the default settings to own specific settings by following these steps:

1. Open up httpd.conf file, and find some lines that look like this:

```
Customizable error responses come in three flavors:
1) plain text 2) local redirects 3) external redirects
#
Some examples:
#ErrorDocument 500 "The server made a boo boo."
#ErrorDocument 404 /missing.html
#ErrorDocument 404 "/cgi-bin/missing_handler.pl"
#ErrorDocument 402 http://www.example.com/subscription_info.html
```

2. Change that information to the following, and then restart Apache:

```
#Customizable error responses come in three flavors:
1) plain text 2) local redirects 3) external redirects
#
Some examples:
ErrorDocument 400 /error.php?400
ErrorDocument 401 /error.php?401
ErrorDocument 403 /error.php?403
ErrorDocument 404 /error.php?404
ErrorDocument 500 /error.php?500
```

### What these errors are saying

```
400: Bad Request
401: Authorization Required
403: Forbidden
404: Not Found
500: Internal Server Error
```

### Using die() function

1. open **notepad** and create a text file and save it as test.txt
2. open **Dreamweaver** type the following code without providing test .txt

```
<?php
```

```
if(!file_exists("/tmp/test.txt"))
{
 die("File not found");
}
else
{
 $file=fopen("/tmp/test.txt","r");
 print "Opend file sucessfully";
}
// Test of the code here.
?>
```

By using this way easily write efficient code using above technique that can stop program whenever it errors out and display more friendly message.

### Custom Error Handling Function

Own created function can be used to handling any error. PHP provides a framework to define error handling function.

#### Syntax

```
error_function(error_level,error_message, error_file,error_line,error_context);
```

Parameter	Description
error_level	Required - Specifies the error report level for the user-defined error. Must be a value number.
error_message	Required - Specifies the error message for the user-defined error
error_file	Optional - Specifies the filename in which the error occurred
error_line	Optional - Specifies the line number in which the error occurred
error_context	Optional - Specifies an array containing every variable and their values in use when the error occurred

### Possible Error levels

These error report levels are the different types of error the user-defined error handler can be used for. These values cab used in combination using | operator

Value	Constant	Description
1	E_ERROR	Fatal run-time errors. Execution of the script is halted
2	E_WARNING	Non-fatal run-time errors. Execution of the script is not halted
4	E_PARSE	Compile-time parse errors. Parse errors should only be generated by the parser.
8	E_NOTICE	Run-time notices. The script found something that might be an error, but could also happen when running a script normally
16	E_CORE_ERROR	Fatal errors that occur during PHP's initial startup.
32	E_CORE_WARNING	Non-fatal run-time errors. This occurs during PHP's initial startup.

256	E_USER_ERROR	Fatal user-generated error. This is like an E_ERROR set by the programmer using the PHP function trigger_error()
512	E_USER_WARNING	Non-fatal user-generated warning. This is like an E_WARNING set by the programmer using the PHP function trigger_error()
1024	E_USER_NOTICE	User-generated notice. This is like an E_NOTICE set by the programmer using the PHP function trigger_error()
2048	E_STRICT	Run-time notices. Enable to have PHP suggest changes to code which will ensure the best interoperability and forward compatibility of code.
4096	E_RECOVERABLE_ERROR	Catchable fatal error. This is like an E_ERROR but can be caught by a user defined handle (see also set_error_handler())
8191	E_ALL	All errors and warnings, except level E_STRICT (E_STRICT will be part of E_ALL as of PHP 6.0)

All the above error level can be set using following PHP built-in library function where level can be any of the value defined in above table.

```
int error_reporting ([int $level])
```

Following is the way to create one error handling function:

```
<?php
function handleError($errno, $errstr,$error_file,$error_line)
{
 echo "Error: [$errno] $errstr - $error_file:$error_line";
 echo "
";
 echo "Terminating PHP Script";
 die();
}
?>
```

Once custom error handler is defined then there is need to set it using PHP built-in library **set\_error\_handler** function. Now let's examine example by calling a function which does not exist.

```
<?php
error_reporting(E_ERROR);
function handleError($errno, $errstr,$error_file,$error_line)
{
 echo "Error: [$errno] $errstr - $error_file:$error_line";
 echo "
";
 echo "Terminating PHP Script";
 die();
}
//set error handler
set_error_handler("handleError");

//trigger error
myFunction();
?>
```

## Exceptions Handling

PHP 5 has an exception model similar to that of other programming languages. Exceptions are important and provide a better control over error handling.

Let's explain three new keyword related to exceptions.

1. **Try** - A function using an exception should be in a "try" block. If the exception does not trigger, the code will continue as normal. However if the exception triggers, an exception is "thrown".
2. **Throw** - This is how to trigger an exception. Each "throw" must have at least one "catch".
3. **Catch** - A "catch" block retrieves an exception and creates an object containing the exception information.

When an exception is thrown, code following the statement will not be executed, and PHP will attempt to find the first matching catch block. If an exception is not caught, a PHP Fatal Error will be issued with an "Uncaught Exception ...

- An exception can be thrown, and caught ("caught") within PHP. Code may be surrounded in a try block.
- Each try must have at least one corresponding catch block. Multiple catch blocks can be used to catch different classes of exceptions.
- Exceptions can be thrown (or re-thrown) within a catch block.

### Example

Following is the piece of code, copy and paste this code into a file and verify the result.

```
<?php
try {
 $error = 'Always throw this error';
 throw new Exception($error);

 // Code following an exception is not executed.
 echo 'Never executed';

} catch (Exception $e) {
 echo 'Caught exception: ', $e->getMessage(), "\n";
}

// Continue execution
echo 'Hello World';
?>
```

In the above example `$e->getMessage()` function is used to get error message. There are following functions which can be used from **Exception** class.

- **getMessage()**- message of exception
- **getCode()** - code of exception
- **getFile()** - source filename
- **getLine()** - source line
- **getTrace()** - n array of the backtrace()
- **getTraceAsString()** - formatted string of trace

**STEP BY STEP****Custom Exception Handler**

Use following code to create own exception handler.

1. Open Dreamweaver and create a php page
2. Type the following function code in that file

```
<?php
function exception_handler($exception) {
 echo "Uncaught exception: ", $exception->getMessage(), "\n";
}

set_exception_handler('exception_handler');

throw new Exception('Uncaught Exception');

echo "Not Executed\n";
?>
```

Now checkout the result in browser

**PHP - Bugs and Debugging**

In programming language or for a programmer, Bugs finding and Debugging is a core thing which is most important.

To make error messages to display in the browser, set the **display\_errors** configuration directive to **On**. To send errors to the web server error log, set **log\_errors** to On. Set them both to on if error messages are to be shown in both places.

Another feature is quote and bracket matching, which helps to make sure that quotes and brackets are balanced. While typing a closing delimiter such as }, the editor highlights the opening { that it matches.

There are following points which need to be verified while debugging program.

- **Missing Semicolons** - Every PHP statement ends with a semicolon (;). PHP doesn't stop reading a statement until it reaches a semicolon. If semicolon is left at the end of a line, PHP continues reading the statement on the following line.
- **Not Enough Equal Signs** - When ask whether two values are equal in a comparison statement, you need two equal signs (==). Using one equal sign is a common mistake.
- **Misspelled Variable Names** - If you misspelled a variable then PHP understands it as a new variable. Remember: To PHP, \$test is not the same variable as \$Test.
- **Missing Dollar Signs** - A missing dollar sign in a variable name is really hard to see, but at least it usually results in an error message so that you know where to look for the problem.
- **Troubling Quotes** - You can have too many, too few, or the wrong kind of quotes. So check for a balanced number of quotes.
- **Missing Parentheses and curly brackets** - They should always be in pairs.
- **Array Index** - All the arrays should start from zero instead of 1.

Moreover, handle all the errors properly and direct all trace messages into system log file so that if any problem happens then it will be logged into system log file and you will be able to debug that problem.

## 21. PHP - Built-in Functions

PHP **function** topic is already discussed in **learning unit 14**. Here is the list of various important function categories.

- **PHP Array Functions**

Some of php array function are listed below

Function	Description
array()	Creates an array
array_change_key_case()	Changes all keys in an array to lowercase or uppercase
array_chunk()	Splits an array into chunks of arrays
array_column()	Returns the values from a single column in the input array
array_combine()	Creates an array by using the elements from one "keys" array and one "values" array
array_count_values()	Counts all the values of an array
array_diff()	Compare arrays, and returns the differences (compare values only)
array_diff_assoc()	Compare arrays, and returns the differences (compare keys and values)
array_diff_key()	Compare arrays, and returns the differences (compare keys only)
array_diff_uassoc()	Compare arrays, and returns the differences (compare keys and values, using a user-defined key comparison function)
array_diff_ukey()	Compare arrays, and returns the differences (compare keys only, using a user-defined key comparison function)
array_fill()	Fills an array with values
array_fill_keys()	Fills an array with values, specifying keys
array_filter()	Filters the values of an array using a callback function
array_flip()	Flips/Exchanges all keys with their associated values in an array
array_intersect()	Compare arrays, and returns the matches (compare values only)
array_intersect_assoc()	Compare arrays and returns the matches (compare keys and values)
array_intersect_key()	Compare arrays, and returns the matches (compare keys only)
array_intersect_uassoc()	Compare arrays, and returns the matches (compare keys and values, using a user-defined key comparison function)
array_intersect_ukey()	Compare arrays, and returns the matches (compare keys only, using a user-defined key comparison function)

- **PHP Calendar Functions**
- **PHP Class/Object Functions**
- **PHP Character Functions**
- **PHP Date & Time Functions**



- PHP Directory Functions
- PHP Error Handling Functions
- PHP File System Functions
- PHP MySQL Functions
- PHP Network Functions
- PHP ODBC Functions
- PHP String Functions
- PHP SimpleXML Functions
- PHP XML Parsing Functions

**Note:** if you need to see complete php built in function reference than visit following link <http://in.php.net/manual/en/funcref.php>

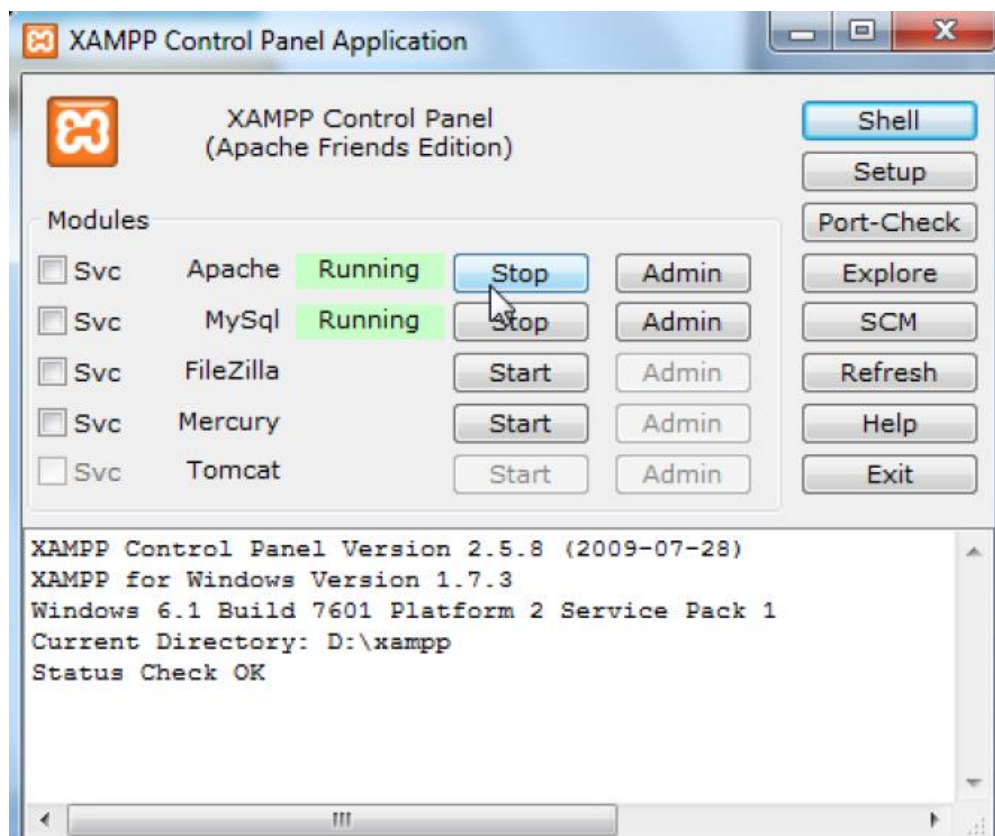
### 20.1. Configure MySQL Database with a PHP Website

We already covered the installation method of xampp server, apache and mysql in **learning unit 5**, now we are going to configure **MySQL** database with php.

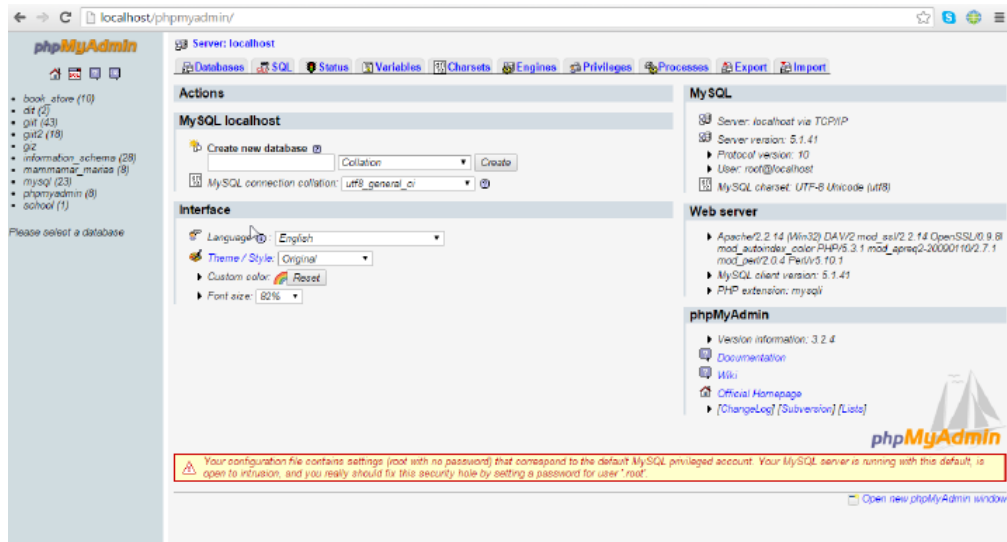
#### Creating and Modifying Database in PHPmyadmin

#### STEP BY STEP Using PHPmyadmin

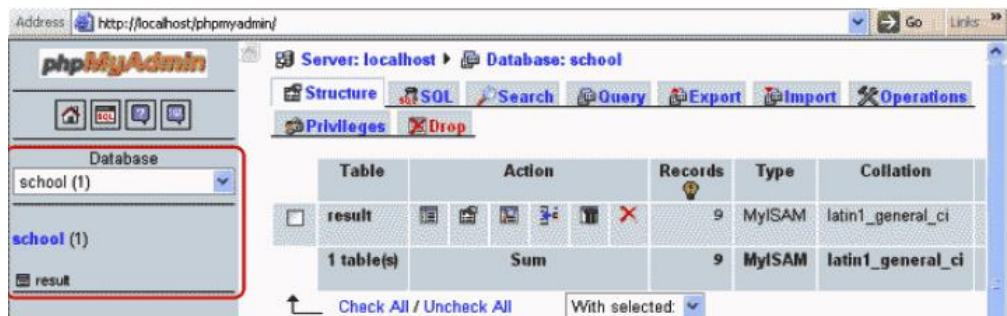
1. Open **xampp** server and start **apache** and **mysql**



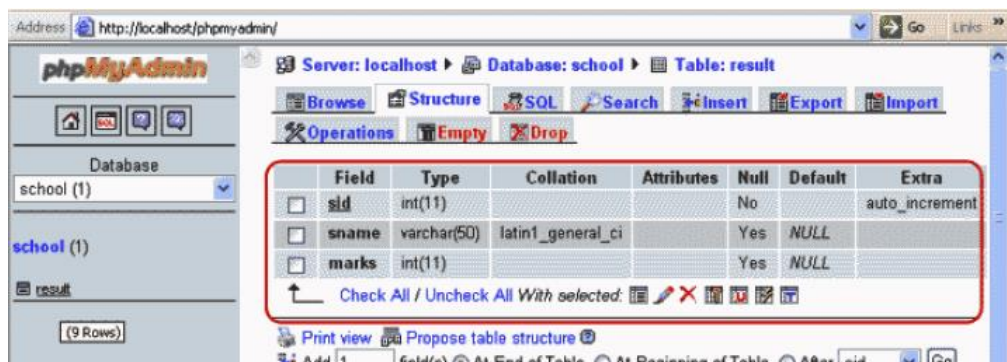
2. Open browser and type url address <http://localhost/phpmyadmin>



- Open existing database titled **school** and create table titled **result**



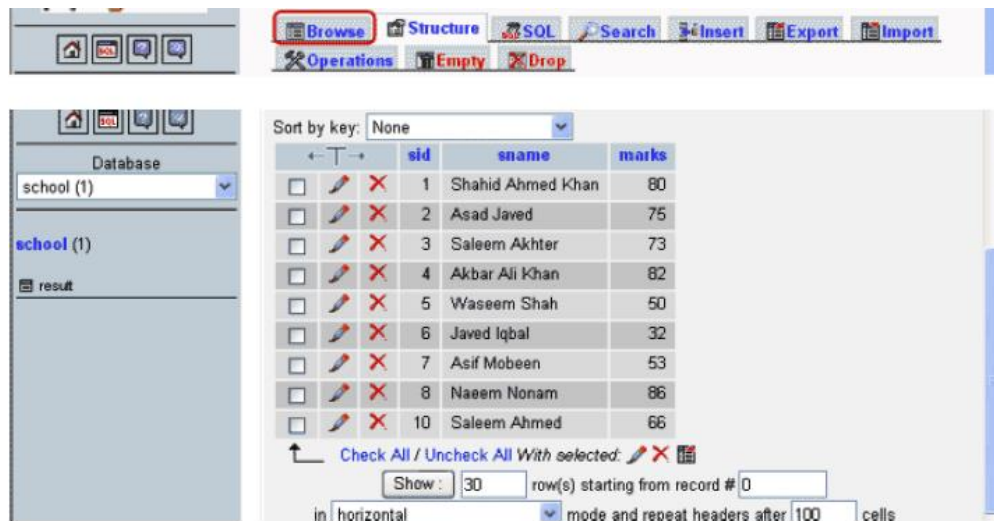
- Now click on result table on right side you all column of that table



- Below the table you can see a ribbon where you can apply different operation on table



- On the top of the window there is button title **browse** by using this button you can see all data of your table



7. Now again open **result** table for **new** record insertion click on **navigation** bar than you can see a form where in **values** tab you put the values and click on the go button

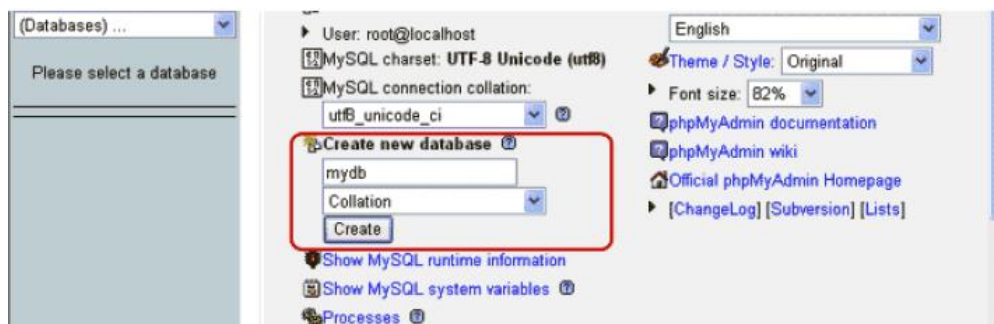
Field	Type	Function	Null	Value
sid	int(11)			<input type="text"/>
sname	varchar(50)		<input checked="" type="checkbox"/>	<input type="text"/>
marks	int(11)		<input checked="" type="checkbox"/>	<input type="text"/>

☒ Ignore

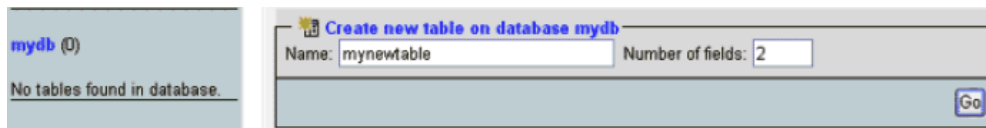
Field	Type	Function	Null	Value
sid	int(11)			<input type="text"/>
sname	varchar(50)		<input checked="" type="checkbox"/>	<input type="text"/>
marks	int(11)		<input checked="" type="checkbox"/>	<input type="text"/>

### Creating New Database in PHPmyadmin

1. Open **phpmyadmin** and click on **home** button
2. Type mydb in textbox for new database



3. Now create new table in table ribbon title mynewtable and set 2 field



mydb (0)

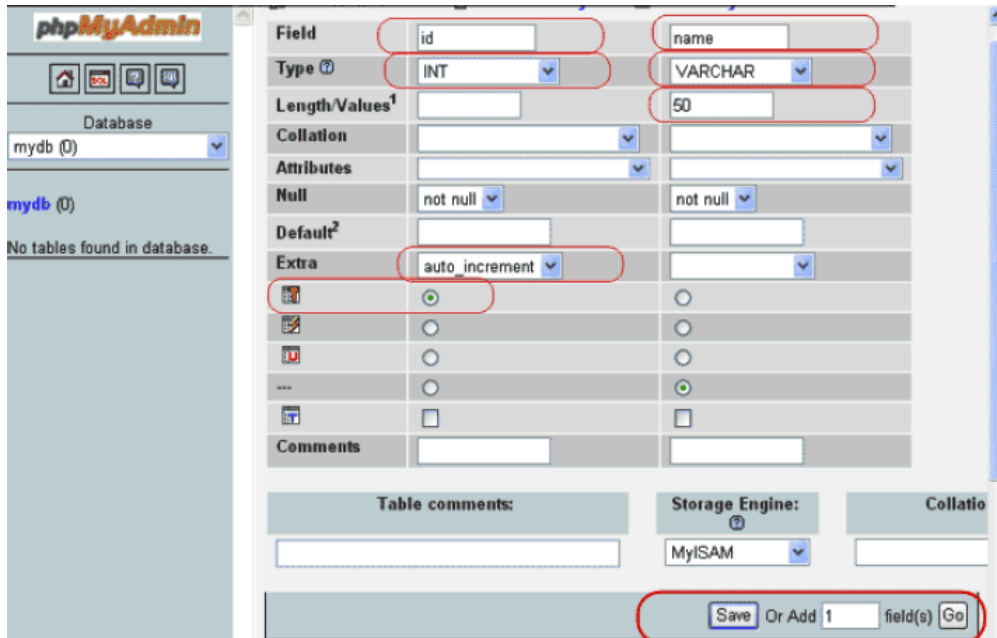
No tables found in database.

Create new table on database mydb

Name: mynewtable Number of fields: 2

Go

- After little bit time you see the form which have two field and in that form you can set the name of column there data type and key attribute as well.



phpMyAdmin

Database: mydb (0)

mydb (0)

No tables found in database.

Field	id	name
Type	INT	VARCHAR
Length/Values <sup>1</sup>		50
Collation		
Attributes		
Null	not null	not null
Default <sup>2</sup>		
Extra	auto_increment	
	<input checked="" type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input checked="" type="radio"/>
	<input type="checkbox"/>	<input type="checkbox"/>
Comments		

Table comments:

Storage Engine: MyISAM

Collation:

Save Or Add 1 field(s) Go

Set id field type **int** and check the **auto\_increment** radio button. Set name field data type as **varchar** length 50 and then click on save button.

- If you want to **drop** the table then from left navigation tab select the table and then from menu click on **drop** button.



Structure SQL Search Query Export Import Operations

Privileges Drop

- When you completely created a database from local server and want to upload database from **host server** then first you should **export** the database. Select the database which you want to export then from the top menu click on export button then you see export page like below

The screenshot shows the 'View dump (schema) of table' dialog box. On the left, under 'Export', the 'SQL' option is selected and circled in red. On the right, under 'Options', the 'Structure' and 'Data' sections are checked. At the bottom, the 'Save as file' section is circled in red, showing 'File name template' as '\_TABLE\_', 'Compression' as 'None', and a 'Go' button.

This page shows lot of format where you can import or export the database. Normally **sql** is selected mostly. Then at last check on **Save as file** button, give the name to file, select **zip** format and click on **Go** button.

## 20.2. MySql Manipulation with PHP

### 1. MySQL Connection using PHP Script:

PHP provides **mysql\_connect()** function to open a database connection. This function takes five parameters and returns a **MySQL** link identifier on success or **FALSE** on failure.

#### Syntax:

```
connection mysql_connect(server,user,passwd,new_link,client_flag);
```

Parameter	Description
server	Optional - The host name running database server. If not specified, then default value is localhost: 3036.
user	Optional - The username accessing the database. If not specified, then default is the name of the user that owns the server process.

passwd	Optional - The password of the user accessing the database. If not specified, then default is an empty password.
new_link	Optional - If a second call is made to mysql_connect() with the same arguments, no new connection will be established; instead, the identifier of the already opened connection will be returned.

**Example:**

```
html>
<head>
<title>Connecting MySQL Server</title>
</head>
<body>
<?php
 $dbhost = 'localhost:3036';
 $dbuser = 'guest';
 $dbpass = 'guest123';
 $conn = mysql_connect($dbhost, $dbuser, $dbpass);
 if(! $conn)
 {
 die('Could not connect: ' . mysql_error());
 }
 echo 'Connected successfully';
 mysql_close($conn);
?>
</body>
</html>
```

**2. Creating Database**

```
<html>
<head>
<title>Creating MySQL Database</title>
</head>
<body>
<?php
 $dbhost = 'localhost:3036';
 $dbuser = 'root';
 $dbpass = 'rootpassword';
 $conn = mysql_connect($dbhost, $dbuser, $dbpass);
 if(! $conn)
 {
 die('Could not connect: ' . mysql_error());
 }
 echo 'Connected successfully
';
 $sql = 'CREATE DATABASE pakistan';
 $retval = mysql_query($sql, $conn);
 if(! $retval)
 {
 die('Could not create database: ' . mysql_error());
 }
 echo "Database pakistan created successfully\n";
 mysql_close($conn);
?>
</body>
</html>
```

### 3. Drop Database

```
<html>
<head>
<title>Deleting MySQL Database</title>
</head>
<body>
<?php
$dbhost = 'localhost:3036';
$dbuser = 'root';
$dbpass = 'rootpassword';
$conn = mysql_connect($dbhost, $dbuser, $dbpass);
if(! $conn)
{
 die('Could not connect: ' . mysql_error());
}
echo 'Connected successfully
';
$sql = 'DROP DATABASE pakistan';
$retval = mysql_query($sql, $conn);
if(! $retval)
{
 die('Could not delete database: ' . mysql_error());
}
echo "Database pakistan deleted successfully\n";
mysql_close($conn);
?>
</body>
</html>
```

### 4. Selecting mysql Database

```
<html>
<head>
<title>Selecting MySQL Database</title>
</head>
<body>
<?php
$dbhost = 'localhost:3036';
$dbuser = 'guest';
$dbpass = 'guest123';
$conn = mysql_connect($dbhost, $dbuser, $dbpass);
if(! $conn)
{
 die('Could not connect: ' . mysql_error());
}
echo 'Connected successfully';
mysql_select_db('pakistan');
mysql_close($conn);
?>
</body>
</html>
```

#### Executing Query

1. **Save** the following code in htdocs/mysql folder with the name of connection.php

```
<?php
//No direct access to this page
```

```
if (preg_match (" /connection .php/" ,$_SERVER ['SCRIPTFILENAME']))
{
(die ("Access denied");
}
// configuration variables
define ("HOSTNAME" , "localhost");
define ("USERNAME" , "root");
define ("PWD" , "");
define ("DBNAME" , "school");
//link to mysql server
if (!$link = mysql_connect (HOSTNAME ,USERNAME ,PWD))
{
die ("Cannot connect to MySQL Server .
 \n" .mysql_error ());
}
//selecting database
if (!mysql_select_db (DBNAME,$link)) {
die ("Cannot select database .
 \n" .mysql_error ());
}
?>
```

**2. Save** the following code inhtdocs/mysql folder with the name of result.php

```
<?php
//connection file
include "connection.php" ;
//query to execute
$query = "SELECT * FROM result" ;
//executing query
$q_result = mysql_query ($query,$link) or die(mysql_error());
if(mysql_num_rows ($tResult) <= 0)
{
print "No record found"; }else(printmysql_pum_rows ($cLEesult) . " rows in result table" ;
}
Else{
Print mysql_num_rows ($q_result) . "rows in result table" ;
}
? >
```

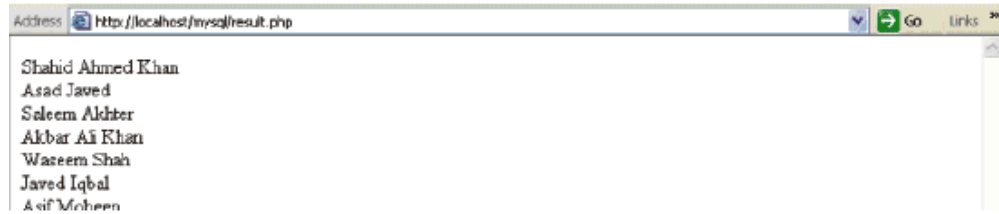
### Getting Table Rows in Loop

**1. Save** the following code inhtdocs/mysql folder with the name of result.php

```
<?php
//connection file
include "connection.php";
//query to execute
$query = "SELECT * FROM result";
//executing query
$q_Result = mysql_query ($query,$link) or die(mysql_error());
if(mysql_num_rows ($q_Result) <= 0)
{
die("No record found");
}
while($Row = mysql_fetch_assoc ($1_Result))
{
print $Row['sname'] . "
";
}
?>
```



2. The result should look like below figure



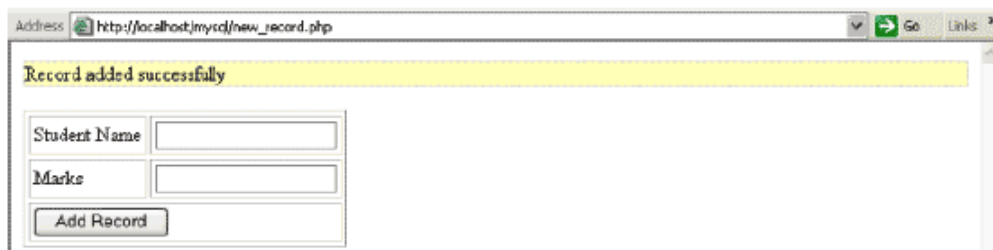
### Inserting New Record

1. Now we are going to create a form in html table and inserting new record in student table. Copy the below code in **htdocs/mysql** folder with the name of **new\_record.php**

```
<?php
//connection file
include "connocion.php";
//cleaning string
function cleanString($string) {
$string = htndspecialchars(trim($string));
return $string;
}
//function for new form
function print_Form(){
//new form var
$newForm = "<form method= \"post \" action= \"I $_SERVER 'PHP_SELF' j \">
<table border=1 cellpadding=3 cellspacing=3>
<tr><td>Student Name</td>
<td><input type= \"text \" name= \"sName\"></td></tr>
<tr><td>Marks</td>
<td><input type= \"text \" name= \"sMarks \"></td></tr>
<tr><td colspan=2><input type= \"submit \" value= \"Add Record\">
<input type= \"hidden \" value= \"true \" name= \"post \">
</td></tr></table></form>";
return $newForm;
}
//saving record
function save_Record()
{
$Name = cleanString($_POST['sName']);
$Marks = (int) cleanString($_POST['sMarks']);
//checking for empty values
if(empty($Name) || empty($Marks))
{
error Message("Cannot insert empty record");
}
//marks range
if($Marks < 0 || $Marks > 99)
{
error Message("Marks must be between 1-99");
}
//max student name
if(strlen($Name) > 40)
{
error Message("Name is too long"); }
//query
$query = "INSERT INTO result(sname,marks)";
```

```
VALUES('$Name'e$Marks)";
//executing query
if(mysql_query($query))
{
 print "<div style=background:4FFFFCC;border:dashed 1px #cccccc'>
 Record added successfully</div>";
 print print_Form(); //show form again
}
Else{
 error Message(mysql_error()); //if error in query
}
}
//error message
function error_ Message($error)
{
 $msg = "<div style=background:#FFFFCC;border:dashed 1px #cccccc'>
 $error Back</div>";
 die($msg);
}
//what to do
if($_POST('post')) {
 //if form is posted
 Save_Record(); }
Else{
 //first time print the form
 Print print_Form();
}
?>
```

The output looks like below figure



## Learner's Activity

Create dynamic website using php and mysql follow the steps

1. Open **htdocs** in xampp folder
2. Create website folder titled **mywebsite**
3. Inside **mywebsite** folder create images, css, js folders
4. Inside the **mywebsite** folder create **header.php**, **left\_sidebar.php**, **right\_sidebar.php**, **content.php**, and **footer.php** file
5. Inside **css** folder there is file which contain style of your website titled **style.css**
6. Inside **js** folder there is file which contain form validation scrip of your website titled **formvalidat.js**
7. Inside **images** folder there is all images related to your website
8. Create **index.php** page and using include or require function include all php files
9. Create **contact form** page which have a contact form and apply **formvalidat.js** file
10. Apply CSS on all pages

## Summary of Module

- ASP.NET is an open-source server-side Web application framework designed for Web development to produce dynamic Web pages. It was developed by Microsoft to allow programmers to build dynamic web sites, web applications and web services.
- Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs for Microsoft Windows, as well as web sites, web applications and web services.
- Microsoft Visual Studio controls multiple controls i.e. server controls, datasever controls, validation controls, navigation controls, login controls and web form controls that provides developer ease to develop project efficiently and within time framework.
- PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.
- Adobe Dreamweaver is a proprietary web development tool developed by Adobe Systems. It is widely used by developers to create static and dynamic website.
- Dynamic website are developed with the use of PHP elements i.e. variables, operators, decision, loops, arrays, methods, files, functions, cookies and session, sending emails etc.

## Frequently Asked Questions (FAQs)

FAQ 1: What is PHP?

**Answer** PHP: Hypertext Preprocessor is open source server-side scripting language that is widely used for web development. PHP scripts are executed on the server. PHP allows writing dynamically generated web pages efficiently and quickly. PHP is free to download and use.

FAQ 2: Echo vs. print statement.

**Answer** cho() and print() are language constructs in PHP, both are used to output strings. The speed of both statements is almost the same.

echo() can take multiple expressions whereas print cannot take multiple expressions.

FAQ 3: What is a Session in PHP?

**Answer** Sessions allow data to be transferred from one page to another. Session information is temporary and information is valid until the user is using the website. A session assigns a unique ID, UID, to each visitor.

A PHP session starts using: `<?php session_start(); ?>`

FAQ 4: Difference between include and require?

**Answer** include() and require() are similar except the way they handle failures. include() produces a warning and require() produces a fatal error.

FAQ 5: Which PHP statement is used to connect PHP with MySQL?

**Answer** The statements that can be used to connect PHP with MySQL is:

```
<?
$conn = mysql_connect('localhost');
echo $conn;
?>
```

FAQ 6: What is the use of super-global arrays in PHP?

**Answer** Super global arrays are the built-in arrays that can be used anywhere in website. Some of super global array are \$\_post, \$\_get, \$\_request etc

FAQ 7: What are the different types of errors in PHP?

**Answer** There are three types of errors in PHP.

1. Notice: These are very normal and non-critical errors and they even not displayed to users. For examples accessing a variable that not existed at all.
2. Warning: These are little bit critical errors. These results are displayed to users but do not affect the output of code. For example trying to include any file that is not exists.
3. Fatal errors: These are really critical errors. For example calling any nonexistence class.

FAQ 8: How constants are defined in a PHP script?

**Answer** Define () is used to define constants in PHP.  
define ("Newconstant", 30);

FAQ 9: What is the maximum size of a file that can be uploaded using php and how can we change this?

**Answer** You can change maximum size of a file by setting upload\_max\_filesize variable in php.ini file.

FAQ 10: How can we destroy the cookie?

Answer Cookies can be destroyed by setting the cookie time in past.

FAQ 11: Describe Master page.

Answer A Master page offers a template for one or more web forms. It defines placeholders for the content, which can be overridden by the content pages. When users request the content page, ASP.NET merges the layout of the master page with the content of the content page and produce output.

FAQ 12: Different Method of navigation of asp.net

Answer There are many ways to navigate from one page to another in ASP.NET.

- Client-side navigation
- Cross-page posting
- Client-side browser redirect
- Client-Side Navigation

FAQ 13: Explain Asp.net Web Form

Answer Web Forms are an extremely important part of ASP.NET. They are the User Interface (UI) elements which provide the desired look and feel to your web applications. Web Forms provide properties, methods, and events for the controls that are placed onto them.

FAQ 14: Name the mechanism that enables server controls to maintain their state.

Answer The mechanism that enables controls to maintain their state is called View State.

FAQ 15: Difference between DropDownList and listbox

Answer The DropDownList only allows a user to make a single selection whereas the ListBox allows for multiple selections. In addition, the DropDownList only shows one item in the list when it's not expanded, while the ListBox is capable of displaying multiple items simultaneously.

FAQ 16: The TreeView control exposes a number of style properties that enable you to change items in the tree. Which property do you need to change if you want to influence the background color of each item in the tree? What's the best way to change the background color?

Answer To change the background color of items in the TreeView control you can use the NodeStyle element as follows:

```
<asp:TreeView ID="TreeView1" runat="server" DataSourceID="SiteMapDataSource1" ShowExpandCollapse="False"> <NodeStyle BackColor="White" /></asp:TreeView>
```

Instead of setting the BackColor property (which results in an inline style), you're better off setting the CssClass property:

```
<NodeStyle CssClass="TreeNodeStyle" />
```

You then need to create a separate class in your CSS file: .TreeNodeStyle{background-color: White;}

FAQ 17: What options do you have to redirect a user to another page programmatically? What's the difference between them?

Answer To redirect a user to another page programmatically, you can use Response.Redirect, Response.RedirectPermanent, or Server.Transfer. The first two options send a redirect instruction to the browser and are thus considered client-side redirects. Server.Transfer, on the other hand, takes place at the server, enabling you to serve a different page without affecting the user's address bar.

FAQ 18: What property do you need to set on the control to prevent users from expanding or collapsing items in the tree?

Answer To display a TreeView that doesn't have the ability to expand or collapse nodes, you need to set its Show ExpandCollapse property to False.

FAQ 19: How do you tell the validation mechanism that validation succeeded or failed in your CustomValidator routines?

Answer To tell the validation mechanism whether the data you checked is valid, you set the IsValid property of the args argument in your custom validation method. This applies to both client- and server-side code. The following snippet shows how this is done in the client-side validation method for the ContactForm.ascx control:

```
if (phoneHome.value != "" || phoneBusiness.value != "")
{
 args.IsValid = true;
}
else
{
 args.IsValid = false;
}
```

FAQ 20: What's the difference between the LoginView and LoginStatus controls? When would you use each one?

Answer The LoginStatus simply displays a simple link that indicates whether or not the user is logged in. By default the text that is displayed is Login when the user is currently not logged in, and Logout when the user is already logged in. Clicking the link either sends the user to the default Login page, or logs the user out.

## Test Yourself!

Please mark the correct one from the given options. You can check your answer with the Answer Key at the end of this module.

**1. PHP stands for?**

- |                                |                           |
|--------------------------------|---------------------------|
| a. Personal Home Page          | b. Hypertext Preprocessor |
| c. Pretext Hypertext Processor | d. Preprocessor Home Page |

**2. A PHP script should start with \_\_\_\_ and end with \_\_\_\_:**

- |            |               |
|------------|---------------|
| a. < php > | b. < ? php ?> |
| c. <? ?>   | d. <?php ?>   |

**3. Which of the conditional statements is/are supported by PHP?**

- |                         |                       |
|-------------------------|-----------------------|
| a. if statements        | b. if-else statements |
| c. if-elseif statements | d. All of above       |

**4. What will be the output of the following PHP code?**

```
1. <?php
2. $y = 2;
3. if ($y-- == ++$y)
4. {
5. echo $y;
6. }
7. ?>
```

- |      |              |
|------|--------------|
| a. 2 | b. 3         |
| c. 1 | d. no output |

**5. What will be the output of the following PHP code?**

```
1. <?php
2. $x = 5;
3. $y = 10;
4. $z = "$x + $y";
5. echo "$z";
6. ?>
```

- |        |              |
|--------|--------------|
| a. 15  | b. 10 + 15   |
| c. \$z | d. \$x + \$y |



- 6.** Which of the below statement is equivalent to \$add+=\$add?
    - \$add=\$add
    - \$add=\$add+\$add
    - \$add=\$add+1
    - \$add=\$add+\$add+1
  - 7.** Which statement will output \$x on the screen?
    - echo "\$x";
    - echo "\$\$X";
    - echo "/\*\$x";
    - echo "\$x;";
  - 8.** How many ways can a session data be stored?
    - 3
    - 4
    - 5
    - 6
  - 9.** Which one of the following lines need to be uncommented or added in the php.ini file so as to enable mysqli extension?
    - extension=php\_mysqli.dll
    - extension=mysqli.dll
    - extension=php\_mysqli.dl
    - extension=mysqli.dl
  - 10.** Which one of the following methods can be used to diagnose and display information about a MySQL connection error?
    - connect\_errno()
    - connect\_error()
    - mmysqli\_connect\_errno()
    - mmysqli\_connect\_error()
  - 11.** Asp stands for?
    - All Standard page
    - A server page
    - Active Server page
    - Active Standard page
  - 12.** Which software can be used to set up a web server to run server side language?
    - Adobe Photoshop
    - Dreamweaver
    - XAMPP
    - None
  - 13.** Asp.net File extension?
    - .asmx
    - .asp
    - .aspx
    - .ascx
  - 14.** What is default scripting language in asp net(Server Side)
    - VB script
    - Java script
    - Perl
    - Python
  - 15.** How do you get information from a form that is submitted using the "get" method?
    - Request.querystring
    - Request.QueryString
    - \_get
    - \_GET

**16. Which is not a database service?**

- |           |          |
|-----------|----------|
| a. SQL    | b. MySQL |
| c. Oracle | d. PHP   |

**17. Which of these objects is NOT an ASP component?**

- |                 |                |
|-----------------|----------------|
| a. Link Counter | b. counter     |
| c. AD Rotator   | d. File Access |

**18. Which of the following denote the web control associated with Table control function**

- |             |                 |
|-------------|-----------------|
| a. DataList | b. ListBox      |
| c. TableRow | d. All of Above |

**19. Which of the following denote New Data-bound Controls used with ASP.NET**

- |                  |                 |
|------------------|-----------------|
| a. GridView      | b. FormView     |
| c. SqlDataSource | d. All of Above |

**20. How do we Delete, Update, Select data in a Dataset**

- |                   |                  |
|-------------------|------------------|
| a. SqlDataAdapter | b. SqlDataReader |
| c. SqlCommand     | d. None of Above |

## Answer Key

MCQ Number	Answers	MCQ Number	Answers
1	a, b	11	c
2	d	12	c
3	d	13	c
4	a	14	a
5	a	15	c
6	b	16	a
7	b	17	c
8	a	18	d
9	d	19	a
10	c	20	d



# Module 8: Design and Present Final Project

## Learning Outcomes

After completion of this learning module, learner will be able to:

- Develop a dynamic website in ASP.Net / PHP
- Prepare a project document



# Learning Unit 1: Dynamic Website in ASP.Net / PHP

## Overview

In this learning unit, you will learn how to design and implement software development life cycle (SDLC) phases in any website project. After completion of this learning unit, you will be able to integrate designing skills and development concepts with SDLC Model to develop websites projects.

## 1. Implement SDLC Phases in a Web Project

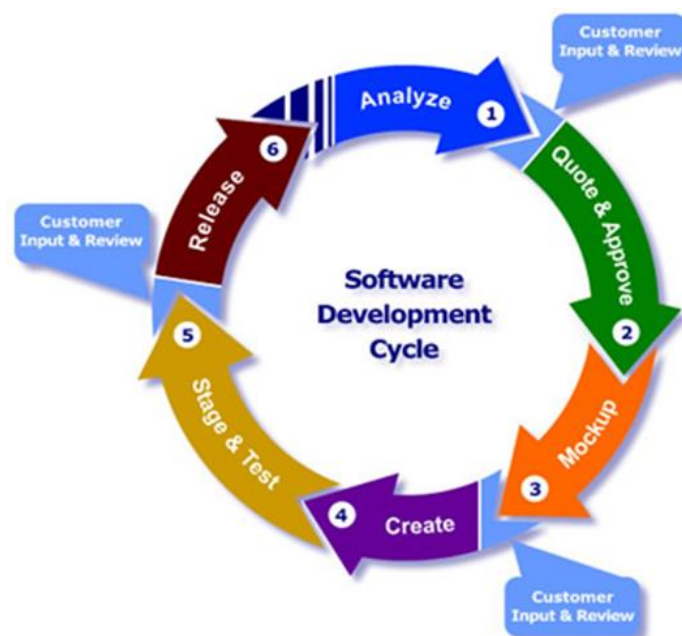
### What is SDLC?

SDLC, Software Development Life Cycle is a process used by software industry to design, develop and test high quality software's. The SDLC aims to produce a high quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates.

- SDLC is a framework defining tasks performed at each step in the software development process.
- ISO/IEC 12207 is an international standard for software life-cycle processes. It aims to be the standard that defines all the tasks required for developing and maintaining software.

A typical SDLC consists of the following stages:

- Stage 1: What is the best interest of the customer
- Stage 2: Planning and Requirement Analysis
- Stage 3: Defining Requirements
- Stage 4: Designing the product architecture
- Stage 5: Building or Developing the Product
- Stage 6: Testing the Product
- Stage 7: Deployment in the Market and Maintenance

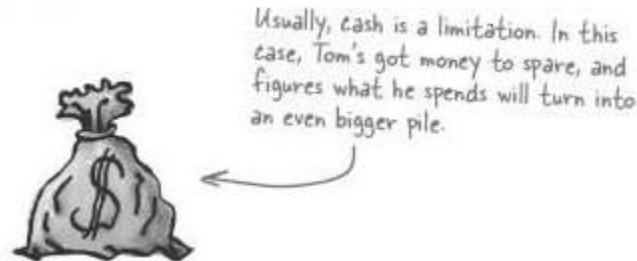


## 1. What is the Best Interest of the Customer:

If the customer's unhappy, everyone's unhappy! Every great piece of software starts with a customer's big idea. It's your job as a professional web developer to bring those ideas to life. But taking a vague idea and turning it into working code that satisfies the customer isn't so easy.

### Mortally Project has two Most Concern:

- How much will it cost



- How long will it take



### Practical Experience:

In some practical experience some client/customer gives the information about ones demands in natural language or give some links of desire websites category. So being a designer should extract the idea behind the project.



## 2. Planning and Requirement Analysis

### Requirement Analysis (knowing what the customer wants)



So the reaction of the developer for the above requirement should be like next figure

**Sharpen your pencil**

Here's one to get you started.

Your job is to analyze the Orion's CEO's statement, and build some initial requirements. A requirement is a single thing that the software has to do. Write down the things you think you need to build for Orion's Orbits on the cards below.

Remember, each requirement should be a single thing the system has to do.

If you've got index cards, they're perfect for writing requirements down.

## Remember

**Brainstorming** is a group or individual creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its member(s). The term was popularized by Alex **Faickney Osborn** in the 1953 book *Applied Imagination*.

**Sharpen your pencil**

**Solution**

Let's start by breaking out the requirements from what the Orion's Orbits CEO is asking for. Take his loose ideas and turn them into snippets, with each snippet capturing one thing that you think the software will need to do...

Each card captures one thing that the software will need to provide.

Talk to the client to get more information and also try to get additional requirements



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### Blue Sky with the Customer:

Blue sky means **Think BIG** when to iterate with the customer requirements. Brain storm with other people. Tow head are better than one head.

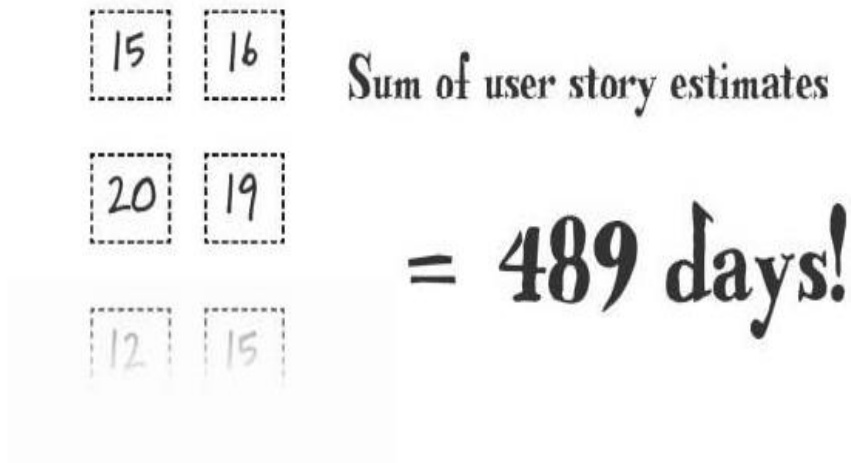


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### Finally Ready to Estimate the Whole Project:

focused user stories, dealt with all the assumption that team were making in estimate and it have set of estimate that all believe in so it's time to get back to the customer with total project estimate

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### Planning for Success:

Every piece of software starts with a great plan. So in this phase of **SDLC** learn how to create the plan, how to prioritize their requirements. Finally it creates an achievable development plan that the team can easily execute and monitor.

### Customer wants their Software Now:

Customer wants their software **when they need it** and not a moment later. It comes to grips with the customer idea's using brainstorming.

#### Remember

Design is not just what it looks like and feels like. Design is how it works.  
—Steve Jobs

#### Our Estimate

489 days

The total after summing up all the estimates for your user stories

#### What the customer wants

90 days!



## Work the way to a Reasonable Milestone

### 1. Add two new people to the team



#### Remember

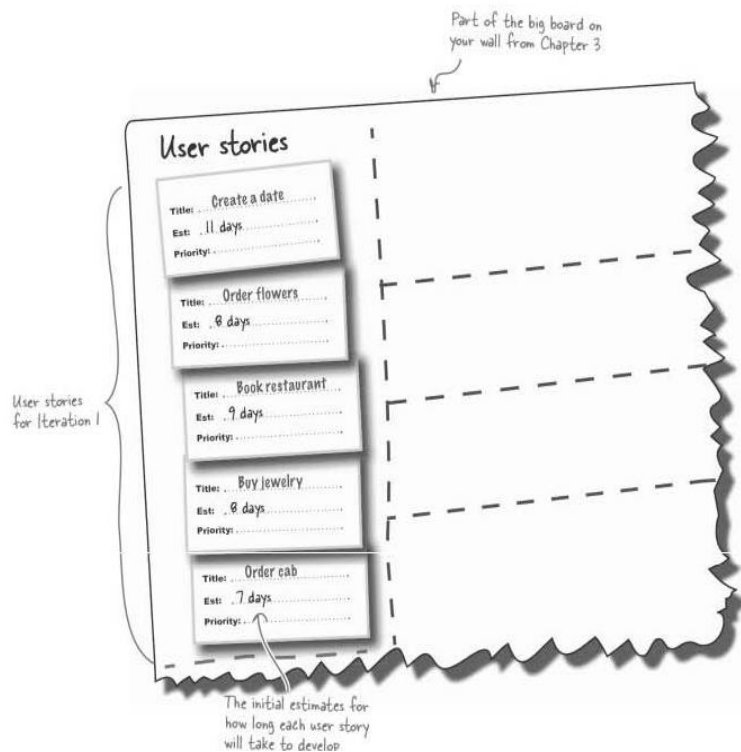
Design is easy. All you do is stare at the screen until drops of blood form on your forehead.  
—Marty Neumeier

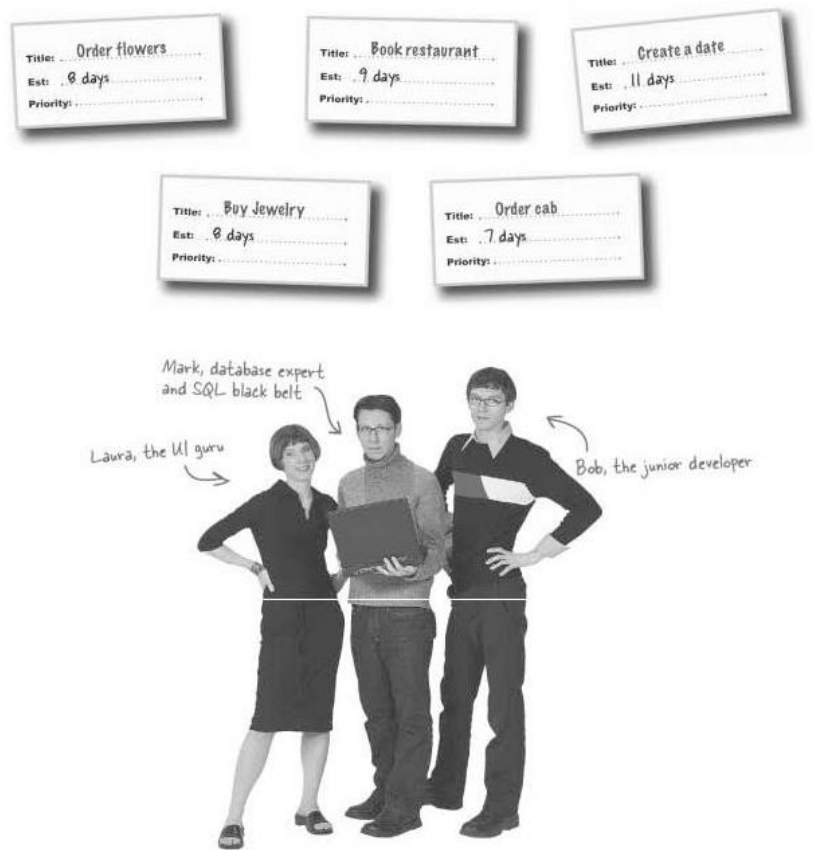
## Designing the Product Architecture:

Good design help the deliver. A bad design was making life **hard for everyone**, and to make matter worse

## Building or Developing the Product:

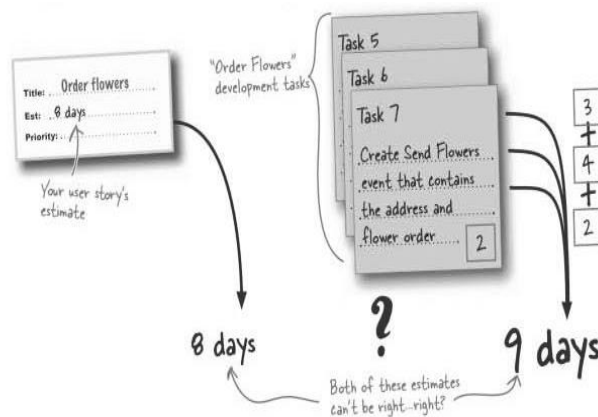
It is the time to go to work user stories capture what need to develop but now it's time to convert the user stories to real life in **SDLC** phase, it is the time to going to learn how to break user stories into tasks, and how task estimate help the tracks the project from foundation to completion.



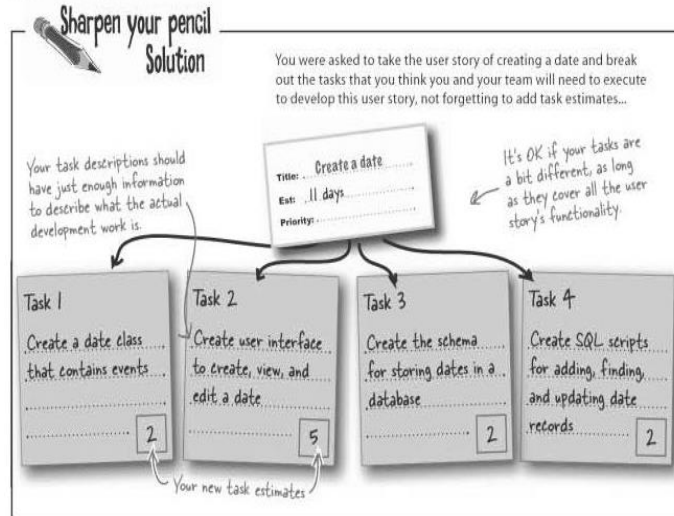


### Do the Task and Add Up:

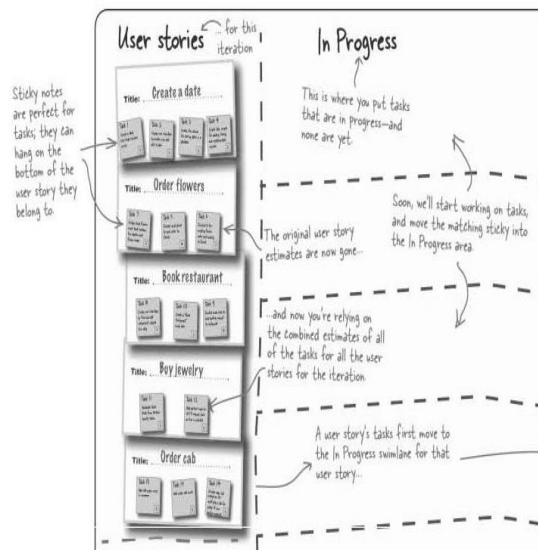
Notice a problem which are possible with the estimation because it got user stories with an estimate. But now adding new estimate to the specified task.



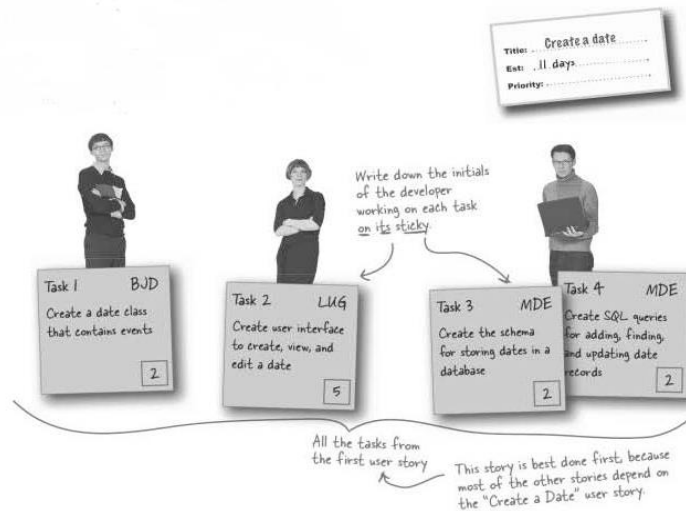
tasks have estimates



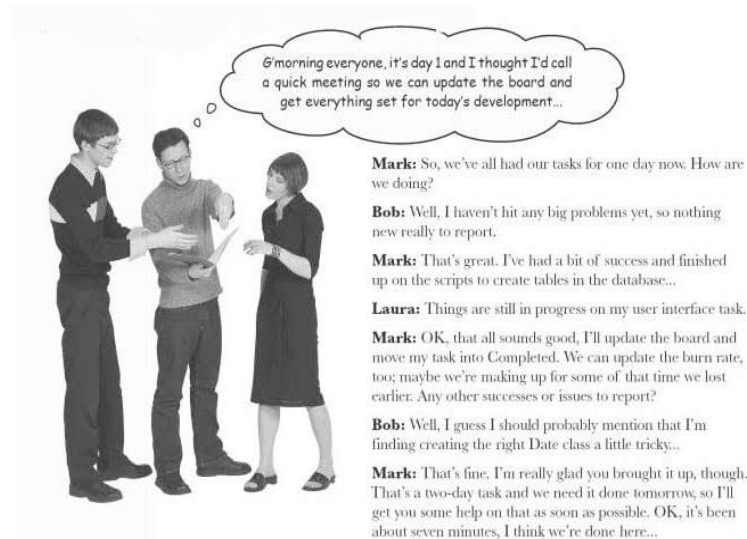
### Add your Task to Your Board:



## Start Working on the Tasks:



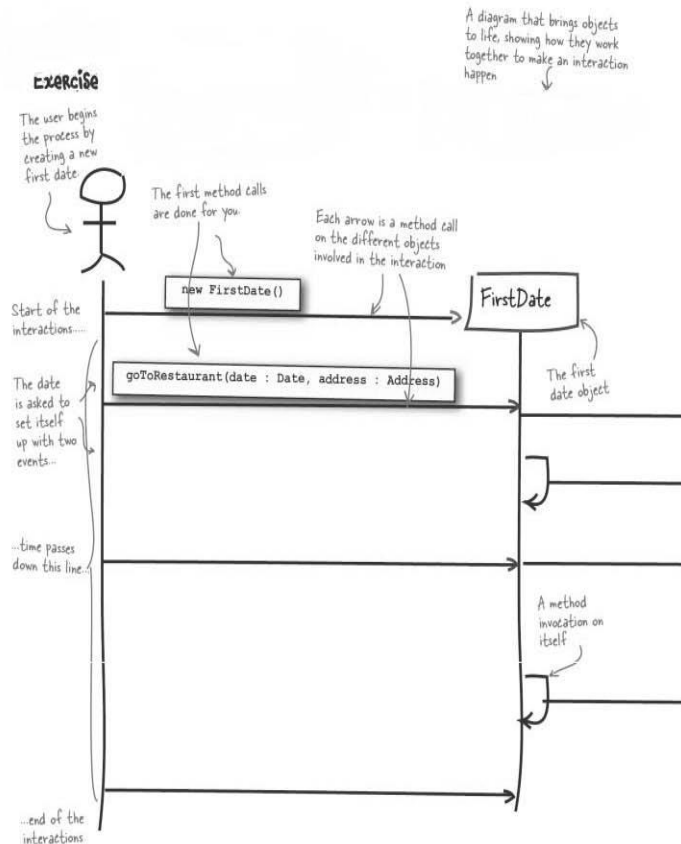
## The First Standup Meeting:





## Creating Dates:

bringing your design to life with a sequence diagram



### Do you know?

Black-box testing is a method of software testing that examines the functionality of an application without peering into its internal structures or workings. This method of test can be applied to virtually every level of software testing: unit, integration, system and acceptance.

## Testing the Product:

### Sometimes Even the Best Developer Breaks the Build.

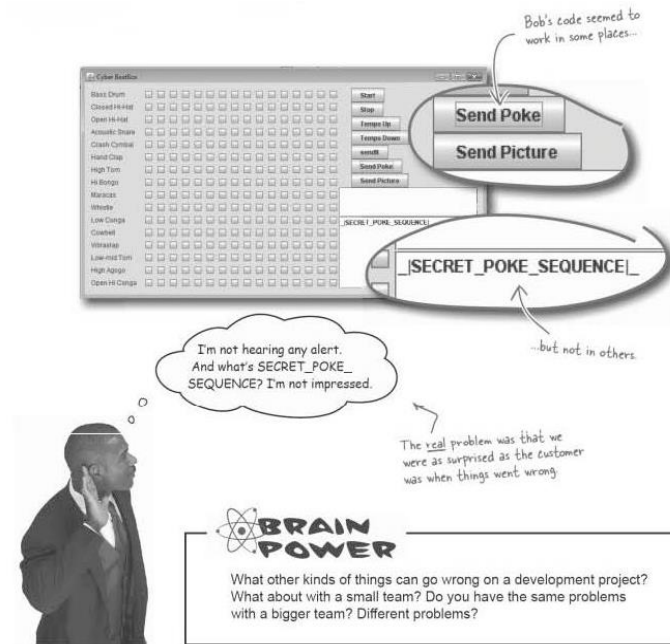
Test the compiled code over and over again, and test machine and committed it into the repository. There are many testing method like **black box testing** and **white box testing**

### Things are always go wrong:

Everyone who's ever done development knows what it's like. Its late in some cases missing the small thing like ++ increment operator suddenly it elegant code goes into pieces

### Do you know?

White box testing is a testing technique that examines the program structure and derives test data from the program logic /code. The other names of glass box testing are clear box testing, open box testing, logic driven testing or path driven testing or structural testing.



## Standup meeting



**Bob:** I did get it compiling! It took me forever to integrate the changes and get everything building again. It's not my fault.

**Mark:** Yeah, the code compiled; it just didn't work. So he didn't screw up as badly as it looks, really.

**Laura:** Didn't you test things?

**Bob:** Well, the code worked fine on my machine. I ran it and everything seemed fine...

**Mark:** OK, but running your code and doing a quick checkover is not really putting your code to the test.

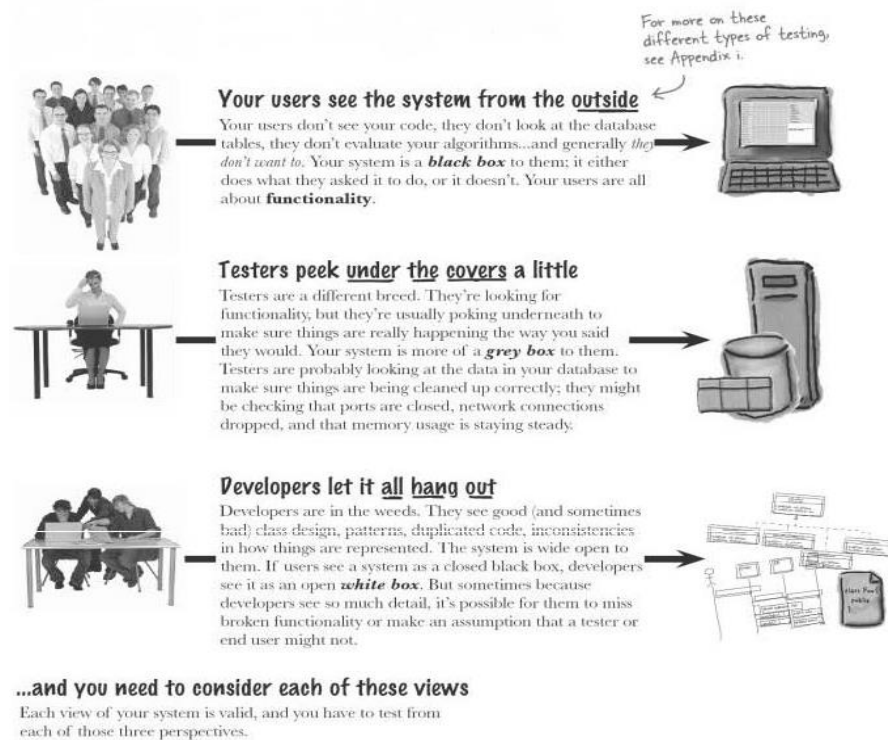
**Laura:** Exactly. The functionality of your software is part of your responsibility, not just that the code "seems to work"; that's never going to wash with the customer..

**Bob:** Well, now that we have a version control server and build tool in place, this shouldn't be a problem anymore. So enough beating up on me, alright?

**Mark:** Hardly! Our build tool makes sure the code compiles, and we can back out changes with version control, but that doesn't help making sure things work right. Your code compiled; that was never the problem. It's the functionality of the system that got screwed up, and our build tool does nothing for that.

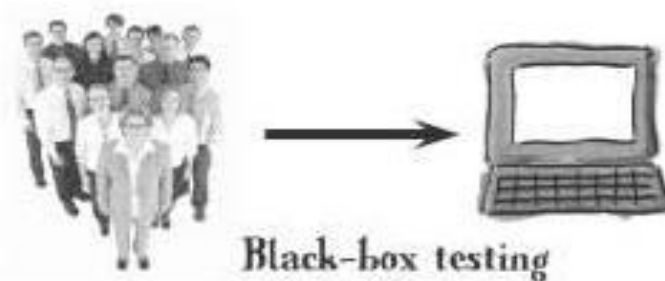
**Laura:** Yeah, you didn't even realize anything had gone wrong...

## There are three ways to look at your system....



## Black Box Testing Focus on Input and Output:

The user is on outside to the system they only see what it put into the system and what come back out.



- ☐ **Functionality.** Hands down, this is the most important black box testing. Does the system do what the user story says it is supposed to do? With black box testing, you don't care if your data is being stored in a text file or a massively parallel clustered database. You just care that the data gets in there like the story says and you get back the results the story says you should.
 

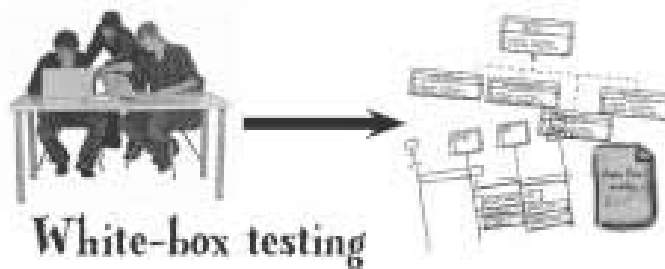
This isn't "the OrderProcessor class can handle GiftCard objects" functionality; it's about if a customer can buy a drink with their gift card.
- ☐ **User input validation.** Feed your system 3.995 for a dollar amount or -1 for your birthday. If you're writing a web application, put some HTML in your name field or try some SQL. The system better reject those values, and do it in a way that a typical end user can understand.
- ☐ **Output results.** Hand-check numerical values that your system returns. Make sure all of the functional paths have been tested ("if the user enters an invalid ending location, and then clicks "Get Directions"..."). It's often helpful to put together a table showing the various inputs you could give the system, and what you'd expect the results to be for each input.
 

Error conditions are usually the last thing most developers think about, but it's the first thing most customers notice.
- ☐ **State transitions.** Some systems need to move from one state to another according to very specific rules. This is similar to output results, but it's about making sure your system handles moving from state to state like it's supposed to. This is particularly critical if you're implementing some kind of protocol like SMTP, a satellite communications link, or GPS receiver. Again, having a map of the states and what it takes to move the system from one to the other is very useful here.
- ☐ **Boundary cases and off-by-one errors.** You should test your system with a value that's just a little too small or just outside the maximum allowable value. For example, checking month 12 (if your months go from 0-11) or month 13 will let you know if you've got things just right, or if someone slipped up and forgot about zero-based arrays.
 

Customers don't usually make huge mistakes—they make little typos, and those are the things you're testing for here.

### White Box Testing Use Inside Knowledge:

At the deepest level of testing, practice the white box test. This is where exactly what is going on inside the box. And do the best to break the code. Ongoing to test white box testing, it should aware with the code, about to test.



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- ☐ **Testing all the different branches of code.** With white-box testing you should be looking at *all* of your code. You can see all of the `if/elses` and all the case and switch statements. What data do you need to send in to get the class you're looking at to run each of those branches?
 

*Most code works great when things are going as expected—the so-called "happy path"—but what about when things go off-track?*
- ☐ **Proper error handling.** If you do feed invalid data into a method, are you getting the right error back? Is your code cleaning up after itself nicely by releasing resources like file handles, mutexes, or allocated memory?
 

*Black-box testing looked at error messages, but what about what the code left around when things go wrong? That's for white-box testing to examine.*
- ☐ **Working as documented.** If the method claims it's thread-safe, test the method from multiple threads. If the documentation says you can pass null in as an argument to a method and you'll then get back a certain set of values, is that what's really going on? If a method claims you need a certain security role to call it, try the method with and without that role.
- ☐ **Proper handling of resource constraints.** If a method tries to grab resources—like memory, disk space, or a network connection—what does the code do if it can't get the resource it needs? Are these problems handled gracefully? Can you write a test to force the code into one of those problematic conditions?

### Deployment in the Market and Maintenance:

At last deploy the project in real office of market by creating user manual that how user can be use the product. There should be maintaining every month or week after development date and keep mature the product if any bug found in real life.

## Learner's Activities

### Design the Interface of Website / Application

<b>Description:</b>	This activity based on learner performance. Each will develop interface of website using designing tools (Photoshop / Dreamweaver/HTML/CSS/JavaScript etc) while following SDLC Designing phase concepts.
<b>Time Guideline:</b>	30 hours
<b>Purpose:</b>	Designing of final project
<b>Outcomes :</b>	<ol style="list-style-type: none"><li>1- Each learner, will present the project vision after collecting requirements from customer.</li><li>2- Than will draw layout in Adobe Photoshop</li><li>3- Learner will present the designing work before class.</li></ol>

### Develop the Functionality of Website

<b>Description:</b>	This activity based on learner's performance. Each will add programming functionality in the application using programming and database concept (PHP or ASP.Net), will develop session management, login, Data and other detailed functionality as per the requirements from clients.
<b>Time Guideline:</b>	30 hours
<b>Purpose:</b>	Development of final Project
<b>Outcomes :</b>	<ol style="list-style-type: none"><li>1- Each will develop and test the functionality of the project as per the client requirements.</li><li>2- Each will live run the application before.</li></ol>

# Learning Unit 2: Prepare a Project Document

## Overview

In this learning unit, you will learn how to documents the website/ application. After completion of this learning unit, you will be able create following documents: design, Implementation, Testing, Deployment, Maintenance and project user manual.

### 1. Web Design Document

A Website / application **design document** is a written description of product, that a Web designer/Developer writes in order to give a software development team overall guidance to the architecture of the software project. Practically, a design document is required to coordinate a large team under a single vision. A design document needs to be a stable reference, outlining all parts of the software and how they will work. The document is commanded to give a fairly complete description, while maintaining a high-level view of the software.

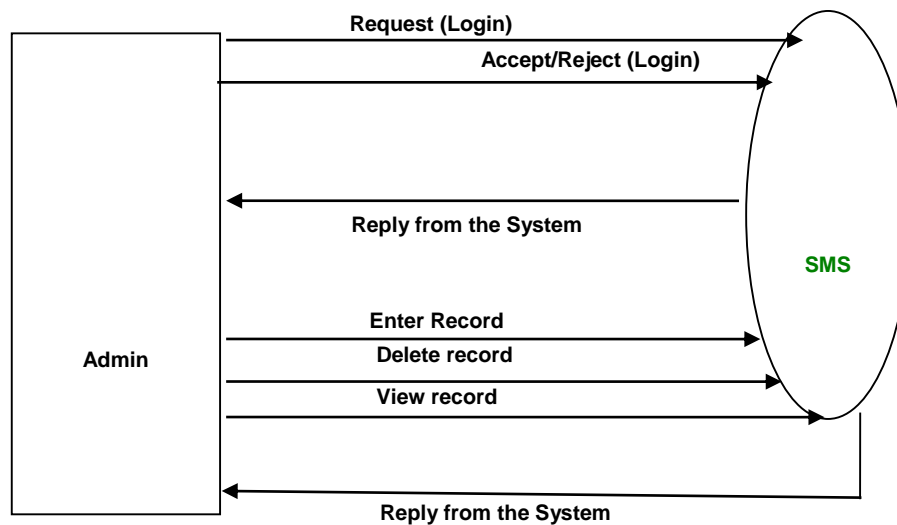
1. The **data design** describes structures that reside within the software. Attributes and relationships between data objects dictate the choice of data structures.
2. The **architecture design** uses information flowing characteristics, and maps them into the program structure. The transformation mapping method is applied to exhibit distinct boundaries between incoming and outgoing data. The data flow diagrams allocate control input, processing and output along three separate modules.
3. The **interface design** describes internal and external program interfaces, as well as the design of human interface. Internal and external interface designs are based on the information obtained from the analysis model.
4. The **procedural design** describes structured programming concepts using graphical, tabular and textual notations. These design mediums enable the designer to represent procedural detail, which facilitates translation to code. This blueprint for implementation forms the basis for all subsequent software engineering worked.

### Database Design

The major objective of database design is to map the conceptual data model to an implementation model that a particular DBMS can process with performance that is acceptable to all users throughout the organization.

### Context Data Flow Diagram of System

Context DFD emphasis on the relationship between the system and its environment. The system as a whole is represented by a bubble and the external entities are shown as rectangle from which input flows and to which output is directed. No information about the structure of the system itself is pictured in a context DFD. The arrows going in the direction from user to system represents user's requests and the arrow which is coming from system to user represent system's response in respect of user requests. Request can be of any type relating to records i.e. cloth status, customer status, vendor status and relating to reports.



### Entity Relationship Model

The entity relationship model was developed to facilitate database design by allowing the designer to express the logical properties of the database in an enterprise schema. The word enterprise means the organization for which the database is kept. The enterprise schema is a description that corresponds to the conceptual level in the three level architecture. Entity relationship diagrams are used to express the logical structure of the model. The enterprise schema will be valid regardless of the database system chosen, and it can remain correct even if the DBMS is changed. Unlike a schema written in DLL, the entity relationship diagrams that we will use are not generally available to be used by the DBMS for creating the logical structure or doing external/conceptual or conceptual/internal mappings. The diagrams are basically design tools and documentation for the system.

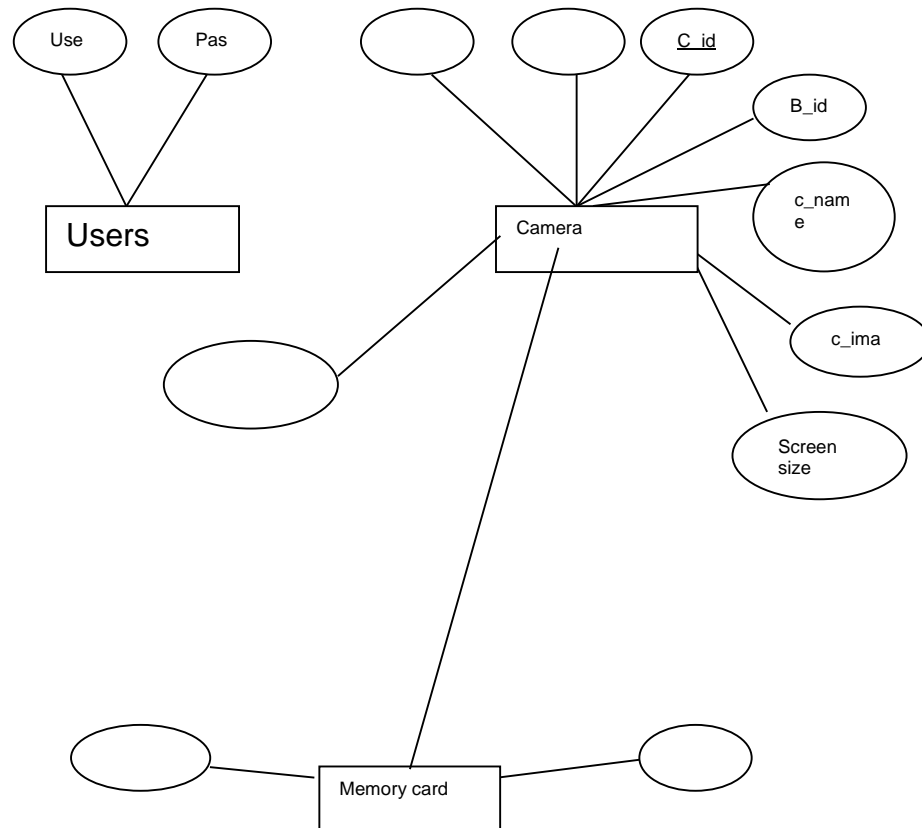
The items in the model represent “things” in the real world, and the relationships between the real world “things” are expressed by relationships in the model. The model describes the environment in terms entities, attributes, and relationships.

The term entity means any object that exists and can be distinguished from other objects. It is a person, place, event, object or concept in the real world we wish to represent in the database. A collection of entities of the same type is called an entity set. The attributes of an entity set define the properties or qualities of the entity type. Entities are often linked by association or relationships, which are connections or interactions between the entity instances. By abstraction, we can identify the common properties of certain relationships and define a relationship type and a corresponding well defined relationship set as the collection of relationships of that type.

The relationships that satisfy the requirements for membership in the relationship set at any moment are the instances or members of the relationship set. The keys of the related entities are used as attributes of the relationship set. As with entities and attributes, the relationship type and the well-defined relationship set are part of the intension and the instances are part of the extension of the model.



### Entity Relationship Diagram of the System



## 2. Web Project's Implementation Document

System development starts when detailed system design of proposed system created. System development is the renovation of system design into a genuine functioning computer system. This task is accomplished by coding.

### Tools and Technologies Used

PHP, SQL, HTML, CSS, JavaScript, Xampp, Dreamviewer and their Tools development/ designing tool, Microsoft Word, for documentation and diagrams

### Interface Designing

This stage of implementation provides the mean of interaction to the user with the system. The output of this stage will let the user be able to interact with system. The main purpose of this phase is to develop a user-friendly interface for the ease of customer. The quality of good interface is that it must be simple, user-friendly, and attractive. The interface should not be complex.

These points should be considered while designing interface:

- **User-Friendly Interface**

The interface should be simple. Proper messages should be displayed on the screen to let the user know about the transactions. Transactions should be completed in stepwise manner.

- **Simple Language**

The language used on the screen should be simple and precise. Language should not be complex or the steps should not be confusing to the user.

### 3. Web Project Testing Document

#### Test Specification Summary

In the software development industry testing of software is essential to ensure a reliable product. The testing of **Mobile product CMS** can be done using a single Pentium 4 or higher computer with Windows XP or higher operating system, xampp server, Dreamviewer, etc .

#### Input Specifications

In testing the Website Forms, the input for most of test cases will be entered though keyboard and mouse.

#### Output Specifications

The output of all the tests will be displayed by windows operating system and web browser like Mozilla Firefox, Google chrome etc using on monitor

#### Test Environment

The testing of the **Mobile product CMS** will be done in an environment where we should have an Intel or any other machine with a Windows XP or higher version of operating system and 256 MB or higher of RAM and 2 GHz processor or higher.

The system should also be connected to LAN or internet for proper functioning.

#### Special Procedural Requirements

There are no extra ordinary procedures required for conducting the tests on the scientific **Mobile product CMS**.

#### Inter-case Dependencies

There is no interdependency between in use cases.

#### Test Cases

##### Test Case Item – 1

When user press on login button then registration or login form should be appear

By using the above technique create plan for all forms and events and check that all thing working according to the requirements.

### 4. Web Project's Deployment Document

The deployment plan gives a complete understanding of how the system will be deployed and how the environment will be set for the system to work properly and effectively.

#### Objectives:

The objective of the deployment plan is to give a guide line to the deployment team as how to deploy the system at the client website in a professional manner.

### Deployment Scope:

The deployment scope of the **Mobile product CMS** is that there will be a database in mysql which store all the page as well as mobile product data.

### Seats:

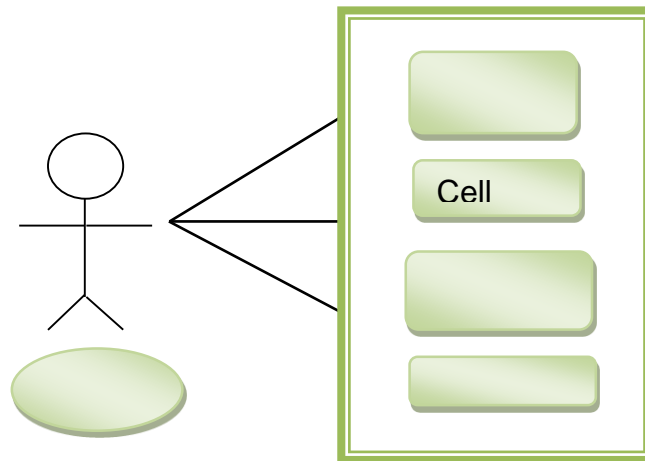
The main source code will be under the control of IT expert.

### Components

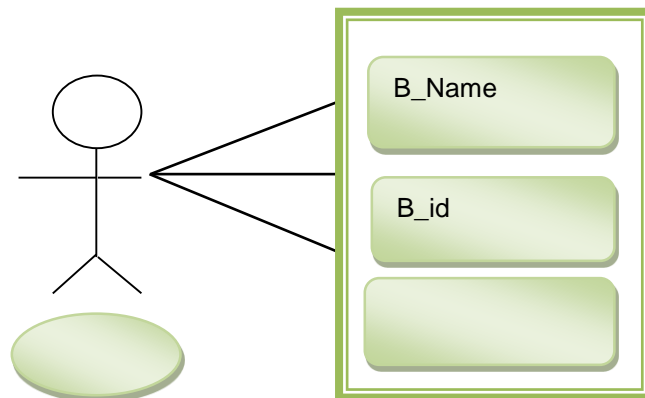
1. Pentium 4 computer or higher
2. UPS
3. Web browser

The point of coding will be at least Pentium4 computer with LAN connectivity or at least internet connectivity. There should be a UPS for electricity backup. The database should be on **phpmyadmin** and all the files and folders should be in **htdocs** folder

### Architecture for admin



### Architecture for visitor



### Installation Strategy:

It can be used at hosting server and people can access by typing the URL address on browser.

### **Website Installation Process:**

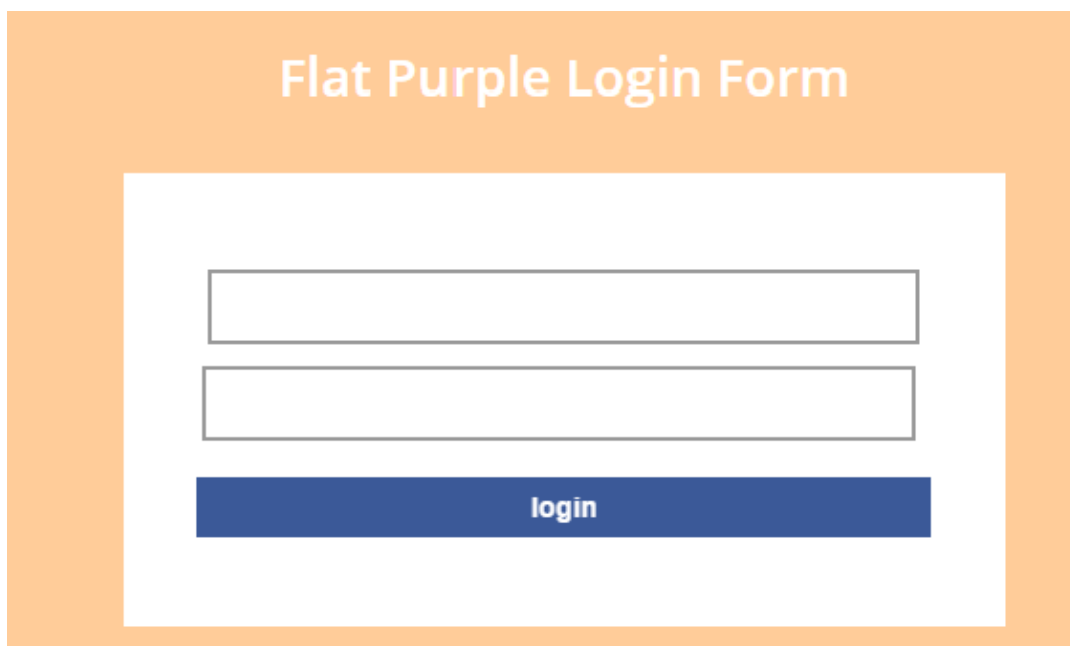
The website installation starts with the hardware once the hardware is set and the systems are ready.

## **5. Web Project's Maintenance and Support Document**

The user will be given two days training on how to use the system. The user will also be given a user manual in which all the activities will be shown how they work. The user will also be given the training that how to maintain the website and common functionality issues.

## **6. Web Project's User Manual**

### **1. Login View**



The image shows a login form titled "Flat Purple Login Form" in white text on an orange background. The form itself is a white rectangle containing two input fields and a login button. The first input field is for the username, and the second is for the password. The login button is blue with the word "login" in white text.

Flat Purple Login Form

login

## 2. Home Page

### My Mobile Arena

You can search mobiles and their features.


[Home](#) [Admin!](#)

Search:


#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)

#### Mobiles



[For Galaxy S6 active Details](#)



[For Galaxy A7 Duos Details](#)

## 3. Cell Details

### My Mobile Arena

You can search mobiles and their features.


[Home](#) [Admin!](#)

Search:

#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)

#### Nokia X Mobiles



Cell Name	Nokia X+
Camera	3.15 MP
Memory Card	32 GB
Platform	Android OS
Screen Size	4.0 inches

[Samsung](#) [Nokia](#) [LG](#) [HTC](#) [Huawei](#)

Footer stuff goes here. Copyright, disclaimers – stuff like that.

#### 4. Admin Page

### My Mobile Arena

You can search mobiles and their features.


[Brands](#)
[Add Cell](#)
[Cell List](#)
[Logout](#)

Search:


#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)


#### Mobiles



[For Galaxy S6 active Details](#)



[For Galaxy A7 Duos Details](#)



#### 5. Add Brand

### My Mobile Arena

You can search mobiles and their features.

[Brands](#)
[Add Cell](#)
[Cell List](#)
[Logout](#)

Search:

#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)

#### Mobiles

Brand Name:

Samsung	<a href="#">Edit</a>   <a href="#">Delete</a>
Nokia	<a href="#">Edit</a>   <a href="#">Delete</a>
LG	<a href="#">Edit</a>   <a href="#">Delete</a>
HTC	<a href="#">Edit</a>   <a href="#">Delete</a>
Huawei	<a href="#">Edit</a>   <a href="#">Delete</a>

[Samsung](#)
[Nokia](#)
[LG](#)
[HTC](#)
[Huawei](#)

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## 6. Add Cell Details

### My Mobile Arena

You can search mobiles and their features.

[Brands](#)
[Add Cell](#)
[Cell List](#)
[Logout](#)

Search:

#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)

#### Mobiles

Cell Name:

Screen Size:

Camera:

Memory Card:

Platform:

Brand :

Select image to upload:  No file chosen

[Samsung](#)
[Nokia](#)
[LG](#)
[HTC](#)
[Huawei](#)

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## 7. Cells List

### My Mobile Arena

You can search mobiles and their features.


[Brands](#)
[Add Cell](#)
[Cell List](#)
[Logout](#)

Search:


#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)


#### Mobiles



[Edit Galaxy S6 active](#)  
[Delete Galaxy S6 active](#)



[Edit Galaxy A7 Duos](#)  
[Delete Galaxy A7 Duos](#)



[Edit Galaxy Tab A 8.0](#)

## 8. Edit Cells

### My Mobile Arena

You can search mobiles and their features.

[Brands](#) [Add Cell](#) [Cell List](#) [Logout](#)

Search:

#### Mobile Brands

- [Samsung](#)
- [Nokia](#)
- [LG](#)
- [HTC](#)
- [Huawei](#)

#### Mobiles

Cell Name:	<input type="text" value="Galaxy S6 active"/>
Screen Size:	<input type="text" value="5.1 inches"/>
Camera:	<input type="text" value="16 MP"/>
Memory Card:	<input type="text" value="32 GB"/>
Platform:	<input type="text" value="Android OS"/>
Brand :	<input type="text" value="Samsung"/>
Select image to upload:	<input type="button" value="Choose File"/> No file chosen
<input type="button" value="Edit Cell Detail"/>	

[Samsung](#) [Nokia](#) [LG](#) [HTC](#) [Huawei](#)

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## Summary of the Module

- Designing and development are the main phases in software development. It is important to use best designing and development software to efficiently develop project within given time frame.
- Documentation is very important to describe different software processes and user interaction with the software.

## Frequently Asked Questions (FAQs)

FAQ 1: What is SDLC?

Answer SDLC, Software Development Life Cycle is a process used by software industry to design, develop and test high quality software's.

FAQ 2: Write the phases of SDLC

Answer

- phase 1: Planning and Requirement Analysis
- phase 2: Defining Requirements
- phase 3: Designing the product architecture
- phase 4: Building or Developing the Product
- phase 5: Testing the Product
- phase 6: Deployment in the Market and Maintenance

FAQ 3: How many important concern of the client about project

Answer Client have two major concern about his project

- How much will it cost
- How long will it take means time

FAQ 4: What is the goal to requirement analysis?

Answer The ultimate goal of requirement analysis is to knowing what the customer wants.

FAQ 5: What is **blue sky** means in **SDLC**

Answer Blue sky means **Think BIG** when you iterate with you customer requirements. Brain storm with other people. Two head are better than one head.

FAQ 6: In designing the interface section what is the **surveying the possibilities** means

Answer **Surveying the possibilities** is to begin considering what makes a high-quality website.

FAQ 7: Who are creating the web standards

Answer World Wide Web Consortium (W3C) is the central organization who is responsible for creating and maintaining web standards

FAQ 8: What is **ER** diagram

Answer Graphical representation of entities/tables and its relationship.

FAQ 9: What are use cases?

Answer A use case is a narrative document that describes a set of sequences; in which each sequence represent the interaction of things outside the system (its actors) with the system itself (and its key abstractions).

FAQ 10: What is the purpose of the project user manual?

Answer The purpose of the project user manual is to give the complete brief to the user that how they can use the product and maintain it.

## Test Yourself!

Please mark the correct one from the given options. You can check your answer with the Answer Key at the end of this module.

1. **Which of the following is not a phase of SDLC?**
  - a. Requirement gathering
  - b. Maintenance
  - c. Analysis
  - d. All of the above
2. **Which of the following is not type of SDLC models?**
  - a. Big bang model
  - b. Agile model
  - c. Capability Maturity model
  - d. Spiral model
3. **In you institution student are asked to develop a dynamic website. Which model would be preferable?**
  - a. Waterfall model
  - b. Spiral model
  - c. Code and fix model
  - d. Agile model
4. **Testing which you check the code is?**
  - a. Black box
  - b. White box
  - c. Red box
  - d. Green box
5. **SDLC abbreviated as?**
  - a. System design lifecycle
  - b. Software design lifecycle
  - c. System development life cycle
  - d. Software development life cycle
6. **Testing which is done without planning and documentation is?**
  - a. Adhoc testing
  - b. Adhoc testing
  - c. Regression testing
  - d. Regression testing
7. **Which of the following is black box testing?**
  - a. Code path analysis
  - b. Basic path testing
  - c. Boundary value analysis
  - d. None of above
8. **Which of the following are true about website designing phase?**
  - a. Coloring
  - b. typography
  - c. layout
  - d. All of the above

**9. CMS stand for?**

- |                             |                              |
|-----------------------------|------------------------------|
| a. Course management system | b. Content management system |
| c. Color management system  | d. None of above             |

**10. Software guru says that designing is driving activity why?**

- |                                                                  |                      |
|------------------------------------------------------------------|----------------------|
| a. Design work extends from start of development to coding       | b. Black box testing |
| c. The two major products of designs are SRS and design document | d. All of the above  |

## Answer Key

MCQ Number	Correct Answer
1	d
2	c
3	c
4	d
5	b
6	a
7	b
8	d
9	d
10	b



# **Module 9: Perform Duties and Exhibit Rights at the Workplace**

## **Learning Outcomes**

After completion of this module, You will be able to:

- Plan Business Process activities
- Create awareness about rights





# Learning Unit 1: Demonstrate Ethics and Professional Conduct

## Overview

In this learning unit, you will learn about the exhibition of ownership in decision making process, Utilization of resources and tangible office equipment (assets) and appreciate them to perform the responsibilities regarding them. After completion of this learning unit, you will be able to understand responsibility, respect, fairness and honesty against the applicable territorial laws.

## 1. Demonstrate Ethics and Professional Conduct

Ethical mindfulness of a worker is a basic element of the work environment for quality of production & services of the business/company.

### Ethics at Work

You should be aware of various basic concepts of ethics relating to their working environment.

#### Remember

**Morality** The goodness or badness of human

### What is Ethics

The word ethics comes from Greek word ethos which mean habits, thus ethics is science of habit of individuals in society.

The proper rules that are implemented on a person's behavior during the work. That demonstrates what is right and what is wrong at workplace, there can be some obligations to stop worker from doing what is not ethical like stealing, not punctual etc.

Respecting the Co-workers, Understanding the Organizational Structure for Departmental, Higher Authorities and lower staff.

### Objective of Ethics:

The objective for studying the ethics is helping the students to have practical knowledge and understanding of self and different ethical issues.

Naturally Ethic can be divided in to four areas :

1. **Meta Ethics** is about that what actually the right means
2. **Normative Ethics** is how workers should act.
3. **Applied Ethics** mean that how do we use moral knowledge and apply it in our practice
4. **Descriptive Ethics** relatively mean that what do the workers think what is right.

### Ethics Training:

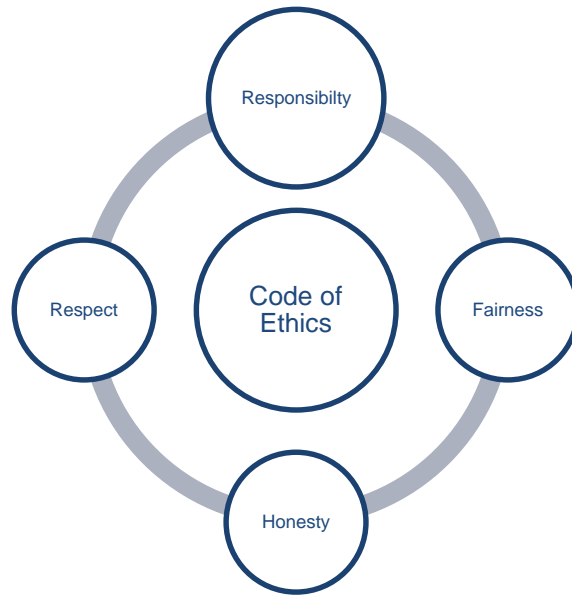
Training is required to help the workers to understand the ethical aspects of decision making and to include the standard ethics to their daily behavior. It help employee to deal with ethical issues under pressure.

### Code of Ethics:

A formal statement of principles and ethical standards that maintain a worker should place the integrity of the profession and the interests of clients above his own benefits, act with responsibility, honesty, proficiency, and respect. Sustain and progress professional competency.

#### Remember

Respect Follow  
conduct  
Professional  
behavior Safety of  
work  
environment  
Honesty is the best



### What is Ethical Behavior:

#### Remember

Work gives you  
meaning & purpose  
and Life is empty  
without it.

Respect for humanity, respect for basic rights and be good human at work and other place.

Excellence and growth based on the talent of the workers.

### Professional Conduct

The standards professional conduct are guidelines similar like code of ethics but the standards of professional conduct guide lines are more clear and in detailed way in the professional environment.

A professional worker should be bound by certain requirement, certain fundamental issues or principles, rules that govern worker behavior, whenever talk about professional that mean that there is some profession behind it and there is some institution that tell that how to behave like a professional. The professional status comes from the trust that users uses in public places in opposition.

- A profession give us a certain set of guide lines to follow.
- Professional conduct is the making of rules by professionals of the governing body for worker to follow it.
- The professional conduct is normally taken for the private organization's professionals for contractual nature of employment.
- Professional code of conduct may vary from profession to profession like Teaching, Marketing, Accounts, medical doctors and administration etc.

## Leaner's Activity

### Questions:

1. To think how you define ethics and then write it down.
2. Students to share the definition with beside seated students and have the comparison and rewrite the definition after sharing and comparison.

## 2. Exhibit Ownership of the Decisions

The Exhibition of ownership in decision making can be explained as the demonstration of their decisions in practical life .It is not necessary that every decision that will make is successful and it can be failed. It encourage one to make the right decisions and bring the positive prospective in his mind that if “Decision are not failed then their process of learning will stop” and learning process works as a circulation of blood in practical and professional life. Important factor is that one should avoid the negative decision and negative expectation from a positive decision.

### Remember

Implantation of ethics and performing duties are main step of success in any organization

## 3. High Regard for Resources

Confidence and trust are major skills that the teacher transfer to students and motivate them to work. Assignment of different tasks and goals, Designing and development of different projects and trust them on their resources will encourage you to work towards success. Appreciation is also an important factor that is necessary to encourage the team and individual work.

## 4. Make Decisions and Act Impartially/Objectively

Decisions making process is no doubt a complicated and tough task but it is a great platform to learn the different activities and projects and develop the different skills .Some people are very active to complete their tasks individually but it is not necessary to work completely on the decisions we can divided them in teams and start working accordingly. There is another factor that everyone not have the similar skills and qualities so while making the teams and start working you will get the pool of skills .When you set a goal then you will start working on it and this will enable you that how you work partially and impartially work on decisions and complete them .Self - assessment or self-examine is a test regarding your skills in which you have to judge yourself without any interest and assigning projects like AutoCAD which you will be cover later in each module .Regardless to professionalism and other formal thinking there is a moral happiness and inner satisfaction that encourage and motivate you to work more and achieve the different tasks.

## 5. Act in Truthful Manner in Conduct/Communication

Communication is a major tool that play a vital role because through communication can easily explained the idea, point of view, thinking knowledge to others. If everyone assume that next person or colleague or co helper or team coordinators understands the view without any explanations or communication it is very hard to work. Communication provide everyone a chance to explain their thinking and ideas. Sharing different ideas and discussions are founder of innovations and creativity.

## Leaner's Activity

### Case Study

Shumaila loves clothes. She wishes she could have all the designer clothes she wants. Unfortunately, she can't; she has two brothers and three sisters, and her parents cannot afford to buy all their children designer clothes.

Shumaila has a few friends that have some designer jeans. Her friends let her borrow the jeans, even though this is against her parents' wishes. Her parents felt that Shumaila should not borrow them in case something were to happen to them. In that case, they would need to purchase an outfit to replace the damaged one.

One day on the way home from school, Shumaila tripped and fell on her knees. She tore holes in both knees of the designer jeans she had borrowed from her friend, Julie. Shumaila was crying, not only because she had injured her knees, but because the new jeans were ruined.

**Write down your opinion about Shumaila decision.**

1. What is Shumaila going to do?
2. Should she tell her parents?
3. Should she tell Julie?
4. What decisions should Shumaila have made prior to borrowing the jeans?
5. Does Shumaila have an obligation to Julie?

### CASE STUDY WORKSHEET

Use this worksheet to evaluate case study.

Identify the problem.

What are the person's choices?

- a.
- b.
- c.
- d.
- e.

Gather information: What information should gather a person that would be helpful to know before making a decision?

- a.
- b.
- c.
- d.

Consider the outcome. What would be the results of the decision?

- a.
- b.
- c.
- d.

Make the decision. What should the person do?

Evaluate ones decision. Why do one think this is the best decision possible?

## 6. Ethics in the Workplace

Working in an organization, it should consider the following ethical approaches in mind to execute duty at workplace.

Ethics in workplace either at working in higher management or lower staff, the following four points help to understand.

### 1. Relationships at Work

- Management/owner toward client/customer
- Management/owner toward employees
- Employee toward Employer, Co-workers, Customers

### 2. Business Abuse

Any illegal, unethical, irresponsible Act done against an Employer

### 3. Results of Business Abuse

- Show Product prices very high
- Business Failure due to Mismanagement of an organization
- Fewer Jobs
- Unpleasant/Unfriendly/Hostile Working Conditions and environment of an organization.
- **Examples of Business Abuse**
- **Example-1**
  - Stealing of Merchandise and Money
  - Shoplift
  - Kickback
  - Conflict of Interest
  - Unauthorized Discounts
  - Time stealing: Come late and leave before timing
- **Example-2**
  - Destruction of product, record, faith.
  - Falsify Records
  - Break Confidentiality
  - Ignore Safety Rules

- Misrepresent Merchandise
- **Example-3**
  - Poor Client Service
  - Irresponsible Behavior
  - Addictions
    - Drugs
    - Alcohol
    - Tobacco

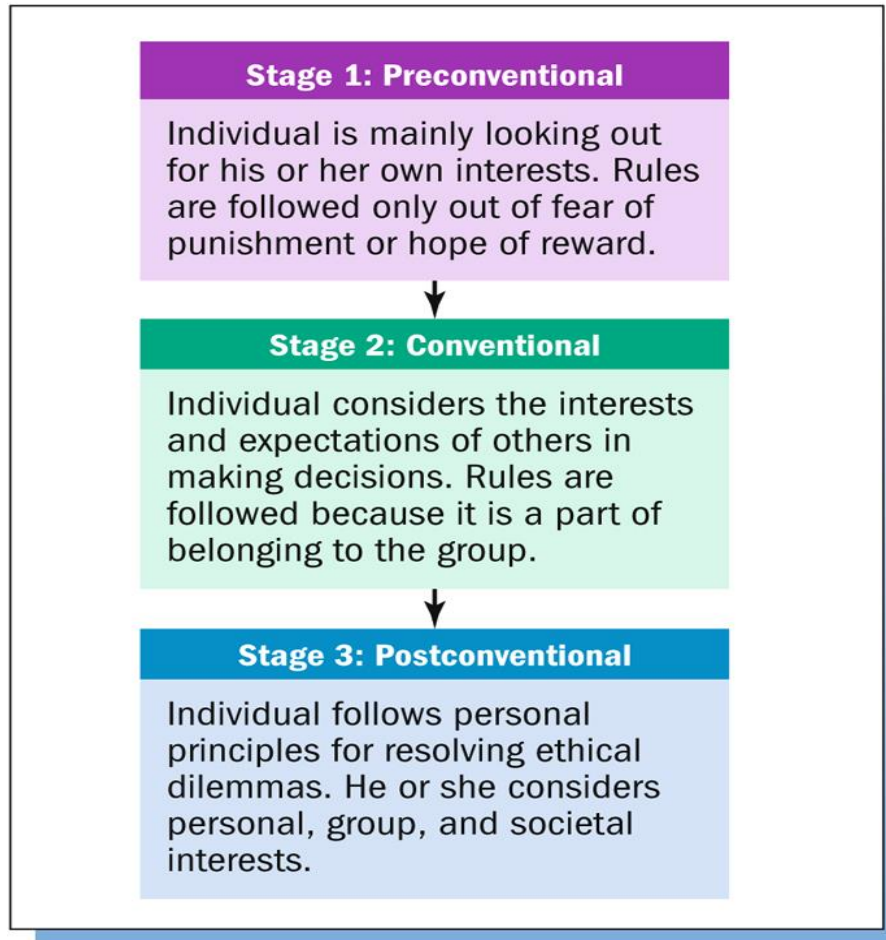
#### **4. How Employers Respond or rectify to Business Abuse**

- Increase Security
- Loss prevention management.
- Investigation
- Networks/Helplines
- threats of trial
- **Increase Employee Loyalty**
  - Fair Remunerations & Welfares
  - Fair and Reliable Treatment
  - Recognition for Good Work

## **7. Development of Individual Ethics**

An individual ethics can be develop in any environment either one is a student at any institution or employee in any organization, It need to consider the following stages.

## Stages of Moral and Ethical Development

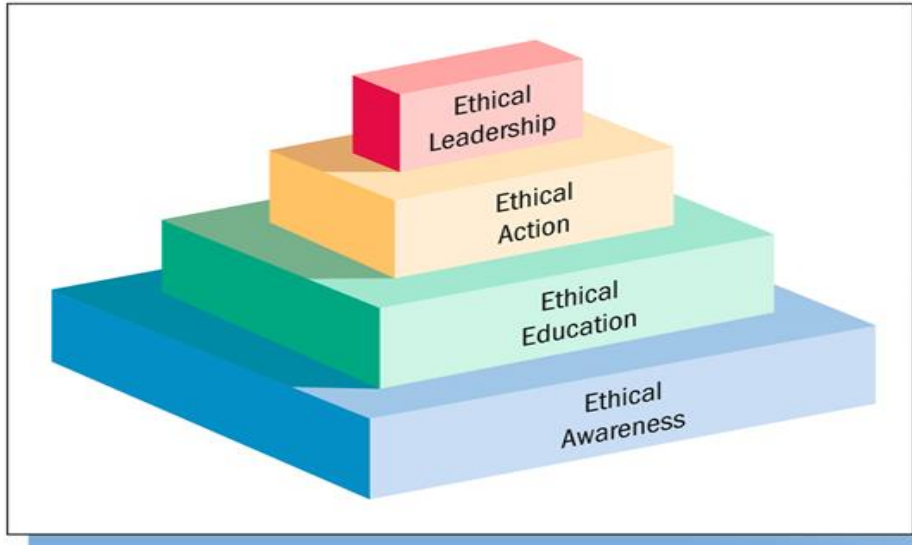


### Job Challenges On-the-Job Ethical Dilemmas:



### How Organizations Shape Ethical Conduct:

### Structure of an Ethical Environment



#### Ethical Awareness

Ethical awareness is essential part of an Institution and organization which describe Code of Conduct formal statement that defines how the organization expects and requires employees to resolve ethical questions.

#### Ethical Education

Codes of conduct cannot detail a solution for every ethical situation, so Institution and corporations provide training and workshop in ethical reasoning as **Character Building society** in Pakistan initiated by the Director General (Awareness and Prevention) National Accountability Bureau (NAB).

The Aim of this society is to following a prudent strategy to set up character building societies at grassroots level across the country aimed at making the younger generation useful citizens and enabling them to differentiate between good and bad deeds.

#### Ethical Action

Ethical education helps the employee's recognize and reason through ethical problems and turning them into ethical actions.

#### Ethical Leadership

Executives in organization and Trainer in Institution must exhibit/show ethical behavior in their actions while dealing employees and Trainer respectively



## Learner's Activity

Briefly answer the following questions:

1. One have started working for an organization as web designer.
  - What might be your duties and rights in accordance with the following conduct requirements?
    - ☐ **Integrity**
    - ☐ **Objectivity**
    - ☐ **Competence**
    - ☐ **Fairness**
    - ☐ **Confidentiality**
    - ☐ **Professionalism**
    - ☐ **Diligence**

What impact will policies, rules and regulations governing the work and workplace have on the employment?

## Learning Unit 2: Plan Business Processes Activities

### Overview

In this unit, you will be introduced about the In-line Manager role & duties. After completing this unit you will be able to Identify tasks by coordinating recurring meetings, intimate resource availability, create and keep documentations, validate applicable company defined standards.

### 1. In-Line Manager

#### Do You Know

Communication is a process, which involves sharing of information between people through a Continuous activity of speaking, listening, and understanding.

In-Line Management is a business phenomenon which elaborates administrative activities that pay attention directly to the result of product or services. In a corporate hierarchy, a line manager holds authority in a chain of command or may be over a particular product line. One is responsible with meeting corporate objectives in a specific functional area or line business or specific task.

Before going to introduce the business process activity we must have a look on communication skills.

#### Communication in the Organization

Communication in the modern organization flows downward, upward, and the horizontal, its destination can be either internal or external.

#### Downward Communication:

Downward communication flows from people at higher levels to those at lower levels in the organizational hierarchy. The primary function of downward communication is to inform employees about things important to them such as:

- Information about their jobs
- Organizational policies and procedures
- Feedback about their performance
- Organizational goals and objectives

The types of downwards communication may include instructions, speeches, meetings, announcements, memos, notifications, letters, hand-books, pamphlets, company newsletters and periodicals, bulletin boards (notice boards) policy statements, and procedures. For downward communication some use written communication, others use oral communication.

#### Upward Communication

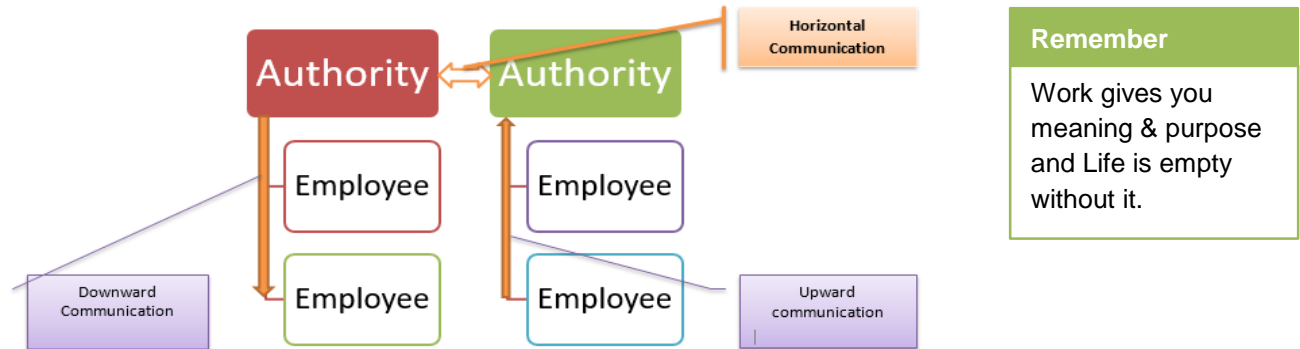
Upward communication travels from subordinates to superiors and continues up. Upward communication is extremely important, as upper management needs to know specifically about: Production performance, marketing information, and financial data, what lower-level employees are thinking, and so on.

Upward internal communication is becoming increasingly important day by day. Today many executives sincerely seek frank comments from employees, in addition to the usual periodic reports. Successful managers listen closely to opinions, complaints, problems, and suggestions especially when they are clearly and effectively stated.

As a response to increasing global competition, some companies are developing new management styles, which make input from employees an integral part of important decisions affecting the company.

### Horizontal Communication:

It includes horizontal flow of information, with people on the same or similar organizational levels, and diagonal flow, with people at different levels who have no direct reporting relationships. The horizontal communication is used to speed up information flow, to improve understanding, and to coordinate efforts for the achievement of organizational objectives.



## 2. Business Process

A business process is a collection of related activities or tasks that outputs a specific product or services what will designed for a specific objectives for a particular customers or client.

There are three main types of business processes:

**Management processes:** That defines the rules regulation of the operation of the system e.g. strategic management.

**Operational processes :** That define the basic business for the creation of primary value that is to developing, marketing for the product **or services**

Supporting processes: that defines the recruitment, financing and technical expert.

## 3. Estimated Time

Estimate time is an “Estimated time to complete” is a time projection and or effort required to complete a project/task activity in which the task should be completed. Estimated time to complete is a value that is expressed in hours of work required to complete a task or project.

- Use the work breakdown structure to facilitate estimation.
- Review the tasks at the bottom of the work breakdown structure and look for the longest path through the sequence diagram.
- Use experience from previous projects to estimate the time it will take to complete the tasks.
- Having any previous data, it will be the key element of precisely estimating time to complete.
- For example, let's assume that one is a Web Developer and have to develop a mobile product CMS website having create product, update product, delete product and view product on web page'. The Mobile product **CMS** will require 15 hours on reviewing data from previous developed CMS pages in

which the task has taken 15 hours to complete, thus in CMS one can estimate the time of completion as 15 hours. In this same way use past data to estimate the time of completion of an entire project.

- In the absence of previous data or experience one would have to guesstimate, which is inefficient and may error occur in time guesstimated.
- To develop a schedule, all of the tasks and estimates are placed in a calendar. The calendar would include a specified time period, identify resources and their allocation, how much time the task is expected to take and when each task is scheduled to start and finish as the scheduled shown in table below.

Number	Task Description	Start Date	Completion Date

The preferred way to complete the project is to apply “**Break down**” structure and “**Time estimation to complete**” on the project.

**Procedure:** How to apply time estimation and Breakdown Structure

Create mobile product website which have insert, update, select and delete product option

**Breakdown:**

To develop the Mobile product **CMS** website in 15 days, divided the task in different stages.

**Stage-1:** creating and normalizing the database

**Stage-2:** creating the design of website of different pages

**Stage-3:** applying **PHP** code to display the product

**Stage-4:** testing insert, select, update, and delete product function in website

**Time estimation:**

Number	Task Description	Start Date	Completion Date
1	creating and normalizing the database	12/07/2015	13/07/2015
2	creating the design of website of different pages	14/07/2015	14/07/2015
3	applying PHP code to display the product	15/07/2015	15/07/2015
4	testing insert, select, update, and delete product function in website	16/07/2015	16/07/2015

## 4. Work Load

**Workload** is the amount of **work** an individual has to do. There is a distinction between the actual amount of **work** and the individual's perception of the **workload**.

**Workload** can be of two types one as

Quantitative: The amount of **work** to be done in office environment, in a specified period i.e. 8 hours in a day.

The second as qualitative: The work which may difficulty by nature.

# Learning Unit 3: Develop Awareness about Rights

## Overview

In this unit, you will be introduced about the inspirational requirement of human rights in employment context. After completing this unit, you will be able to understand the different rules, regulation & right under the formation of Standard Operating Procedure (SOP), and proprietary protection with its different kind, like Copyright and Intellectual rights etc.

## 1. Rights

Rights are legal, social, or ethical principles of freedom or entitlement; that is, rights are the fundamental normative rules about what is allowed of people or owed to people, according to some legal system, social convention, or ethical theory.

## 2. Rules

Rules define standards for activities which help the smooth operation of the Project/Task/ or organizational work at workplace.

**Definition:** Rules is a Statement that establishes a **principle** or **standard**, and **serves** as a **norm** for guiding or mandating **action** or **conduct**.

Rules may be divided into four **general** categories:

1. **Folklore:** These rules are Unpublished that are conveyed by **behavior** and are implicitly understood.
2. **Guidelines:** These rules are commonly **published** and recommended **practices** that allow some **discretion** with their interpretation and use.
3. **Mandates:** These rules are Published commands that may not be ignored in any circumstance and whose **violation** is punished.
4. **Policies:** Published rules that imply a predicted behavior and whose violation may be **permitted** or tolerated under certain circumstances.

## 3. Responsibility

### Remember

Work gives you meaning & purpose and Life is empty without it.

**Definition:** A moral, legal, or mental accountability. A particular burden of obligation. Answerable.

### Aspects of Responsibility

Accountability. Free to choose and makes it accountable for choices.

Duty. Obligated to do what is expected.

**Employee's responsibility:** The following responsibility must perform by the employee while working in work place, all these responsibilities will be mentioned in the SOP of the organization, the employee first read the SOP and then take care of each point in the workplace.

**Employee should**

- Be punctual in his/her duty and honor to his/her commitments for the duty time
- Do what the employer say they will do
- Always Listen to what the customer/client wants and treat them politely.
- Honor service commitments
- Treat proprietary information appropriately
- Provide value for the paycheck
- Always Honor the agreements with the employers either its formal job agreement or what they have implicitly agreed to do.
- Behave loyally to the employers.
  - Take care of proprietary information of the organization.
  - Provide good customer/client service.
  - Be good agent of the company's resources.
  - Commit to organizational goals and try you best to achieve that goals.

**Employer responsibility:** Following are the responsibilities of the employee toward employees in workplace.

**Employer should**

- Keep business sustainable.
- Act in accordance with laws/rules/regulations.
- Always provide competitive wages and benefits to employee.
- Continually enhance employee skills which will benefit for both employee and employer.
- Provide reasonable health benefits (e.g., sick, casual, Earn, and Leave in-cashment (If possible) and maternity/paternity leaves).
- Respect the employees and take care of their dignity.
- Pay a living wage
- Honor contracts and obligations to employees.
- Reinforce and reward organizational loyalty.

## 4. Standard Operating Procedure (SOP)

### Do You Know?

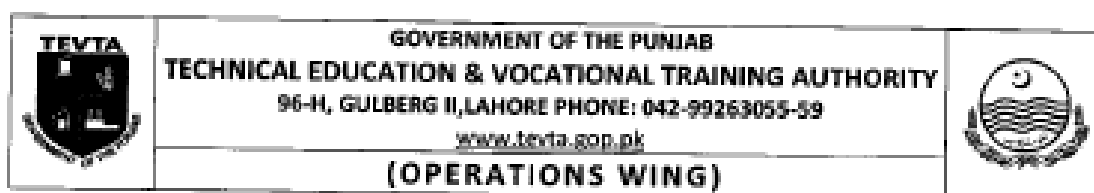
**Breakdown:** Break down is used to divide the project into simple modules or tasks to complete the whole project within different dates.

A Standard Operating Procedure (SOP) is a document consisting of step-by-step information on how to execute a task.

Standard Operating Procedure (SOP) is a document to define rules and regulation for specific task / project or company profile.

Example: An example of TEVTA short courses SOP recently developed in all TEVTA Institutions.

Notification released before running the project/task by the board of management, they define the rules and regulation for running of the project.



### NOTIFICATION

Subject: - SOP FOR 3 & 6 MONTHS SHORT COURSES (MAY, 2015) PHASE - II

No. TEVTA / GM (O-II) / Short Courses / 244 – 15/ 527 The standard Operating Procedure (SOP) is hereby notified for conduct of 3 & 6 months duration short courses (Phase – II) in selected TEVTA institutes. The SOP is attached for implementation in letter and spirit.

No. Even  
Dated: May 19, 2015

**CHAIRPERSON TEVTA**

A copy is forwarded to:

1. All General Managers, TEVTA.
2. All Deputy General Managers, TEVTA.
3. All Zonal Managers, TEVTA, Punjab.
4. All District Managers, TEVTA, Punjab with the request to forward the same to the field formation immediately for further necessary action.
5. The Manager (MIS), TEVTA.
6. SA to the Chairperson TEVTA.
7. PS to C.O.O TEVTA.



## 1. INTRODUCTION

In line with the policy directions of the Government of the Punjab, TEVTA has specifically focused on requirements of the industry and has started an aggressive, forward looking and demand driven courses to provide skills for employability to the youth of Punjab with focus on children of poor and down trodden families' w.e.f. May, 2015. The short courses have been designed after interaction with the industry / prospective employers.

## 2. SALIENT FEATURES OF PROGRAMME

To attract the poor unemployed youth for training in employable skills, the program has following features:

- No fee will be charged
- Registration fee will be provided by TEVTA.
- Free training material will be provided by the institutions.
- Stipend will be awarded for financial support of students, on completion of course.

## 3. TRAINING SCHEDULE FOR 1<sup>st</sup> BATCH (PHASE – II)

Start of classes of 1<sup>st</sup> Batch (Phase – II) w.e.f May 18<sup>th</sup>, 2015.

## 4. TRAINING PARAMETERS

- |                               |                               |
|-------------------------------|-------------------------------|
| • Courses duration            | 3 months & 6 months           |
| • Total Contact hours         | 400 hours / 800 hours         |
| • Average daily conduct hours | 5 hours / day (5 days / week) |

### 4.1 Timings

The training / classes will be conducted in evening shift from 2:00 p.m. to 07:00 p.m. (5 hours per day). However, respective District Manager may accord permission to the institutes' for early start of classes 01 hour, considering the locality of the institute and weather conditions. All the classes will be arranged in the premises of institutes and will not start before 02:00 p.m.

### 4.2 Number of Trainees per Class

Admission target for each institution has been given by the concerned District Managers, keeping in view demand of the industry in the district. The admission target finalized by the HQ has been circulated among the field offices for execution of training activities, as per plan.

**Payment Criteria Show the Payment Method which Never be Changed.**

## 9. ENGAGING / HIRING OF STAFF

### 9.1 PAYMENT CRITERIA OF TEACHING STAFF

Teaching staff will be paid on basis of per hour. If the enrollment in the class is less than 60% of the capacity mentioned above, no remuneration will be paid to the instructors. In case the enrollment is 60 to 80 % of the capacity proportionate payment will be made to the instructors. In case enrollment is above 80% full remuneration as mentioned in para 8.1 will be paid to the instructors.

**9.1.1** Admin staff will be paid on the basis of per trainee per month. Expenditure for remuneration to the staff must remain within maximum limits.

### 9.2 RATE OF REMUNERATION FOR TEACHING STAFF

The engaged teaching staff must be competent and skilled to impart the relevant skills and theoretical instructions.

Hiring of highly skilled persons is recommended from market after a healthy competition if the instructor from institute is not available or not competent to impart training.

#### RATE OF REMUNERATION FOR ADMIN STAFF

SR. NO.	CATEGORY	MAXIMUM MONTHLY LIMIT
1	Principal / Manager / Head of Institution	Rs. 3000/-
2	Admission Clerk / Accountant	Rs. 2000/-
3	Naib Qasid / Attendant	Rs. 1500/-

## 5. Proprietary Information

Proprietary information is only information which only disclosed in front of owner. These information in the form of documents limits who can view it or know about its contents, it also called trade secret.

Some examples of proprietary information include:

- Financial Information
- Employee Document and Profile information
- New Business Plan information
- Stock and Inventory Information

**Intellectual property (IP)** is a term referring to creations of the **intellect** for which a **monopoly** is assigned to designated owners by **law**.

Intellectual property rights include

- **Patents:** A **patent** is a form of right granted by the government to an inventor, giving the owner the right to exclude others from making, using, selling, offering to sell, and importing an **invention** for a limited period of time, in exchange for the public disclosure of the invention.
- **Copyright:** A Copyright is an exclusive rights to a producer/creator/designer of their original works, usually for a limited time, but can be renew by renewal law.
- **Industrial design rights:** An **industrial design right** also called **design right** protects the visual design of objects that are not purely useful. An industrial design consists of the creation of a shape, configuration or composition of pattern or color, or combination of pattern and color in three-dimensional form containing artistic value.

## Summary of Module

- Ethical mindfulness of a worker is a basic element of the work environment for quality of production & services of the business/company.
- Code of Ethics: A formal statement of principles and ethical standards that maintain a worker should place the integrity of the profession and the interests of clients above his own benefits, act with responsibility, honesty, proficiency, and respect. Sustain and progress professional competency.

## Frequently Asked Questions (FAQs)

FAQ 1: Do you know about the goodness?

Answer: The state or quality of being good in the society. Goodness is the nature and character of God.

FAQ 2: What are trade secrets?

Answer: The Inner Bound of Proprietary Information.

FAQ 3: What is leave Encashment?

Answer: Encashment of leave means that employee will receive the cash for leaves which are not taken by the employees.

FAQ 4: Develop a Mobile Product CMS Website.  
What will be the “Gathering information” stage of life cycle methodology for the development of drawing?

“Gathering information” stage of life cycle methodology as below

The Web Developer should queries regarding Database, Functionality of different pages, security, Actors or users etc.

For example:

Develop Mobile Product CMS to meet supplied floor plan with the following specifications:

- Answer:
- Admin can insert mobile product with user Friendly GUI approach
  - Admin can delete mobile product
  - Admin can update mobile product
  - Admin can see visitors comments and replying answers

Visitors can see all mobiles and can comment on every product

FAQ 5: What is mean by guesstimate?

Answer: Make an estimate without complete information with guess work.

FAQ 6: What is mean by estimate?

Answer: Estimate gives you a general idea about the value, size, or cost of (something) with strong information.

FAQ 7: Importance of communication?

Answer Importance of communication has always been realized in all times because it is the most vital means by which people are connected together in the society to share information, ideas, without communication you will be unable to work in professional environment.

FAQ 8: What is involved in the communication process?

Answer

- Idea
- Encoding
- Channel
- Decoding
- feedback

FAQ 9: Level of Communication?

Answer Intrapersonal Communication: When you think, you use intrapersonal communication  
Interpersonal Communication: Conversation between two or more than two person to share ideas and information.

FAQ 10: Do you know the symbol of copyright?

Answer Yes! ©

## Test Yourself!

Please mark the correct one from the given options. You can check your answer with the Answer Key at the end of this module.

**1. Morality is?**

- |                            |                                     |
|----------------------------|-------------------------------------|
| a. Act of student in class | b. Goodness or badness of human Act |
| c. Follow Rules            | d. None                             |

**2. The word *ethics* comes from .....?**

- |          |           |
|----------|-----------|
| a. Latin | b. German |
| c. Greek | d. None   |

**3. To test yourself by**

- |                    |                     |
|--------------------|---------------------|
| a. Self-assessment | b. Other assessment |
| c. Self-examine    | d. Both a and c     |

**4. Which is/are the result of Business Abuse?**

- |                           |                                  |
|---------------------------|----------------------------------|
| a. Show Illegal act       | b. Show Product prices very high |
| c. Unauthorized Discounts | d. Both b and c                  |

**5. SOP Stand for?**

- |                                 |                                 |
|---------------------------------|---------------------------------|
| a. System Operating Procedure   | b. Standard Operating Process   |
| c. Standard Operating Procedure | d. Standard Operation Procedure |


## Answer Key


MCQ Number	Correct Answer
1	b
2	c
3	d
4	c
5	c





## National Vocational and Technical Training Commission (NAV TTC)

 5th Floor Evacuee Trust Complex Sector F-5/1, Islamabad.

 +92 51 9044 04

 +92 51 9044 04

 [info@navttc.org](mailto:info@navttc.org)

 [www.navttc.org](http://www.navttc.org)