

Internet and Web Designing

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Dr. Babasaheb Ambedkar Open University



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Internet and Web Designing

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**Fundamental of Internet, Intranet &
Extranet**

Unit 1: Fundament of Internet , Intranet and Extranet

1

Unit Structure

- 1.1. Learning Objectives
- 1.2. Introduction To Internet
- 1.3. Internet – Intranet - Extranet
- 1.4. Connection of Internet
- 1.5. Network Topology
- 1.6. Let us sum up
- 1.7. Check your Progress
- 1.8. Check your Progress: Possible Answers
- 1.9. Further Reading
- 1.10. Assignment
- 1.11. Activities

1.1 LEARNING OBJECTIVE

After studying this unit student should be able to:

- Emerging applications of Internet from Its History
- Able to differentiate Internet – Intranet - Extranet
- Types of Internet Connection
- Layout of desktop called Topology of Computer Network

1.2 INTRODUCTION TO INTERNET

In the early days, most people just used the internet to search for information. Today's internet is a constantly evolving tool that not only contains an amazing variety of information, but also provides new ways of accessing, interacting and connecting with people and content. As a result, new terms are constantly appearing as new technologies are introduced.



Figure-1 Applications of Internet

The internet is the most cost-effective communications method in the world, in which the following services are instantly available:

- Email

- Web-enabled audio/video conferencing services
- Online movies and gaming
- Data transfer/file-sharing, often through File Transfer Protocol (FTP)
- Instant messaging
- Internet forums
- Social networking
- Online shopping
- Financial services

What is Internet: “Largest Computer Network in the world, connecting millions of computers? A network is a group of two or more computer systems linked together.”

Friends, we look at the Time-Line and brief history of Internet with its application we can get idea from below figure

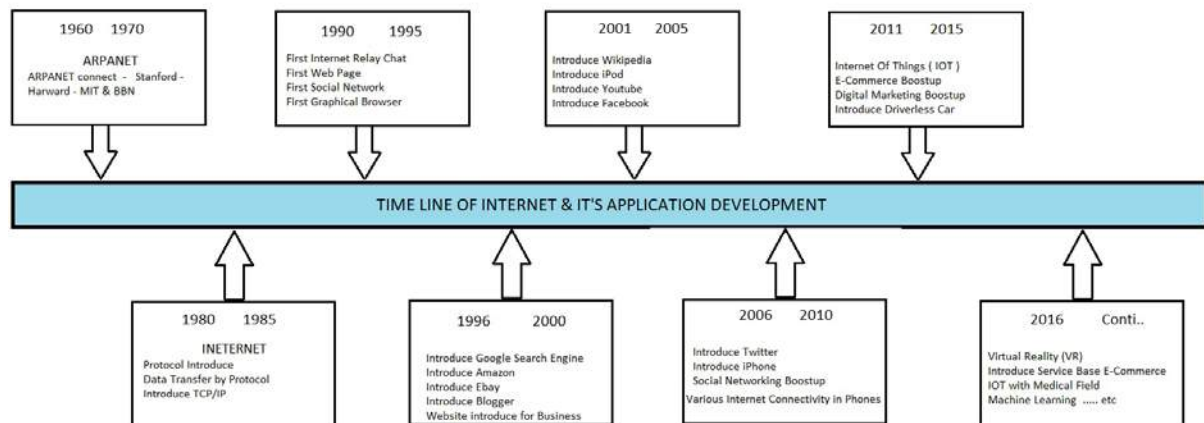


Figure 2: Time Line / History of Internet

Advantages of Internet:

- E-mail
- 24 hours a day - 7 days a week: availability
- Information
- Online Chat
- Net banking
- E-commerce
- Entertainment

- Software Downloads

Limitations of Internet

- Theft of Personal information
- Negative effects on family communication
- Internet addiction
- Children using the Internet
- Virus threat

1.3 INTERNET – INTRANET - EXTRANET

Hi Friends Internet – Intranet and Extranet is basically terminology that provide at various types of computer network for different purpose. We can clear our concept by below diagram

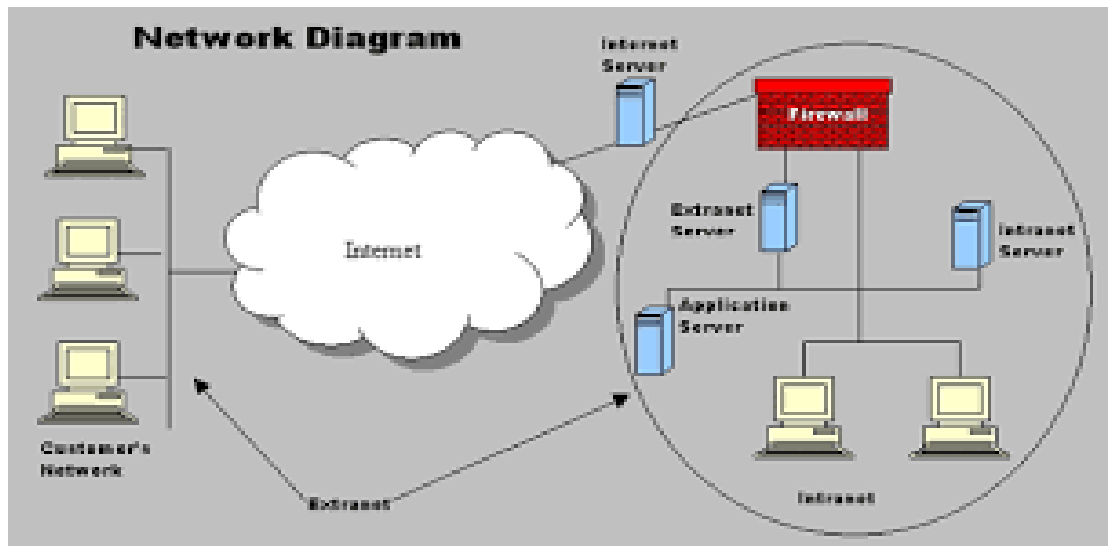


Figure 3: Internet – Intranet and Extranet

If we compare this three terms it is easily understood by the comparison factor like layout – process – Accessibility – Security – Maintenance ... etc.

Internet	Intranet	Extranet
Global Interconnect Network	Private Network specific to an organization	Private Network that use public network but share information to one or more entity (Suppliers and Vendors)
Accessible to Everyone	Only Members can Access	Permitted External Members can Access (Suppliers and Vendors)
Not Control by any Authority	Control by specific Authority	Control by more than one Authority
Owned by no One	Owned by single Organization	Owned by Single / Multiple organization (Suppliers and Vendors)
Sharing Information throughout Worldwide	Sharing sensitive information throughout organization	Sharing information between members and external members (Suppliers and Vendors)
Security is depend on User of device connected to Network	Security provide by Firewall	Security provide by Firewall that separate Internet and Extranet
Internet is free and open for all	Intranet is regulated and operated by certain policies	Extranet regulated by contractual between companies
Access all facilities without username and password	Access facilities to specific users as per policies	Access facilities to Internal as well as external members as per restriction.
No Maintenance required	Maintenance required for user level policy as well as data security	Maximum Maintenance required for Internal Users as well as permitted External users for data transfer
Ex. We use Internet	Ex. A Company Use	Ex. An MNC Company Use

normally	Internet for only their Employee.	Internet for its multiple branches and Employee.
Ex. abjadeja@gmail.com	Ex. abjadeja@TCS.db.com	Ex. abjadeja.ind@TCS.db.com

1.4 CONNECTION OF INTERNET

There are five types of Internet connections

1. Dial Up connections
2. Leased Connections
3. DSL Connections
4. Cable Modem Connections
5. VSAT

Dial Up Connection

Such type of Internet Connection that **use Phone Line** for Internet Access is called Dial up Connection

For Dial Up connection Friends **one Device mainly used name MODEM (Modulation Demodulation)** that **convert Analog signals (telephone) to Digital Signal (Desktop) and same as vice verse.**

Dial Up connection generally use **Telephone line as main source** and when connect Internet Telephone number dial it generates buzzing sound when **ISP (Internet Service Provider)** connect with Main Line.

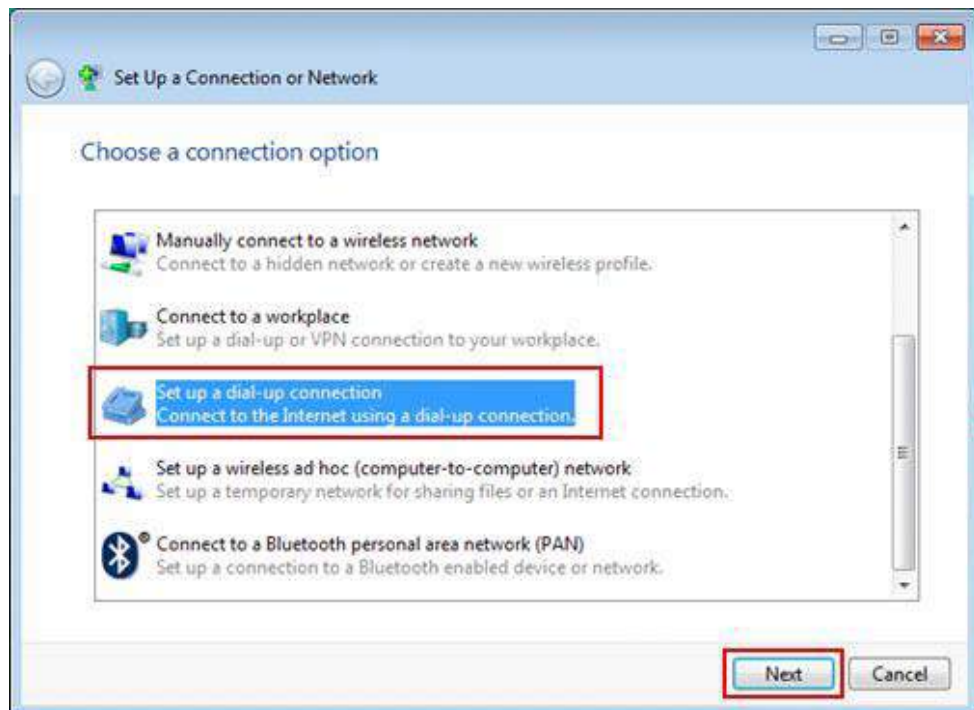


Figure 4: Dial up Connection Setup

Advantages

- Low Price
- Low Maintenance
- Secured Connection – IP Address continually changes
- Offer in Rural areas also where Telephone line available

Disadvantages

- Slow Speed
- Phone Line is must
- Busy signals for friends and family members when dial up
- Telephone Cable dependency

Leased Connection

Friends it is extended version of Dial up Connection only

Such type of Internet Connection that **use Permanent Tele Phone Line** for two or more points as leased as Internet Access is called Leased Connection

This is leased line so the **Telephone line and Internet line is distributed by ISP** (Internet Service Provider) so it is better than Dial up Connection.

Advantages

- Connection speed is better because connection does not carry any other communications
- Connection can divide in two lines it is called multiplexing
- Speed is better than Dial Up Connection
- Reliable because down time is very less
- Bandwidth of signal can easily transmit because it's separate telephone line
- Secure and Private

Disadvantages

- Maximum transmission speed is 1.544 Mbps
- Phone Line is must
- It is expensive as installation and for rent level
- Distance dependent to nearest Telephone exchange

DSL Connections

DSL means Digital Subscriber Line (DSL) is special type of Internet Access technology where **Data transfer by Digital** way

Data transfer rate is compare to high level i.e. **256 Kbit/second to 40 Mbit/second** directions to the customer.

Data transmission and signal can be both the way **Asymmetric Digital Subscriber Line (ADSL)** as well as **Symmetric Digital Subscriber Line (SDSL)** so Upload and Download Data rates are same.

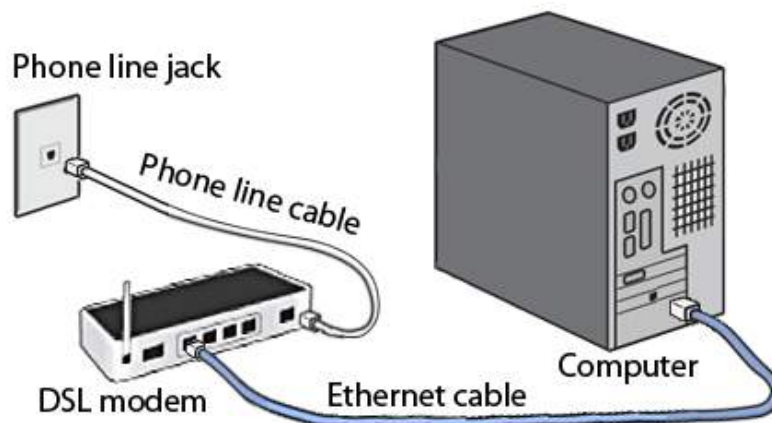


Figure 5: DSL Connection Setup

Advantages

- High Bandwidth

- Cheap line charges from the phone company
- Best for data traffic management
- DSL can integration with other external entity like ATM and WAN technology also
- More secure than Dialup as well as Leased line internet connection

Disadvantages

- No standard formation for various types of WAN
- Comparative expensive Setup Cost (DSL Modem required)
- Connection is slower when multiple external entity like ATM or WAN are parallel working

Cable Modem Connections

Friend's most general use of Internet Access Technology of today

“Internet Access Technology that use **Bridge and Modem** that supply bit-direction data **transmission by Radio Frequency** is called Cable Model Connection “

Guys now days we can see at our home also Coaxial cable runs our TV set with Setup box as well it provides Internet to our home members for multiple smart phones can use data band width receive.

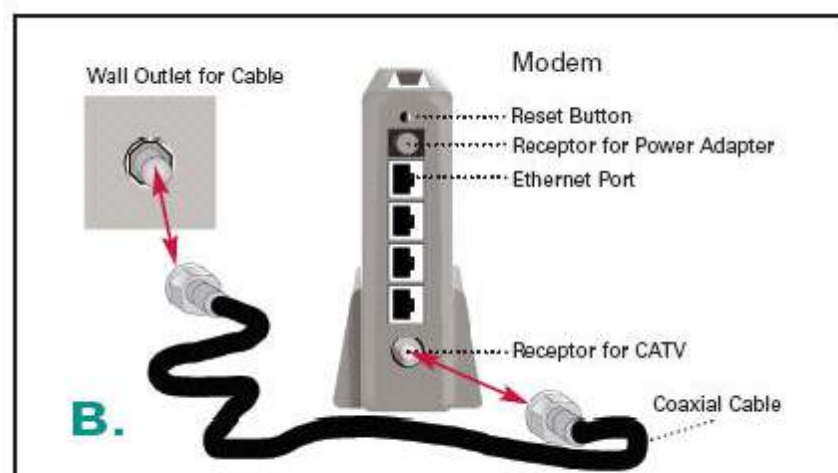


Figure 6: Cable Modem Connection

Advantages

- Most general as maximum use of technology now a day's use by customer.
- No telephone line required

- Data transfer rate is high
- It can be attach more than one electronic device at a time .(ex. router can connect laptop , desktop , smart phones at a time)
- Routing can increase the strength of signals as well as continues data transfer rate
- File transfer capability is also high
- It is always connected (i.e. it can automatically connect multiple device like some wifi provides such facilities)

Disadvantages

- Coaxial cable is comparatively costly
- Modem cost is additional
- Bandwidth is equal to the budget of customer i.e. as per expense of money customer can received maximum bandwidth up 40 Mbps

VSAT

It means Very Small Aperture Terminals (VSAT)

“Internet Access technology that use at earthbound station (satellite) communication special establishment for transferring Data, Voice and Video signals broadcasting Television is known as VSAT”

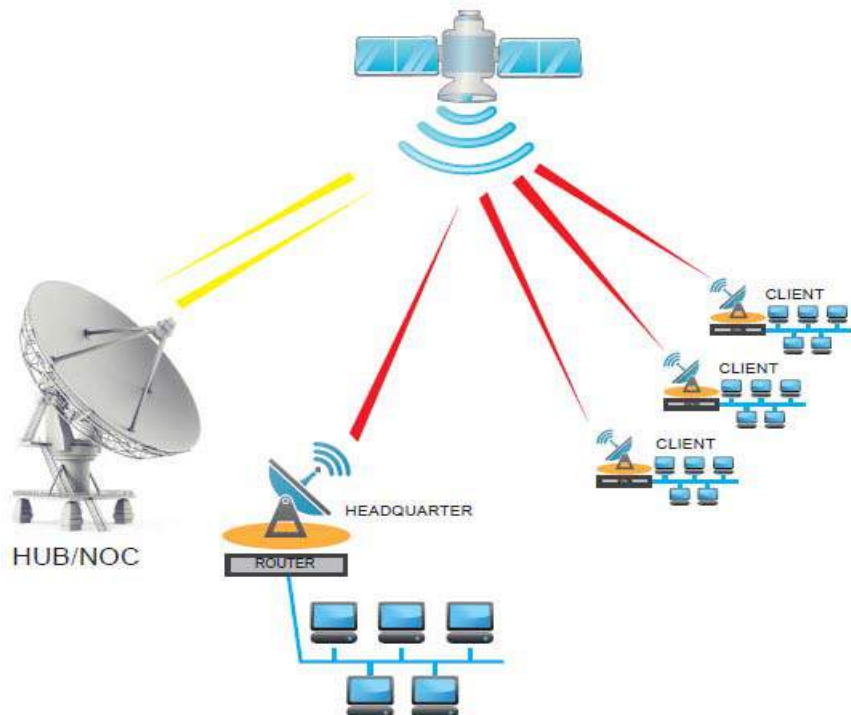


Figure 7: VSAT Connection

The **satellite sends and receives** signals from a **ground station** that acts as a hub for the system. **Every user is interconnected with the hub station** via the satellite, forming a topology. The hub controls the whole operation of the network. For one user to communicate with another, every transmission needs to initial go to the hub station that then retransmits it via the satellite to the opposite finish user's VSAT.

Advantages

- Global Data transmission in real sense.
- One Stop solution for any type of data.
- Most Flexible and Portable.
- Easy to upgrade.
- Multiple Device accessibility.
- **It is most secure so Data privacy can easily manage.**
- Data transfer rate is very high.

Disadvantages

- Setup cost is extremely high.
- Sometimes service quality limitation like 'latency' (high level of data transfer rate is very low for small period of times due to satellite communications)
- High level of maintenance required.
- High level of skill required for Setup design as well as satellite transmission
- Adopt by very confidential department.

1.5 NETWORK TOPOLOGY

Hey Friends, In Computer System, the network topology refers to the **pattern of arrangement for the connected Devices** that involves **network as well its nodes** and connecting lines. A business setup or a home automation network can be designed better by including the concepts of understanding of standard topologies its routes, broadcast and other wireless connecting devices.

To build and efficient and effective Network three main measure can be considered are message receiving Speed between nodes, Network Structuring Cost and

reliability of Network in times of connection or nodes malfunctioning. In simple terms a Network Topology is the description of a network layout, linking the sender and receiver nodes using the connecting lines.

Network Topology Types

In a personal computer network like home the Network Topology can be arrangement in a defined structure or any virtual shape.

The structure of the network can be defined in two forms, Physical Topology that depicts the factual Workstation layout and Logical Topology the signal pathway among nodes. In some networks both the forms of network Topologies can be essentially identical while in other they might not be similar like Physical Topology of some can be of one configuration while it can be operating on another configuration arrangement of networks. The various common physical topologies can be categories as following basic types:

Bus Topology

Ring Topology

Star Topology

Mesh Topology

Tree Topology

Hybrid Topology

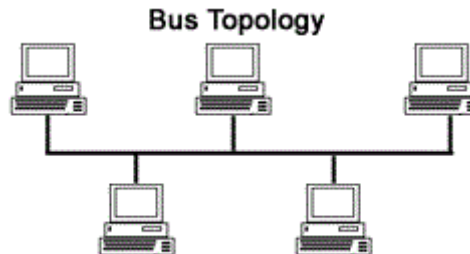
Bus Topology

The Bus Topology is a network type in which all the devices/nodes/workstation are connected in sequence to the main single cable having one transmission line called as Bus. It is even called as Linear Bus topology where each workstation is directly connected to every other workstation in the network using a common backbone. This type of topology is used in Ethernet LAN.

The characteristics of Bus Topology can be stated as:

- One direction Data transmission.

- Single Cable device/Node connectivity.
- The communication medium is shared through an interface connector.
- The sender sends a broadcast message through a cable visible to all nodes, while only the intended receiver recognizes and progresses the message.



Advantages:

- Effortless understanding
- Simplified topology.
- Comfortably Expandable.
- Less Expensive.
- Less requirement of Connecting Cable in respect to other Topologies.
- Small networks are availed.

Disadvantages:

- Length Limitation of Connecting Cable.
- Transmission failure of one Cable stops the entire network signaling.
- Able to manage the medium network traffic.
- Network Performance reduces during heavy network traffic.
- Slow speed of transmission than the other topology.
- Less Reliability as it is prone to network failure.
- Entire network Failure becomes unusable once the backbone cable interrupts.

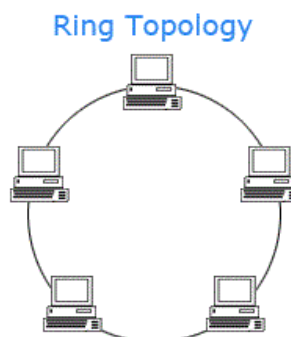
Ring Topology

The Ring Topology is a network type in which all the devices/nodes/workstation are connected to each other in a closed loop configuration in such a way that first node

connects to the succeeding nodes and the last node ends in connectivity with the first node, hence making circular structure known as Ring. This type of topology is used in school campus and Offices.

The characteristics of Ring Topology can be stated as:

- Ring Structure formation.
- Each Workstation is connected to two devices
- During transmission repeaters are used to prevent the data loss as the message has to travel from sender crossing all nodes when it reaches to targeted receiver.
- Bit-by-Bit Data transmission passes through each node till it reaches the receivers node.
- Single directional data transmission either clockwise or anti-clockwise.
- The unidirectional data transmission according to requirement can be modified into bidirectional through the use of to and fro connection between each nodes, becomes Dual Ring Topology.
- The two-way directional data flow in Dual Ring Topology maintains the data so that data failure of one is backup by second ring, hence is Network is always up.
- Data Transmission is smooth as the node containing tokens can only transmit data.



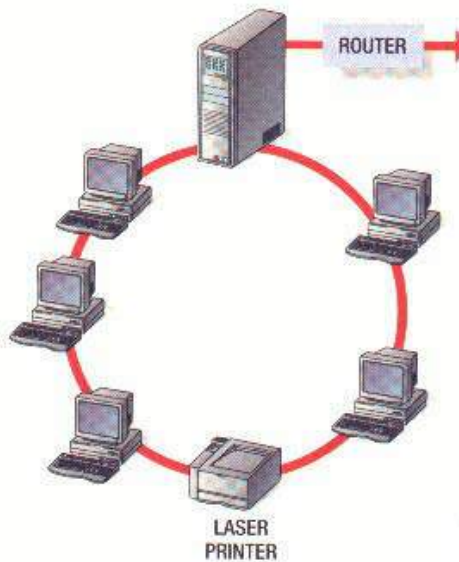
Advantages:

- Manages High Traffic network
- Reasonable cost of installation.

- Conformable expansion of workstation.
- Fairly low cost.

Disadvantages:

- Laborious Troubleshooting.
- Network connectivity and activity gets suspended at the time of addition and removal of workstation.
- Entire Network gets interrupted by malfunctioning of single workstation.
- Loop breaks and stops data transmission at failure of single cable.
- the entire network is down on
- Time Consuming as the data passes single or multiple Intermediate nodes.
- Average speed data transmission.

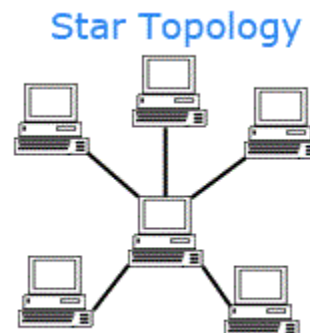


Star Topology

The Star Topology is a network type in which all the devices/nodes/workstation are directly connected to each other by a connecting devices like Hub, Switch or Router through Cable to the central Computer System or Server making a structure known as Star. This type of topology is used in many home networks and other Common local networks.

The characteristics of Star Topology can be stated as:

- A central computer indirectly connects each workstation.
- Connecting device act as the central Workstation that connects all the others nodes.
- Dedicated Connection of all workstation to Hub/Switch.
- Data Flow uses Hub that operates as a repeater.
- Twisted pair, Optical Fiber or coaxial cable can be used.



Advantages:

- Low network traffic among few nodes enhances the network performance.
- No Network downtime due to malfunctioning of individual nodes or cables
- Smooth up gradation of connecting Devices like Hub and Switch.
- Quick and effective troubleshooting.
- Effortless setup and transform.
- Single workstation is affected by Dropout while remaining nodes works efficiently.

Disadvantages:

- Expensive installation.
- Expensive usage inclusive of devices.
- Excellent Speed during distance transmission Head Quarter Traffic jam is unavoidable.
- Entire Network downtime during central connecting device failure.
- Failure of connecting device Hub/Switch leads dropout of entire transmission.

- Efficiency and Performance is measured on the capacity of connecting device Hub/Switch.
- Star Topology utilizes more cable in comparison to bus topology.
- The reliability is hazardous as failure on Head Quarter stops all transmissions.

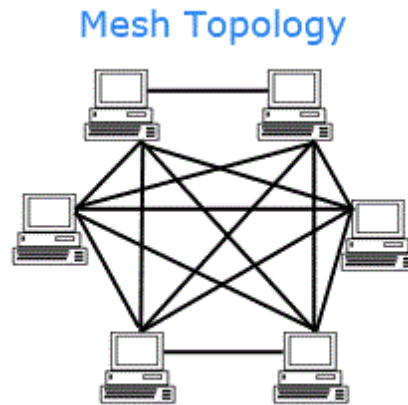
Mesh Topology

The Mesh Topology is a network type in which each device/node/workstation is directly connected to any of the available and required Node present in the Network in such a way where there is no defined shape hence forming a Mesh structure. This type of topology is used in mainly used in some WANs, internet and Wireless Networks.

The characteristics of Star Topology can be stated as:

- On the basis of connections there are two types of [Mesh](#) Topology:
 - Partial Mesh Topology: There is an exclusive connection between required nodes only and very few nodes are connected each other.
 - Full Mesh Topology: All nodes have common mutual connection among each other.
- Mesh topology initiates the concept of routes as the broadcasted message onto this topology has multiple paths from sender to receiver. The two mechanisms of Data transmission in this Topology are:
 - **Routing:** it has Routing Logic based on network requirements that directs the data in to its receiver through shortest path. The information about malfunctioning nodes resides in routing logic; hence it avoids those nodes during data transmission.
 - **Flooding:** It does not require Routing Logic as same data is transmitting broadcasted to all network nodes. The advantage is that there is no data loss in flooding while on the other hand the unwanted load over the network is increased.

- Node to Node connection is present.
- Completely connected.
- Vigorous and Robust.
- Non-flexible.



Advantages:

- High Fault Tolerance due to Node-to-Node connectivity redundancy
- Own Data load is carried by all the connection itself.
- Speedy diagnosis of Troubleshooting and Faults.
- Security and Privacy efficiency is offered.

Disadvantages:

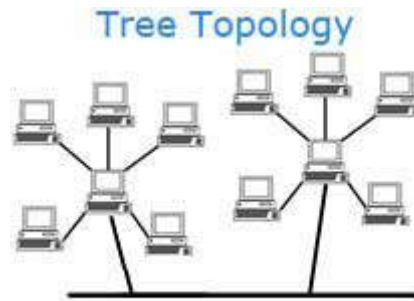
- Complex Installation and configuration.
- Expensive in terms of Connecting Cable.
- Needs voluminous Cable.
- Used in highly critical networks due to High cost.

Tree Topology

The Tree Topology is a network type in which each device/node/workstation is hierarchically connected having a root node followed by two or multiple sub-levels nodes that further has second level of sub nodes forming a shape called s Tree Structure. This type of topology is used in mainly used in Wide Area Network.

The characteristics of Tree Topology can be stated as:

- Has structure similarity with Bus (Network Backbone) and Star (low level nodes connectivity) topologies. Tree topology connects manifold star structured topologies together onto a bus.
- Three levels of hierarchy should be structured.
- Efficient where cluster or groups of workstations are positioned in groups.



Advantages:

- Tree shaped simply distinguishable connection.
- Bus and Star Topology extension.
- Effortless and flexible nodes extension.
- Maintenance and Management is straightforward.
- Speedy Fault finding and troubleshooting.

Disadvantages:

- Heavily wired.
- Expensive.
- Expansion on Nodes challenges maintenance.
- Failure of Connecting Devices leads network failure.

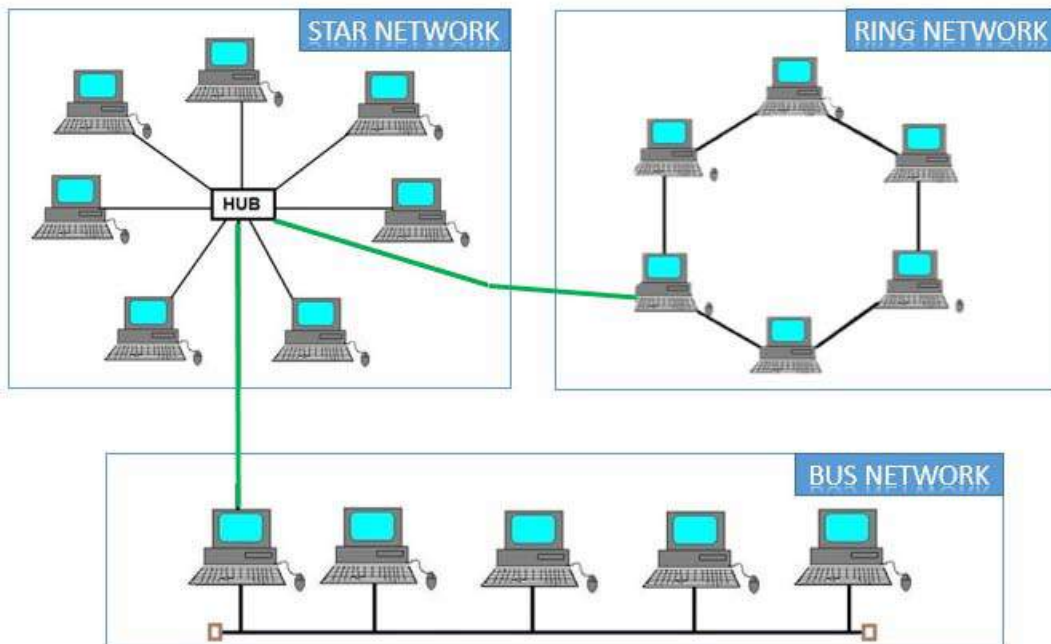
Hybrid Topology

The Hybrid Topology is a network type in which all the devices/nodes/workstation are connected in such a way that it is combinations of two or more different topologies, hence forming a combined structure called as Hybrid. This type of topology is used in multiple LAN networks in High-level organizations.

The characteristics of Hybrid Topology can be stated as:

- Has an arrangement of two or more than two topologies.
- The characteristics, merits and demerits are indirectly inherited from the combined topologies.

HYBRID TOPOLOGY



Advantages:

- Speedy Troubleshooting
- Reliable Fault Finding.
- Effective transmission.
- Smooth expansion of Size.
- Scalable.
- Flexible.

Disadvantages:

- Complex Design
- Multifaceted Combination.
- Hierarchical mode of Network

- Expensive.

1.6 LET US SUM UP

Hey Friends now you complete this unit of Introduction to Internet let's focus on some of the key point that are as key elements are: Internet – Internet uses – Internet history – a comparison between Internet – Intranet – Extranet; Many ways to get Internet connection and each types advantages and disadvantages – for number of desktop arranging pattern: topology; Types of various topology with its advantages and disadvantages of each topology.

1.7 CHECK YOUR PROGRESS

- The most basic topology is Bus Topology? [True / False]
- Full form for below
 - LAN
 - WAN
 - FTP
 - DSL
- For satellite communication we use _____ Internet Connection

1.8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- The most basic topology is Bus Topology? [True]
- Full form for below
 - LAN –Local Area Network
 - WAN – Wide Area Network
 - FTP – File Transfer Protocol
 - DSL – Digital Subscriber Line
- For satellite communication we use VSAT Internet Connection

1.9 FURTHER READING

Following are some Online Reference Reading as PDF:

[http://ignou.ac.in/userfiles/Block2\(1\).pdf](http://ignou.ac.in/userfiles/Block2(1).pdf) [Pg 5 – 22 For Network Topology]

[http://ignou.ac.in/userfiles/Block2\(1\).pdf](http://ignou.ac.in/userfiles/Block2(1).pdf) [Pg 18 – 20 For Internet Connection]

<http://www.csl.mtu.edu/cs4451/www/notes/Network%20Topologies.pdf>
[About Network Topology]

<http://www.just.edu.jo/~mqais/cis99/PDF/Internet.pdf> [About Internet]

YouTube Reference:

<https://www.youtube.com/watch?v=YOXwcbwSEUo> [About Introduction to Internet]

<https://www.youtube.com/watch?v=NSHj9BLnhj0> [About Network Topology]

<https://www.youtube.com/watch?v=teWamog0iuk> [About Network Devices]

1.10 ASSIGNMENTS

1. Define Internet , Its uses with its advantages and disadvantages
2. What is Internet Connection Type? Explain any 2 in Detail
3. Differentiate the below terms :
 - a. Dial Up Connection v/s VSAT
 - b. DSL Connection v/s Cable Modem Connection
 - c. Bus Topology v/s Star Topology
 - d. Tree Topology v/s Hybrid Topology
4. What is Computer Network Topology? Explain any 2 Topology with its characteristics block diagram and advantages and disadvantages.

1.11 ACTIVITIES

Note: For Activities Learners can use reference of search engine

Creative Zone:

- Draw Internet Development Time Line / History of Internet
- Find where you find Internet , Intranet and Extranet in your Daily Life
- Different Network Topology and Hardware Device Requirement list

Analytical Zone:

- Internet Users statistics in World and India
- Which Internet Connection is popular according to Users statistics
- Maximum popular topology according to Users statistics

Unit 2: Internet Terminology

2

Unit Structure

- 2.1. Learning Objectives
- 2.2. Introduction to WWW
- 2.3. Web Browser, Web Server and Distributed Web Server
- 2.4. Basic Internet Terminologies: IP Addressing and Domain Name System
Web Hosting, Virtual Host, Multi Homing, Document Root, Cookies
- 2.5. Internet Service Provider and their Services
- 2.6. Static Web Sites & Dynamic Web Sites
- 2.7. Let us sum up
- 2.8. Check your Progress
- 2.9. Check your Progress: Possible Answers
- 2.10. Further Reading
- 2.11. Assignment
- 2.12. Activities

2.1 LEARNING OBJECTIVE

After studying this unit student should be able to understand the concept of:

- Internet and World Wide Web.
- Web Browser, Web Server and Distributed Web Server.
- Basic Internet Terminologies: IP Addressing and Domain Name System
Web Hosting, Virtual Host, Multi Homing, Document Root, Cookies.
- Internet Service Provider and their Services.
- Static Web Sites & Dynamic Web Sites.

2.2 INTRODUCTION TO WWW

Learners, the World Wide Web (WWW), also commonly known as Web, can be defined as an information space where various categories of web documents and resources are recognized by Uniform Resource Locators (URLs), interlinked by hypertext links in form of Web pages that integrates as Websites, and accessible via the Internet connectivity.



Figure 1: World Wide Web (WWW) Connectivity

Facts to ponder:

- World Wide Web Consortium (W3C) is a web organization that was framed with the support of Tim Berners Lee who is designated as Web Inventor and defined that the World Wide Web is a global collection of documents and other resources, linked by hyperlinks and URIs.
- The Uniform Resource Locators (URL) is a web address used to identify documents on the Web.
- The WWW connect all types of devices having the connectivity network configuration as displayed in the Figure 1 either through cables or wireless connectivity.
- Using Web browser, one can access all information available on the internet.
- Web is software that makes browsing of hypertext document easy over the internet.
- Most commonly the web uses Hyper Text Transfer Protocol (HTTP) to share the information on Web.
- Web pages are primarily text documents formatted and annotated with Hypertext Markup Language (HTML).
- Web is very good example of distributed networks in which everything looks like a document.
- The World Wide Web follows client/server software design model where Client Software (ex. Web Browser) can be used to request information & Server Software is used to process on request and provide information to resolve the request.
- Web supports the nonlinear structure, multimedia information, hypertext information and Graphical User Interface (GUI) to arrange and retrieve information over the internet.

2.3 WEB BROWSER, WEB SERVER AND DISTRIBUTED WEB SERVER

Friends, a Web Browser also known simply as Browser which is application software used for exploring the required information and resources on the Web using a Web

Server. The Web Browsers and Web Servers function together as a Client/Server (C/S) System, that is a standard method in Computer Networking used for designing applications where data is kept in central locations (server computers) and efficiently shared with any number of other computers (the clients) on request.

Web Browser

Learners, an application Software that we used to view web pages of a website as well as upload or download files on FTP Web Servers can be called as Web Browser. The most popular Web Browsers are Google Chrome, Microsoft Internet Explorer, Mozilla Firefox, Apple Safari and others

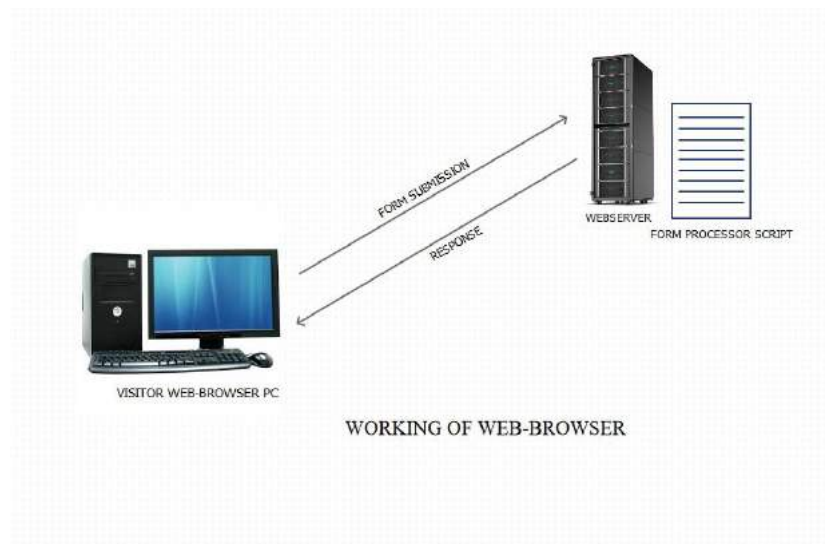


Figure 2: Web Browser Working

Facts to ponder:

- All web browsers function as clients that request information from websites (servers).
- Numerous web browser clients can request data from the same website. Requests can happen at all different times or simultaneously as shown in Figure 2.
- Client-server systems conceptually call for all requests to the same site to be handled by one server.
- Web browsers also rely on DNS to work with URLs. These protocol standards enable different brands of web browsers to communicate with different brands of web servers without requiring special logic for each combination.

- Web Browsers Caches the web pages by storing in cookies to increase the efficiency of Internet.
- While working on a Web Browser the below listed awareness is must:
 - Efficient Web Browser offering security and additional features must be used.
 - Latest updated version of Web Browser should be used.
 - Other than the standard, the other variety of Web Browsers must be explored.
 - The reading of reviews of Web Browser should be read.

Web Server

Friends, a Web Server is a rich configuration Computer system performing storing, processing and deliver of Web Pages of a Website with the help of application software. The most commonly used Web Server Is Apache Server which is a Free and Open Source Software (FOSS) Tool that holds maximum number of websites. Other available Web Server is Internet Information Service (IIS) owned by Microsoft. Another web server that is generally available is Internet Information Service (IIS). IIS is owned by Microsoft.

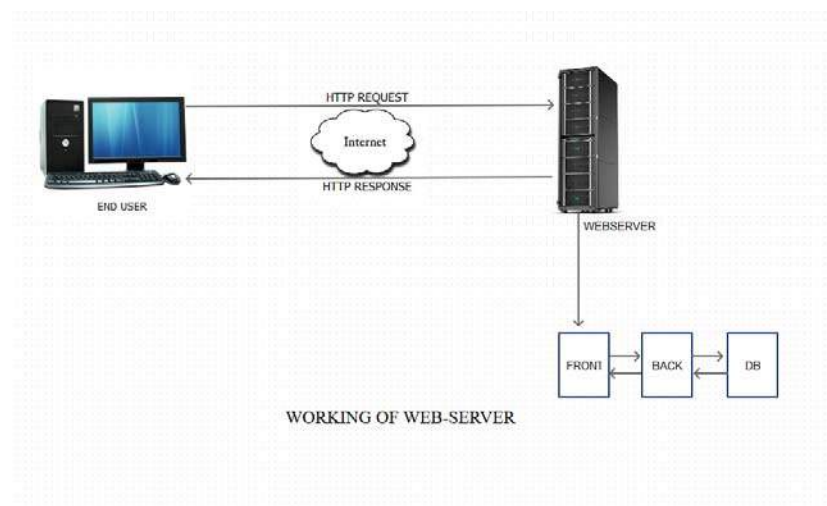


Figure 3: Web Servers Working

Facts to ponder:

- A Web Server comprises of many websites from same or different organizations. A unique IP Address is assigned to every Website on the same Web Server or even sometimes multiple websites are configured

using Host Header and/or different ports without using different IP Address.

- The Web server does the website request-response communication between connected devices by using Hypertext Transfer Protocol (HTTP), the email communications is done using Simple Mail transfer Protocol (SMTP) and the File transfer as well as storage is done using File Transfer Protocol (FTP) as displayed in the Figure 3.
- The Web Server displays the Website content onto the Web Browser.
- A web Server working locally is called as Intranet Web server.
- In practice, however, because the volume of requests to web servers can sometimes grow very large, web servers are often built as a distributed pool of multiple server computers.
- Web browsers and servers communicate via TCP/IP. Hypertext Transfer Protocol (HTTP) is the standard application protocol on top of TCP/IP supporting web browser requests and server responses.
- A basic web browsing session works like this: Working of Web Browser and a Web Server can be Explained as per the Below Figure 4 and given steps:

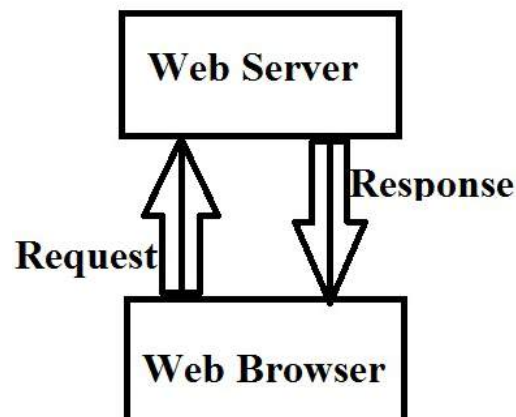


Figure 4: Web Server and Web Browser working

Step 1: The required URL is written by the user on the address bar of a Web Browser, knowing which the browser initiate the TCP connection to the Web Server which seeks information from DNS Server about which IP address the Domain Name is referring.

Step 2: The Web Browser after knowing the IP address of the domain name, sends a HTTP request of the required information of complete URL to the respective Web Server. The content can include embedded URLs advertising banners or other third-party content that in turn triggers the browser to issue new TCP connection requests to those locations. If requested page does not exist an appropriate error message is displayed.

Step 3: After receiving the content page from web server the browser retrieves it from Http packets and displays accordingly. It even temporarily stores information about the surfed history into local files on Computer System called as Cookies.

Step 4: The Web Server responds by sending the requested page to the Web Browser.

Every time a request is send in form of URL, or clicking of the hyperlink Step 2 and Step 3 are repeated to view a particular Web Page on the Internet.

Distributed Web Server

A Distributed Web Server (DWS) is a web server distributed across different geographical locations across the world to enhance the speed of Request-Response communication. It comprises of multiple Web Server holding various information by the use of Enhances Domain Name Service Platform.

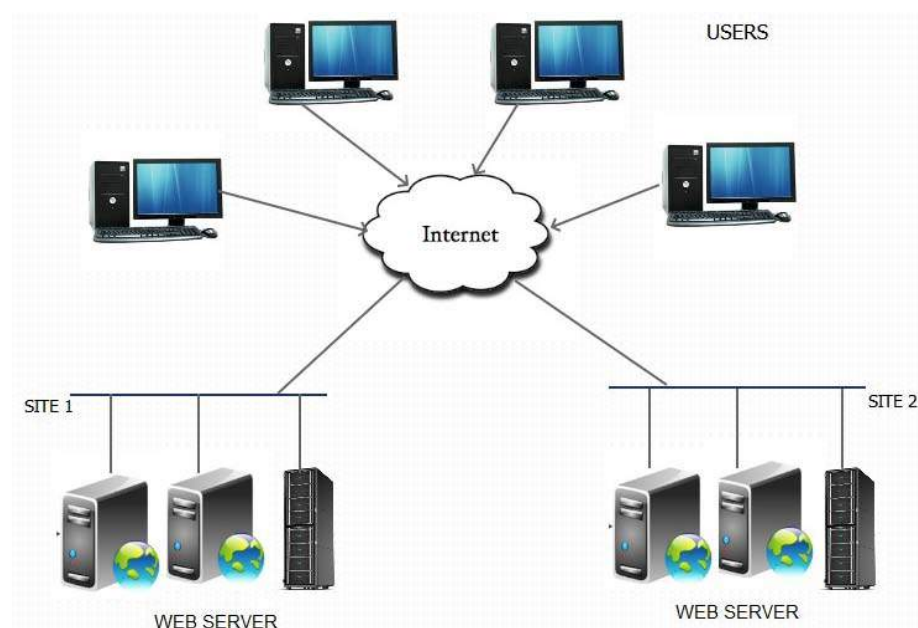


Figure 5: Distributer Web Server (DWS)

Additional facts to ponder:

- A DWS like a Web Server is a Computer system with high configuration that securely stores the hosted Website onto different Web Servers as displayed in the Figure 5.
- Some DWS are even Web servers that are dedicated for gaming, storage, FTP, email etc.
- DWS is software that responds to the request of the client for web resources and information.
- A DWS respond to the client request in either of the following two ways:
 - Sending the file to the client associated with the requested URL.
 - Generating response by invoking a script and communicating with database
- The balancing of a load of replicated documents that are stored in different geographical location among different servers is always point of concern and handled with care.
- The promptness of handling Request-Response traffic displays the efficiency of a DWS.
- A good performance of DWS can be achieved by the technique of Object replication.
- DWS environment is most reasonable and dynamic against any failure of Hardware or Software.

2.4 BASIC INTERNET TERMINOLOGIES

Hey friends, the basic Internet Terminologies can be understood as detailed below.

IP Addressing and Domain Name System

An Internet is the largest network spread across the world connecting thousand millions of individual networks having large number of computer system and other connecting devices. In order to successfully communicate over this large network, each and every computer system as well other connecting devices having

information are required to be identified uniquely. The uniquely identification to differentiate each of them from one another is done by:

- IP Addressing
- Domain Name System

- **IP Addressing**

The information sharing among all the devices like Computer System, printer, hub, switch, router, gateway or any other device on a network requires a unique address in the form of logical number address is known as Internet Protocol (IP) addressing.



Figure 6: IP addressing

Facts to ponder:

- IP Address is measured as most vital component in networking that integrates the entire WWW in a single platform.
- Shares similarity to an address of an individual/organization required to post a professional or a personal letter.
- Considered as core component for designing a network based architecture without which no network can be framed.
- Every Node/Device on network is uniquely identified and assigned an IP Address using Transmission Control Protocol/Internet Protocol (TCP/IP) communication protocols as displayed in Figure 6.

- Being logical number IP address is subjected to change.
- The numbering system in an IP address is divided into 2 sections: The Network Section specifies type of Network and the Host section specifies the exact location.
- The IP addresses are categorized into two types: Firstly Classfull IP addressing in which IP address are grouped into 5 distinct classes—A, B, C, D and E and Secondly Classless IP addressing which has an random length of the prefix.
- The two Standards for IP Addressing are: Internet Protocol Version 4 (IPv4) and Internet Protocol Version 6 (IPv6) the core details are specified in the below Table 1.

Table 1: Specification of IP Addressing Standards

Specification	IPv4	IPv6
Addressing Length	32 bits (4 bytes)	128 bits (16 bytes)
Address Representation	Decimal	Hexadecimal
Numbering Format	x. x. x. x x = Octet having decimal value between 0 and 255, separated by periods.	y: y : y : y : y : y : y : y y = segment having hexadecimal value between 0 and FFFF, separated by colons - not periods.
Encryption and Authentication	Not offered	Offered
Broadcast Address	Provided	Not Provided

Fragmentation supported by:	Sender and Forwarding Routers	Only Sender
Header includes:	Checksum	Does not include Checksum
Example	101:102:103:104	3333:4444:cccc:dddd:5555:6666:eeee:ffff

- **Domain Name System (DNS)**

The Domain Name System (DNS) is can be called as the phonebook, that is a hierarchical and decentralized naming system for computers information, services, or other required resources of the Internet using which the user retrieves the entire information from Internet or a private network. An individual can access information online through domain names, like google.com, wikipedia.org and others.

The Domain Name System has following characteristics:

- Domain Name is the unique name given to each computer which is connected to the Internet.
- Domain Names are given on the basis of geographical location or on the type of an organization.
- Domain names are not case sensitive.
- Domain Name can be based on geographical location as mentioned in and type of an organization as mentioned in Table 2.

Table 2: Some Domain Name

Geographical Location based Domain Names		Type of an organization based Domain Names	
Domain Specification	Location	Domain Specification	Organization Type
in	India	.com	Commercial
uk	United Kingdom	.edu	Educational
us	United State of America	.org	Non – profit

au	Australia	.gov	Government
ch	China	.mil	Military group
bz	Brazil	.net	Network

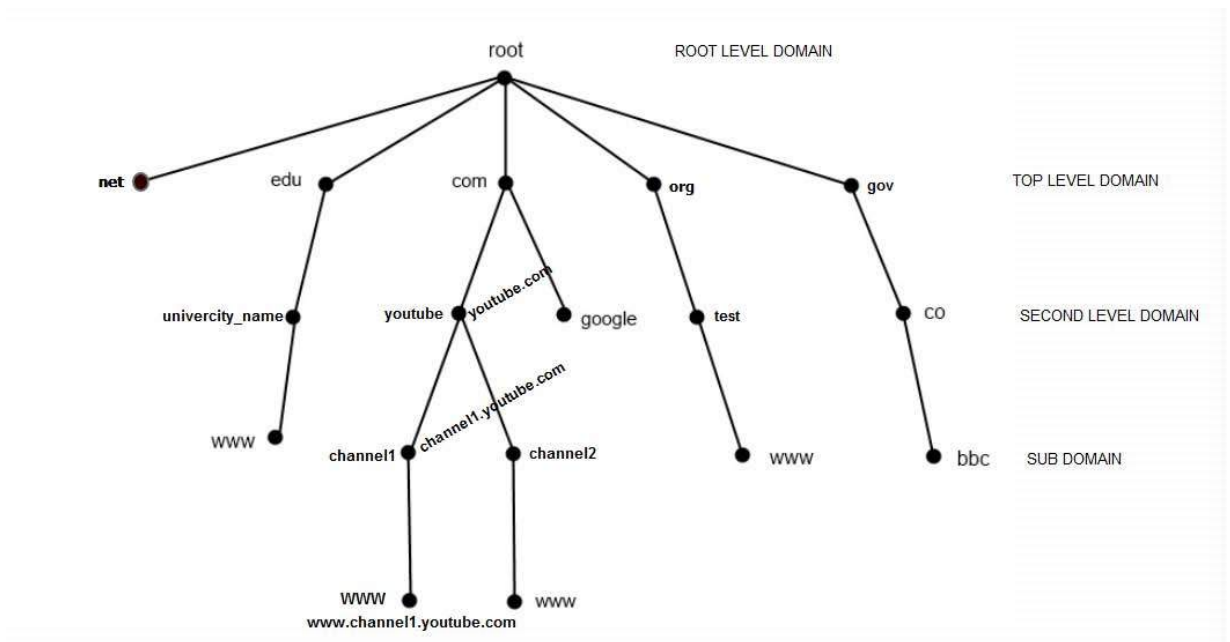


Figure 7: Domain Name System

Facts to ponder:

- The domain name is written on the address bar of a Web Browser to access the required information.
- Web browsers interact through Internet Protocol (IP) addresses when DNS translates domain names to IP addresses so that the Web Browser can load Internet resources.
- The Internet maintains two principal namespaces, the domain name hierarchy and the Internet Protocol (IP) address spaces as displayed in Figure 7.
 - The Domain Name System maintains the domain name hierarchy and provides translation services between it and the address spaces.
 - Internet name servers and a communication protocol implement the Domain Name System.

- DNS is helpful in locating any computer on the Internet because DNS server contains database of domain names and corresponding IP addresses.
- Domain name is essential in Internet due to two main reasons :
 - Firstly, domain name is easier to remember than IP address.
 - Secondly, shifting of remote computer from one place to another is possible without affecting the user, as DNS handles it by changing relevant information in database.

Web Hosting

Friends, Web Hosting are a service of providing online web space for storage of web pages of a Website that are made accessible by World Wide Web. The Organizations/companies which offer website hosting services are known as Web hosts, who can either be an Internet Service Provider (ISP), or companies that specifically provide a Web hosting service, such as A2 Hosting, Blue Host, HostGator, GoDaddy, Network Solutions and others.

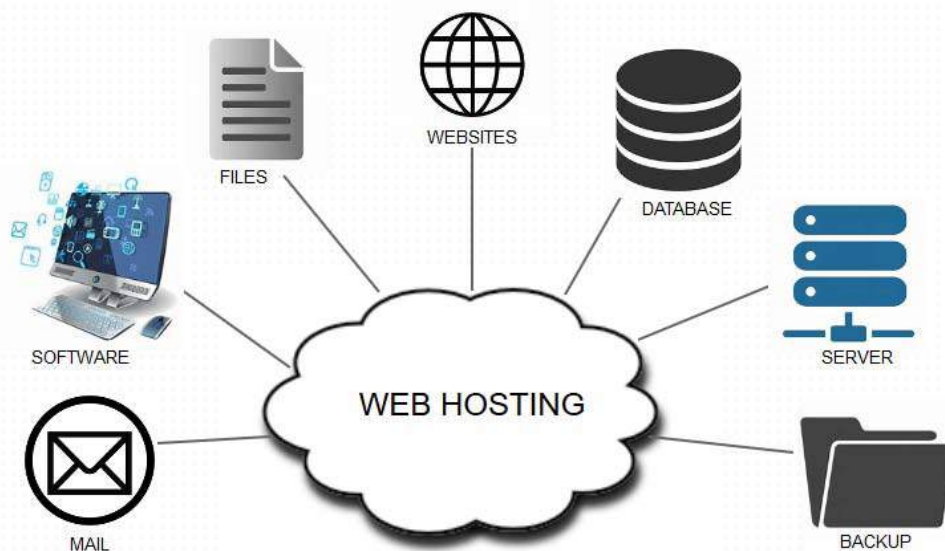


Figure 8: Web Hosting

Facts to ponder:

- Web hosting service allows organizations and individuals to post a website or web page onto the Internet.
- A web host, or web hosting service provider, is a business that provides the technologies and services needed for the website or webpage to be viewed in the Internet like Email, Softwares, Files, Websites, Databases, Server, and Backup as displayed in the Figure 8.
- Websites are hosted, or stored, on special computers called servers. When Internet users want to view your website, all they need to do is type your website address or domain into their browser. Their computer will then connect to your server and your Webpages will be delivered to them through the browser.
- There are many types of Web hosts and Web hosting services, these includes:
 - Shared Web Hosting, possessing multiple Websites hosted onto single Web Server.
 - Virtual Private Server (VPS)/Virtual Dedicated Server (VDS), represents a server subdivided into multiple smaller servers.
 - Reseller Hosting, where the Customers themselves act as Web Hosts.
 - Dedicated Hosting, in which the User/Client gets control over entire Server except the Hardware.
 - Managed Hosting, in which the User/Client does not have control over entire Server, hence permitting Web Host to guarantee the excellence of the service. The User/Client may manage entire data and information by using FTP or other Remote management tools.
 - Grid Hosting, targets stability and flexibility by sharing resources onto various number of Servers that can be added or removed without affecting other transactions.

Virtual Host

Learners, the Virtual Host is a method of for hosting multiple domain names and executing more than one Website with separate handling of each domain name on a single Server/pool of servers. The Figure 9 displays three Virtual Host: www.virtualhost1.com, www.virtualhost2.com and www.virtualhost3.com onto a

single DNS Server further connected to a Web Server that is lined to the virtualhost1 target folder, virtualhost2 target folder and virtualhost3 target folder respectively.

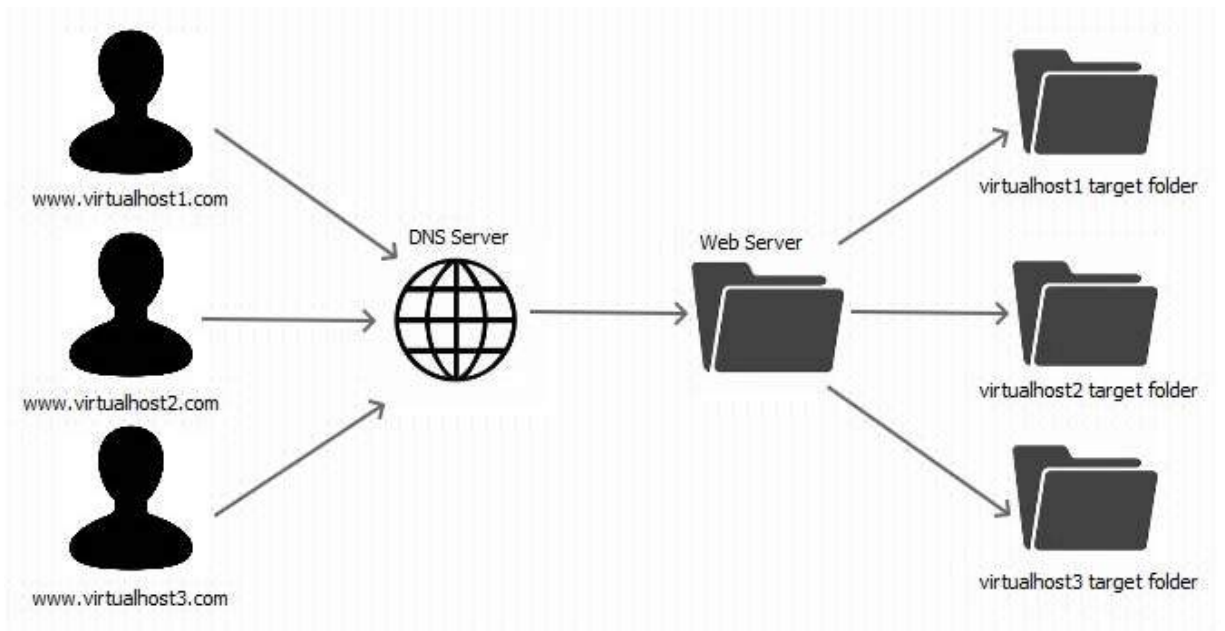


Figure 9: Virtual Host

Facts to ponder:

- Virtual Host permits one server to share its resources in form of Storage (memory) and Processing (Processor) by providing some of the services to use similar Host name.
- This type of hosting is used in reference to the Web Servers as well as other Web/Internet/Online Services.
- Shared Web Hosting is cost effective as then dedicated Web Server as it provides multiple hosting by multiple clients on a single Web Server.
- The other applicability is that it provides facility to a single client who has requirement of multiple names denoting different services on a single Hosting Server.
- Two main types of virtual hosting can be considered:

- Name based: Host name oriented accessibility by the Client which saves IP Address and other related managing tasks, on one condition that the functioning protocol must respond with the host name at suitable time.
- IP based: Individual IP Address oriented accessibility for respective Host Name.
- Port based: Port oriented accessibility that is rarely used due to low user friendliness.

Multi Homing

Friends, in Multi Homing Network a host or an interconnected Network is connected to multiples Networks with an objective to improve performance by effective routing towards the destination through a Network and increase reliability by routing through alternative network when there is failure of a particular link. The Figure 10 displays a Multi Homing Network having 3 Network interfaces consisting of different Internet Service Provider ISP 1 and ISP 2 responding to the requested destination in to Internet.

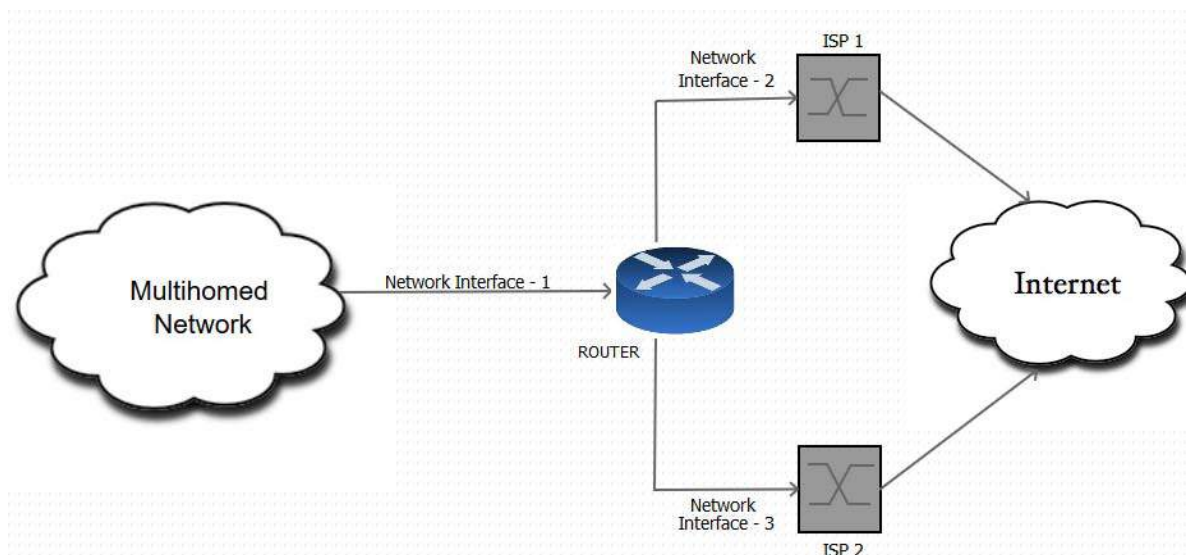


Figure 10: Multi Homing Network

Facts to ponder:

- In Multi Homing a distinctive host or destination network is related to a single network.

- A Multi Homed host commonly is allocated multiple addresses with a count of one per connected network.
- Device connectivity in it is such that the single host may be connected to multiple networks to route the message to the destination like, a desktop computer system is concurrently connected to a home network and VPN while a Mobile Phone/Tablet is connected to WiFi Network or a 4G.
- Multiple different ISPs are part of Multi homed networks where every ISP allocates a single IP address or a range of IP addresses to the client of an organization.
- Routers use BGP (), a part of the TCP/IP protocol suite, to route between networks using different protocols.
- The Internal Border Gateway Protocol (IBGP) is used at Domain side and External Border Gateway Protocol (EBGP) is used to communicate with different routers that are individually using Border Gateway Protocol (BGP) of TCP/IP to route among networks using different Protocols.

Document Root

Learners, the Host Web Server possessing all the Websites stores all the files of hosted domains, addon domain and subdomains separately onto a folder/directory that is known as Document Root. Since, CPanel permits multiple domain and its interrelated domains, hence Document Root solves the purpose of uniquely identifying the interrelated files.

Facts to ponder:

- The storage pattern of a domain on a Web Server is that the primary domain roots in a public_html folder/directory, its subdomain and addon domain are rooted to its respective folder within public_html folder/directory as displayed in the figure 11

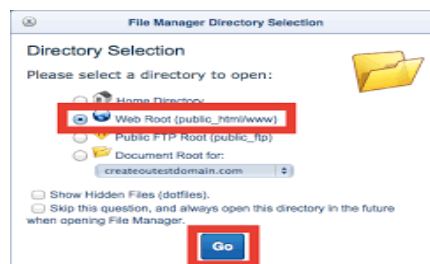


Figure 11: Document Root

- The entire document root can be found within CPanel by a single click over the subdomains as well as addon domains.
- The document folder is unique for each and every domain.
- All the Webpages and other related files of a websites possessing a domain name are found in Document Root.
- Document Root can even be stated as a folder/directory that possesses almost all the HTML files that serve the Request-Response most of the HTML files which are served in response to requests.

Cookies

Friends, a Cookie for Web means a file stored in the User's computer containing information about the access of Web Browser in a form of a small text file produced by a website. The cookie can be stored temporary for that Internet session or permanent onto the hard Disk, supporting the user to keep roadmap for his/her internet access. The Web Cookies can be disabled /enabled/ installed additionally to record the Internet Information Retrieval as displayed in the Figure 12.

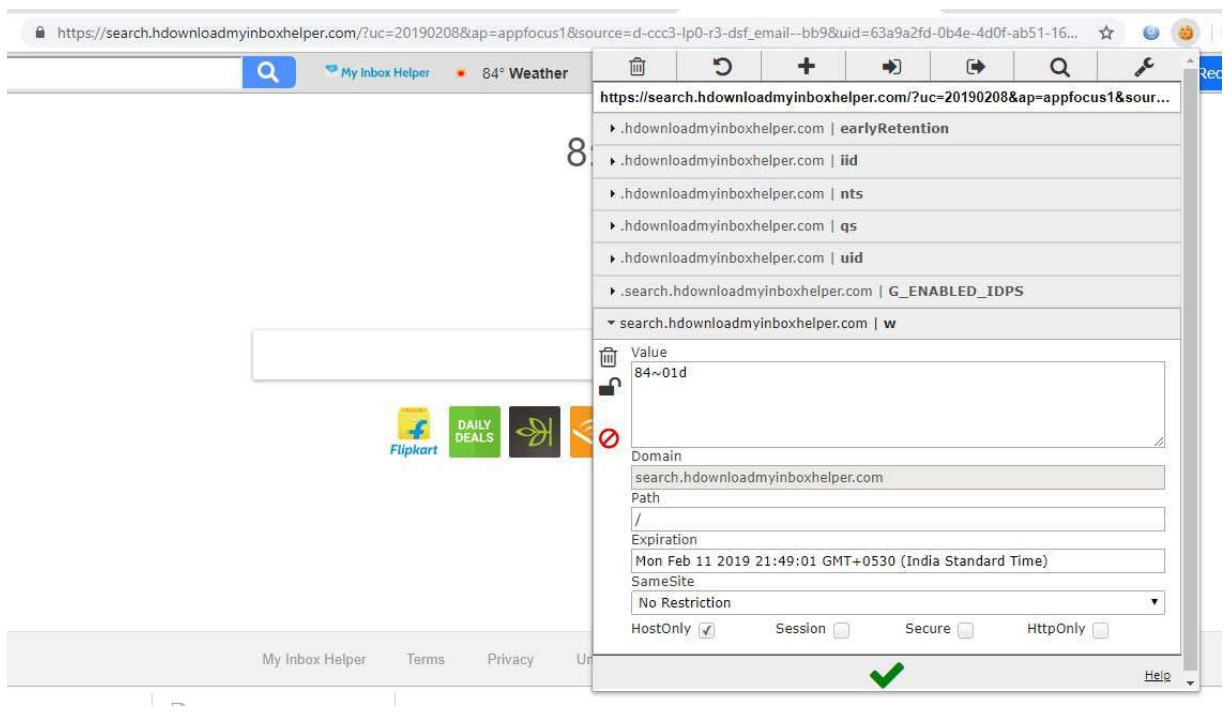


Figure 12: Installed Web Cookies management Interface

Facts to ponder:

- Web Cookies are files, generally from the visited Web Pages, which are stored on a user's computer.
- Stores a small amount of data, specific to a particular client and website.
- Maintains the State/Status of Web Browser.
- The Cookie stored Information like usernames, password, session token, etc. can be accessed either by the Server/Client Computer System.
- It permits the Web Server to share the user its personalized page
- There are different types of Web Cookies :
 - Session Cookies – Online cart items information is stored for only a specific period of time and once the Web Browser is closed it gets expired.
 - Permanent Cookies – These remember the Login ID and Password to save the typing time of user if user has opted and information is stored permanently even when the Web Browser is closed. It is recommended to delete these types of cookies after a specific duration.
 - Third-Party Cookies – Installed by third parties for collecting certain information may be for beneficial Investigation or Hacking.
- Some Parameters that can be shared for Information Retrieval are Web Cookie's Name, Value, Expiration Date, Validity Path, and Validity Domain.

2.5 INTERNET SERVICE PROVIDER AND ITS SERVICES

Learners, an organization/company Internet Service Provider (ISP) that provides all the Users on Web with the medium of communication among devices availing Internet services on Personal Computers, Laptops, Tablet, Notebook and other Mobile Devices is Internet Service Providers as displayed in Figure 13. The full form of ISP is even abbreviated as Independent Service Provider. Many a times it is even called as Internet Access Provider (IAP).

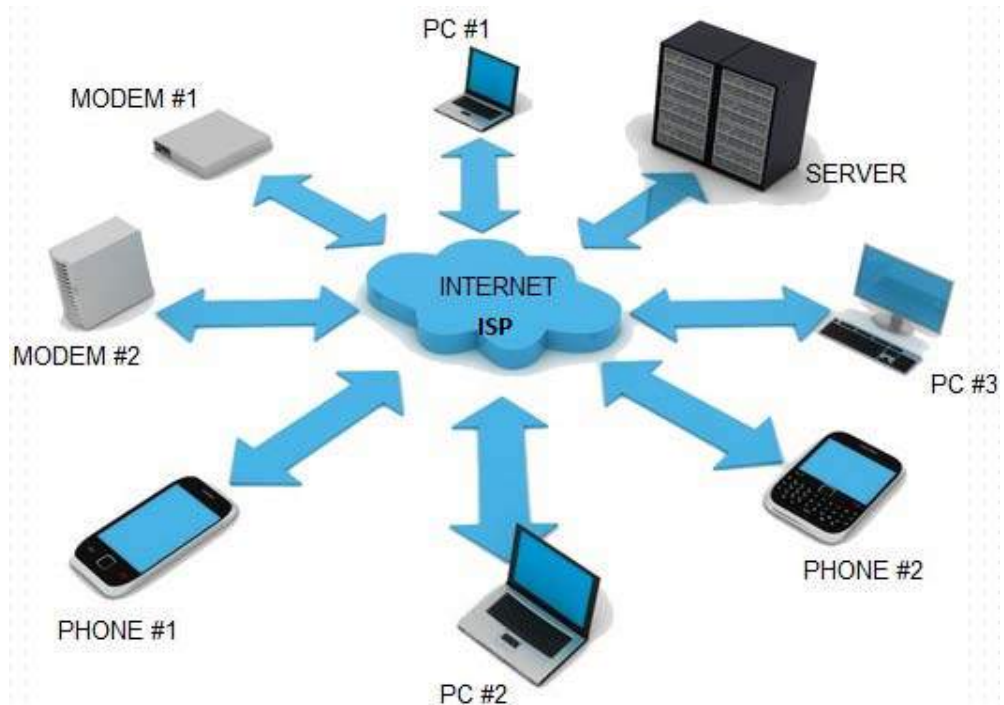


Figure 13: Internet Service Provider (ISP)

The Technology medium of the Internet Access that interlinks the Internet accessing devices and Web in form of Information Packets over particular routing protocols are called as Digital Transmission Technology. Some of these are:

- Dial-up: Oldest traditional least expensive telephone line modem to modem technology.
- Digital Subscriber Loop/Line (DSL): Succeeding technology of Dial-Up having higher transmission speed either through the common Asymmetric Digital Subscriber Line (ADSL) or additional Symmetric Digital Subscriber Line (SDSL).
- Cable: High Bandwidth commonly used a broadband Internet Access and requiring additional installation of Equipment. It may use telephone line/fiber optic cables for data transmission.
- Wireless Broadband: Presently the most common technology having capability of providing the Internet access over remote geographical locations.
- Wireless Fidelity (Wi-Fi): Freely/Paid widely distributed providing access to wireless/mobile devices mainly used in Public Places within a scope of particular range of scope.

- Integrated Services Digital Network (ISDN): Online high speed, high quality data transmission on phone lines.
- Ethernet: Dedicated various speeds leveled used in Wired/Wireless local area Network (LAN).
- Satellite: Provides services in rural regions with a limitation of data limits and speed challenges.

ISP Services

- Internet Access Service: Provides Web/Internet communication medium services on either of the above mentioned ISP's technologies over a large area covering entire globe. A number of access providers also provide email and hosting services.
- E-Mail/Mailbox Service: Provides overall E-mail communication services like sending, receiving, storing, broadcasting and other E-Mail related services. The Internet Access supports this service even.
- Hosting Service: Provides bundle of services as Website/all Web Hosting's, File Transfer Protocols (FTP) for uploading/downloading/managing all web Files, Virtual Machines for virtual operations, Cloud universal availability, Web/Physical Servers managers and E-Mail communications.
- Transit Service: Provides Hosting and Internet Access ISP's through speedy high bandwidth connectivity.
- Virtual Service: Provides all cost effective efficient Virtual services supporting all above services and even called as purchase services of Self/Other IPS.
- Free Service: Provides no-charging/free of cost to all the customers doing some branding by advertisement during the user connectivity. It is even called as Freenets.

2.6 STATIC WEBSITES & DYNAMIC WEBSITES

Friends, a website is a collection of related web pages, including multimedia content (that may contain text, images, audio, video), typically identified with a common domain name, and published on at least one Web Server. The Website on the basis of functionalities can be Statics when is a developed in HTML and CSS while Dynamic Website is developed using Scripting Languages. The choice of type of Website is wholly in on the basis of Utility and requirement as Dynamic Website contains Web Server and Database Server to manage all while Static Website can be sun on Server even as displayed in the Figure14.



Figure14: Dynamic VS Static Website

Facts to ponder:

The decision of Dynamic Website over Static Website Can be understood on the basis of different functionalities as mentioned in the Table 2.3

Table 2.3: Dynamic Website VS Static Website

Criteria	Dynamic Website	Static Website
Developing Technology	PHP, ASP.NET, Java Script, SERVLET and other dynamic scripting languages. Uses both client-side scripting and server-side scripting.	Only HTML and CSS.
Theme & Content	Can be changed Runtime.	Fixed cannot be changed.

Browsing & Loading	Slower to Static as require Server Request of Web Pages.	Speedy as does not require request to Web Server.
Websites content Updates	Automatically	Tedious
Most common are File/URL Extension	.php, .asp and .jsp	.htm or .html
Utility	When frequent Changes in content of Web Pages are required.	When less frequent Changes in content of Web Pages and Small Informative Website are required.
Coding	Complex	Simple
Web Hosting with Database Support	Required	Not Required
Prebuilt content	Keeps Changing as per requirement.	Always same at the timer of Loading.
Interactivity	Good User can View and Use the content.	Through Hyperlink.
Sharing elements	Easily share HTML code between Web Pages.	Requires duplication of HTML on every page.

2.7 LET US SUM UP

Hey Friends, now as you have completed this unit, you should be able to learn the concept of Internet and its Related Terminologies which are the building blocks of WWW. Firstly you have learnt Web Browser, Web Server and Distributed Web Server; secondly the Basic Internet Terminologies: IP Addressing and Domain Name System; Web Hosting, Virtual Host, Multi Homing, Document Root, Cookies; Thirdly

Internet Service Provider and their Services; and finally Static Web Sites & Dynamic Web Sites.

2.8 CHECK YOUR PROGRESS

- Define Web Browser, Web Server and Distributed Web Server.
- _____ is a file stored in the User's computer containing information about the access of Web Browser in a form of a small text file produced by a website.[Cookie, Multi Homing, Virtual Host, Web Host]
- Full form for below
 - WWW
 - URL
 - W3C
 - HTTP
 - GUI
- List any four ISP Services.
- _____ is even called as Phonebook.

2.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

➤ **Definitions:**

Web Browser: An application Software that we used to view web pages of a website as well as upload or download files on FTP Web Servers can be called as Web Browser.

Web Server: A Web Server is a rich configuration Computer system performing storing, processing and deliver of Web Pages of a Website with the help of application software.

Distributed Web Server: A Distributed Web Server (DWS) is a web server distributed across different geographical locations across the world to enhance the speed of Request-Response communication.

- **Cookie** is a file stored in the User's computer containing information about the access of Web Browser in a form of a small text file produced by a website.
- Full form for below
 - WWW: World Wide Web
 - URL: Uniform Resource Locator
 - W3C: World Wide Web Consortium
 - HTTP : Hyper Text Transfer Protocol
 - GUI: Graphical User Interface
- ISP Services are: Internet Access Service, Hosting Service, Virtual Service, E-Mail/Mailbox Service.
- **Domain Name System** is even called as Phonebook.

2.10 FURTHER READING

Following are some Online Reference Reading as PDF:

<http://egyankosh.ac.in/handle/123456789/40098> [About Web Browser Pg.: 36-52]

<http://www.egyankosh.ac.in/bitstream/123456789/12519/1/Unit-2.pdf> [About IP Address Pg.: 1-8]

YouTube Reference:

<https://www.youtube.com/watch?v=YOXwcbwSEUo&list=PL04D5787E247DC324>
[About Internet Terminologies]

2.11 ASSIGNMENTS

5. What is Domain Name System? Explain.

6. Explain Working of Web Browser and Web Server.
7. Differentiate between **Static Web Sites & Dynamic Web Sites**.
8. Give the use of Web Hosting and Virtual Host.
9. What are Multi Homing and Document Root?

2.12 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement.

Creative Zone:

- List of various Web Browsers.
- Name various ISPs.
- Give the steps to find IP Address of your Desktop/Laptop.

Analytical Zone:

- List out Popularity of Web Browser according to World Wide Statistics.
- List out various companies Users Statistics those ISPs in India.

Unit 3: Web Server And Protocols

3

Unit Structure

- 3.1. Learning Objectives
- 3.2. Introduction To Web Server and It's Types
- 3.3. Domain Name Server
- 3.4. Web Protocols
- 3.5. Mail Clients and News Groups
- 3.6. Let us sum up
- 3.7. Check your Progress
- 3.8. Check your Progress: Possible Answers
- 3.9. Further Reading
- 3.10. Assignment
- 3.11. Activities

3.1 LEARNING OBJECTIVE

After studying this unit student should be able to:

- Concept and Functions of Web Server
- Main Types of Web Servers
- Web Site name giving process and Domain Name System
- Web Protocols and its functions

3.2 INTRODUCTION TO WEB SERVER AND ITS TYPES

A web server is a system that delivers content or services to end users over the internet. A web server consists of a physical server, server operating system (OS) and software used to facilitate HTTP communication.

Web Server is a combination of hardware (server) and software that provide service to end user on Internet.

Web Server is work as Hardware when we purchase web space (A place where group of web pages called Website hosts) – It also provide basic service base on Operating System (OS) level – It provide group of rules that known as protocol for providing WebPages to our browser (i.e. Internet Explorer, Google Chrome, Mozilla Firefox.....etc) – It also provide Dynamic Data (Data receive from Database or sometimes dynamic data by Library functions). Friends after understanding this we can define Web Server definition as below

“A system (Combination of hardware as well as software) that provide Website’s WebPages from Internet to End users with the help of protocols is called Web Server”

If we look on the functions of Web Server that are as below

- Store Web Pages and provide primary level security of Websites
- Help to Access Website Database (Dynamic Data Access)
- Provide proper response to End users as per their request.
- Bandwidth (Internet signal Strength ratio) controlling on Network traffic

- Serve Virtual Web Service if required
- Support Server side scripting

How Web Serve Works / Web server Services

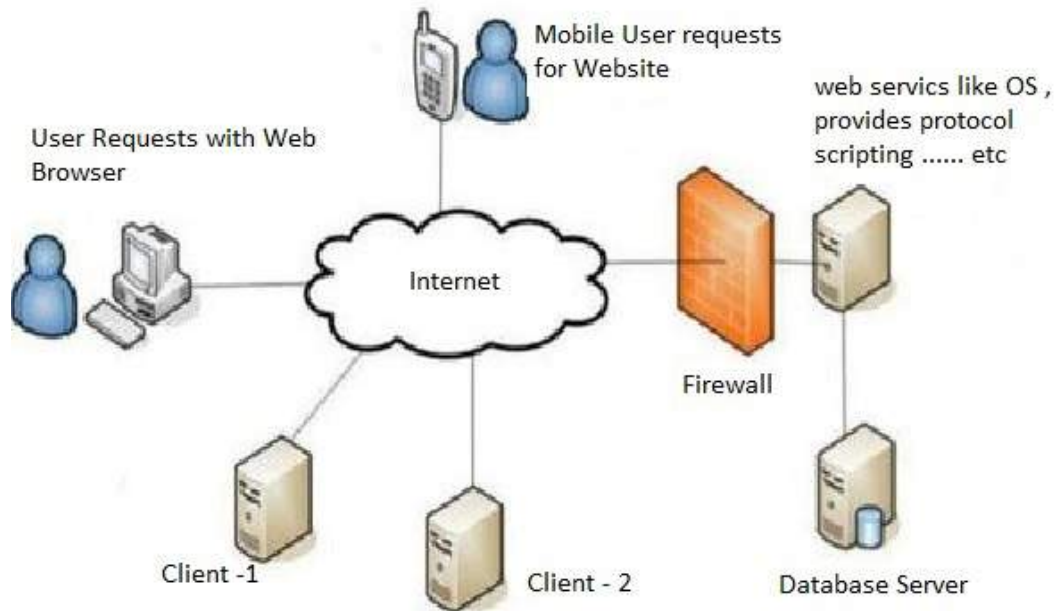


Figure 1: Web Server Application Diagram

Web server comeback to client request by mainly two ways

1. It send the file to the client associate with request URL (Universal Resource Locater)
2. Provides response by proper scripting and communicating with source language (ex. HTML, PHP, ASP.NET Etc)

Friends there are number of types of web server but among all them leading are

1) Apache HTTP Web Server

One of the most admired web server in the world developed by the Apache Software Foundation. Apache is open source software which supports major all operating systems including Linux, UNIX, Windows, FreeBSD, Mac OS X and more. Approximately more than 70% of machines run on Apache Web Server.

Customization of apache web server is easy as it contains a model base structure. It is also an open source which means that you can add your own modules to the server when to require and make modifications that suit your requirements.

It is more stable than any other web servers and is easier to solve organizational issues. It can be installing on multiple platforms successfully.

2) MS IIS Web Server

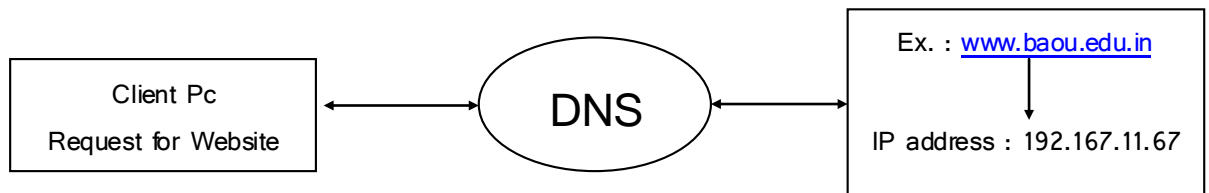
The Internet Information Server (IIS) is a high performance base Web Server from Microsoft. This web server runs on only Windows NT/2000 and 2003 platforms (and may be on upcoming new Windows version also). IIS comes bundled with Windows NT/2000 and 2003; Because IIS is tightly integrated with the operating system so it is relatively easy to administer it.

Friends let take looks on difference between this both the Web server

Particular	Apache	MS-IIS
Developer	Apache Software Foundation	Microsoft
License	Open source i.e. Freely download from Internet	License under Microsoft
Operating System	All Major OS (windows , Linux , Unix , Mac ... etc)	Only in major Windows
Popularity	More than 70% developer use this	Approximately 20 – 30 % developer use this web server
Portability	Most portable in terms of Operating System as well as functionality	Comparatively less portable
Modularity	Developer or Administrator can add their own module to the server	Developer or Administrator cannot edit or add any module in it.
Execution speed	It runs in user's space only so it is faster	It runs in User's space as well as Kernel so execute slower than Apache
Inclusion	It works as only Web Server	It works as Web Server as well as Application Server

3.3 DOMAIN NAME SERVER (DNS)

“A conversable server that convert any web address (URL) to IP address to access website to local device”



Advantages of DNS

1. DNS is Exclusive - Generally DNS is that the exclusively system within the entire world which will assist you browse the web. With the web turning into associate degree integral a part of the society, it's more and more become necessary that DNS Servers stay maintained. While not them, then the web wouldn't exist.
2. No need to memorizing IP addresses -DNS servers offer a peachy resolution of changing domain or sub domain names to IP addresses. Imagine however it'd feel having to hit the books the IP addresses of twitter, Facebook, Google or the other website that you just unremarkably frequent on a commonplace. It'd undoubtedly be horrific. Its system additionally makes it straightforward for search engines to be ready to categories and archive info.
3. Save and security sweetening -DNS servers area unit a very important part for the safety of your home or work connections. DNS servers that are designed for security functions sometimes make sure that makes an attempt to hack your server atmosphere area unit disappointed before entry into your machines. However, it's necessary to notice that the word used is increased. This suggests that you just can would like different security measures place in situ to safeguard your information, particularly if it's an outsized organization with a lot of sensitive information.
4. Fast Internet Access - DNS servers have quick web associations -People and organizations that use DNS servers is ready to profit of high connection speeds that area unit a key feature in a number of these servers.

Disadvantages of DNS

1. Dependency – It is indisputable fact that its written account will only be controlled by a non-profit organization (Internet Society - ISOC) with roots tied in one country. This challenges the construct of internet neutrality and has been a wide propagated argument over the last 3 decades.
2. No Personal Identity for Data Analysis - DNS queries typically don't carry any info regarding the purchasers United Nations agency initiated it. This can be one among the explanations why DNS has been common among hackers. This can be as a result of the server aspect can only see the information science address from wherever the question came from and which might occasionally be manipulated by hackers.
3. DNS servers based on the principle of a slave-master relationship. This implies that if the master server is not working or manipulated in any method, then it'll be arduous to access the net page or info that was hosted on the server. Hackers have conjointly used this to their advantage. By targeting the server machine and creating redirects to alternative pages, they need been ready to realize ways that of phishing info.

3.4 WEB PROTOCOLS

A protocol basically defines the rules and regulations for communicating between network devises. Network protocol is used for devices which identifies and establish connection with each other, as well as making rules in which data is packed to perform input output. For high performance network some protocols supports data compression designs.

For computer networking packet switching methods are used to send and receive message. The message which is been sent is divided into pieces that are collected at the destination. There are many protocol designed for specific purpose.

OSI & TCP/IP Protocol-Stacks and Protocols

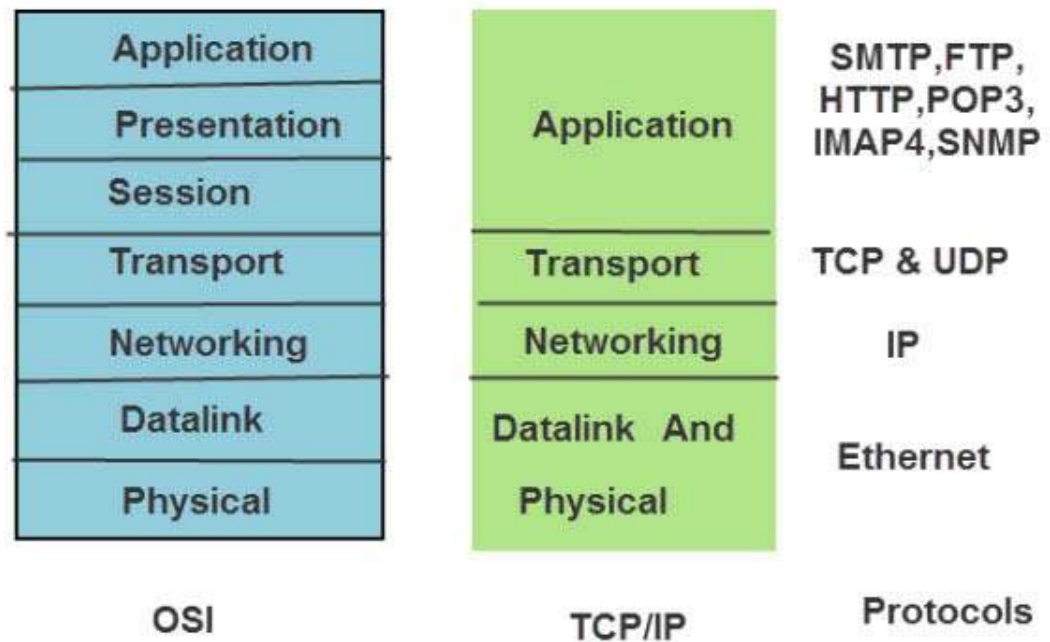


Figure -2: Functions of Various protocols

As per diagram shows the major protocols functionality that comparing of TCP/IP model with the association of Computer Network Model (OSI) by this we can easily understand that OSI model have seven layer for data transmission from one computer to other computer but when we observe about the protocol model it has only two parts

Application layers: It includes 3 layers of OSI model (Applications, Presentation and Session) that work for only application and other process

Data Transmission Layer: It includes 4 layers of OSI model (Transport, Networking, Data link and Physical) that work for how data or internet signal transmit from client Computer to Server.

- **HTTP**

Full form: - Hypertext transfer protocol

Used: - It is basically used on the application layer, it is primarily used on the World Wide Web

Since: - 1990

HTTP is a protocol used for getting the data from internet such as html documents, basically http is TCP/IP based protocol which helps to put data on World Wide Web.

It is standard way for communicating between computer with each other http specifies how request of Clint is sent to the server and how the server respond, any data can be exchanged worldwide through http protocol message sent by a Clint to the server is called request and the answer is called response

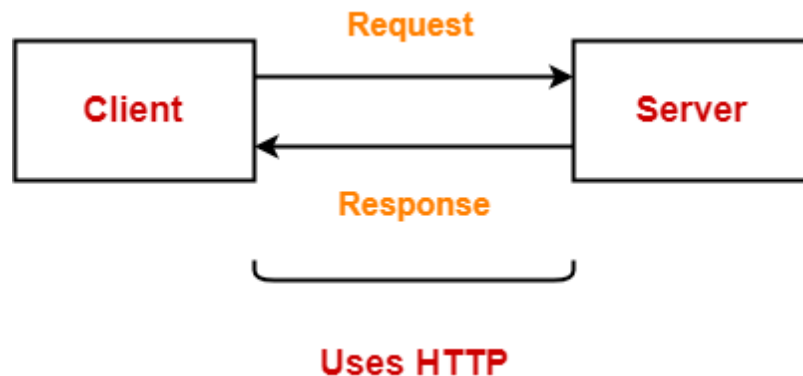


Figure – 3: How HTTP Protocol works

Basic features of http protocol

HTTP is connectionless:

A browser creates an HTTP request as the request is created the Clint waits for the reply. The request is been processed by the server and the response is sent back to the receiver, as the receiver receive the response the connection is disconnected. A new connection established each time when the server and the Clint wants to communicate

HTTP is media independent:

If the Clint and the user know to manage the data (content) then any type of data can be transferred through HTTP, thus it is important to specify the type of data (content)

HTTP is stateless:

As HTTP is connectionless it is also a stateless protocol, A user and the server are aware of each other during a current connection, as the connection is lost they forget each other, due to this the data can't be retain once the connections is lost

The basic characteristics of HTTP: -

- Through this protocol browser and server can exchange on web
- This protocol is basically based on request response protocol
- New connection is build on each request

• TCP/IP

Full form: Transmission Control Protocol/Internet Protocol

Use: it is used on transport layer

TCP/IP is a group of protocols which is used to connect various computers on internet, in private networks it can also be used a communication protocol, TCP/IP specifies data transfer on internet through end to end communication which is broken into packets, if there is any failure in the network TCP/IP recovers it automatically and makes system reliable.

There are two main protocols in TCP/IP

TCP defines how channels of communication across a network are created by application. The message is assembled in small packets and reassembled on the destination

IP defines the address and route of the packet to reach the right destination, this IP is checked by each gateway computer to determine the address of the message

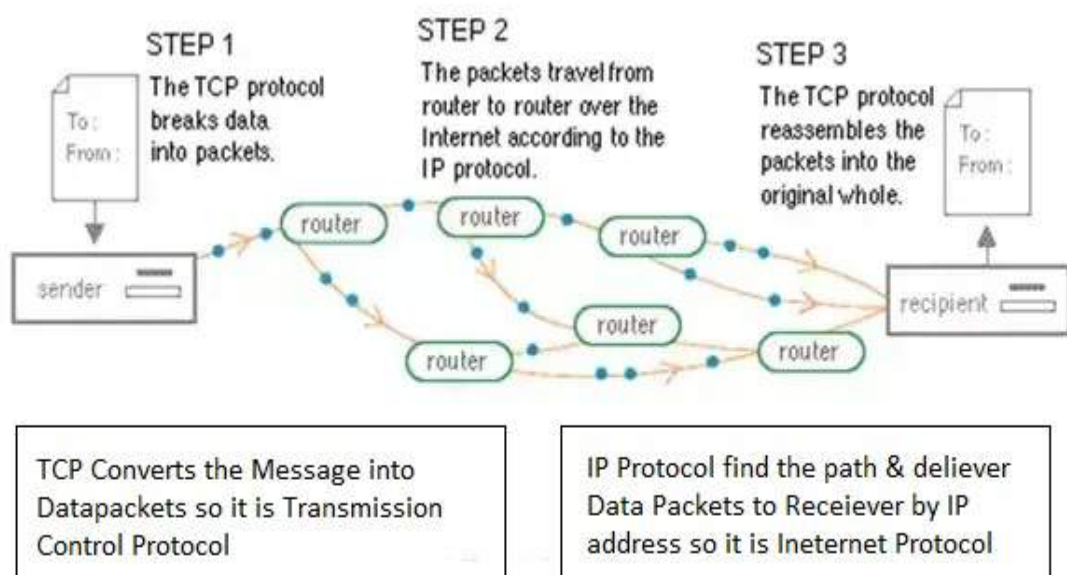


Figure – 4: How TCP/IP works

Features of TCP/IP

Multi vendor support:

Many hardware and software vendors use TCP/IP, it is not limited to only one vendor

Interoperability:

Due to TCP/IP a user is able to work in a heterogeneous network. A user using a Linux machine can download file from windows machine because of TCP/IP. There are no limits of TCP/IP.

Logical Addressing:

There is a permanent and globally unique address of a network adapter which is known as MAC address. While manufacturing it is burnt into a card. LAN delivers data packets through adapter's physical address. Network adapters check that the message is delivered to its own physical address.

Refutability:

Router can read logical addressing information and send the packet to its receiver. TCP/IP is a routable protocol. Due to this the data can be moved from one place to another.

Name resolution:

It is difficult for humans to remember many IP address IP address are made for computer, so to solve this problem TCP/IP provides us user friendly names which are very easy to remember

- **FTP:**

Full form: file transfer protocol

Use: It is used on the transport layer

FTP is used to transfer file from computers, if we have to download any file from internet it is not possible without FTP, due to FTP we can also transfer web pages, due to FTP we can show web pages created by an individual on the internet, FTP transfer the web page files to the server of the user so he can easily access the web page

As long as two computer are connected to internet they can share the file through FTP, data like music, word document, spreadsheets, power point files, etc can be shared

How FTP works

There are two tasks happening when a file is transferred – uploading and downloading. Uploading means file transfer from computer to server and downloading means file transfer from server to computer. TCP/IP is used by FTP to transfer the file

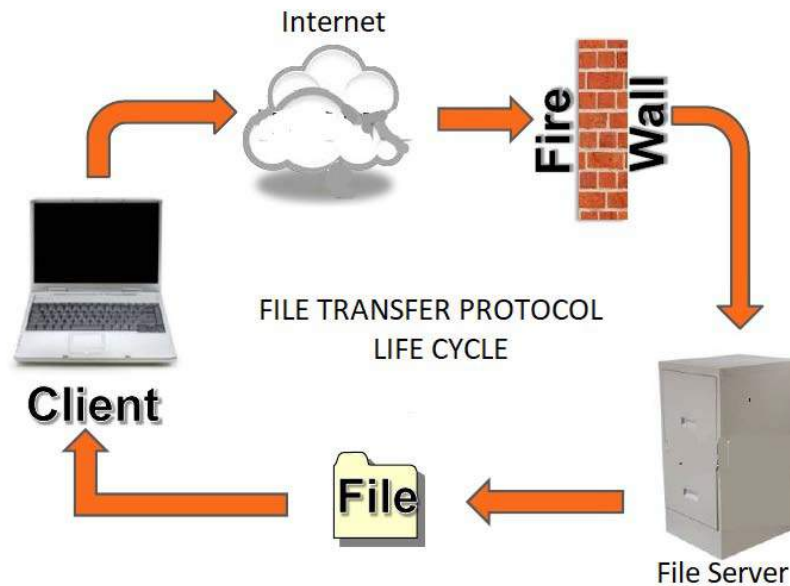


Figure – 5: How FTP Works

Security should be kept in mind if you are using FTP. Otherwise virus can harm your device

Features of FTP:

Security:

FTP provides a good security to a computer network so there are less chances of getting data lost. FTP provide password to protect storage location

User access control:

Due to security and privacy reasons the access should be limited to a very few number of people. FTP provides the facility to allow the access to the selected person

• **SMTP**

Full form: Simple Mail Transfer Protocol

USE: It works on application layer

To send or receive the mail we require SMTP, this protocol allows sending email through internet. SMTP server is always on listing mode

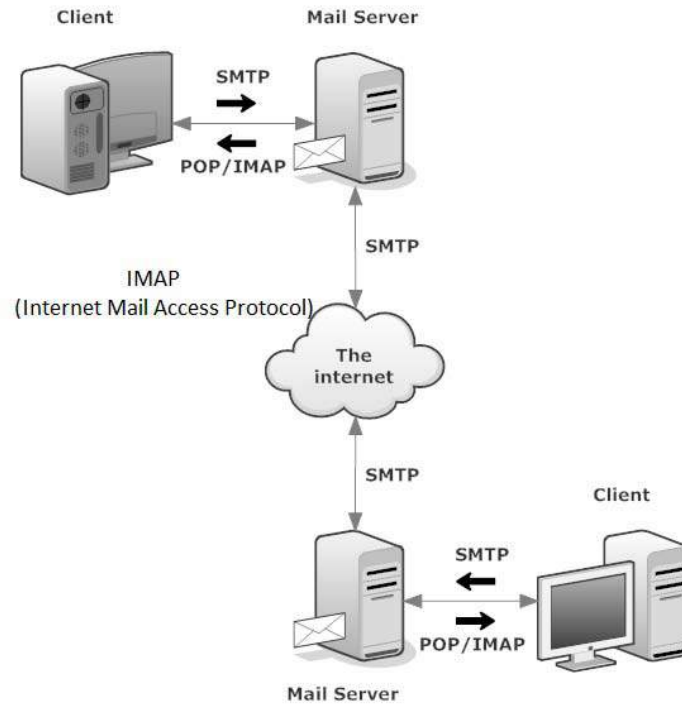


Figure – 6: How SMTP Works

There are two stages of communication between the sender and receiver

- ✓ Sending mail
- ✓ Receiving mail

Sending mail

Through SMTP the mail is sent in a series of request and receive between the Client and the user

Receiving mail

The mail is checked by the user agent at the server side, if there is any information it inform about that to the user

Features of SMTP:

Mail Relaying

Due to mail relaying the mail can be transferred from one server to another server

Mail Forwarding:

SMTP provides the feature of forwarding a mail which we have received from an another person

Turning:

Through SMTP the sender of the mail and the receiver of the mail can change their roles

- **IMAP**

It stands for Internet Message Access Protocol.

The Internet Message Access Protocol works in an application layer Internet Protocol.

It is used by e-mail clients to retrieve e-mail messages. It retrieves e-mail messages from a mail server over a TCP/IP connection.

In previous years it was known by these following names:-

1. Internet Mail Access Protocol
2. Interactive Mail Access Protocol
3. Internet Mail Access Protocol

IMAP version 4 revision 1 is the current version (IMAP4).

Here, e-mail clients and devices generally leave messages on the server until the user explicitly deletes them. It allows users to organize messages into folders, have multiple client applications know which messages have been read, flag messages for urgency or follow-up and save draft messages on the server.

Characteristics

- It supports both on-line and off-line modes of operation.
- It allows multiple clients to manage the same mailbox.
- Each make their own changes to the mailbox that will show in other devices connected to the same mailbox.
- IMAP is faster.
- IMAP accounts can keep better track of read, unread, and deleted messages.

- Most implementations of IMAP support multiple logins; this allows the end user to simultaneously connect to the email server with different devices.
- It is the most prevalent Internet standard protocols for e-mail retrieval.
- Virtually all modern e-mail clients and servers support both.

- **POP3**

It stands for post office protocol 3.

POP3 works in an application layer in the OSI model. It is the most recent version of a standard protocol for receiving e-mail. It is a client/server protocol.

Characteristics

- It provides end user ability to fetch and receive e-mail.
- It is built into most popular e-mail products such as Eudora and Outlook Express.
- This standard protocol is built into Netscape and Microsoft Internet Explorer Browsers.
- It is mainly designed to delete mail on the server as soon as the user has downloaded it.
- Here, some implementations allow users or an administrator to specify that mail should be saved for a period of time.
- It is the primary protocol behind email communication.
- It uses TCP/IP protocol stack for network connection and works with Simple Mail Transfer Protocol (SMTP) for end-to-end email communication.
- In this end-to-end mail communication POP pulls messages and SMTP pushes them to the server.
- POP3 accounts allow users to have mailboxes on a server with their domain names.
- In order to set up POP3 email accounts for our web address, your domain must be hosted on server, which has name servers.
- It provides a simple, standardized way for users to access mailboxes and download messages to their computers.
- Its major advantage is that once the mail messages are delivered to the client PC, they can be read with or without connecting to the internet.
- This protocol is supported by almost all e-mail clients.

3.5 MAIL CLIENTS AND NEWS GROUPS

Mail Client

It is a piece of computer hardware or software that accesses a service made available by a server.

The Internet Message Access Protocol (IMAP) is a mail protocol.

IMAP used for accessing email on a remote web server from a local client. Email client is a desktop application that enables users to receive and send emails directly on their desktop.

It's called a client because e-mail systems are based on client-server architecture. It provides a central interface for receiving, composing and sending emails or configure email address. Email client is also known as email reader or mail user agent (MUA)

Characteristics

- An email client, email reader or mail user agent (MUA) is a computer program used to access and manage a user's email.
- Mozilla Thunderbird and IBM Lotus Notes are popular examples of email clients.
- Email client can be used to configure multiple email addresses from different email service providers.

News Groups

“A discussion group on the internet is called newsgroup.”

Different users share their ideas or thoughts on internet.

It is an internet-based discussion around an individual, entity, organization or topic. Newsgroup is part of "USENET"(user network), which is service, or facility, on the internet. Newsgroup was created in 1979 by some students to exchange message.

Characteristics

- It is organized into categories and subcategories.
- It is similar to blogs, but usually has more question and answers.
- Newsgroup is used in a protocol which is NNTP (Network News Transfer Protocol) to read and post message.
- News servers provide the Infrastructure that makes newsgroups work.
- Each news server has special software that maintains a file for each newsgroup serviced by that server.
- To view and post messages to a newsgroup, you need a Newsreader.
- Some newsgroup is moderated by a designated person who decides which postings to allow or to remove.
- Most newsgroups are immoderate.

3.6 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should be able to learn and clear some basic questions like What is web server? How web server works ? – Main types of Web Server – How can we register our own web site? On Internet by DNS - Web Server provides any services by some standard rules and regulation known as Protocols – You learnt about some main Protocols with their characteristics – Protocols features and its usability in OSI model.

3.7 CHECK YOUR PROGRESS

- Which Protocol is associated with Transportation layer?
- Which Protocol is delivering Data Packets to proper destination? [TCP ,IP ,FTP]
- Full form for below
 - URL
 - DNS
 - FTP
 - SMTP
 - IMAP

- MUA is work with _____

3.8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- **TCP/IP** - Protocol is associate with Transportation layer
- **IP** Protocol is delivering Data Packets to proper destination
- Full form for below
 - URL – Universal Resource Locater
 - DNS – Domain Name Server
 - FTP – File Transfer Protocol
 - SMTP – Simple Mail Transfer Protocol
 - IMAP - Internet Message Access Protocol.
- MUA is work with **News Groups**

3.9 FURTHER READING

Following are some Online Reference Reading as PDF:

<http://egyankosh.ac.in/bitstream/123456789/26321/1/Unit-5.pdf> [Pg 82 – 88 For Protocol]

<ftp://ftp.dsv.su.se/users/jpalme/The-future-of-e-mail.1.pdf> [Pg 1 – 8 Mail Clients and Newsgroups]

<http://www.ignou.ac.in/upload/UNIT%20-%202-BSC-011-BL3.pdf> [Pg. 39 - 46 for Web Server]

YouTube Reference:

<https://www.youtube.com/watch?v=eA9mnY1Z2so> [About web Server & Protocol]

<https://www.youtube.com/watch?v=O--rkQNKqls&list=PLbRMhDVUMngf-peFloB7kyiA40EptH1up> [About Web Protocols]

<https://www.youtube.com/watch?v=q3MwN9R0Br4> [About DNS and Directory]

3.10 ASSIGNMENTS

1. Define Web Server? Explain how it works?
2. What is Protocol? Explain any 2 Protocol with its characteristics , Pros and Cons
3. Differentiate the below terms :
 - a. MS-IIS v/s Apache
 - b. TCP v/s IP
 - c. Mail Clients v/s News Groups
 - d. FTP v/s SMTP
4. What is DNS? How It works , Discuss its advantages in short

3.11 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- Draw How Data Packets Transmission by TCP
- Draw How Data Packets Delivered by IP
- How FTP work during Data Transmission when any File attach with message?

Analytical Zone:

- How many website upload under Apache and MS-IIS from world level and India level
- Find the growth of News Groups in statistics during last 3 years in World and India
- Give only names of Protocols that use File Wall for its works

Unit 4: Recent Internet Technology Applications

4

Unit Structure

- 4.1. Learning Objectives
- 4.2. Introduction To E-Mail
- 4.3. E-Commerce and Other Services
- 4.4. Social Networking
- 4.5. Chatting and Instant Messaging
- 4.6. Audio and Video Conference
- 4.7. Let us sum up
- 4.8. Check your Progress
- 4.9. Check your Progress: Possible Answers
- 4.10. Further Reading
- 4.11. Assignment
- 4.12. Activities

4.1 LEARNING OBJECTIVE

After studying this unit student should be able to:

- E-Mail and Its services
- Emerging IT service like E-Commerce , B2B Transaction
- E-Service like E-Learning , E-Banking , E-Governance
- Social Networking to Social Media platform of Chatting , Audio – Video Conferencing

4.2 INTRODUCTION TO E-MAIL AND ITS SERVICES

“A service that can send and receive immediately message across the world with the help of Internet is called Electronic Mail or E-Mail”

Friends, to understand Email it is necessary to compare Email with Traditional Mail

So let's take a look of this comparison.

Particular	Traditional Mail	Email
Process manage	By Human	By Internet
Address	It has addressed with the recipient's Name , Street address , City , State , Country with Zipcode	It always written in a standard format like username , the '@' symbol and last email provider's domain Username includes alphabets, numbers , special symbols (except '@')
Requirement	In Traditional Mail in a sealed envelope or packing	In Email required Internet , Account in Email provider
Time	It takes time like days , weeks or sometimes months i.e. it takes long time and waste time	It immediately delivery so it takes no time and fasted process
Dependency	Process depend on distance between sender and receiver	Process depend on Internet and it's speed
Main entity includes	Sender – receiver – post box – post office – transportation	Sender – receiver – Inbox – Compose mail – Internet
Power	No need to power supply	Power supply is required because manage by Electronic devices

Digital Literacy	No need to have Digital literacy	Digital literacy is must
Example	Dr. A. B. Jadeja Jyotirmay Parisar, Opp. Shri Balaji Temple, Sarkhej- Gandhinagar Highway, Chharodi, Ahmedabad, Gujarat 382481	abhijit.highereducation@gmail.com

Structure of Email

To receive emails, you may would like associate email account associated an email address. Also, if you would like to send emails to others, you may have to be compelled to acquire their email addresses. it is important to be told the way to write email addresses properly as a result of if you are doing not enter them precisely right, your emails won't be delivered or could be delivered to the incorrect person.

Email addresses are always written in a standard format that includes a **user name**, the @ (at) symbol, and the **email provider's domain**

The **User name** is the name that we **choose as unique**.

i.e. : abhijit.highereducation@gmail.com (in this ex. abhijit.highereducation is **User name**)

The **Email provider** is the website that host our Email account

i.e. : abhijit.highereducation@gmail.com (in this ex. gmail.com is **Email provider**)

Advantages of Email

- **Productivity tools:** Email is typically prepackaged with a calendar, address book, instant electronic communication, and additional for convenience and productivity.
- **Access to web services:** If you wish to register for Associate in nursing account like Facebook or order merchandise from services like Amazon, you may would like Associate in Nursing email address thus you'll be safely known and contacted.
- **Easy mail management:** Email service suppliers have tools that permit you to file, label, prioritize, find, group, and filter your emails for

straightforward management. You'll even simply management spam, or junk email.

- **Privacy:** Your email is delivered to your own personal and personal account with a countersign needed to access and consider emails.
- **Communication with multiple people:** you'll send Associate in Nursing email to multiple people directly, providing you with the choice to incorporate as few as or as many of us as you wish during a spoken language.
- **Accessible anyplace at any time:** You don't have to be reception to urge your mail. You'll access it from any pc or mobile device that has an online affiliation.

Webmail Providers

- Google's Gmail
- Yahoo
- Microsoft's Outlook.com
- Hotmail.com



Email Productivity Features

- **Instant messaging, or chat,** that you has **text-based conversations**
- An **online address book,** where we can store **contact information** for the people you contact.
- An **online calendar** to facilitate **organizes our schedule** and **shares it** with other people.
- A **public profile** that we can use for basic social networking purposes, like sharing photos, previous work or school history, and status updates, among other things with expanding our social network.
- Google Drive for Gmail only.
- Google Docs for Gmail only.
- 15 GB (Giga Bytes) Inbox for Gmail only.
- We can send Emails up to 25 MB (Mega Bytes) data attachment for Gmail only.

4.3 E-COMMERCE AND EMERGING SERVICES

Friends, now a day's everyone are familiars about E-commerce; if we think beyond this now "Digital India and Digital Payment" is also part of E-Commerce.

E-commerce also known as "Online Shopping"

Define: "An Electronic structure where potential Buyer and potential seller meet with the use of Internet only and transaction perform is called E-Commerce"



Figure -1: Block Diagram of E-commerce

If we want to understand the types and subtypes of E-commerce we can understand by Block diagram that display as below

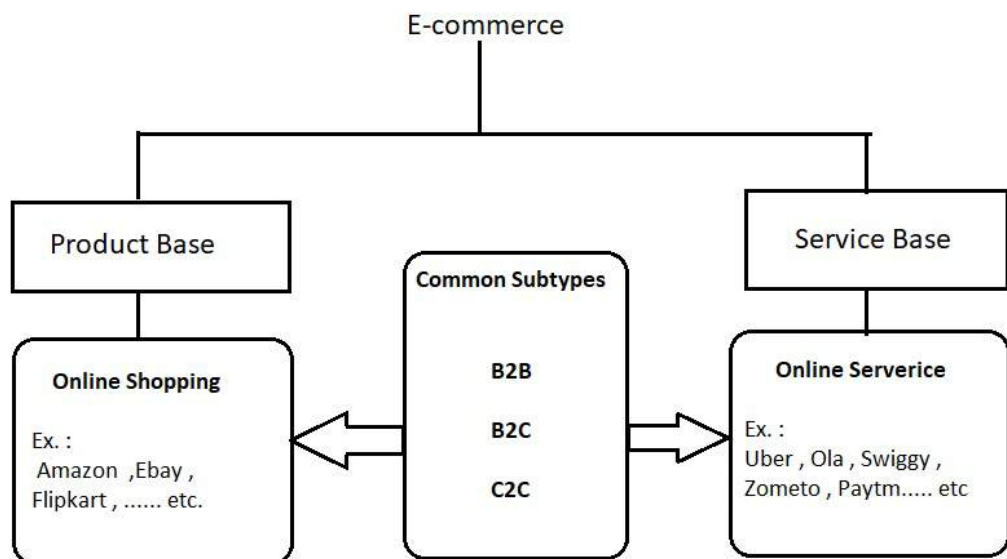


Figure -2: Types and Subtypes of E-commerce

Product Base E-Commerce:

"An E-Commerce where money transaction performs on Product purchase and sell is called Product Base E-Commerce" (Ex. Person X purchase mobile via www.amazon.co.in)

Service Base E-Commerce:

“An E-Commerce where money transaction perform on purchase of specific service is called Product Base E-Commerce” (Ex. Person X give order of online Food Delivery via zomato, use urbanclap, Use swiggy ... etc)

B2B E-commerce - B2B or business-to-business is that the form of e-commerce within which the mercantilism takes place between 2 businesses or organizations/companies while not the involvement of client.

Characteristics

- Transaction between two or more business organization
- Product or service transaction is always in bulk.
- Majority branded business provides this process.
- Some out sourcing work in this process.
- No Client Involvement
- Ex. : Intel Company provides various types of processor and chipset to other brand of laptop like Lenovo , HP , IBM , Sonyetc

B2C e-commerce - In recent times, B2C or business-to-consumer e-commerce has business or service transaction between one business to N customer or consumers is called B2C

Characteristic

- It a lot of unremarkably called on-line selling and involves customers buying product and services on-line. Amazon.com, dingle computers, Drugstore.com, Travelocity, etc are a number of the flourishing samples of B2C e-commerce.
- B2C e-commerce has expedited a click and drag on-line store in situ of the standard brick and mortar selling stores.
- It's reduced dealings prices by increasing consumers' access to data thereby easing the total procedure of shopping for and commerce product and services.
- Customers will currently simply compare varied options offered by completely different brands over an equivalent product and add genuineness to their call.
- Additionally to the current, we tend to even have some smart on-line reviewers like rotten tomatoes, top10reviews, etc, that has on-line reviews for

varied merchandise and services and helps customers in creating a best obtain each on-line still as offline.

C2C e-commerce - Consumer-to-consumer commerce is that the trade between 2 shoppers or potential seller as public and potential buyer as public is called C2C”.

Characteristics

- C2C transactions bear associate degree analogy with the standard commercialism strategies cherish sales promotions, auctions and alternative vertical industries.
- Fashionable websites facilitating C2C e-commerce area unit eBay, BaZee.com, Napster, etc. the buyer commerce over on-line bazaar helps patrons to barter and patronize a selective value.
- Ex.: www.olx.in , www.quicker.com , www.olacabs.com , www.uber.com
etc

Friends, if want to understand the pros and cons of E-Commerce we need to compare Traditional Commerce with Electronic Commerce

Particular	T-Commerce	E-Commerce
Seller Side		
Objective	It product base transaction here product is centre focus	It is customer base transaction here customer is centre focus
Setup Cost	Set up cost is very high	Set up cost is not very high
Maintenance	Very High maintenance	Very low maintenance
Other Expense	Other Expense like showroom, furniture, light bill, etc	Less other expense
Man Power	Maximum man power require	Less man power require transportation (logistics) is third party service
Process	Some time semi manual , manual or electronic base	100% IT base because it is Online
Transparency	Business transaction is not 100% transparency	Business transaction is 100% transparency
Stock Management	It may be manipulate because it is manual	It is trusted and 100% transparence because items stock is online
Buyer Side		
Shopping Time	Shopping timing is limited	24 x 7 shopping
Choice of product	Product choice is limited	Product choice from wide range
Payment	Payment is not flexible	Payment is flexible ex. : cash

	because Credit card , Debit card , Cash	on delivery , credit card , debit card , Easy EMI with not paper work
Return policy	Return policy is not flexible	Any product return policy is very flexible
Exchange offer	Exchanging product is not reliable and may be not good value of product	Exchanging product is reliable and good value to product
Time Consuming	It is very time consuming because buyer has to visit the shop or place	It is less time consuming because buyer can buy from digital device
Other Cost	For buying product buyer has to travel from one place to other place this is additional cost	No need to travel from one place to another place because buying from digital device
Limitation of E-Commerce		
Digital Literacy	No need of literacy or digital literacy	Digital literacy is must (digital device operation require for shopping)
Product Verification	Product can buy on the basis of seeing , touching or smelling of product	Product cannot really seen , touch or smell when purchasing product
Product	All types of product selling	Some product like vegetables, fruits, gold Etc not trust worthy now days for online shopping.



Figure – 3: Online Shopping Process Life Cycle

E-Banking

Online banking, conjointly called E-banking.

“An Online system that associates electronic payment system that allows customers of a bank or different financial organization to conduct spread money of monetary of economic transactions through the web site or Smartphone is called E-banking.”

The web industry can generally connect with or be a part of the core industry operated by a bank and is in distinction to branch banking that was the normal method customers accessed banking services. Some banks operate as a "direct bank" (or “virtual bank”), wherever they believe fully on net banking.

Internet banking code provides personal and company banking services giving options like viewing account balances, getting statements, checking recent dealings and creating payments. Access is typically through a secure computing device employing a username and positive identification, however security could be a key thought in net banking and plenty of banks conjointly supply 2 issue authentications employing a (security token).

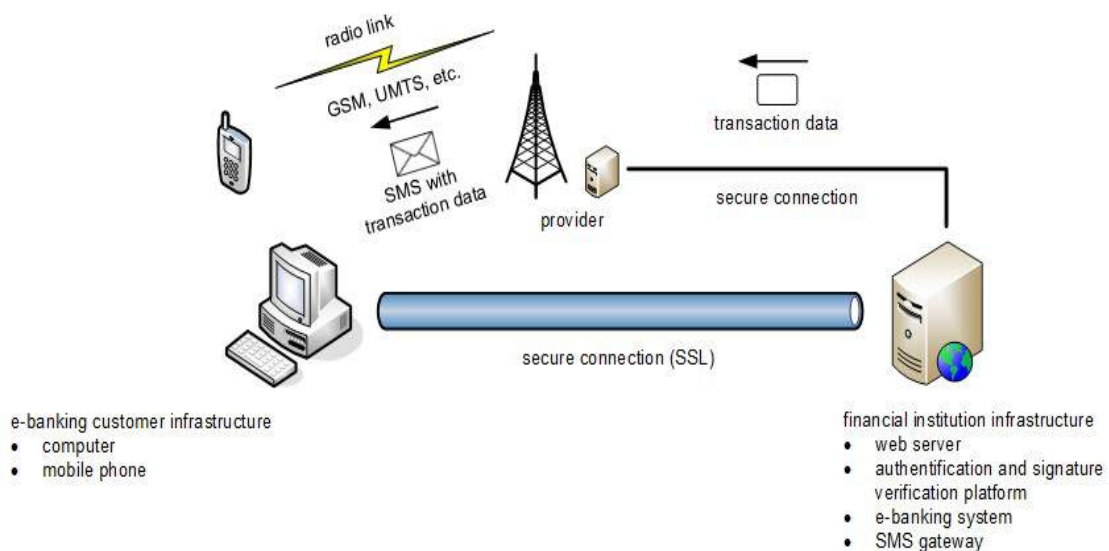


Figure – 4: Process Architecture of E-Banking

Friends, we discuss the **Advantages of E-banking** we need to understand as per two types.

- 1) Non-Transaction base advantages.
- 2) Transaction base advantages.

1) Non-Transaction base advantages.

- Easily to Viewing account balances
- Easily to Viewing recent transactions
- Easy to Download bank statements, for example in PDF format
- Easy to View images of paid cheques
- Easy to Order new cheque books
- Easy to Download periodic account statements
- Easy to download applications for M-banking, E-banking etc.

2) Transaction base advantages.

- Easy to transfers fund between the customer's linked accounts.
- Easy to Pay third parties, including bill payments (see, e.g., BPAY) and third party fund transfers. (see, e.g., FAST)
- Easy to Investment purchase or sale.
- Easy to Loan applications and transactions, such as repayments of enrollments
- Easy to Credit card applications
- Easy to Register utility billers and make bill payments

3) Economic institution administration.

4) Management of number of users having varying levels of authority.

5) Business approval process.

6) So flexible that anywhere anytime finance transaction can perform.

Disadvantages of E-banking

- Basic requirement is Internet.
- User must aware about method of E-banking.
- Data privacy is must if any account password or PIN or Transaction code share with anyone it will be high risk of Online financial fraud.

E-Learning

Friends, Understanding eLearning is easy.

“E-Learning is learning methodology by electronic technologies to access instructional program outside of a standard schoolroom.”

In most cases, it refers to a course, program or degree delivered entirely on-line.

There square measure several terms accustomed describe learning that's delivered on-line, via the net, starting from Distance Education, to processed electronic learning, on-line learning, web learning and lots of others.

We tend to outline eLearning as courses that square measure specifically delivered via the net to somewhere apart from the schoolroom wherever the faculty member is teaching. It's not a course delivered via a DVD or compact disc read-only memory, video tape or over a television station. It's interactive therein you'll be able to additionally communicate together with your lecturers, professors or alternative students in your category. Generally it's delivered live, wherever you'll be able to “electronically” raise your hand and move in real time and generally it's a lecture that has been recorded. There's continuously an instructor or faculty member interacting /communicating with you and grading your participation, your assignments and your tests. E-Learning has been evidenced to be a self-made methodology of coaching and education is turning into the way of life for several voters in North geographical area.

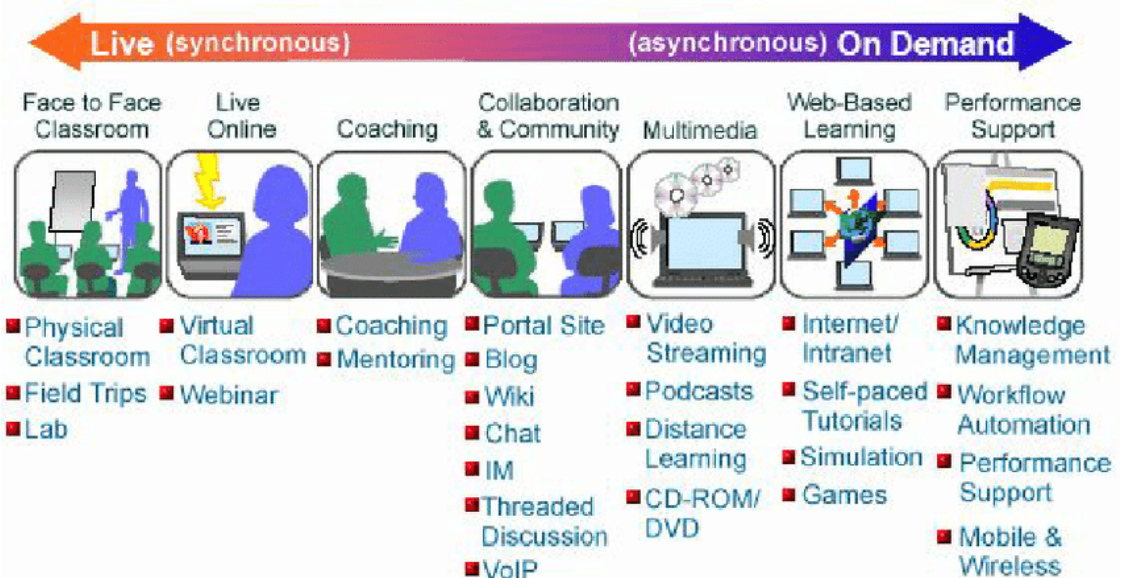


Figure -5: Methods of E-Learning

Methods of E-Learning

- 1. Collaboration & Community** : A learning method where Learning base general website approach to general topic learning is called coloration & Community
Ex.: Wiki, Blog, Chat,
- 2. Multimedia** : A learning method where E-Contents available as in Offline or Online as form of Multimedia and animation based in form of CD , DVD , Podcast or Video Streaming is known as Multimedia
Ex.: CD, DVD, Podcast, Video Streaming
- 3. Web Based Learning** : A learning method where E-contents provides Online by various ways like Simulation , Games , Self paced Tutorials via Internet or Intranet is known as Web Based Learning
- 4. Performance Based Learning** : A learning method where Online as well as Offline E-content available as per course or demand wise that can personalize progress report (Dash board) as well as E-evaluation system develop under Blended learning approach is called Performance Based Learning

Advantages of E-Learning

- Class work will be scheduled around personal and skilled work, leading to versatile learning.
- Reduces travel value and time to and from college
- Learners could have the choice to pick learning materials that meets their level of information and interest
- Learners will study where they need access to a pc and web
- Self-paced learning modules permit learners to figure at their own pace
- Flexibility to affix discussions within the bulletin board rib discussion areas at any hour, or visit with classmates and instructors remotely in chat rooms
- Different learning designs are self-addressed and facilitation of learning happens through varied activities
- Development of pc and web skills that are transferable to alternative aspects of learner's lives

- Successfully finishing on-line or computer-based courses builds understanding and certainty and encourages students to require responsibility for his or her learning

Disadvantages of e-Learning

- Unmotivated learners or those with poor study habits could fall behind.
- Lack of acquainted structure.
- Students could feel isolated or miss social interaction so the necessity to understanding totally different learning designs and individual learner desires.
- Instructor might not forever be offered on demand.
- Slow or unreliable web connections will be frustrating.
- Some courses like ancient active courses will be troublesome to simulate.

E-Governance

Friend simply understanding is

E-governance = Electronic (ICT based) + Government Service

E-governance is more about government than about "e" improves efficiency, improves services helps achieve specific outcomes can contribute to broad policy objectives can be a major contributor to reform can help build trust between governments and citizens can open up the policy process challenges existing ways of working seamless government services will drive agencies closer together "ICT and Internet based services of Government that interact with citizens to increase reliability and transparency is called E-Governance"



Figure – 6: Process Architecture of E-Governance

E-Governance is defined as the application of electronic means in the interaction between government and citizens and government and business, to simplify and improve democratic, government and business, to simplify and improve democratic, government and business aspects of governance. Many developing country governments face these problems of inefficiency, internal and external communications breakdowns, poor service delivery, and corruption. Civil society organizations often lack the capacity to use ICT (Information and Communication Technology) effectively, even though ICT can be a powerful tool for making information available to the public and preventing corrupt practices.

Advantages

- Generate reliability between citizen and Government.
- Better and faster process of Government.
- Reduce corruption in Government.
- Creating better business environment.
- Increase public participation in Government process.
- Better productivity and efficiency of government agencies.
- Better quality of life from unsatisfied communities.
- Reduce cost of running Government.

Disadvantages

- Literacy ratio in country.
- Digital literacy is necessary.
- Limited Mobile users.
- Slow speed of Internet.
- High Internet costs as telecommunication infrastructure country still not reach up to 4G speed of Internet.

4.4 SOCIAL NETWORKING

Hey friends simply understand social media as

**Social media = Sharing various types of Information among group of people
via Internet**

Social networking could be an internet based mostly communication media that permits users to possess conversations, share info and make contents. There square measure various social media sites like blogs, social networking sites, instant electronic messaging, photo-sharing sites, video-sharing sites and additional. Billions and billions of individuals across the globe use social networking sites to share and create connections on a private level. As Associate in nursing introduction to social networking sites individuals use social media to speak with friends, family and to find out new things that interests them and that is amusing. Business homes use social media to possess language with their target market, get feedback from customers, promote, and elevate their complete. Professionals additionally use social media to extend their information in their various fields and build a network of execs from similar trade.



Figure – 7 : Social Networking example

While there square measure several social media sites within the internet, Associate in nursing introduction to social networking sites just like the ones listed below is extremely necessary.

Facebook: This is a social networking site, which permits people or group of people to connect with network as friends, business houses and organizations. It is perfect site for companies to build up their overall brand understanding and post contents, videos, photos, event listing and links.

LinkedIn: This is a business related social media platform primarily used for skilled networking. It is an ideal site to post updates, job postings, academic programs, events and projects for knowledge sharing purpose.

Twitter: This micro-blogging site allows users to post their thoughts towards worldwide. Business houses and individuals looking to engage their group at a high regularity rate should consider using Twitter.

Advantages:

- Always connected with group of people.
- Finding people very easily.
- Finding people with similar interest.
- Use as promotional tools.
- Information spread rapidly.

Disadvantages:

- Big issue on Data Privacy.
- It consumes lots of time.
- Sometimes unreliable information.
- It increases problems in relationship.
- It reduces the personal touch day by day.

Types of Social Networking



Figure – 8 : Types of Social Networking

1. Social Connections

“A type of Social networking by which we can keep in touch with friends and family members”

List of the most commonly used websites for building social connections online.

Facebook: Possibly the most popular social media utility, Facebook offers a way for users to build connections and share information with people, group of people and organizations they choose to interrelate with online.

Twitter: Share your thoughts and keep up with others via online information network.

Google +: This relatively new entrant to the social connection marketplace is designed to allow users to build circles of contacts that they are able to interact with and that is integrated with other Google products

2. Multimedia Sharing

“A type of Social networking makes it simple to share video and photography content online is Multimedia sharing “

List of the most commonly-used websites for building Multimedia Sharing.

YouTube: A platform that allows us to share and view video content

Flickr: This site provides a powerful option for organizing digital photographs online, as well as we can share with others also.

3. Professional

“A type of Social network that are designed to provide opportunities for career-related growth is known as Professional social networking”

Some of these types of networks offer a general forum for professionals to connect, while others are focused on particular occupations or interests.

A few examples of professional social networks are as below.

LinkedIn: More than 135 million members since November of 2011 to till, LinkedIn had, making it the biggest online professional network.

Classroom 2.0: Social network particularly designed to help academicians/teachers connect, share and help each other with professionally by teaching – learning purpose

4.5 CHATTING AND INSTANT MESSAGING

Instant electronic messaging (IM) could be a catch-all name for a spread of various services that primarily offer users with the chance to interact in period of time communication.

Typically direct by text oral communication, messengers usually conjointly offer a spread of further practicality that varies wildly from supplier to supplier. This additional practicality has, on some platforms, lead to them being thought-about as full-blown social media networks, on a par with Facebook, Twitter and alternative platforms.

In 2015, itinerant electronic messaging apps were employed by one.4bn customers and eMarketer predicts that, by 2018, the amount of chat app users worldwide can reach 2 billion, representing eightieth of Smartphone users worldwide.

In a shell, it's solely a matter of your time before everybody and their granny, in much each country on the earth, area unit victimization IM.

Famous names for Chatting and Instant Messengers are as below.

WhatsApp

Owned by Zuckerbeg & Co. and with over 1bn users, most of that area unit technical school savvy millennially, WhatsApp is that the clear competitor within the IM community and therefore the solely really international IM service with any vital uptake altogether continents round the world.

Offering text chat, voice recording, media sharing, cluster broadcasts and a strong network, you'd for sure bet your house on this IM large being the one to pave the means for the long run of IM [insert emoticon face emoticon].

Facebook Messenger

Formed from the net chat perform of the social network, Facebook courier has created real inroads within the EMEA and U.S. regions with over 800m users.

However it's cleared that with bound restrictions in places like Asia, its move out of those 2 markets and into the APAC region is a tricky one to tackle.

WeChat

With 650m users, primarily within the APAC region, WeChat is, considerably, dominant within the Chinese market giving users the possibility to speak during a 'walkie talkie' vogue oral communication, also as alternative typical options like cluster chats and video calls.

WeChat is additionally a social network Associate in nursing a long transactional platform. It offers its users the chance to buy, ask brands, order taxis (its 'Didi Dache' service is basically China's Uber) and browse the news.

Comparing Chat with Instant Messaging

Chat	Instant Messaging
<ul style="list-style-type: none"> • It is One to many communication process. 	<ul style="list-style-type: none"> • It is One to One communication process
<ul style="list-style-type: none"> • Concept of Chat room is established for multiple communications. 	<ul style="list-style-type: none"> • Concept of One to One messaging with individuals
<ul style="list-style-type: none"> • Basic purpose is as per common interest or topic base group of people 	<ul style="list-style-type: none"> • Basic purpose is just instant message and communication by internet
<ul style="list-style-type: none"> • Ex. : Whatsapp 	<ul style="list-style-type: none"> • Ex. : Facebook messenger

Instant Messaging

Advantages:

- It's immediate: you don't need to wait for the other person to ensure his email.
- It's great for rapid messages, questions, or notifications.
- Compared to email, it's easier to carry on a conversation or multiple conversations.
- You can stay logged in while doing other things on your computer, which makes it easy to handling multiple tasks.

Disadvantages:

- If someone is not online, you may have to contact him another way.
- It's not as convenient as email for lengthy or complicated messages.

4.6 AUDIO AND VIDEO CONFERENCING

Audio conferencing

Audio conferencing is that the conduct of associate audio conference (also known as a phone call or audio teleconference) between 2 or a lot of folks in numerous locations employing a series of devices that enable sounds to be sent and received, for the aim of communication and collaboration at the same time.

An audio conference might involve exclusively 2 parties, or several parties concerned at constant time. Audio conferencing is conducted either through phone line or the web by mistreatment devices like phones or computers. If one solely desires to pay attention, he/she simply wants speakers. If he/she decides to talk further, he/she may have an electro-acoustic transducer further.

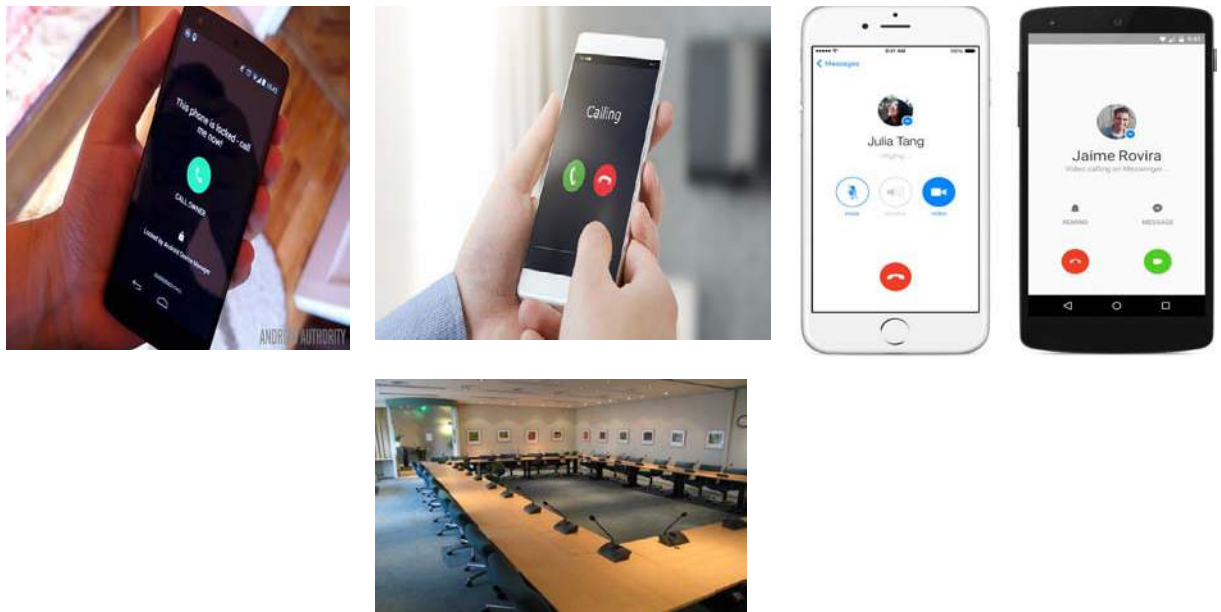


Figure – 9: Example of Audio Conference

Advantages:

- It is Cost effective Communication tool.
- Easy to accessible.
- Save lots of time and money.

Disadvantages:

- Communication is just verbal.
- Sometimes quality of communication is not full reliable.

Video conferencing

“Telecommunication technologies that enable video with audio telecommunication with the help of Internet is called Video conferencing”

This is a very broad category of online tools, incorporating a range of options from free one-to-one audio conferencing all the way to more sophisticated and expensive tools such as Polycot which allow multiple sites with entire classes participating using video and audio.



Figure – 10: Video Conferencing/Calling Smartphone Apps.

Advantages:

- Audio as well as video both benefits.
- Free to download. (No Cost)
- More reliable than Audio conferencing.
- It saves lots of time of travel if anyone wants to meet other people.
- Some companies now a day's use it as interview and training part to save time and money.

Disadvantages:

- Communication between limited numbers of systems.
- It is free so sometimes Audio and video quality is not 100% reliable.
- Video calling / conferencing use high bandwidth of Internet data packets so it not completely free.

4.7 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should be able to learn Emerging technologies use as core part of Internet – Basic communication E-Mail then Various most popular service of Internet like E-Commerce, E-Banking – E-Learning, Business transaction of B2B of E-Commerce, Internet Service that all major people connected with it as Social Media networking like Chatting, Instant Messaging and Finally Audio and Video Conferencing

4.8 CHECK YOUR PROGRESS

- Give the name of Web Mail Service providers?
- An Intel Company provides mother boards to major laptop brands is known as _____ [B2B , B2C , C2C , None of this]
- Full form for below
 - B2B
 - B2C
 - E-Mail
 - C2C
 - OTP
- Give names of 4 components of Process Architecture of E-Governance
- _____ and _____ are main part of any E-Mail

4.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Web Mail Service providers :- **Google , Yahoo , Hotmail , Outlook**
- An Intel Company provides mother boards to major laptop brands is known as :-
B2B
- Full form for below

- B2B: Business To Business
 - B2C : Business To Consumer / Customer
 - E-Mail : Electronic Mail
 - C2C : Customer To Customer
 - OTP : One Time Password
- 4 Components of Process Architecture of E-Governance are : **Process , People , Technology , Resource**
- **User Name** and **E-Mail Provider** are main part of any E-Mail

4.10 FURTHER READING

Following are some Online Reference Reading as PDF:

<https://www.inf.unibz.it/~ricci/IT/slides/1-www.pdf> [About Internet Technology Uses]

<http://www.ignou.ac.in/upload/B2U1cit-002.pdf> [Pg 5 – 15 About E-Commerce]

YouTube Reference:

<https://www.youtube.com/watch?v=tfPfwDrfSP8> [About E-Mail]

<https://www.youtube.com/watch?v=-Y9pvVWanL4> [About E-Banking]

<https://www.youtube.com/watch?v=yGTovSBTfTs> [About E-Learning]

https://www.youtube.com/watch?v=tbRF_ELh0Nc [About Social Networking]

<https://www.youtube.com/watch?v=-oUOoHU8QfA> [About Video Conferencing]

<https://www.youtube.com/watch?v=xKJjyn8DaAw> [About E-Commerce]

4.11 ASSIGNMENTS

1. What is E-Mail? Discuss advantages and disadvantages of E-Mail
2. What is E-Banking? Discuss advantages of E-Banking
3. Differentiate the below terms :

- a. Chat v/s Instant Messaging
- b. B2B v/s C2C
- c. Amazon v/s Swiggy
- d. Audio Conference v/s Video Conference

4. What is E-Learning? Explain any 2 method of E-Learning with its Advantages and Disadvantages

4.12 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- List out G-Mail services provide by Google
- Draw Payment Process diagram for any Online Shopping
- Draw History Time line of E-Commerce Development
- List various Service Providing by E-Banking
- List 2 to 3 out some website or Mobile app that provide E-Learning
- Which chatting smart phone app u use most give 2 to 3 reasons.

Analytical Zone:

- How many users use Facebook Messenger in world level as well as at India
- Provide statistics of E-Banking users in India
- Provide statistics comparison of buyers of Amazon v/s Flipkart

Block-2

Developing Web Pages Using

HTML

Unit 1: HTML Tags

1

Unit Structure

- 1.1. Learning Objectives.
- 1.2. Introduction to HTML and HTML Tags.
- 1.3. Heading Tag.
- 1.4. Linking Tags.
- 1.5. Images Tags.
- 1.6. Special Characters and Horizontal Rules Tags.
- 1.7. Lists.
- 1.8. Meta Elements.
- 1.9. Let us sum up.
- 1.10. Check your Progress
- 1.11. Check your Progress: Possible Answers.
- 1.12. Further Reading.
- 1.13. Assignment.
- 1.14. Activities.

1.1 LEARNING OBJECTIVE

The Block 2 - Unit 1 aims to develop skills of developing Webpages using Hyper Text Markup Language (HTML). After studying this Unit student should be able to:

- Understand the basic concept of HTML.
- Able to work in HTML Environment.
- Design a Webpage of Websites using various tags like: HTML, giving Heading, introducing Link, setting Internal Links, inserting Images, using Special Characters and Horizontal Rules, preparing List and using Meta Elements.

1.2 INTRODUCTION TO HTML AND HTML TAGS

Hypertext Markup Language (HTML) is the standard markup language mainly used for developing Webpages of a Website that can even be called as a Web Application. The Web Application is viewed in Web Browser that receives the Webpages designed in either from the local Computer System Storage or a Web Server and transforms it to multimedia Webpages.

- **Facts to Ponder:**
 - The World Wide Web Consortium (W3C) describes specifications, hence influencing the functionalities of HTML. The W3C has defined HTML as an application of the Standard Generalized Markup Language (SGML). The W3C maintains both the HTML as well as Cascading Style Sheet (CSS) standards and has increased the use of CSS in addition to HTML.
 - Most recent version of specification for the HTML is 5.0.
 - HTML develops the structure of a Webpage semantically and in the beginning included views for the appearance of the document in a Web Browser.

- The main advantage of using HTML is that it can embed the Scripts such as JavaScript in form of programs which influence the behavior and content of Webpages and even embeds Cascading Style Sheet (CSS) that describe the look and layout of content on Webpage.
- Along with developing and designing Webpages, it is even used for Intranet, Internet as well as extranet Applications, Help Files, Network Applications and other specific domains.

- **Working in HTML Environment**

The working Environment of HTML is user friendly and is operationally feasible as it does not require very many special, specific, specialization skills. The Technical requirements of HTML requirement are even feasible and it can be implemented on every kind of Computer System.

- **HTML Environment:** The Environment or Tools required for working in HTML are:
 - HTML Editor: It is required to create and save HTML document. It can be classified in two categories – Text Based HTML editor (Ex: Notepad, WordPad, Edit plus) and What You See Is What You Get (WYSIWYG) based Text editor. The Text based Editors are most commonly used. The HTML webpage that is developed in notepad is saved with .html or .htm as file extension.
 - Web Browser: Web Browser is software which is used to view documents websites that are developed in HTML and Web Development languages. The role of Web Browsers is not to display the HTML tags, but use them to understand the content of the Webpage in a Website. Some commonly used Web Browsers used to view HTML Documents are Google Chrome, Microsoft Internet Explorer, Netscape Navigator, Mozilla Firefox, Opera and others.

- **HTML Tags**

- HTML Tags also called as HTML Element is used to indicate the structure and format of a Web Document.
- HTML Webpages are developed and designed using HTML Elements.
- The language provides a means to develop and Design structured documents by having HTML Elements for Text like headings, paragraphs, lists, links, quotes and other forms.
- Tags in HTML consist of Alphanumeric Tags, which are located within opening and closing angular brackets (<>). Example: <TAG>
- The Alphanumeric Tags are not case sensitive that means the tag <html> and <HTML> has the same meaning.
- Spaces are not allowed between the angle brackets and the Tag text.
- The HTML Tags are of two types:
 - ✓ Container Tag: HTML tags come in pairs with an opening tag (for example : <TAG_NAME>) and closing tag (for example : </TAG_NAME >), these tags are known as Container Tag.
 - ✓ Empty Tags: Some tags (for example :) that do not require closing tag, is known as Empty tag.
- Every Tag has some properties that are known as attributes that are written within the opening tag specifying its value. The syntax is as follows :
 - <TAG ATTRIBUTE = "value "> // Opening Tag
 -
 - Content
 -
 - </TAG> // Closing Tag

○ **Structure of HTML Document**

The basic Skeleton Structure of HTML Document is as displayed below:

```

<HTML>
  <HEAD>
    <TITLE>
  </TITLE>

```

```

</HEAD>

<BODY>

    <TAG_1>.....</TAG_1>

    <TAG_2>.....</TAG_2>

    ...

    ...

    <TAG_N>.....</TAG_N>

</BODY>

</HTML>

```

The meaning of each tag is elaborated in the Table 1.

Table 1: Basic HTML Tags

Basic HTML Tags	Description
<HTML>.....</HTML>	HTML document starts with <HTML> opening tag and ends with </HTML> tag. Rest all Tags are embedded within it.
<HEAD>.....</HEAD>	It contains opening and closing <TITLE>.....</TITLE> Tags, sometimes other Scripts and styles even.
<TITLE>.....</TITLE>	The opening and closing <TITLE>.....</TITLE> Tags defines the title displayed on the Title Bar of the Web Browser Tab.
<BODY>.....</BODY>	The entire visible part of the HTML document is between <BODY>.....</BODY>. All the elements like text, audio, video that is displayed on Web Browser are defined within <BODY>.....</BODY> Section.

<p><TAG_1>.....</TAG_1> & <TAG_N>.....</TAG_N></p>	<p>These are the various Tags to display text, audio, video and other styling in the HTML Document. These are detailed further in this Chapter.</p>
--	---

- **Steps to create an HTML Webpage**

- Example 1: Creating a HTML Webpage.**

- Solution:**

- ✓ Step 1: Open any text Editor (EX : NOTEPAD) as displayed in the Figure 1.

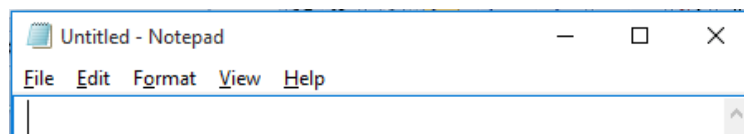


Figure 1: Notepad Interface

- ✓ Step2: Write the HTML code for your Webpage & displayed in Figure 2.

```

<HTML>
    <HEAD>
        <TITLE> Demo webpage
    </TITLE>
    </HEAD>
    <BODY>
        <H1> First HTML webpage.
    </BODY>
</HTML>

```

Figure 2: HTML Code

- ✓ Step3: Click on Save option in File menu and in the Save As dialog box give the File Name with .htm or .html extension. The file will be saved as HTML Document.



Figure 3: Interface

- ✓ Step4: Open the File in the Web Browser to view the output as displayed in Figure 4.



Figure 4: HTML Document view in Web Browser

○ **Basic useful HTML Tags**

There are various basic of Tag that supports and fulfils the Text, Paragraph, Page formatting as well as additional requirements of HTML Document. Some such Tags are as detailed in the Table 2.

Table 2: Some Basic HTML Tags

Tag	Description	Type	Attribute	Use
<P>... </P>	Defines a paragraph	Container Tag	ALIGN VALUE=left/right /center/justify	<P align="left">Left Align paragraph</P> <P

				<p>align="center">Center Align Paragraph</P></p> <p>Output: Left Align paragraph Center Align Paragraph</p>
 	It starts a new line where paragraph is not required. It forces a line break wherever and is similar to single spacing in a document.	Empty Tag	NIL	<p><P>This
 is a paragraph with line breaks</P></p> <p>Output: This is a paragraph with line breaks</p>
<!-->	Inserts a comment in the HTML source code anywhere in the document and the browser will ignore everything inside the brackets. Used to self notes or a helpful	Empty Tag	NIL	<p><P> The html comment would <!--This is a comment -->be displayed like this in Web Browser.</P></p> <p>Output: This html comment would be displayed like this in Web Browser.</p>

	message to someone looking at the source code.			
--	---	--	--	--

Note for Practical: All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.

1.3 HEADING TAG

Explanation: The Heading Tag provides heading or the titles in the HTML document to show the proper document structure in the Web Browser.

Purpose: Specifies Heading/Sub-Headings/Titles/Sub-Titles in the HTML Document.

Type: Container Tag.

Syntax:

- HTML has six levels of headings, presented as **<H1>**, **<H2>**, **<H3>**, **<H4>**, **<H5>**, AND **<H6>**.
- The **<H1>** Tag defines the main/most important Heading, while **<H6>** Tag defines the Lowest Sub-Heading/least important Heading.
- Example: `<H1> Main Heading </H1>`

Attribute: Align = Specifies the alignment of Heading. Values = left (default), right, center and justify. Example: `align="center"`.

Example 2: HTML Program is demonstrating types of Heading Tag.

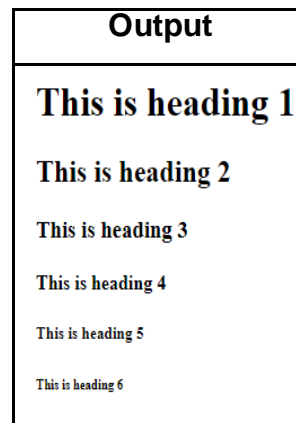
Solution:

```

<HEAD>
    <TITLE>Heading Example</TITLE>
</HEAD>
<BODY>
    <H1>This is heading 1</H1>
    <H2>This is heading 2</H2>

```

```
<H3>This is heading 3</H3>
<H4>This is heading 4</H4>
<H5>This is heading 5</H5>
<H6>This is heading 6</H6>
</BODY>
```



1.4 LINKING TAG

The Linking Tag is used to provide the Links or the connectivity in a HTML Document. The link can be categorized as:

- External Link: Between different Web Pages of a Website.
- Internal Link: within a single Web Page itself.

Both the types are explained in details below.

- **External Link**

Explanation:

- The Link Tag Links Document, Image and even email.
- It puts a Hyperlink in a Web Page and such Links can be categorized as: Text Link (Link among different Web Pages of a Website or other linked websites using a text), Image Link Tags (Image is Linked to a another Webpage), and can be a specific Email Link.
- Link can be applied to a Text or the Images. The linked text is called as Hypertext/Hotword and the portion of linked image is called as Hotspot.
- When a cursor is moved over Hypertext or Hotspot its shape changes from standard arrow cursor into hand shaped mouse cursor representing it as a Linked Text/Image. Once it is clicked the respective linked document or locating is reached.
- In the Web Browser the standard format for Hypertext is blue underlined text in a HTML Document. Once the link is visited the color of Hypertext/Hotspot may change.

Purpose: Allows linking in HTML document and can be used for navigation between many different Web Pages of a Website containing.

Type: Container Tag.

Syntax:Hyperlink can be generated by putting text between opening closing Anchor tag. <A> and tag.

Attributes:

- HREF: Defines the link address that signifies the path of the Hyperlinked HTML Document. The value in it must be source file completed address or name with extension (if file exist in the same folder where the Linked Document is located). Example :
 - Text Link : < A HREF="baoueregistration.html"> Registration
 - Image Link :
 - Email Link : < A HREF="mailto:feedback@baou.edu.in?subject=Email Assistance"> Email Help Desk

- TARGET: Defines where to open the linked document. Example :
< A HREF="baoueregistration.html" TARGET="blank"> Registration

Example 3: HTML programs to demonstrate Text Link.

Solution:

<HEAD>

<TITLE>HTML Text Link**<TITLE>**

</HEAD>

<BODY>

<P>This is a link to **<A HREF**
="http://www.google.com"**>**GOOGLE.com**</P>**

</BODY>

Output	This is a link to GOOGLE.com
---------------	--

Example 4: HTML programs to demonstrate Image Link.

Solution:

<HEAD>

<TITLE>HTML Image Link**<TITLE>**

</HEAD>

<BODY>

<P>Click on below picture to visit my homepage :**

<A HREF=**
"http://www.baou.edu.in/home"><IMG

SRC="baou_logo_n.png">with link border : **

</P>**

<P>Click on below Image to visit the homepage:**



<A HREF=**
"http://www.baou.edu.in/home"><IMG

SRC="baou_logo_n.png">without link border :

**

</P>**

</BODY>

Output	<p>Click on below picture to visit my homepage:</p>  <p>without link border :</p> 
---------------	--

Example 5: HTML programs to demonstrate Email Link.

Solution:

<HEAD>

<TITLE>HTML Email Link</TITLE>

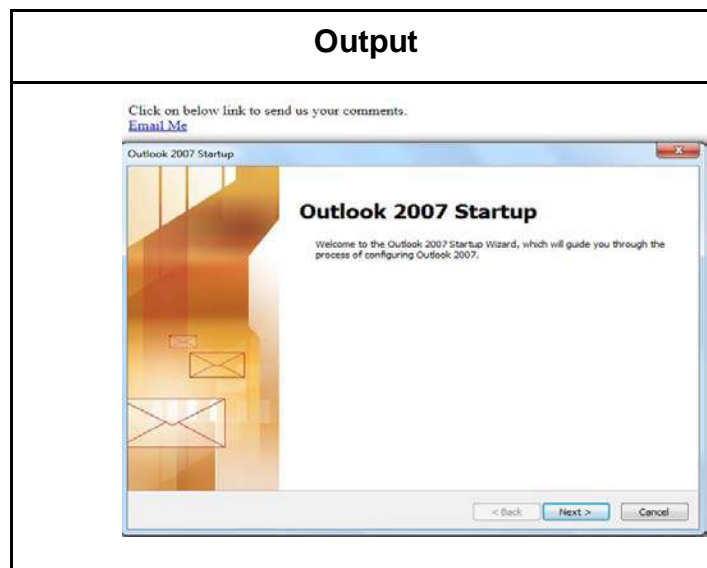
</HEAD>

<BODY>

Click on below link to send us your comments. **
**

Email Me

</BODY>



Note: Once Email Me is clicked using outlook account an email can be send using Outlook Express Account.

- **Internal Linking Tag**

Explanation: In HTML document when a link is set within a single Webpage it is known as Internal Link. It is used for navigation within a Webpage.

Purpose: Used to set linking within a Webpage for navigation in different section of a Webpage in a HTML Document.

Type: Container Tag.

Syntax:

- The Internal Link/Hyperlink can be established either by providing an absolute path or relative path.
- The opening and closing Anchor tag `<A>` and `` tag is used for anchor point name, which is referred to an internal link into a same page.
- Internal link name is followed by hash Symbol (#). Whenever, there is a click on such Anchor link, the referred link automatically scrolls to the desired position in the Webpage.

Attributes:

- HREF: Defines the Internal link address that signifies the path of the linked HTML Document. The value in it must be source file completed address or name with extension (if file exist in the same folder where the Linked Document is located). The internal links are should be followed by # symbol. Example: `< A HREF="#SelfLearningContent1"> Self Learning Content 1 `.
- NAME: Identifies the element with a unique name. Example:
 - `< A HREF="#TOP">Reach Top of Page`
 - `Reach Top of Page`

Example 6: HTML programs to demonstrate Internal Link Tag.

Solution:

```

<HEAD>
  <TITLE>HTML Internal Link Tag </TITLE>
</HEAD>
<BODY>
  <A HREF="#topic1">Topic 1</A>
  <A HREF="#topic2">Topic 2</A>
  <A HREF="#topic3">Topic 3</A>
  <HR>
  <BR>
  <A NAME="topic1">Introduction of Topic 1</A>
  <P>This is sub topic.1</P>

```


<P>This is sub topic.2</P>

<P>This is sub topic.3</P>

<P>This is sub topic.4</P>

<P>This is sub topic.5</P>

<P>This is sub topic.6</P>

<P>This is sub topic.7</P>

<P>This is sub topic.8</P>

<P>This is sub topic.9</P>

<P>This is sub topic.10</P>

<P>This is sub topic.11</P>

<P>This is sub topic.12</P>

<HR>

Introduction of Topic 2

<P>This is sub topic.1</P>

<P>This is sub topic.2</P>

```

<P>This is sub topic.3</P>
<P>This is sub topic.4</P>
<P>This is sub topic.5</P>
<P>This is sub topic.6</P>
<P>This is sub topic.7</P>
<P>This is sub topic.8</P>
<P>This is sub topic.9</P>
<P>This is sub topic.10</P>
<P>This is sub topic.11</P>
<P>This is sub topic.12</P>
<HR>
<A NAME="topic3">Introduction of Topic 3</A>
  <P>This is sub topic.1</P>
  <P>This is sub topic.2</P>
  <P>This is sub topic.3</P>
  <P>This is sub topic.4</P>
  <HR>
</BODY>

```

Output	Topic 1 Topic 2 Topic 3
	<hr/>
	Introduction of Topic 1
	This is sub topic.1
	This is sub topic.2
	This is sub topic.3
	This is sub topic.4
	This is sub topic.5
	This is sub topic.6
	This is sub topic.7
	This is sub topic.8
	This is sub topic.9
	This is sub topic.10
	This is sub topic.11
	This is sub topic.12
	<hr/>
	Introduction of Topic 2
	This is sub topic.1
	This is sub topic.2

Note: Whenever Topic 1/Topic2/Topic 3 is clicked the location of the active content is to its respective marked area. Similarly the navigation can be done to Top/Bottom/Particular Location within a Webpage.

1.5 IMAGES TAGS

Explanation: The Image HTML Tag displays the image/s that can improve the design and the appearance of a Webpage of a Website. The browser puts the image where the image tag occurs in the document. If you put an image tag between two paragraphs, the browser shows the first paragraph, then the image, and then the second paragraph.

Purpose: Used to insert image in HTML Document

Type: Empty Tag.

Syntax: The IMG Tag is used to display Image in the HTML Document. Example :

<IMG..... >

Attributes:

- SRC: Specifies the path of the Image File Source.
- HEIGHT: Specifies the height of the inserted Image. Values is assigned in pixels or percentages. Example : HEIGHT=200.
- WIDTH: Specifies the width of the inserted Image. Values is assigned in pixels or percentages. Example : WIDTH="100".
- ALT: A mandatory attribute that specifies an alternate text for an image, when the image cannot be displayed. Example: ALT="BAOU".
- BORDER: Specifies Image border thickness. Values is assigned in pixels, value 0 means Image with no border should be displayed. Example: BORDER=0.
- ALIGN: Sets the alignment of the image according to the Webpage margins. Values = left (default), right, center and justify. Example: ALIGN= "center"

Example 7: HTML programs to demonstrate Image as Background as well as desired location.

Solution:

```
<HEAD>
```

```
    <TITLE>HTML Image Tag</TITLE>
```

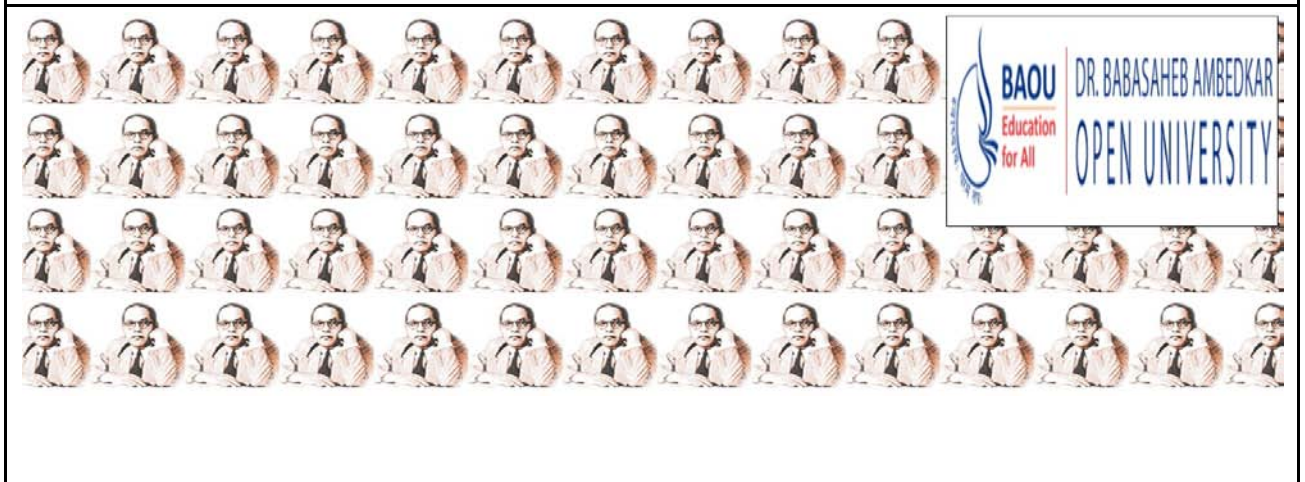
```
</HEAD>
```

```
<BODY BACKGROUND="baba_img_n.jpg">
```

```
<IMG SRC="baou_logo_n.png" ALIGN="RIGHT" ALT="BAOU"  
BORDER=1 WIDTH=350 HEIGHT=250>
```

```
</BODY>
```

Output



1.6 SPECIAL CHARACTERS AND HORIZONTAL TAGS

- **Special Characters**

Explanation: Many special symbols are needed to be included in HTML

Document these are known as Special Characters. These are also known as Character Entities/Entities.

Purpose: Used to insert Symbols or Punctuation in HTML Document. Example: “, &, <, >, Space and others.

Syntax: The Character Entity is begins with ampersand Symbol, followed by entity number or defined Entity Name and ends with a semicolon. To include Special Characters either of the two methods can be used:

- Entity Number: The Special Character/Entity is identified by a defined Entity Number. Example: Quotation mark Symbol (“) can be included by using the format and Entity Number `"`;

- Entity Name: The Special Character/Entity is identified by a defined Entity Name. Example: Quotation mark Symbol (“) can be included by using the format and Entity Name "
- Some Special Characters/Entities which are used in HTML Document are described in Table 3.

Table 3: Some Special Characters/Entities in HTML Document

Description	Entity Number	Entity Name	Symbol
Quotation mark	"	"	“
Ampersand	&	&	&
Less than	<	<	<
Greater than	>	>	>
Non-breaking Space	 	 	
Inverted exclamation	¡	¡	¡
Cent sign	¢	¢	¢
Pound sterling	£	£	£
Yen sign	¥	¥	¥
Copyright	©	©	©
Registered trademark	®	®	®
Fraction one-fourth	¼	¼	¼
Fraction one-half	½	&frac21;	½
Fraction three-fourths	¾	¾	¾
Inverted question mark	¿	¿	¿
en dash	–	–	-
em dash	—	—	—
dagger	†	†	†
Horizontal ellipsis	…	…	...
Euro	€	€	€
trademark	™	™	™

Example 8: HTML programs to demonstrate Special Characters.

Solution:

```

<HEAD>
  <TITLE>HTML Special Characters</TITLE>
</HEAD>
<BODY>
  <H1><U>Using Special Character</U></H1>
  <H2>With Entity Number </H2>&#38;
  <H2>With Entity Name</H2>&amp;
</BODY>

```

Output	<u>Using Special Character</u>
	With Entity Number
	&
	With Entity Name
	&

- **Horizontal Rules Tag**

Explanation: The Horizontal Rules or Horizontal Line is used to draw a Horizontal Line either for representing different section of Content, Horizontal Rule (HTML 4.01) or a thematic break (HTML 5). However, the Horizontal Rule Tag that displays a horizontal rule in visual browsers, but is now defined in semantic terms, rather than presentational terms.

Purpose: Used to insert a Horizontal line to separate content (or define a change) in a HTML Document.

Type: Empty Tag.

Syntax: The HR Tag is used to display Horizontal Line in the HTML Document. Example: <HR >

Attributes:

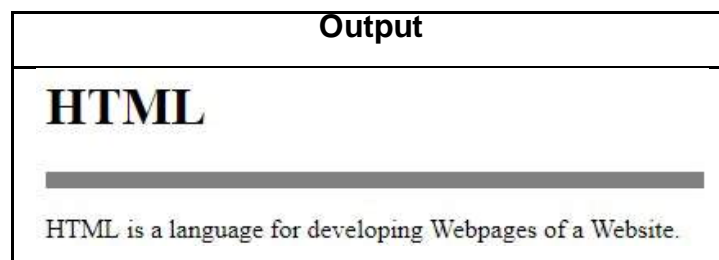
- ALIGN: Sets the alignment of the Horizontal Rule according to the Webpage margins. Values = left, center, right. Example: ALIGN="center"
- NOSHADE: Specifies that a Horizontal Rule should render in one solid color (noshaded), instead of a shaded color. Example: NOSHADE

- SIZE: Specifies the height of a Horizontal Rule. Value is given in pixels or %. Example: SIZE = 100
- WIDTH: Specifies the width of a Horizontal Rule. Value is given in pixels or %. Example: WIDTH = 100

Example 9: HTML programs to demonstrate Horizontal Rule Tag.

Solution:

```
<HEAD>
  <TITLE>HTML Horizontal Rule Tag </TITLE>
</HEAD>
<BODY>
  <H1>HTML</H1>
  <HR ALIGN="LEFT" NOSHADE SIZE=10 WIDTH=400>
  <P>HTML is a language for developing Webpages of a Website.</P>
</BODY>
```



1.7 LISTS

Explanation: The information or the content can be represented in the form of list in the HTML Documents. In HTML the list can be represented in two ways, Ordered List and Unordered List.

Purpose: Used to represent the contents in form of Ordered List (sequential Numbers/Alphabets) or Unordered List (Bullets) in a HTML Document.

Type: Container Tag.

- **Ordered List Tag:**An ordered list is represents list of items that are marked with Numbers/Alphabets.

Syntax:

- An Ordered list starts with the opening tag and ends with Closing Tag having list of Items in between.
- Each list item starts with the opening tag and ends with Closing Tag having in between one Item name per ... tag.
- By default the list items will be marked with number.

Attributes:

TYPE: Defines the type of the list item marker as mentioned below.

- TYPE="1" : List items will be marked with numbers (Default).
- TYPE="A" : List items will be marked with uppercase letters.
- TYPE="a" : List items will be marked with lowercase letters.
- TYPE="I" : List items will be marked with uppercase roman numbers.
- TYPE="i" : List items will be marked with lowercase roman numbers.

Example 10: HTML programs to demonstrate Ordered List Tag.

Solution:

```
<HEAD>
  <TITLE>HTML Ordered List Tag </TITLE>
</HEAD>
<BODY>
  <H2>Ordered List with Alphabets</H2>
  <OL type="A">
    <LI>List Item 1</LI>
    <LI>List Item 2</LI>
    <LI>List Item 3</LI>
  </OL>
</BODY>
```


Output	<p style="text-align: center;">Ordered List with Alphabets</p> <p>A. List Item 1 B. List Item 2 C. List Item 3</p>
---------------	---

- **Unordered List Tag:** An ordered list is represents list of items that are marked with Particular Symbols called as Bullets.

Syntax:

- An Unordered list starts with the opening tag and ends with Closing Tag having list of Items in between.
- Each list item starts with the opening tag and ends with Closing Tag having in between one Item name per ... tag.
- By default the list items will be marked with small black circles Bullets.

Attributes:

TYPE: Defines the type of the list item marker as mentioned below.

- TYPE="disc" : List items will be marked with a small black circle Bullet (default).
- TYPE="circle" : List items will be marked with a circle.
- TYPE="square" : List items will be marked with a Square.
- TYPE="none" : List items will not be marked.

Example 11: HTML programs to demonstrate Unordered List Tag.

Solution:

```

<HEAD>
    <TITLE>HTML Ordered List Tag </TITLE>
</HEAD>
<BODY>
    <H2>Unordered List with Circle Bullets</H2>
    <UL type="circle">

```

```
<LI>List Item 1</LI>
<LI>List Item 2</LI>
<LI>List Item 3</LI>
</UL>
</BODY>
```

Output	Unordered List with Circle Bullets <ul style="list-style-type: none">◦ List Item 1◦ List Item 2◦ List Item 3
---------------	---

1.8 META ELEMENT TAG

Explanation: The Meta Element Tag of HTML provides Metadata that signifies data/information about another data. Metadata is machine parsable and is not displayed on the Webpage.

Purpose: The Meta Elements are usually used to specify page description, keywords, author of the document, last modified and another metadata. The metadata or the information about another data can be used by browsers to display content or reload page, Search Engine's keywords and even other Web Services.

Type: Empty Tag.

Syntax:

- The <META> tags are embedded within <HEAD> Tag of HTML Document.
- Metadata is always passed as name/value pairs.

Attributes:

- NAME: Specifies a name for the metadata. Values = application-name, author, description, generator, keywords and viewport.
- CONTENT: Gives the value associated with the http-equiv or name attribute. Values = text.
- HTTP-EQUIV: Provides an HTTP header for the information/value of the content attribute. Values = content-type, default-style, refresh.

Example 12: HTML programs to demonstrate Meta Tag.

Solution:

```
<HEAD>
  <TITLE>HTML Meta Tag </TITLE>
  <META NAME="description" CONTENT="Description for Website">
  <META NAME="keywords" CONTENT="HTML, CSS, XML, JavaScript">
  <META NAME="author" content="Mr. XYZ">
  <META NAME="viewport" content="width=device-width, initial-scale=1.0">
</HEAD>
<BODY>
<P>!!!All Meta Data/ information go in the Head section of HTML Document!!!</P>
</BODY>
```

Output
!!!All Meta Data/ information go in the Head section of HTML Document!!!

1.9 LET US SUM UP

Hello Friends, now as you have completed this unit, you should be able to learn the concept, working and importance of Hyper Text markup Language. The various HTML Tags like formatting; paragraph; Heading; Link; Images; Special Characters; Horizontal Rules; Lists and meta element tag attributes, purpose and implementation should have been understood.

1.10 CHECK YOUR PROGRESS

- Define:Hyper Text Markup Language and HTML Tags.
- _____ Tag starts a new line where paragraph is not required in HTML Document. [<p>,
, <!-->, None of these]

- Full form for below
 - HTML
 - SGML
 - WYSIWYG
- HTML has 10 levels of Headings represented by Heading Tags.[True/False].
- The Entity Name for Trademark Special Character is _____.
- The HTML Tags can be _____ and _____ Tags.
[Specific/Container/Empty/Core]

1.11 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Definition:

Hyper Text Markup Language: Hypertext Markup Language (HTML) is the standard markup language mainly used for developing Webpages of a Website that can even be called as a Web Application.

HTML Tags: HTML Tags also called as HTML Element is used to indicate the structure and format of a Web Document.
- **
** Tag starts a new line where paragraph is not required in HTML Document.
- Full forms
 - HTML : Hyper Text Markup Language
 - SGML : Standard Generalized Markup Language
 - WYSIWYG : What You See Is What You Get
- HTML has 10 levels of Headings represented by Heading Tags.**False**
- The Entity Name for Trademark Special Character is **™**
- The HTML Tags can be **Container** and **Empty** Tags.

1.12 FURTHER READING

Online Reference Reading as PDF:

<http://egyankosh.ac.in/bitstream/123456789/9954/1/Unit-2.pdf> [About Basic HTML Tags Pg. 31-43]

Online Reference Reading as Video:

- <https://www.youtube.com/watch?v=QEtWL4IWIL4&list=PLFDF119180A908779> [About HTML tags]
- <https://www.youtube.com/watch?v=omuyzDmNaf4> [About HTML tags]

1.13 ASSIGNMENTS

1. Explain the Structure of a HTML Document
2. Write Steps to Create a HYML Document.
3. Give difference between :
 - a. External and Internal Link Tag of HTML.
 - b. Ordered and Unordered List of HTML
4. Write a short note on Image Tag of HTML.
5. How to insert a Horizontal Line in HTML Document? Explain.

1.14 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

- Design a Webpage using Image, Link, paragraph and Horizontal Line Tag.
- “Hypertext Markup Language is the standard and most powerful markup language for creating web pages and web applications”, justify the statement in your opinion.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a Program in HTML for HTML Document to:

- Create a First HTML Webpage having basic HTML Tags.
- Demonstrate <H1> to <H6> Heading Tags.
- Create External link of: Text, Image and Email.
- Generate an Internal Link within a HTML Document.
- Insert an Image in Background and any desired location
- Insert a Special Character Copyright © Symbol.
- Insert a Horizontal Line between two paragraphs.
- Generate an Ordered List for 3 items of Type “1”.
- Generate an Unordered List for 3 items of Type “square”.
- Execute Meta Element Tag.

Unit 2: Designing HTML Table

2

Unit Structure

- 2.1. Learning Objectives.
- 2.2. Introduction to Designing Tables in HTML.
- 2.3. HTML Table Main Tags.
- 2.4. <TABLE> Tag.
- 2.5. <CAPTION> Tag.
- 2.6. <TH> Tag.
- 2.7. <TR> Tag.
- 2.8. <TD> Tag.
- 2.9. Let us sum up.
- 2.10. Check your Progress.
- 2.11. Check your Progress: Possible Answers.
- 2.12. Further Reading.
- 2.13. Assignment.
- 2.14. Activities.

2.1 LEARNING OBJECTIVE

Hello Learners, in the Block 2 - Unit 2 you will be able to learn and understand Designing HTML Table Using Hyper Text Markup Language and its associated Attributes used to incorporate a table in a Webpage of a Website. After studying this Unit student should be able to:

- Organize Data in form of Tables in Webpage using <TABLE> Tag.
- Provide Title to a Table using <CAPTION> Tag.
- Format table using Table Tag attributes like: BORDER, BORDERCOLOR, FRAME, RULES, CELLSPACING, CELLPADDING, ALIGN, BGCOLOR, HEIGHT AND WIDTH.
- Give Table Heading using Table Heading <TH> Tag.
- Insert and manage Table Row using <TR> Tag.
- Add the data in the Table Cell using <TD> Tag and its attributes.

2.2 INTRODUCTION TO DESIGNING TABLES IN HTML

Explanation:

- A table is a grid structured into columns and rows like a Spreadsheet in a Webpage of a Website Design.
- A Table is a collection of related data arranged in form of cells, rows and columns in a tabular format.
- The Data in Cell can be in form of text, Hyperlinks, images, nested tables or other.
- The tables are considered as two dimensional complex structures of rows and Columns of Cell
- An example of basic Table representation is shown in Table 1 below where the first Row represents Table Header Row 1/ Column 1, Table Header Row 2/ Column 2 and so on while the second row represents Table Row 1/ Table Data 1, Table Row 2/ Table Data 6 and so on.

Table 1: Basic Table Structure

Table Header Row 1/ Column 1	Table Header Row 2/ Column 2	Table Header Row 3/ Column 3	Table Header Row 4/ Column 4
Table Row 1/Table Data 1	Table Row 1/Table Data 2	Table Row 1/Table Data 3	Table Row 1/Table Data 4
Table Row 2/Table Data 5	Table Row 2/Table Data 6	Table Row 2/Table Data 6	Table Row 2/Table Data 8
.	.	.	.
.	.	.	.
.	.	.	.
Table Row N/Table Data N	Table Row N/Table Data N	Table Row N/Table Data N	Table Row N/Table Data N

Purpose: The Table in Webpage a technique to organize and display data in columns and rows that can be useful for:

- Numeric and Text Data summary and presentation.
- Category wise communication.
- Results Displays.
- Comparative Data Analysis.
- Creating Database

2.3 HTML TABLE MAIN TAGS

Explanation:The main Tag is used to design the basic structure of table. All the Tags and sub-Tags are Container Tags. The main tags used to create a Table in HTML are listed and defined in the below Table 2.

Table 2: HTML TABLE MAIN TAGS

Tag	Description
<TABLE>... </TABLE>	<ul style="list-style-type: none"> • Defines a Table with this tag. • It is used to insert table on a Webpage of a Website.

	<ul style="list-style-type: none"> • Tag wraps up a table and all its related elements.
<CAPTION>...</CAPTION>	<ul style="list-style-type: none"> • Defines a caption of a Table. • Used to describe the Title for the Table.
<TH>...</TH>	<ul style="list-style-type: none"> • Stands for Table Header. • Defines Table's Header. • By default the contents declared as Table Header are displayed in a unique style format i.e. bold.
<TR>...</TR>	<ul style="list-style-type: none"> • Stands for Table Row. • Defines Table's each Row. • Used to begin new row in a Table.
<TD>...</TD>	<ul style="list-style-type: none"> • Stands for Table Data. • Defines Table's Data of each cell. • Using it data cells is described.

Note for Practical: All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.

Example 1: HTML program to demonstrate basic Table Tag and its utility in HTML Document.

Solution:

```

<HEAD>
  <TITLE>HTML TABLE MAIN TAGS</TITLE>
</HEAD>
<BODY>
  <TABLE>
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>

```

```

        </TR>
        <TR>
            <TD>FOUR</TD>
            <TD>FIVE</TD>
            <TD>SIX</TD>
        </TR>
    </TABLE>
</BODY>

```

Output	A SIMPLE TABLE ONE TWO THREE FOUR FIVE SIX
---------------	--

2.4 <TABLE> TAG

Explanation: The <TABLE> Tag is the main external tag within which all the other tags used to create a Table structure are defined.

Purpose: Creates a Table like structure in a Webpage of a Website in a HTML Document.

Type: Container Tag

Syntax: The table grid is created by enclosing table details with opening <TABLE> Tag and a Closing </TABLE> Tag. Example : <TABLE>... Other related tags used to create a Table ... </TABLE>

Attributes: The <TABLE> Tag has various attributes that contribute to formatting and customization of the Table Structure. The <TABLE> Tag attributes are listed and described in the below.

- **<TABLE> Tag BORDER Attribute:** The BORDER attribute is used to specify the border of a Table in a Webpage of a Website of HTML Document. The value of the attribute is given in pixel. Like : <TABLE BORDER=3>...</TABLE>

Example 2: HTML programs to demonstrate BORDER attribute of <TABLE> Tag.

Solution:

```
<HEAD>
  <TITLE>HTML TABLE BORDER ATTRIBUTE</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=1>
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>
    <TR>
      <TD>FOUR</TD>
      <TD>FIVE</TD>
      <TD>SIX</TD>
    </TR>
  </TABLE>
</BODY>
```

OUTPUT	A SIMPLE TABLE		
	ONE	TWO	THREE
	FOUR	FIVE	SIX

- **<TABLE> Tag BORDERCOLOR Attribute:** The BORDERCOLOR Attribute is used to specify the Border Color of a Table in a Webpage of a Website of an HTML Document. The value of the attribute is given in Hexa value or Color Name. Like : <TABLE BORDERCOLOR= "green">...</TABLE>

Example 3: HTML programs to demonstrate BORDERCOLOR attribute of <TABLE> Tag.

Solution:

```
<HEAD>
  <TITLE>HTML TABLE BORDERCOLOR ATTRIBUTE</TITLE>
```

```

</HEAD>
<BODY>
  <TABLE BORDER=1 BORDERCOLOR="red">
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>
    <TR>
      <TD>FOUR</TD>
      <TD>FIVE</TD>
      <TD>SIX</TD>
    </TR>
  </TABLE>
</BODY>

```

OUTPUT	A SIMPLE TABLE		
	ONE	TWO	THREE
	FOUR	FIVE	SIX

- **<TABLE> Tag BGCOLOR Attribute:** The BGCOLOR Attribute is used to specify the background color of a Table in a Webpage of a Website of HTML Document. The value of the attribute is given in Hexa value or Color Name. Like : <TABLE BGCOLOR= "green">...</TABLE>

Example 4: HTML programs to demonstrate BGRCOLOR attribute of <TABLE> Tag.

Solution:

```


<HEAD>
  <TITLE>HTML TABLE BGCOLOR ATTRIBUTE</TITLE>
</HEAD>
<BODY>

```

```

<TABLE BORDER=1 BORDERCOLOR="red"
BGCOLOR="green">
  <CAPTION>A SIMPLE TABLE</CAPTION>
  <TR>
    <TD>ONE</TD>
    <TD> TWO</TD>
    <TD>THREE</TD>
  </TR>
  <TR>
    <TD>FOUR</TD>
    <TD>FIVE</TD>
    <TD>SIX</TD>
  </TR>
</TABLE>
</BODY>

```

OUTPUT	
--------	--

- **<TABLE> Tag BACKGROUND Attribute:** The BACKGROUND Attribute is used to set an image as the background of a Table in a Webpage of a Website of HTML Document. The value of the attribute will be path of an image. Like :
<TABLE BACKGROUND = "baba_img_n.jpg"> ...</TABLE>

Example 5: HTML programs to demonstrate BGRCOLOR attribute of <TABLE> Tag.

Solution:

```

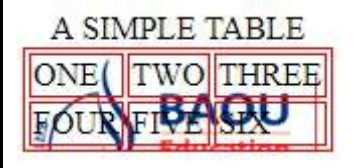
<HEAD>
  <TITLE>HTML TABLE BACKGROUND ATTRIBUTE</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=1 BORDERCOLOR="red"
    BACKGROUND="baou_logo_n.png">

```

```

<CAPTION>A SIMPLE TABLE</CAPTION>
  <TR>
    <TD>ONE</TD>
    <TD>TWO</TD>
    <TD>THREE</TD>
  </TR>
  <TR>
    <TD>FOUR</TD>
    <TD>FIVE</TD>
    <TD>SIX</TD>
  </TR>
</TABLE>
</BODY>

```

OUTPUT	
--------	--

- <TABLE> Tag FRAME Attribute:** The FRAME Attribute allows to state which portion of the border in a Table of a Webpage in a Website of HTML Document will be displayed (render). The values of the attribute that can be specified for FRAME attribute are:
 - above - displays top edge only.
 - below – displays bottom edge only.
 - border – displays all four sides.
 - box – display all four sides(like border).
 - hsides – displays top and bottom edges.
 - lhs – displays left edge only.
 - rhs – displays right edge only.
 - void – displays no border.
 - vsides – displays left and right sides.

Example : <TABLE FRAME = "above"> ...</TABLE>

Example 6: HTML programs to demonstrate FRAME attribute of <TABLE> Tag.

Solution:

```
<HEAD>
  <TITLE>HTML TABLE FRAME ATTRIBUTE</TITLE>
</HEAD>
<BODY>
  <TABLE FRAME ="vsides">
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>
    <TR>
      <TD>FOUR</TD>
      <TD>FIVE</TD>
      <TD>SIX</TD>
    </TR>
  </TABLE>
</BODY>
```

OUTPUT	A SIMPLE TABLE ONE TWO THREE FOUR FIVE SIX
---------------	--

- **<TABLE> Tag RULES Attribute:** The RULES Attribute like FRAME attribute also deals with the BORDER attribute, differs that RULES deals with the inside border edges in a Table of a Webpage in a Website of HTML Document. The values of the attribute that can be specified for RULES attribute are:

all – displays all borders.

cols – displays border between cells.

groups – displays borders between all cell group

none – hides all interior borders.

rows – displays borders between rows only.

Like : <TABLE RULES = "cols"> ...</TABLE>

Example 7: HTML programs to demonstrate RULES attribute of <TABLE> -
Tag.

Solution:

```
<HEAD>
  <TITLE>HTML TABLE RULES ATTRIBUTE</TITLE>
</HEAD>
<BODY>
  <TABLE RULES ="all">
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>
    <TR>
      <TD>FOUR</TD>
      <TD>FIVE</TD>
      <TD>SIX</TD>
    </TR>
  </TABLE>
</BODY>
```

OUTPUT	A SIMPLE TABLE		
	ONE	TWO	THREE
	FOUR	FIVE	SIX

- **<TABLE> Tag CELLSPACING Attribute:** The CELLSPACING Attribute specifies the amount of space between cells of a Table in a Webpage of a Website in HTML Document. The values of the CELLSPACING attribute can be specifies in pixels OR percentage.

Like : <TABLE CELLSPACING=1> ...</TABLE>

Example 8: HTML programs to demonstrate CELLSPACING attribute of <TABLE> Tag.

Solution:

```

<HEAD>
    <TITLE>HTML TABLE CELLSPACING ATTRIBUTE</TITLE>
</HEAD>
<BODY>
<TABLE BORDER=3 CELLSPACING=6>
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
        <TD>ONE</TD>
        <TD>TWO</TD>
        <TD>THREE</TD>
    </TR>
    <TR>
        <TD>FOUR</TD>
        <TD>FIVE</TD>
        <TD>SIX</TD>
    </TR>
</TABLE>
</BODY>

```

OUTPUT	A SIMPLE TABLE					
	<table border="1"> <tr> <td>ONE</td> <td>TWO</td> <td>THREE</td> </tr> <tr> <td>FOUR</td> <td>FIVE</td> <td>SIX</td> </tr> </table>	ONE	TWO	THREE	FOUR	FIVE
ONE	TWO	THREE				
FOUR	FIVE	SIX				

- **<TABLE> Tag CELLPADDING Attribute:** The CELLPADDING attribute specifies the amount of space between the cell border and the cell contents of a Table in a Webpage of a Website in HTML Document. In other words it can be used to specify the space between cell boundary and text. The values of the CELLPADDING attribute can be specified in pixels OR percentage. Like :
<TABLE CELLPADDING =1> ...</TABLE>

Example 9: HTML programs to demonstrate CELLPADDING attribute of <TABLE> Tag.

Solution:

```
<HTML>
  <HEAD>
    <TITLE>HTML TABLE CELLPADDING ATTRIBUTE</TITLE>
  </HEAD>
  <BODY>
    <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12>
      <CAPTION>A SIMPLE TABLE</CAPTION>
      <TR>
        <TD>ONE</TD>
        <TD>TWO</TD>
        <TD>THREE</TD>
      </TR>
      <TR>
        <TD>FOUR</TD>
        <TD>FIVE</TD>
        <TD>SIX</TD>
      </TR>
    </TABLE>
  </BODY>
</HTML>
```

OUTPUT	A SIMPLE TABLE		
	ONE	TWO	THREE
	FOUR	FIVE	SIX

- **<TABLE> Tag ALIGN Attribute:** The ALIGN attribute is used to align the Table in Left, Center or Right in HTML Document. The values of the ALIGN attribute are left, center and right. Like : `<TABLE ALIGN =“center”> ...</TABLE>`

Example 10: HTML programs to demonstrate ALIGN attribute of <TABLE> Tag.

Solution:

```

<HEAD>
  <TITLE>HTML TABLE ALIGN ATTRIBUTE</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
  ALIGN="CENTER">
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>
    <TR>
      <TD>FOUR</TD>
      <TD>FIVE</TD>
      <TD>SIX</TD>
    </TR>
  </TABLE>
</BODY>

```

OUTPUT											
<table border="1" style="margin: auto;"> <tr> <td colspan="3">A SIMPLE TABLE</td> </tr> <tr> <td>ONE</td> <td>TWO</td> <td>THREE</td> </tr> <tr> <td>FOUR</td> <td>FIVE</td> <td>SIX</td> </tr> </table>			A SIMPLE TABLE			ONE	TWO	THREE	FOUR	FIVE	SIX
A SIMPLE TABLE											
ONE	TWO	THREE									
FOUR	FIVE	SIX									

- **<TABLE> Tag HEIGHT AND WIDTH Attribute:** The HEIGHT AND WIDTH attribute is used to specify the height and width of the table respectively. The values of the HEIGHT AND WIDTH attribute can be specified in pixels OR percentage. Like : `<TABLE HEIGHT = "100px" WIDTH = "40px"> ...</TABLE>`

Example 11: HTML programs to demonstrate HEIGHT AND WIDTH attribute of <TABLE> Tag.

Solution:

```

<HEAD>
<TITLE>HTML TABLE HEIGHT AND WIDTH ATTRIBUTE</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
    HEIGHT="200px" WIDTH="80px" >
    <CAPTION>A SIMPLE TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>
    <TR>
      <TD>FOUR</TD>
      <TD>FIVE</TD>
      <TD>SIX</TD>
    </TR>
  </TABLE>
</BODY>

```

OUTPUT	A SIMPLE TABLE		
	ONE	TWO	THREE
	FOUR	FIVE	SIX

2.5 <CAPTION> TAG

<CAPTION> Tag: The <CAPTION> TAG <TABLE> Tag defines the title of a Table attribute in a HTML Document. The Title is written in between the opening <CAPTION>and closing </CAPTION> Tag. This tag is specified opening <TABLE> and closing </TABLE> Tag.Like : <CAPTION>Table Title </CAPTION>

Example 12: HTML programs to demonstrate <CAPTION> TAG.

Solution:

```

<HEAD>
  <TITLE>HTML TABLE CAPTION TAG</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
    HEIGHT="200px" WIDTH="80px" >
    <CAPTION>A NUMBERED TABLE</CAPTION>
    <TR>
      <TD>ONE</TD>
      <TD>TWO</TD>
      <TD>THREE</TD>
    </TR>

```

```

<TR>
    <TD>FOUR</TD>
    <TD>FIVE</TD>
    <TD>SIX</TD>
</TR>
</TABLE>
</BODY>

```

OUTPUT	A NUMBERED TABLE		
	ONE	TWO	THREE
	FOUR	FIVE	SIX

2.6 <TH> TAG

<TH> Tag: The Table Header <TH> Tag is used to specify a Header Row within a Table in a HTML Document. The Header Text is written in between the opening <TH>and closing </TH> Tag. This tag is specified opening <TABLE> and closing </TABLE> Tag. The content specified between Header Row is formatted distinctly as Bold. Like: **<TH>Header Text </TH>**

Example 13: HTML programs to demonstrate <TH> TAG.

Solution:

```

<HEAD>
    <TITLE>HTML TABLE HEADER ROW TAG</TITLE>
</HEAD>
<BODY>
    <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
        HEIGHT="200px" WIDTH="80px" >
        <CAPTION>A NUMBERED TABLE</CAPTION>

```

```

<TR>
  <TH>HEADER ROW 1</TH>
  <TH>HEADER ROW 2</TH>
  <TH>HEADER ROW 3</TH>
</TR>
<TR>
  <TD>ONE</TD>
  <TD>TWO</TD>
  <TD>THREE</TD>
</TR>
<TR>
  <TD>FOUR</TD>
  <TD>FIVE</TD>
  <TD>SIX</TD>
</TR>
</TABLE>
</BODY>

```

OUTPUT	A NUMBERED TABLE		
	HEADER ROW 1	HEADER ROW 2	HEADER ROW 3
	ONE	TWO	THREE
	FOUR	FIVE	SIX

2.7 <TR> TAG

<TR> Tag: The Table Row <TR> Tag is used to specify a Table Row within a Table in a HTML Document. The Table Row Text is written in between the opening <TR>and closing </TR> Tag. This tag is specified opening <TABLE> and closing </TABLE> Tag. Every row in a Table is specified with separate opening <TR>and

closing </TR> Tag, that means total number of rows will be equivalent to total number of opening <TR>and closing </TR> Tag. Like: <TR>...</TR>

Example 14: HTML programs to demonstrate <TR> TAG.

Solution:

```
<HEAD>
  <TITLE>HTML TABLE ROW TAG</TITLE>
</HEAD>
<BODY>
<TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
  HEIGHT="200px" WIDTH="80px" >
  <CAPTION> A NUMBERED TABLE</CAPTION>
  <TR>
    <TH>HEADER ROW 1</TH>
    <TH>HEADER ROW 2</TH>
    <TH>HEADER ROW 3</TH>
  </TR>
  <TR>
    <TD>TABLE ROW 1: A</TD>
    <TD>TABLE ROW 1: B</TD>
    <TD>TABLE ROW 1: C</TD>
  </TR>
  <TR>
    <TD>TABLE ROW 2: D</TD>
    <TD>TABLE ROW 2: E</TD>
    <TD>TABLE ROW 2: F</TD>
  </TR>
</TABLE>
</BODY>
```

OUTPUT	A NUMBERED TABLE		
	HEADER ROW 1	HEADER ROW 2	HEADER ROW 3
	TABLE ROW 1 : A	TABLE ROW 1 : B	TABLE ROW 1 : C
	TABLE ROW 2 : D	TABLE ROW 2 : E	TABLE ROW 2 : F

2.8 <TD> TAG

<TD> Tag: The Table Data <TD> Tag is used to specify a Table Data within a Row of a Table in a HTML Document. The Table Data Text is written in between the opening <TD>and closing </TD> Tag. This tag is specified main opening <TABLE>, opening <TR>, closing </TR> Tag and closing </TABLE> Tag. Every Table data that means Cell Data in a Table is specified with separate opening <TD>and closing </TD> Tag, that means total number of cell will be equivalent to total number of opening <TD>and closing </TD> Tag. Like: **<TD>Cell Text</TD>**

Example 15: HTML programs to demonstrate <TD> TAG.

Solution:

```

<HEAD>
  <TITLE>HTML TABLE DATA TAG</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
  HEIGHT="200px" WIDTH="80px" >
    <CAPTION> A NUMBERED TABLE</CAPTION>
    <TR>
      <TH>HEADER ROW 1</TH>
      <TH>HEADER ROW 2</TH>

```

```

        <TH>HEADER ROW 3</TH>
    </TR>
    <TR>
        <TD>TABLE ROW 1: Cell DATA 1</TD>

        <TD>TABLE ROW 1: Cell DATA 2</TD>

        <TD>TABLE ROW 1: Cell DATA 3</TD>

    </TR>
    <TR>
        <TD>TABLE ROW 2: Cell DATA 4</TD>
        <TD>TABLE ROW 2: Cell DATA 5</TD>
        <TD>TABLE ROW 2: Cell DATA 6</TD>
    </TR>
</TABLE>
</BODY>

```

A NUMBERED TABLE			
HEADER ROW 1	HEADER ROW 2	HEADER ROW 3	
TABLE ROW 1 : Cell DATA 1	TABLE ROW 1 : Cell DATA 2	TABLE ROW 1 : Cell DATA 3	OUTPUT
TABLE ROW 2 : Cell DATA 4	TABLE ROW 2 : Cell DATA 5	TABLE ROW 2 : Cell DATA 6	

- **Attributes of <TD> tag:** The <TD> Tag has a list of attributes that can be used to format the Table Data content as well as enhance the table features. The various <TD> Tag attributes are specified in the below Table 3.

Table 3: <TD> Tag Attributes

<TD> Tag Attributes	Description
ALIGN	Specified to control the horizontal alignment of the contents of a cell. The values of the ALIGN attribute are left, center and right. Example : <TD ALIGN =“center”> ...</TD>
WIDTH	Specified to define width of cells. WIDTH attribute can be specifies in pixels OR percentage. Example : <TD WIDTH =“40px”> ...</TD>
BACKGROUND	Specified to set an image as background in a data cell. The value of the attribute will be path of an image. Example : <TD BACKGROUND = “baba_img_n.jpg”> ...</TD>
BGCOLOR	Specified to change background color of data cells. The value of the attribute is given in Hexa value or Color Name. Example : <TD BGCOLOR= “green”>...</TD>
ROWSPAN	Used to specify the span of a cell. The value is given in numbers. Example : <TD ROWSPAN= 2>...</TD>
COLSPAN	Used to specify the span of a cell. The value is given in numbers. Example : <TD COLSPAN= 2>...</TD>
VALIGN	Specifies the vertical alignment when cells has span of more than one row. The values can be : Top, Middle and Bottom. <TD VALIGN =“MIDDLE”>...</TD>

Example 16: HTML programs to demonstrate Attributes of <TD> Tag.

Solution:

```
<HEAD>
  <TITLE>HTML TABLE DATA TAG ATTRIBUTES</TITLE>
</HEAD>
<BODY>
  <TABLE BORDER=3 CELLSPACING=6 CELLPADDING=12
    HEIGHT="200px" WIDTH="80px" >
  <CAPTION>HTML TABLE DATA TAG ATTRIBUTES</CAPTION>
    <TR>
      <TH>HEADER ROW 1</TH>
      <TH>HEADER ROW 2</TH>
      <TH>HEADER ROW 3</TH>
      <TH>HEADER ROW 4</TH>
    </TR>
    <TR>
      <TD>TABLE DATA TAG ATTRIBUTES</TD>
      <TD ALIGN="LEFT" >Left Aligned</TD>
      <TD ROWSPAN=2 VALIGN="BOTTOM">Rowspan & Vertical Bottom
        Align</TD>
      <TD BGCOLOR="GREEN">BGCOLOR</TD>
    </TR>
    <TR>
      <TD COLSPAN=2 BACKGROUND="baba_img_n.jpg"
        VALIGN="BOTTOM">Colspan &
        Background</TD>
      <TD >HTML TABLE TAG COMPLETED
    </TD>
  </TABLE>
</BODY>
```

OUTPUT

HTML TABLE DATA TAG ATTRIBUTES			
HEADER ROW 1	HEADER ROW 2	HEADER ROW 3	HEADER ROW 4
TABLE DATA TAG ATTRIBUTES	Left Aligned	Rowspan & Vertical Bottom Align	BGCOLOR
Colspan & Background			HTML TABLE TAG COMPLETED

Friends, some Other <TABLE> Tags that are seldom used due to some deformity constraints of a table are:

- **<THEAD> Tag:** Specifies a set of header rows. The constraint is that it can be specified only one time in a table within a HTML Document.
- **<TBODY> Tag:** Specifies the table body. Similar constrains as <THEAD> that it can be specified only one time in a table within a HTML Document.
- **<TFOOT> Tag:** Specifies a set of footer rows. Similar constrains as <THEAD> and <TBODY> that it can be specified only one time in a table within a HTML Document.

2.9 LET US SUM UP

Hello Friends, now as you have completed this unit, you should be able to learn the concept of Designing Tables in HTML. Along with this you must have understood HTML Table Tags like HTML Table Main Tags, <TABLE> Tag, <CAPTION> Tag, <TH> Tag, <TR> Tag and <TD> Tag.

2.10 CHECK YOUR PROGRESS

- Define: HTML Table and <TABLE> Tag.
- The _____ Attribute is used to specify the background color of a Table in a Webpage of a Website of HTML Document. [BGCOLOR,BACKGROUND, BORDERCOLOR, NONE OF THIS]
- Give full form for below :
 - TH
 - TR
 - TD
- The CELLPADDING Attribute specifies the amount of space between cells of a Table in a Webpage of a Website in HTML Document. [True/False]
- The CELLSPACING attribute specifies the amount of space between the cell border and the cell contents of a Table in a Webpage of a Website in HTML Document.[True/False]
- The <CAPTION> TAG <TABLE> Tag defines the _____ of a Table attribute in a HTML Document. [Title/Caption/Header/Footer]

2.11 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- **Definition:**
 - HTML Table: A table is a grid structured into columns and rows like a Spreadsheet in a Webpage of a Website Design.
 - <TABLE> Tag: The <TABLE> Tag is the main external tag within which all the other tags used to create a Table structure are defined.
- The **BGCOLOR** Attribute is used to specify the background color of a Table in a Webpage of a Website of HTML Document.
- **Full forms are:**
 - TH = Table Header

- TR = Table Row
 - TD = Table Data
- The CELLPADDING Attribute specifies the amount of space between cells of a Table in a Webpage of a Website in HTML Document. **False**
- The CELLSPACING attribute specifies the amount of space between the cell border and the cell contents of a Table in a Webpage of a Website in HTML Document. **False**
- The <CAPTION> TAG <TABLE> Tag defines the **Title** of a Table attribute in a HTML Document.

2.12 FURTHER READING

Online Reference Reading as PDF:

<https://www.w3.org/TR/html401/struct/tables.html> [ABOUT HTML TABLE TAG]

Online Reference Reading as Video:

<https://nptel.ac.in/courses/106105084/15>[ABOUT HTML TABLE TAG]

2.13 ASSIGNMENTS

6. Give the purpose of Table in HTML Document.
7. List and explain HTML Table Main Tags.
8. Give difference between :
 - a. <CAPTION> TAG VERSUS <TH> TAG
 - b. <TR> TAG VERSUS <TD> TAG
9. List and define all attributes of <TABLE> tag
10. Write a short note on attributes of <TD> tag.

2.14 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

- Design a Table having all attributes of <TABLE> Tag.
- “The HTML <table> element represents tabular data — that is, information presented in a two-dimensional table comprised of rows and columns of cells containing data”, justify the statement in your opinion.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a Program in HTML for HTML Document to:

- Create a Table having 2 Rows and three columns.
- Demonstrate Table Attributes: CAPTION, BORDER, BORDERCOLOR, BGCOLOR, BACKGROUND, CELLSPACING, CELLPADDING, ALIGN, HEIGHT, WIDTH.
- Create Table Header in a table having 2 Rows and three columns.
- Generate a Table :

Device	Brand	Feature
Mouse	Logitech	Wireless
Laptop	Lenovo	360 degree rotation

Unit 3: Designing HTML Forms

3

Unit Structure

- 3.1. Learning Objectives.
- 3.2. Introduction to Designing Forms in HTML.
- 3.3. Processing Forms in HTML.
- 3.4. Creating Forms using HTML `<FORM>` TAG and `<INPUT>` Tag.
- 3.5. Text Input Controls.
- 3.6. Checkbox and Radio Option Control.
- 3.7. Select Box and File Select Box Control.
- 3.8. Hidden Controls.
- 3.9. Clickable, Submit and Reset Button Control.
- 3.10. Let us sum up.
- 3.11. Check Your Progress
- 3.12. Check your Progress: Possible Answers.
- 3.13. Further Reading.
- 3.14. Assignment.
- 3.15. Activities.

3.1 LEARNING OBJECTIVE

Hello Learners, in the Block 2 - Unit 3 you will be able to learn and understand Designing HTML Forms Using Hyper Text Markup Language and its associated Attributes used to incorporate different Form Controls in a Webpage of a Website as following:

- Concept of Form in HTML Document.
- Creating and Designing Form in HTML Document using <FORM> Element.
- Adding HTML Form Controls in the HTML Document like : Different Text Inputs, Checkboxes, Radio Box, Select Box, File Select boxes, Hidden Controls, Clickable Buttons, Submit and Reset Buttons

3.2 INTRODUCTION TO DESIGNING FORMS in HTML

Friends, a Form are an element that is used to take input in form of some required data from the user/visitor with his/her consent in a Website for future/further reference. This type of form is known as Web Form. Example: Suppose any Internet user wants to use Email service of Website, before using any such service the user need to register on the Website with details like Name, Date of Birth, ID, Password, Contact Number and others.

Facts to Ponder:

- A HTML document can have multiple Forms in a document while the Form elements cannot be nested.
- The Forms in HTML Document can be coded effortlessly.
- Main Purpose of form is to collect User Inputs from Web Document.
- It supports to submit data from its controls to the Web Server.
- It is used to define and restrict the data input from User.
- The form can incorporate many controls like different types of Text field, Radio Buttons, Check boxes, Menu buttons, Scrolling lists, Buttons and others.

3.3 PROCESSING FORMS in HTML

Learners, broadly a Form in HTML document are used to display Information as well as it is a mode of communication between User and a Web Server. The processing of the HTML Document Form is elaborated below.

- The HTML Forms also known as Web-Forms/Fill-Out Forms firstly takes required inputs in a Form from the User/Visitor of a Website.
- The simplest and commonly used approach to manage the data submitted by user in HTML Form is, sending the information to a server side dedicated application developed mostly in scripting language or other platform.
- Following same the information is posted to a Back-end Application such as Common Gateway Interface (CGI) script written in Active Server Page or PHP or other residing on a Web Server. Nowadays the CGI Script are written in Computer Languages like Perl and Python, while when fast processing is required it is written in C, C++ or JAVA.
- The information received on a Web Server will be processed as per the requirement by the backend script or a program having the well defined processing logic. In the Latest Trends the Server Side programming is replaces by another approach of processing the HTML Forms. The approach performs all processing through an Email where User/Visitor needs to first confirm the data/information to further progress the action before a backend Software handles all.

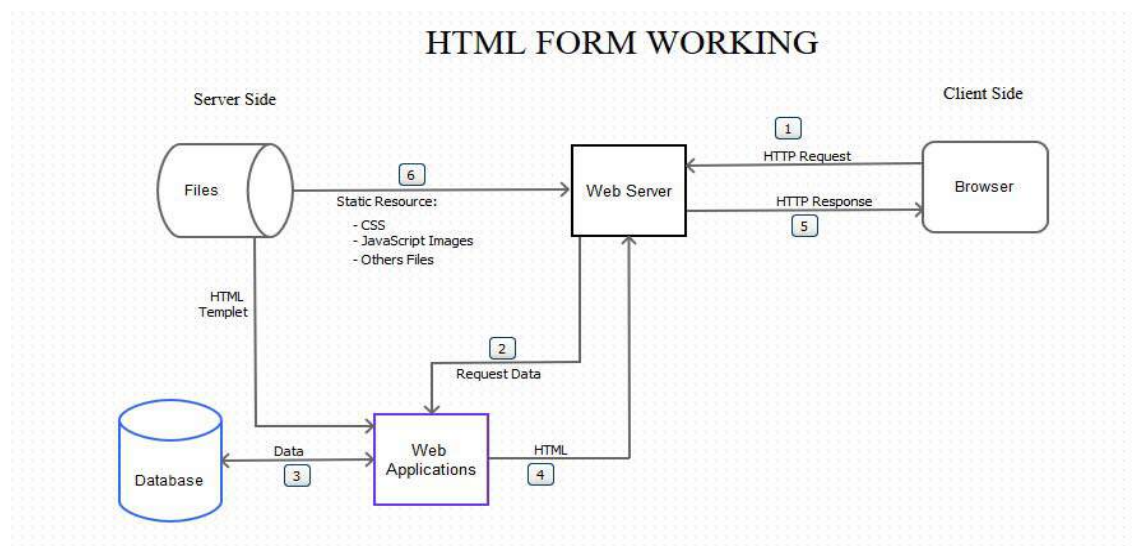


Figure 1: Process of Forms in HTML

The Figure 1 displays the User Side and Client Side HTML Form Processing that can be elaborated by below steps

Step 1: At Client Side the User/Visitor sends the HTTP requests through the Web Browser to the Web Server for a Web Document having

Step 2: At Server side the Web Server Request the Data and sends information to the Backend Web Applications. The information is transferred to the Backend Application Software. The approach by which the data reached destination depends upon scripting logic. Usually the Web Application as well as CGI is developed by the same developer hence the required encoded format can be customized according to the Website Owner.

Step 3: The Backend Web Applications at Server Side searches the data from the Database and receives the requested Data from the local Database and other related Database at Server end. The Backend Application Software can even process the information stored in database and even stores it at Database Server.

Step 4: The Web Application then submits the data to the Web Server. Step 5:

Step 5: A Webpage is generated by Backend Application Software that is returned as a response to the User/Visitor.

Step6: The Web Server even receives the Static Web Resources from File Database at Server End that is send as response to the User/Visitor at Client End so that he/she can further progress as per his/her requirement.

3.4 CREATING FORMS USING HTML `<FORM>` TAG AND `<INPUT>` TAG

- **`<FORM>` TAG**

Explanation: The HTML Forms are mainly use for user input from a Web Page as in some Email Service Providers website, E-Commerce, Tutorials and other interactive websites. An HTML form contains Form Elements that are different types of input elements, like text fields, checkboxes, radio buttons, submit buttons, and more.

In the HTML structure the Web Form is defined in the `<BODY> ... </BODY>` Tag section of HTML Structure as shown below:

```
<HTML>
  <HEAD>
    <TITLE>
  </TITLE>
  </HEAD>
  <BODY>
    <FORM>
    ...
    ...
    ...
    </FORM>
  </BODY>
</HTML>
```

Purpose: Used to take various types of inputs of the User from the Webpage of HTML Document.

Type: Container Tag

Attributes:

- NAME: Denotes a specific unique name of FORM. Eg. : NAME="UNIQUE"
- ACTION: Defines the action to be performed when the form is submitted. It is used to send the data of FORM to the web page on the server when the user clicks submit button.Example. : ACTION="TOI.ASP"
- TARGET: Specifies if the submitted result will open in a new browser tab, a frame, or in the current window.The default value is "_self" which means the form will be submitted in the current window.To make the form result open in a new browser tab, use the value "_blank". Example. : TARGET="_SELF"
- METHOD: Specifies the HTTP method (GET or POST) to be used when submitting the form data:
 - GET METHOD: When GET is used, the submitted form data will be visible in the page address field.
 - POST METHOD: The POST method does not display the submitted form data in the page address field.Example: METHOD="post"

- **<INPUT> TAG**

Explanation:The <INPUT> element is the most important FORM element.The <INPUT> element can be displayed in several ways, depending on the type attribute.

Purpose: Specifies Input Control or field to receive the Input from the user in a webpage.

Type: Empty Tag

Attributes:

- NAME: Denotes a specific unique name of the input element. Example. :
NAME= "StudentID"
- TYPE: Specifies the type of data collected through input field. Its values can be Text, checkbox, radio, select, file, hidden, submit, reset and others.

Example:

<INPUT TYPE="text"> : Defines a one-line text input field
<INPUT TYPE="radio"> : Defines a radio button (for

selecting one of many choices)

<INPUT TYPE="submit"> : Defines a submit button (for submitting the form).

- CHECKED: Indicates that the input element is checked when it is loaded at first time in the Web Browser.
- VALUE: Defines the default value of the Element. Example. :
VALUE="M.SC.(IT)"

Example 1: Program to demonstrate <FORM> TAG AND <INPUT> TAG
Solution:

```
<BODY>
```

```
<FORM ACTION="/action_page.php">
```

```
<H1> Details of Student </H1>
```

```
<HR><BR>
```

```
Enter Your Name :<BR>
```

```
<INPUT TYPE="text" value="Student_name">
```

```
<BR>
<BR>
  Enter Your College Name :<BR>
<INPUT TYPE="text" value="Clg_name">
<BR><BR>
<INPUT TYPE="submit" value="Submit">
</FORM>
</BODY>
```

Output
<p style="text-align: center;">Details Of Student</p> <hr/> <p>Enter Your Name: <input type="text" value="Student_name"/></p> <p>Enter Your College Name: <input type="text" value="Clg_name"/></p> <p style="text-align: center;"><input type="submit" value="Submit"/></p>

Note for Practical: All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.

3.5 TEXT INPUT CONTROLS

Explanation: **Specifies Text input from the user in a Webpage. There are 3 types of Text Input Controls:**

- Single-Line Text Input Control
- Password Input Control
- Multi-Line Text Input Controls

- **Single-Line Text Input Control:** This control is used for scenarios that require only one line of user input, such as search boxes or names. They are created using HTML `< INPUT >` tag but type attribute is set to Text.

Syntax : `< INPUT TYPE="TEXT">`

Attributes:

- **TYPE:** Indicates the type of input control and for text input control it will be set to text.
- **NAME:** Gives a name to the control which is sent to the server to be recognized and get the value.
- **VALUE:** Provides an initial value inside the control.
- **SIZE:** Allows specifying the maximum number of characters a user can enter into the text box.
- **MAXLENGTH:** Allows specifying the maximum number of characters a user can enter into the text box.

Example 2: **HTML program to demonstrate Single-Line Text Input Control.**

Solution:

FIRST NAME : `< INPUT TYPE="TEXT" NAME="FIRST_NAME"/>`

LAST NAME : `< INPUT TYPE="TEXT" NAME="LAST_NAME"/>`

OUTPUT	
FIRST NAME:	<input type="text"/>
LAST NAME:	<input type="text"/>

- **Password Input Control:** This is also a single-line text input but it masks the character soon as a user enters it. They are also created using HTML `< INPUT >` tag but type attribute is set to password.

Syntax : `< INPUT TYPE="password">`

Attributes:

- **TYPE:** Indicates the type of input control and for password input control it will be set to password.

- **NAME:** Gives a name to the control which is sent to the server to be recognized and get the value.
- **VALUE:** Provides an initial value inside the control.
- **SIZE:** Specify the width of the text-input control in terms of characters.
- **MAXLENGTH:** Specify the maximum number of characters a user can enter into the text box.

Example3:

```
USER ID :< INPUT TYPE="TEXT" NAME="USER_ID"/>
PASSWORD :< INPUT TYPE="PASSWORD" NAME="PASSWORD"/>
```

The screenshot shows a window titled "Output" containing two text input fields. The first field is labeled "User id:" and the second is labeled "password:". Both fields are empty and have a standard rectangular border.

- **Multi-Line Text Input Control:** Used when user is required to give details that may be longer than a single sentence. Multi-line Input Controls are created using < TEXTAREA > Tag. It is a container Tag.

Syntax:< TEXTAREA > tag.

Attributes:

- **NAME:** Give a name to the control which is sent to the server to be recognized and get the value.
- **Rows:** Indicates the number of rows of text area box.
- **Cols:** Indicates the number of columns of text area box.

Example4:

```
< TEXTAREA ROWS="5" COLS="50" NAME="description"> enter Your Description Here..... </TEXTAREA >.
```

The screenshot shows a window titled "Output" containing a multi-line text area. The text area has a light gray background and a thin border. The text "ENTER YOUR DESCRIPTION HERE....." is displayed at the top. Below the text area, there is a horizontal bar with a black and white checkered pattern. The text area has a vertical scrollbar on the right side and a horizontal scrollbar at the bottom.

3.6 CHECKBOX AND RADIOBOX CONTROL

- **Checkbox Control:** Used when more than one option is required to be selected. They are also created using `< INPUT >` tag but type attribute is set to CHECKBOX.

Syntax :`< INPUT TYPE= "checkbox" >`

Attributes:

- **TYPE:**Indicates the type of input control and for checkbox input control it will be set to checkbox.
- **NAME:**Gives a name to the control which is sent to the server to be recognized and get the value.
- **VALUE:**Used if the checkbox is selected.
- **CHECKED:**Set to checked if you want to select it by default.

Example5:

```
< INPUT TYPE="CHECKBOX" NAME="maths" VALUE="ON">maths
```

```
< INPUT TYPE="CHECKBOX" NAME="physics" VALUE="ON">physics
```

Output	
<input type="checkbox"/> maths	<input type="checkbox"/> physics

- **Radio Control:** Used when out of many options, just one option is required to be selected. They are also created using `< INPUT >` tag but type attribute is set to RADIO.

Syntax :`< INPUT TYPE= "radio" >`

Attributes:

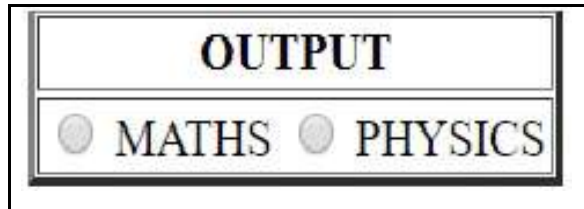
- **TYPE:**Indicates the type of input control and for checkbox input control it will be set to radio.
- **NAME:**Gives a name to the control which is sent to the server to be recognized and get the value.
- **VALUE:**Used if the radio box is selected.
- **CHECKED:**Set to checked if you want to select it by default.

Example6:

```
< INPUT TYPE="RADIO" NAME="SUBJECT" VALUE="MATHS"> MATHS
```

```
< INPUT TYPE="RADIO" NAME="SUBJECT" VALUE="PHYSICS">
```

PHYSICS



3.7 SELECT BOX AND FILE SELECT BOX CONTROL

- **Select Box:** Select box,also called drop down box which provides option to list down various options in the form of drop down list, from where a user can select one or more options.

Syntax:<SELECT NAME="dropdown">

```
< OPTION VALUE="maths" Selected>maths
```

```
< /SELECT>
```

Attributes:

- **NAME:** Gives name to the control which is sent to the server to be recognized and get the value.
- **SIZE:**Used to present a scrolling list box.
- **MULTIPLE:**if set to multiple then allows a user to select multiple items from the menu.
- **CHECKED:**checked set to checked if you want to select it by default.

Example7:

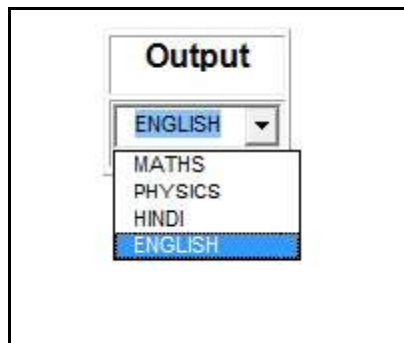
```
< SELECT NAME="dropdown">
```

```
< OPTION VALUE="MATHS" selected>MATHS
```

```
< OPTION VALUE="PHYSICS" selected>PHYSICS
```

```
< OPTION VALUE="HINDI" selected>HINDI
```

```
< OPTION VALUE="ENGLISH" selected>ENGLISH  
< /SELECT>
```



- **File Select/Upload Box Control:** If you want to allow a user to upload a file to your web site, you will need to use a file select/upload box, also known as a file select box. This is also created using the `< input>` element but type attribute is set to file.

Syntax:`<INPUT TYPE="file">`

Attributes:

- Name: **Gives name to the control which is sent to the server to be recognized and get the value.**
- Accept:**specifies the type of files that the server accepts.**

Example8:

```
< INPUT TYPE="file" NAME="fileupload" ACCEPT="image/*" />
```



3.8 HIDDEN CONTROLS

Friends, Hidden form controls are used to hide data inside the page which later on can be pursued to the server; this control hides inside the code and does not appear on the actual page. For example, following hidden form is being used to keep current

page number. When a user will click next page then the value of hidden control will be sent to the web server and there it will decide which page will be displayed next based on the passed current page.

Syntax:`<INPUT TYPE="HIDDEN">`

Example9:

```
< P> this is page 10
```

```
< INPUT TYPE="HIDDEN" NAME="PAGENAME" VALUE="10"/>
```

```
< INPUT TYPE="SUBMIT" NAME="SUBMIT" VALUE="SUBMIT"/>
```

```
< INPUT TYPE="RESET" NAME="RESET" VALUE="RESET"/>
```

Output	
This is page 10	
<input type="submit" value="SUBMIT"/>	<input type="reset" value="RESET"/>

3.9 CLICKABLE, SUBMIT AND RESET BUTTON CONTROL

Friends, the clickable controls are the controls that perform an action after the clicking on it. Two Clickable Controls most commonly used are:

- **Submit Button Control**
- **Reset Button Control**

- **Submit Button Control**

Explanation: The submit button is used whenever you want to confirm and submit the provided details in the Form.

Syntax: `< INPUT TYPE="SUBMIT">`

Example10:

```
< INPUT TYPE="SUBMIT" VALUE="SUBMIT NOW"/>
```

Output

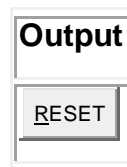


- **Reset Button Control**

Explanation: The reset button is used to clear the inputs by the user while filling a Form in a Webpage of a Website.

Example11:

```
< INPUT TYPE="RESET" VALUE="RESET"/>
```



3.10 LET US SUM UP

Hello friends, now as you have completed this unit, you should be able to learn the concept, working and importance of Forms in HTML. The various HTML FormsControls like Text Input Control, Check Box Control, Radio Button Control, Select Box Control, File Select Box Format, Submit Button, Reset Button purpose and implementation should have been understood.

3.11 CHECK YOUR PROGRESS

- Define: 1. Forms
 2. Checkbox
 3. Radio Button
 4. File Select Box
- _____ Tag is used to create any kind of form button like Radio Button, Check Box, Select Box, etc. [INPUT, TAG, ELEMENT, FORM]
- How many types of Text Input Control are there?
- Write difference between select box and file select box.

3.12 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

➤ Definition:

1. Forms: A Form are an element that is used to take input in form of some required data from the user/visitor with his/her consent in a Website for future/further reference.

2.Checkbox: Used when more than one option is required to be selected.

3.Radio Button:Used when out of many options, just one option is required to be selected.

4. File Select Box:If you want to allow a user to upload a file to your web site, you will need to use a file select/upload box, also known as a file select box.

➤ **INPUT** tag is used to create any kind of form button like radio button, check box, select box, etc.

➤ There are 3 types of Input Text Input Control:

- Single-Line Text Input Control
- Password Input Control
- Multi-Line Text Input Controls

➤ Difference:

<p>➤ Purpose: the submit button is used whenever you want to submit a form.</p> <p>➤ Example:</p> <pre>< INPUT TYPE="SUBMIT" VALUE="SUBMIT NOW"/></pre> <div style="border: 1px solid black; padding: 5px; text-align: center;"><p>Output</p><input type="submit" value="SUBMIT NOW"/></div>	<p>Purpose: the reset button is used to clear the inputs by the user and the markup looks like this:</p> <p>Example:</p> <pre>< INPUT TYPE="RESET" VALUE="RESET"/></pre> <div style="border: 1px solid black; padding: 5px; text-align: center;"><p>Output</p><input type="reset" value="RESET"/></div>
--	---

3.13 FURTHER READING

Online Reference Reading as PDF:

<http://pdf.coreservlets.com/HTML-Forms.pdf>[About HTML Form Pg. 603-657]

Online Reference Reading as Video:

<https://www.youtube.com/watch?v=TeV2eDHtVa0> [About HTML Forms]

3.14 ASSIGNMENTS

11. Explain the Text Input Control.
12. Write Steps to Create a Radio button.
13. Write a short note on HTML Forms.
14. Explain Hidden controls.

3.15 Activities

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Create a college admission form using all the Form Controls you have learned.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a Program in HTML for HTML Document to:

- Code a HTML Form which has male and female options with Radio Controls.
- Code a HTML Form which has Checkbox and it includes many college options you want to apply for after your M.Sc. (IT) course.
- Suppose you are uploading an image and you want to select a file from your files which control box you use and write a code for it.
- By using Text Input Controls code user id and password but remember while coding you must masks the password.

Unit 4: Designing HTML Frames

4

Unit Structure

- 4.1. Learning Objectives.
- 4.2. Introduction to Designing Frame in HTML.
- 4.3. Designing Frames using Frame Document Structure.
- 4.4. Enhancing Frame Functionalities.
- 4.5. IFrame Tag.
- 4.6. Let us sum up.
- 4.7. Check Your Progress
- 4.8. Check your Progress: Possible Answers.
- 4.9. Further Reading.
- 4.10. Assignment.
- 4.11. Activities.

4.1 LEARNING OBJECTIVE

Hello Learners, in the Block 2 - Unit 4 you will be able to learn and understand :

- Concept of HTML frames Using Hyper Text Markup Language.
- Designing HTML Frames using Frame Document Structure through Frameset and Frame Elements.
- Enhancing Frames by improvising <FRAME> Tag Source; <FRAMESET> Tag: Frame Size, Margin between Frame, Border; and Frames Linking
- Working with iFrame.

4.2 INTRODUCTION TO DESIGNING FRAME IN HTML

Friends, HTML FRAMES are the elements used to partition the Web Browser window into multiple partitions in a HTML Document. Using these partitions each section in HTML Document can be used to load and open another different HTML Document.

Facts to Ponder:

- The Web Browser Window is divided into FRAMES in a similar way the tables are organized: into rows and columns.
- A collection of FRAMES in the browser window is known as a FRAMESET.
- Frames are displayed well defined in desktop, Laptop and other big screen display devices.
- The back button of browser is not applicable to navigate in frames.
- A Frame is created by using Frame document that specifies the frame regions on Web Browser and the display content within the frame is specifically loaded in the form of different HTML Documents using Hypertext anchors source tags.
- The structure of a frame-enabling HTML document type is similar to usual HTML structure. The key difference in an HTML document type is that the BODY container element is basically replaced by a FRAMESET container element.

4.3 DESIGNING FRAMES USING FRAME DOCUMENT STRUCTURE

- **HTML Frame Designing Process**

In a HTML Document, the Frames can be created, designed and controlled using a FRAME structure having various elements and following the procedure as elaborated below.

- Process 1: Incorporating <FRAMESET> TAG/ELEMENT in the basic HTML Document structure in place of <BODY> Tag to define the Frame that designs the Webpage.
- Process 2: Constructing the Frames/partitions/divisions for HTML Document content using <FRAME> TAG/ELEMENT that specifies the sub-documents that will appear initially in each partitions of Frame.
- Process 3: Creating a separate HTML Document to be displayed in separate respective Frame.
- Process 4: Linking/Loading content within the frame with the respective HTML Document using <SRC> ATTRIBUTE.

- **Facts to Ponder:**

- The <FRAMESET> Tag even comprises of nested <FRAMESET> and <FRAME> elements and the nested Frame becomes a Sub-Frame.
- When some User Browser do not support Frame the BODY element can pursue the <FRAMESET> Element to present a substitute HTML Document by including <NOFRAMES> elements whose contents are not to be considered by User Browser that supports Frames.
- The HTML Frame Document encloses a set of Frames where each Frame, utilizes the <BODY> element whose elements does not appear before <FRAMESET> element else the <FRAMESET> will be overlooked.
- The <FRAMESET> Tag has an opening <FRAMESET> Tag and matching </FRAMESET> End Tag.

- **Basic Structure of HTML <FRAME> Tag**

The Basic Structure of HTML <FRAME> Tag is as below.

```

<FRAMESET COLS/ROWS="* , * , *">
    <frame src="DOCUMENT1.HTML">
    <frame src=" DOCUMENT2.HTML ">
    <frame src=" DOCUMENT3.HTML">
    <frame src=" DOCUMENT4.HTML">
</FRAMESET>

```

The role of HTML Frame Elements/Tags/Attributes is defined in the Table 1.

Table 1: HTML Frame Elements/Tags/Attributes

HTML Frame Elements	Attributes	Description
<FRAMESET>... </FRAMESET>	COLS/ROWS="* , *"	Specifies Frames Design
	FRAME BORDER	Specifies pattern of Vertical/ Horizontal Frame.
	BORDER COLOR	Specifies Frame border and Color.
FRAME	SRC="Document.HTML"	Specifies the HTML Document to be loaded or displayed in the created Frame.
	NAME, MARGIN WIDTH, SCROLLING, NORESIZE	Specifies Name, Margin Width, Scrolling, Noresize property of a Frame.

- **Note for Practical:**

- All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.
- To perform the practical four HTML documents are created that will be utilized to be displayed in differently created frames as per Exercise 1 through 4.

Exercise 1 to 4: HTML Program to create four HTML Documents that will be utilized for displays in created frames as displayed in Table 2.

Table 2: Creating HTML Document Solution and Output

HTML Document Name	Solution	Output
FRAME_A.HTML	<pre><BODY> <h1>!!!! Frame A !!!!</h1> <p>!!! Frame A content !!!</p> </BODY></pre>	<p>!!!! Frame A !!!!</p> <p>!!! Frame A content !!!</p>
FRAME_B.HTML	<pre><BODY> <h1>!!!! Frame B !!!!</h1> <p>!!! Frame B content !!!</p> </BODY></pre>	<p>!!!! Frame B !!!!</p> <p>!!! Frame B content !!!</p>
FRAME_C.HTML	<pre><BODY> <h1>!!!! Frame C !!!!</h1> <p>!!! Frame C content !!!</p> </BODY></pre>	<p>!!!! Frame C !!!!</p> <p>!!! Frame C content !!!</p>
FRAME_D.HTML	<pre><BODY> <h1>!!!! Frame D !!!!</h1> <p>!!! Frame D content !!!</p> </BODY></pre>	<p>!!!! Frame D !!!!</p> <p>!!! Frame D content !!!</p>

Exercise 5: HTML Program to demonstrate a simple Frame without <FRAMESET> Tag.

Solution:

```
<BODY>  
<h1>HTML Frame without FRAMESET Tag</h1>  
<p>Content of Frame 1 within Frame 1</p>  
</BODY>
```

Output	HTML Frame without FRAMESET Tag Content of Frame 1 within Frame 1
---------------	---

Exercise 6: HTML Program to demonstrate Web Browser resizable Vertical Frames in Webpage.

Solution:

```
<FRAMESET COLS="*, *, *, *">  
<frame src="FRAME_A.html">  
<frame src="FRAME_B.html">  
  <frame src="FRAME_C.html">  
  <frame src="FRAME_D.html">  
</FRAMESET>
```

Output			
!!!! Frame A !!!! !!! Frame A content !!!	!!!! Frame B !!!! !!! Frame B content !!!	!!!! Frame C !!!! !!! Frame C content !!!	!!!! Frame D !!!! !!! Frame D content !!!

Exercise 7: HTML Program to demonstrate Web Browser resizable Vertical Frames in Webpage.

Solution:

```

<FRAMESET ROWS="*,*,*,>
<frame src="FRAME_A.html">
<frame src="FRAME_B.html">
<frame src="FRAME_C.html">
<frame src="FRAME_D.html">
</FRAMESET>

```

Output
<p>!!!! Frame A !!!!</p> <p>!!! Frame A content !!!</p> <hr/> <p>!!!! Frame B !!!!</p> <p>!!! Frame B content !!!</p> <hr/> <p>!!!! Frame C !!!!</p> <p>!!! Frame C content !!!</p> <hr/> <p>!!!! Frame D !!!!</p> <p>!!! Frame D content !!!</p>

Exercise 8 through 11: HTML Program to demonstrate Web Browser resizable Vertical and Horizontal Frames of different variety of partitions in Webpage as displayed in Table 3.

Table 3: Different Frames Layouts Solution and Output

Exercise No: Exercise 8
<p>Solution:</p> <pre> <FRAMESET COLS="*,*,*,> <FRAMESET ROWS="*,*,> <frame src="FRAME_A.html"> <frame src="FRAME_B.html"> </FRAMESET> <frame src="FRAME_C.html"> </pre>


```
<frame src="FRAME_D.html">
</FRAMESET>
```

Output:

!!!! Frame A !!!! !!! Frame A content !!!	!!!! Frame C !!!! !!! Frame C content !!!	!!!! Frame D !!!! !!! Frame D content !!!
!!!! Frame B !!!! !!! Frame B content !!!		

Exercise No: Exercise 9

Solution:

```
<FRAMESET COLS="*,*,*">
<frame src="FRAME_A.html">
<FRAMESET ROWS="*,*">
<frame src="FRAME_B.html">
<frame src="FRAME_C.html">
</FRAMESET>
<frame src="FRAME_D.html">
</FRAMESET>
```

Output:

!!!! Frame A !!!! !!! Frame A content !!!	!!!! Frame B !!!! !!! Frame B content !!!	!!!! Frame D !!!! !!! Frame D content !!!
	!!!! Frame C !!!! !!! Frame C content !!!	

Exercise No: Exercise 10

Solution:

```

<FRAMESET COLS="*,*">
<frame src="frame_a.html">
<FRAMESET ROWS="*,*">
<frame src="frame_b.html">
<FRAMESET COLS="*,*">
<frame src="frame_c.html">
<frame src="frame_d.html">
</FRAMESET>
</FRAMESET>
</FRAMESET>

```

Output:

<p>!!!! Frame A !!!!</p> <p>!!! Frame A content !!!</p>	<p>!!!! Frame B !!!!</p> <p>!!! Frame B content !!!</p> <table border="1" data-bbox="726 1030 1348 1270"> <tr> <td data-bbox="726 1030 1045 1270"> <p>!!!! Frame C !!!!</p> <p>!!! Frame C content !!!</p> </td> <td data-bbox="1045 1030 1348 1270"> <p>!!!! Frame D !!!!</p> <p>!!! Frame D content !!!</p> </td> </tr> </table>	<p>!!!! Frame C !!!!</p> <p>!!! Frame C content !!!</p>	<p>!!!! Frame D !!!!</p> <p>!!! Frame D content !!!</p>
<p>!!!! Frame C !!!!</p> <p>!!! Frame C content !!!</p>	<p>!!!! Frame D !!!!</p> <p>!!! Frame D content !!!</p>		

Exercise No: Exercise 11

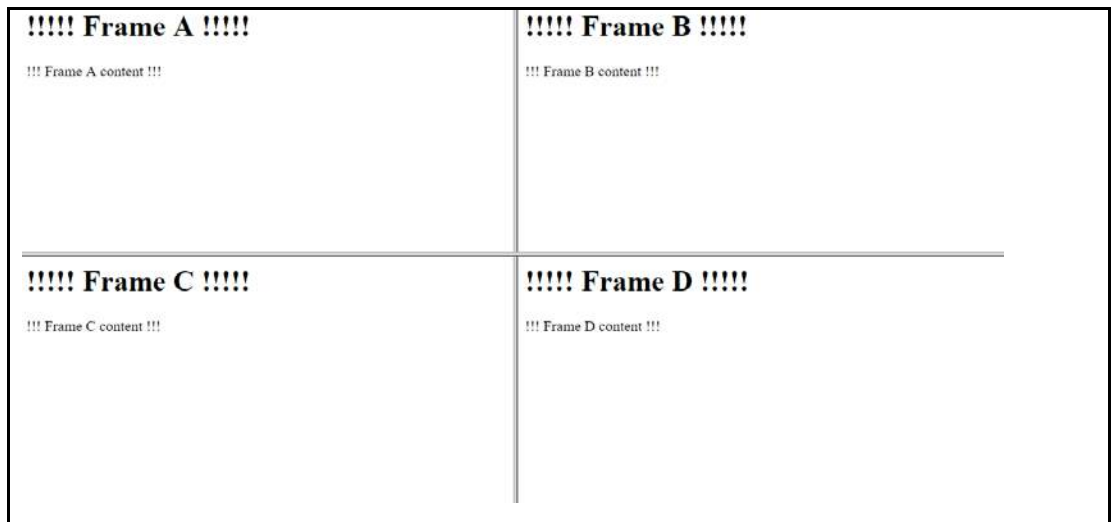
Solution:

```

<FRAMESET ROWS="*,*" COLS="*,*">
<frame src="frame_a.html">
<frame src="frame_b.html">
<frame src="frame_c.html">
<frame src="frame_d.html">
</FRAMESET>

```

Output:



4.4 ENHANCING FRAME FUNCTIONALITIES

The HTML Frame can be made more user friendly, attractive, eye-catching by enhancing the functionalities of <FRAMESET> and <FRAME> Tag. The enhancement that is required in <FRAME> is defined within the Source document and of the <FRAMESET> Tag is defined within the parent document included in the Frameset.

- **Enhancing <FRAME> Tag Source**

Explanation: The Frame can be style as the Webpage with the use of Cascading Style Sheet (CSS). The Style is added to the source document itself either by linking CSS or incorporating CSS in the Source Document as applying CSS to Frameset webpage will not be included in all the individual Source Document of different frames.

Exercise 12: HTML Program to demonstrate Styling a Vertical and Horizontal Frame in a Webpage.

Solution:

Step 1: Include the Cascading Style sheet in FRAME_A.HTML file that is linked to an any Frame featured.

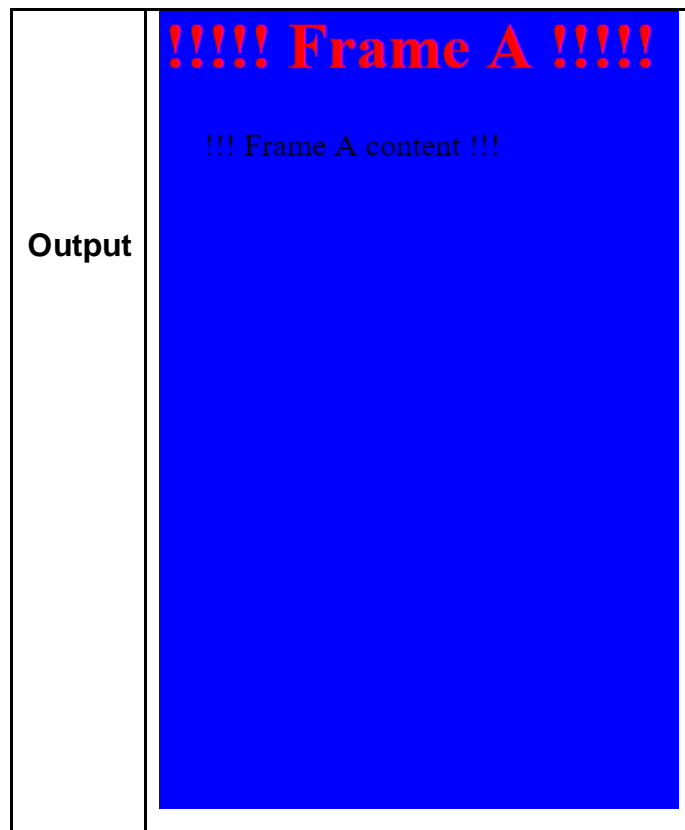
Sample Code:

```
<HEAD>
  <STYLE>
```

```

        body {background: blue;}
        h1 {color: red;}
        p {margin: 20px;}
</STYLE>
</HEAD>
<BODY>
<h1>!!!! Frame A !!!!</h1>
<p>!!! Frame A content !!!</p>
</BODY>

```



Step 2: Update the Webpage code of any frame with the CSS code including Source Document.

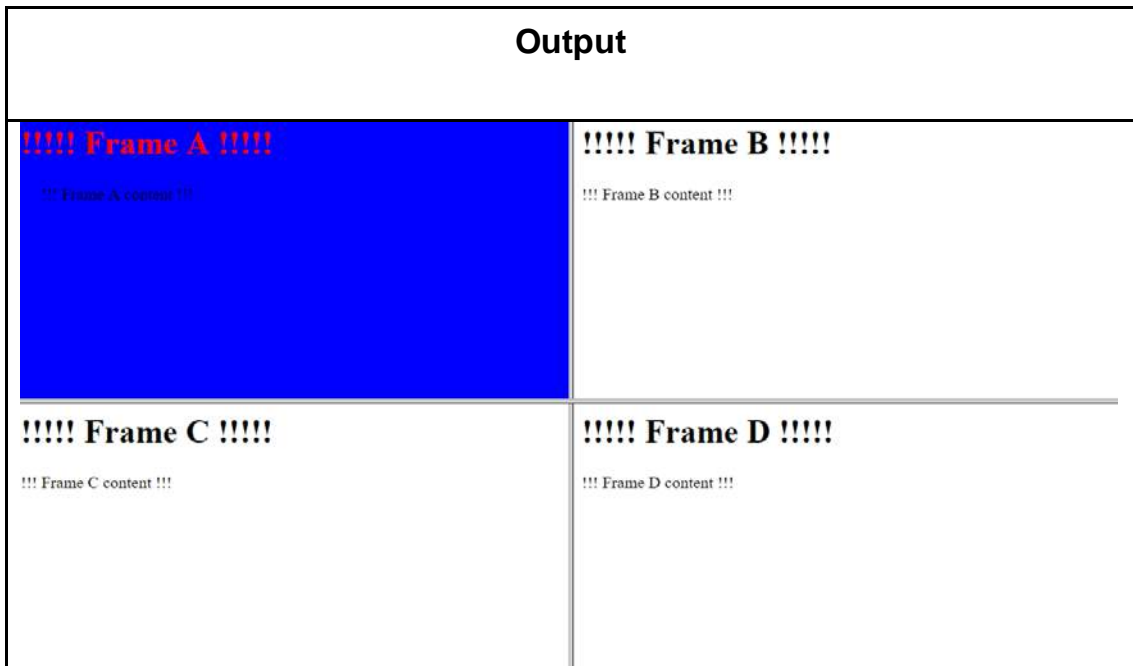
Sample Code:

```

<FRAMESET ROWS="*,*" cols="*,*">
<frame src="FRAME_A_ENHANCEMENT.HTML">
<frame src="FRAME_B.HTML">
<frame src="FRAME_C.HTML">
<frame src="FRAME_D.HTML">

```

</FRAMESET>



- **Enhancing <FRAMESET> Tag**

To enhance the appearance of Frameset, it can be styled as the Webpage by adding additional attributes as well as values to the <FRAME> Tag. The features that can be enhanced are:

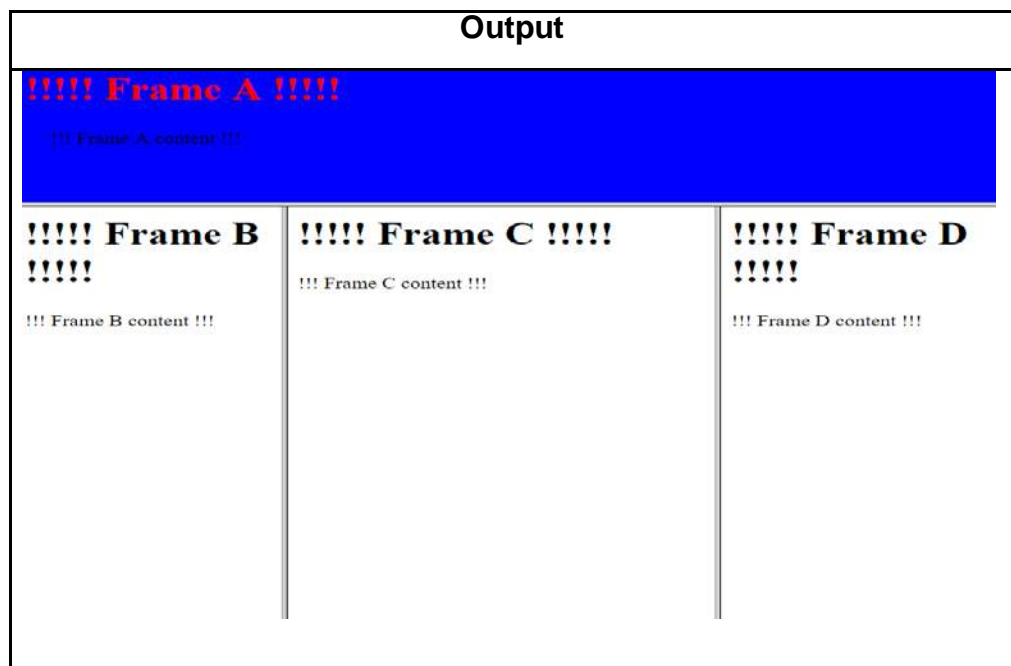
- Frame Size Enhancement.
- Margin between Frame and Borders Enhancement.
- **Frame Size Enhancement**

Explanation: The Frame size enhancement can be done either by defining the size of frame or fixing the size of the frame according to the requirement or even resizing the frame in web Browser display window available space while viewing the Webpage. The Frame Size is defined in either pixels/percentages by providing values in the cols or rows attribute of Frameset. To fix the size in Web Browser window the NORESIZE attribute is added to <FRAME> Tag as the default attribute is resize that allows the visitor to resize the frame in Web Browser Window.

Exercise 13:HTML Program to demonstrate the resizing attribute of the Frame in a Webpage.

Solution: Note in the output of below sample code all the frames can be resized except FRAME_A_ENHANCEMENT.HTML

```
<FRAMESET ROWS="140px,*">  
<FRAME NORESIZE SRC="FRAME_A_ENHANCEMENT.HTML">  
<frameset cols="25%,*,25%">  
<frame src="FRAME_B.HTML">  
<frame src="FRAME_C.HTML">  
<frame src="FRAME_D.HTML">  
</FRAMESET>  
</FRAMESET>
```



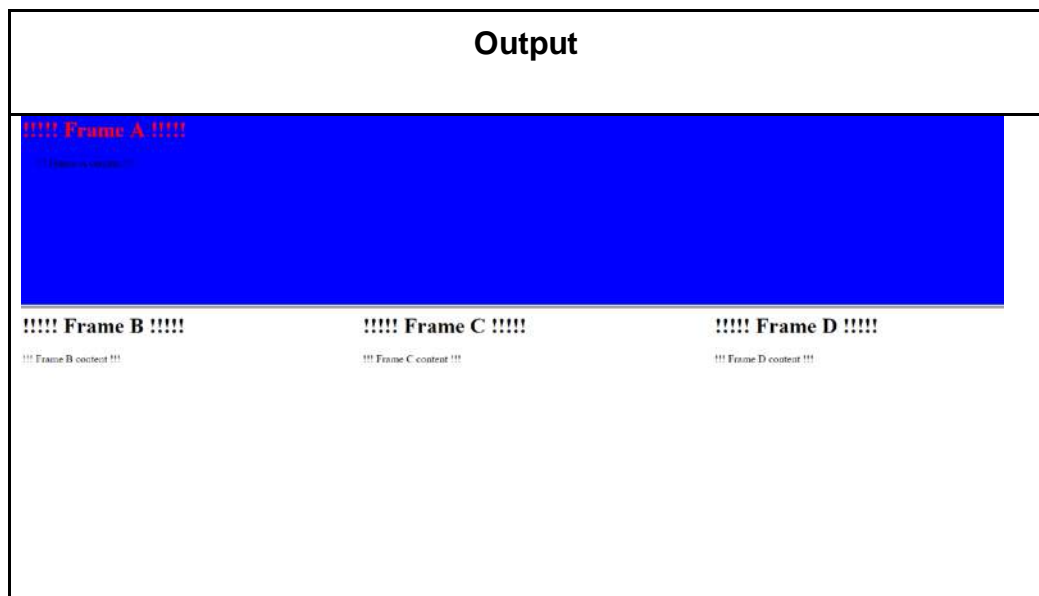
- **Margin between Frame and Borders Enhancement.**

Explanation: The Frame margin can be increase or decreased and even the border can be removed or customized according to the requirement.

Exercise 14:HTML Program to demonstrate the margin and border attribute of the Frame in a Webpage.

Solution:

```
<FRAMESET ROWS="300px,*">  
<frame noresize src="frame_a_enhancement.html" marginheight="20">  
<FRAMESET COLS="33%,*,33%">  
<frame src="frame_b.html" frameborder="0">  
<frame src="frame_c.html" frameborder="0">  
<frame src="frame_d.html" frameborder="0">  
</FRAMESET>  
</FRAMESET>
```



- **Frames Linking Enhancement**

Explanation: The Frame Navigation can be enhanced regardless to the content in other frames by creating Navigation links. The new resource is loaded in one Frame while the other Frames in the Webpage remain static. This is done by using <ANCHOR> TAG that is customized to target a specific Frame by:

- Step 1: Assigning Name Attribute to the Frame tag of the Frame that need to upload the linking tag. Example. <FRAME SRC="FRAME_B.HTML" NAME="mid_col" >

- Step 2: the <Anchor> Tag in the Source Document is added with TARGET attribute. Example: LOAD FRAME_B.HTML

Exercise 15:HTML Program to demonstrate Frame Linking Enhancement in a Webpage.

Solution:

- **Step 1:** In Frame HTML Document assigning Name Attribute to the Frame tag of the Frame that need to upload the linking tag.

Sample Code:

```
<FRAMESET ROWS="300px,*">
<frame noresize src="FRAME_A_ENHANCEMENT.HTML" marginheight="20">
  <FRAMESET COLS="33%,*,33%">
<frame src="frame_b_LINKING.html" frameborder="0">
<frame src="frame_c.html" name="center_col" frameborder="0">
<frame src="frame_d.html" frameborder="0">
</FRAMESET>
</FRAMESET>
```

- **Step 2:** In the Source Documentthe <Anchor> Tag is specified with TARGET attribute having the Name attribute value assignment in Frame Document.

Solution:

```
<BODY>
<h1>!!!! Frame B !!!!</h1>
<p>!!! Frame B content !!!</p>
  <UL>
    <li><a href="FRAME_A_ENHANCEMENT.HTML"
      target="center_col">Load
      FRAME_A_ENHANCEMENT.HTML</a></li>
    <li><a href="FRAME_B_LINKING.HTML" target="center_col">Load
      FRAME_B_LINKING.HTML</a></li>
    <li><a href="FRAME_C.HTML" target="center_col">Load
      FRAME_C.HTML</a></li>
```




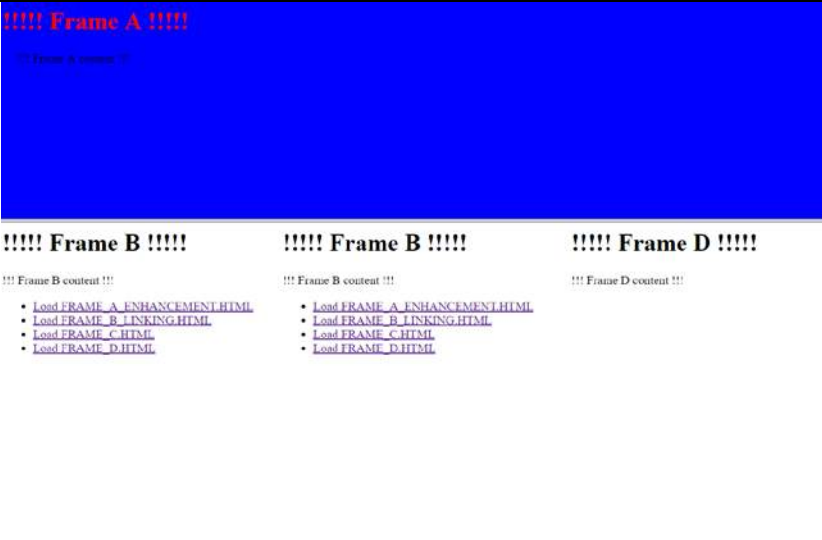
```
<li><a href="FRAME_D.HTML" target="center_col">Load
      FRAME_D.HTML</a></li>
```

```
</UL>
```

```
</BODY>
```

Output: The customized Output is obtained as displayed in Table 4.

Table 4: Frame Liking Output Displays

Outputs		
		
<p>Output 1: Displaying four frames- Frame A, Frame B, Frame C and Frame D, among which the Frame B is having all the Links. When the First Link is clicked and the linked HTML Document is loaded in center Frame.</p>		
		
<p>Output 2: When the Second Link is clicked and the linked</p>		

HTML Document is loaded in center Frame.

!!!! Frame A !!!!
!!! Frame A content !!!

!!!! Frame B !!!! !!!! Frame C !!!! !!!! Frame D !!!!
!!! Frame B content !!! !!! Frame C content !!! !!! Frame D content !!!

- [Load FRAME_A_ENHANCEMENT.HTML](#)
- [Load FRAME_B_LINKING.HTML](#)
- [Load FRAME_C.HTML](#)
- [Load FRAME_D.HTML](#)

Output 2: When the Third Link is clicked and the linked HTML Document is loaded in center Frame.

!!!! Frame A !!!!
!!! Frame A content !!!

!!!! Frame B !!!! !!!! Frame D !!!! !!!! Frame D !!!!
!!! Frame B content !!! !!! Frame D content !!! !!! Frame D content !!!

- [Load FRAME_A_ENHANCEMENT.HTML](#)
- [Load FRAME_B_LINKING.HTML](#)
- [Load FRAME_C.HTML](#)
- [Load FRAME_D.HTML](#)

Output 4: When the Fourth Link is clicked and the linked HTML Document is loaded in center Frame.

Note:

- **Frames Responsiveness:** The advancement of the technology changed the display and viewing devices from 15+ inches Visual Display Unit Desktop to a handheld 2 inches screen Tables and Smart Phones. With this advancement the Website having Frame Layout are point of concern. HTML5 has considered Frames as obsolete and no more recommend its use, however the previous Framed Layout based Website Owners have to upgrade their

Websites to improve the utility of Framed Designs or and redesign it with no frame Layout.

- **Frames Migration:** The present latest versions of HTML have removed this feature entirely, hence Frames cannot be used in the presently designed Websites. Even Web Browser no longer support Frames, hence Website with Frame Layout becomes Unfeasible to use and transition from Frames has become mandatory for the Website Designers.

4.5 IFRAME TAG

Explanation: Presently a new element has been designed to design complex composite HTML Documents called as Inline Frame (IFRAME). This support insertion of HTML Document the same way an Image is inserted, hence all the image attributes can be applied to it. The main difference between FRAME and IFRAME is that IFRAME element is included in BODY element of HTML Structure.

Facts to Ponder

- Paragraph Break is not implemented in IFRAME as it is a Text Level Feature.
- IFRAME can include the target attributes and even can
- Just like a FRAME, an IFRAME can be targeted and even can independently navigate in parent HTML Document.

Working with IFRAME

- To execute IFRAME the container tags included are `<IFRAME>....</IFRAME>`
- Shares most of the attributes used in FRAME elements like SRC, NAME, FRAMEBORDER, MARGINWIDTH, MARGINHEIGHT, SCROLLING.
- The attributes that can be used is RESIZE.
- The add-on attribute of IFRAME is ALIGN.

Attributes:

- SOURCE: Defines address of HTML Document to be displayed IN THE in the IFRAME. Example: src="Document.HTML"
- NAME: Defines an IFRAME's target name for linking fames and HTML Document.
- FRAME BORDER: Defines border to the IFRAME. Example: frameborder=value. Value =1 is default and inserts a border while Value=0 means no border.
- MARGIN WIDTH: Defines Margin width for IFRAME. Example: marginwidth =“Value”. Value is provided in pixels.
- MARGIN HEIGHT: Defines Margin height for IFRAME. Example: marginheight =“Value”. Value is provided in pixels.
- SCROLLING: Defines the availability/ unavailability of Scroll Bar in IFRAME.Example: scrolling="Value" Value="yes/no/auto. Default is auto.
- WIDTH: Defines width of IFRAME Example: width="Value" Value is provided in pixels.
- HEIGHT: Defines height of IFRAME Example: height="Value". Value is provided in pixels.
- ALIGN: Defines the position of IFRAME according to the Text in already present in the HTML Document. Example: align="Value" Value=left/middle/right/top/bottom. Default = bottom.

Exercise 16:HTML Program to demonstrate IFRAME.


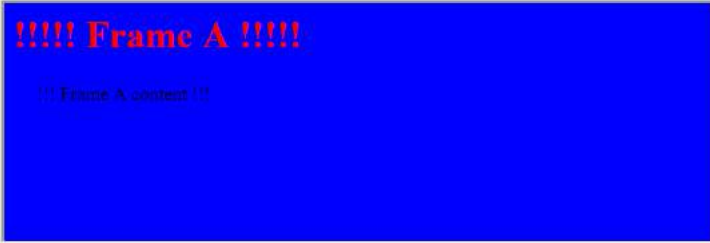
Solution:

```
<BODY>
<iframe width="600" height="200" name="iframe_A"></iframe>
<p><a href="FRAME_A_ENHANCEMENT.HTML" target="iframe_A">Load
FRAME_A_ENHANCEMENT.HTML</a></p>
</BODY>
```

Output: The output of the above IFRAME code is displayed in Table 5.

Table 5: IFRAME Output

IFRAME Output


Load FRAME_A_ENHANCEMENT.HTML
<p>Output 1: IFRAME in HTML document and the link of HTML Document to be loaded.</p>

Load FRAME_A_ENHANCEMENT.HTML
<p>Output 2: Once the link is clicked the Source Document is displayed in IFRAME.</p>

4.6 LET US SUM UP

Hello friends, now as you have completed this unit, you should be able to learn the concept, working and importance of Frames IN HTML. Designing Frames using Frame Document Structure, Frameset and Frame Elements; Enhancing Frames by improvising <FRAME> Tag Source; <FRAMESET> Tag: Frame Size, Margin between Frame, Border; and Frames Linking; and IFRAME working, purpose and implementation should have been understood.

4.7 CHECK YOUR PROGRESS

- Define :
1. FRAME
 2. FRAMESET
 3. IFRAME
 4. Value

- _____ Tag is used to create any kind of Frame.
- Write any 2 Disadvantages of Frame.
- IFRAME is a container Tag. [True/False]

4.8 Check your progress: Possible Answers

- Definition:
 1. **FRAME:** HTML FRAMES are used to divide your browser window into multiple sections where each section can load a separate HTML document.
 2. **FRAMESET:** A FRAMESET may only contain nested FRAMESET and FRAME elements. When a FRAMESET element is nested within another FRAMESET element, it acts as a SUBFRAME.
 3. **IFRAME:** IFRAME are Inline Frame that support insertion of HTML Document the same way an Image is inserted.
 4. **Value:** A simple numeric value is assumed to be a fixed size in pixels. The result of this value varies with the size of a viewer's window.
- **Frame** Tag is used to create any kind of frame.
- The two disadvantages of Frame are:
 - Some smaller devices cannot cope with frames often because their screen is not big enough to be divided up.
 - The browser's back button might not work as the user hopes.
- IFRAME is a container Tag. **True**

4.9 FURTHER READING

Online Reference Reading as PDF:

http://users.cs.cf.ac.uk/Dave.Marshall/Internet/Lectures/25_CM0133_Frames.pdf
[About Basic HTML Frames Pg. 1-35]

Online Reference Reading as Video:

https://www.youtube.com/watch?v=WRdTXaz4_Ls[About HTML FRAME Tags]

4.10 ASSIGNMENTS

1. What is the use of Frame in HTML Document? Explain.
2. Write the basic HTML Frame Structure to design a Frame.
3. List and explain the methods for enhancing Frames and Frameset.
4. Explain document for NON FRAME browser.
5. Write a note on iFrame.

4.11 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Create a webpage of Educational Institute/E-Commerce/Sports that has frames layout and include various Frame enhancements like Linking, resizing, Border, Coloring etc.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a Program in HTML for HTML Frame Document to:

- Set all the Frame / window size to 50%.
- Design the frames that not be resized.
- Set the link between Frame Document and the HTML Document.
- Design an IFRAME in a HTML Document.

Block-3

Cascading Style Sheet

Unit 1: Cascading Style Sheet

1

Unit Structure

- 1.1. Learning Objectives.
- 1.2. Introduction to Cascading Style Sheet.
- 1.3. Cascading Style Sheet Features.
- 1.4. Cascading Style Sheet Selectors.
- 1.5. Let us sum up.
- 1.6. Check Your Progress
- 1.7. Check your Progress: Possible Answers.
- 1.8. Further Reading.
- 1.9. Assignment.
- 1.10. Activities.

1.1 LEARNING OBJECTIVES

Hello Learners, after completing Block 3-Unit 1 you will be able to learn the following:

- Cascading Style Sheet (CSS): Concept, Growth, Process Life Cycle.
- CSS Features and Categories.
- CSS Selectors and its utilization.

1.2 INTRODUCTION TO CASCADING STYLE SHEET

- **Concept**

Hey Friends, for better understanding and illumination let us know the comparison of Hypertext Markup Language (HTML) studied in Block 3- Unit 1 through 4 and CSS as presented in Table 1.

Table 1: Comparison between HTML and CSS

Criteria	HTML	CSS
Full Form	Hyper Text Markup Language.	Cascading Style Sheet.
Purpose	Considered for basic structure of web page.	Considered for basic designing and organizing element of web page.
Structure	Contains <HTML><HEAD><BODY> and other Tags.	Contains Class, Attribute/Property and Selector.
File Extension	.html	.css

Cascading Style Sheets (CSS), tenderly mentioned as CSS, could be a straightforward style language meant to change the method of constructing web content respectably.

CSS handles the design and feel a part of an online page. Using CSS, you'll manage the color of the text, the design of fonts, the spacing between paragraphs, however columns square measure sized and set out, what background pictures or colors square measure used, layout styles, variations in show for various devices and screen sizes also as a spread of different effects.

CSS is simple to be told Associate in Nursing perspectives however, it provides powerful management over the presentation of any markup language document. Most ordinarily, CSS is combined with the markup languages or XHTML.

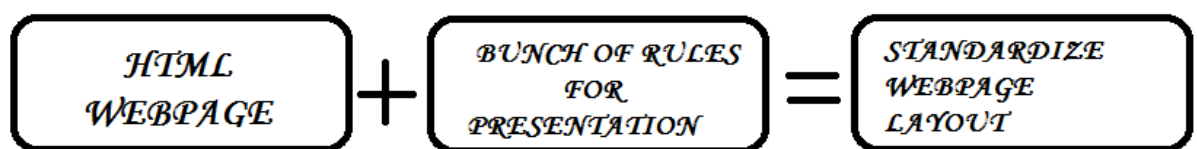


Figure 1: Understanding of CSS

As per above equation displayed in Figure 1 we can define CSS as :

“A bunch of rules when implemented with HTML Document/Webpage to enhance and design more presentable HTML Webpage together makes a Cascading Style Sheet.”

- **Growth of CSS**

CSS is formed and maintained through a bunch of individuals inside the W3C known as the CSS working party. The CSS working party creates documents known as specifications. Once a specification has been mentioned and formally legal by the W3C members, it becomes a recommendation.

Facts to Ponder:

- The legal specifications are known as recommendations as a result of the W3C have no management over the particular implementation of the language and the Freelance firms and organizations produce that computer code.

- The globe Wide net syndicate, or W3C may be a cluster that produces recommendations concerning however the web works and the way it ought to evolve.
- CSS was initially projected by Hakon Wium Lie (designated as Father of CSS) on October ten, 1994, during his working with Tim Berners-Lee (father of HTML) at European Organization for Nuclear analysis (CERN).



Figure 2: Father of CSS

- CSS Versions:
 - CSS was projected in 1994 as an online styling language, to unravel a number of the issues of Hypertext Markup Language. There have been alternative styling languages projections, like vogue Sheets for HTML and JSSS however, among all CSS won over all battle.
 - Cascading Style Sheets level one (CSS1) came out of W3C as a recommendation in Dec 1996. This version describes the CSS language in addition as a straightforward visual data formatting model for all the HTML tags. During and after 1996 user were enabled to set font size, alignment of text, margin setting and enable background as well as foreground with colours of web page elements.
 - Cascading Style Sheets level two (CSS2) became a W3C recommendation in 1998 and builds on CSS1. This version adds support for media-specific vogue sheets e.g. printers and aural devices, downloadable fonts, component positioning and tables. During and after 1996 user were enabled for features such as design style of HTML element and different output devices such as print media as well as other setting of various web browsers for layout perform by table or frame.

- During and after 2005 when Cascading Style Sheets level three (CSS3) user were enabled to use more text effects like drop shadow , semitransparent, colour box, outlines, rotating of web page with slider elements in web page.

- **Process Life Cycle of CSS**

In our HTML web page there are many elements like text, image, video, audio colours and styles but all these all element are unable to organize as standard way by HTML, hence we need to use CSS file.

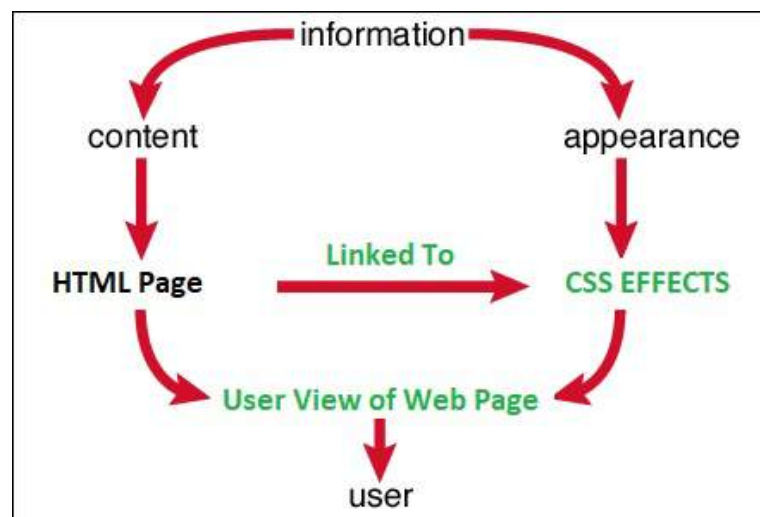


Figure 3: Life Cycle of CSS with HTML

The CSS file is external file that provides bunch of rules to organize various content of HTML web page. The Life Cycle of CSS is presented in the Figure 3. The Entire Webpage features: Content, Information, Appearance are linked to CSS Effects where all club together to present a enhanced Webpage to the user. CSS provide instruction to HTML page for organize and layout for HTML elements to make view more standardize. As figure shown HTML linked with CSS file and according to CSS it enhances the Webpage as more organized as well as more presentable.

1.3 CASCADING STYLE SHEET FEATURES

- Features of Cascading Style Sheet

The Importance of Style sheet is denoted by its features that make the style sheet more explorative and useful to the user. Some of the Features of CSS are:

- **Purpose of CSS:** To make HTML web page more presentable and attractive with less code.
- **CSS saves time** – You'll write CSS once and so recycle same sheet in multiple HTML pages. You'll outline a mode for every HTML part and apply it to as several web content as you wish.
- **Pages load faster** – If you're exploitation CSS, you are doing not have to be compelled to write HTML tag attributes when. Simply write one CSS rule of a tag and apply it to any or all the occurrences of that tag. Thus less code means that quicker transfer times..
- **Easy maintenance** – To create a worldwide modification, merely modification the design, and every one components all told the online pages are going to be updated mechanically.
- **Superior styles to HTML** – CSS incorporates a abundant wider array of attributes than HTML, thus you'll provides a much better look to your HTML page compared to HTML attributes.
- **Multiple Device Compatibility** – vogue sheets permit content to be optimized for quite one form of device. By exploitation identical HTML document, totally different versions of a web site will be bestowed for hand-held devices like PDAs and cell phones or for printing.
- **Global web standards** – currently HTML attributes square measure being deprecated and it's being suggested to use CSS. Thus it's a decent plan to begin exploitation CSS all told the HTML pages to create them compatible to future browsers.

- CSS Categories and its Features

CSS has mainly three categories that depicts its types:

- Inline CSS : the Inline CSS has the below listed features:
 - Placed directly in HTML element.

- No selector used.
 - Inefficient, only applies to HTML element.
 - Recommended only when over ride a style on our internal style sheet
 - Have lower HTTP requests.
 - Useful when user want to test and preview changes.
- Internal CSS : the Internal CSS has the below listed features:
 - Placed in <HEAD> section of HTML element.
 - Uses <STYLE> Tag.
 - Applies to current HTML page.
 - Recommended only when you need to apply style to current Webpage.
 - Highly recommended class and used for providing effect.
 - Has increasing page loading time.
 - External CSS : the External CSS has the below listed features:
 - Saves as separate file as .css extension.
 - Uses <link> tag in <HEAD> tag.
 - Only applied to all HTML Webpages in entire Website.
 - Recommended maximum because it is one time develop, however can be used multiple tines.
 - Immediately response nature, so it reduce Webpage loading time.
 - Once loaded, than after the page may be rendered correctly.

1.4 CASCADING STYLE SHEET SELECTORS

The Cascading Style Sheet Selector has a specific syntax that describes the format to apply the various styles to HTML elements and utilize in different forms.

Friends, to discuss CSS Selectors we need to understand mainly to the following elements as displayed in Figure 4:

- **Selector:** indicate that element the rule applies to. The same rule will apply to more than one part if you separate the part names with commas.
- **Declaration:** Indicates the elements defined in the Selector that ought to be titled. Declarations are separated by a colon and split into 2 parts –
 - **Property:** Indicates the aspect of the element required to be changed. For example: colour, font, width, height, border etc.
 - **Value:** Indicates specify figure we want to use for the chosen properties. For example: if we want to specify the colour property then we need to give the colour value or code to the property or some time exact figure for some border, height, width etc.

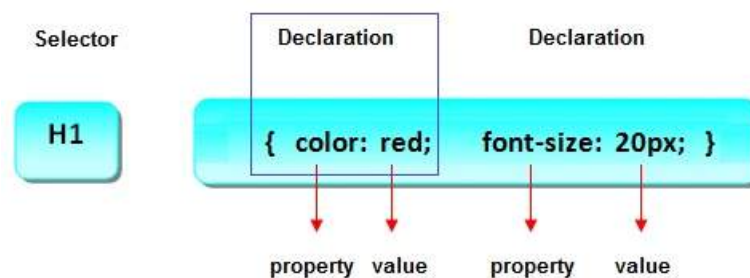


Figure – 4: CSS Selector Syntax

Sometimes Selector uses multiple HTML elements as shown in Figure 5.



Figure 5: CSS Selector using multiple HTML elements

There are various varieties of CSS Selectors based on Square Measure that enable to target rules for specific components in associated degree Mark-Up Language document. There's associated degree Mark-Up Language file to demonstrate the elements that the CSS Selector is applying. CSS Selector's Square Measure is case sensitive, so they should match part names and attribute values exactly. IN the Square Measure there are a lot of advanced selectors that permits to select components supported attributes and their values. Some other Selectors are shaped in below Table 2.

Table 2: CSS Selectors

Selector Category	Meaning	Ex.
Universal Selector	Applied to all elements in the document / web page	<code>* {}</code> Targets all elements on the page
Type Selector	Matches element names	<code>h1, h2, h3 {}</code> Targets the <code><h1></code> , <code><h2></code> and <code><h3></code> Elements
Class Selector	Matches an element whose class attribute has a value with the one specified after the period (or full stop) symbol.	<code>.note {}</code> Targets any element whose class attribute has a value of note <code>p.note {}</code> Targets only <code><p></code> elements

		whose class attribute has a value of note
ID Selector	Matches an element whose ID attribute has a value with one specified after the pound or hash symbol.	<code>#introduction {}</code> Targets the element whose id attribute has a value of introduction
Child Selector	Match an element that is a direct child of another	<code>li>a {}</code> Targets any <a> elements that are children of an element (but not other <a> elements in the page)
Descendent Selector	Matches an element that is a descendent of another specified element (not just a direct child of that element)	<code>p a {}</code> Targets any <a> elements that sit inside a <p> element, even if there are other elements nested between them

1.5 LET US SUM UP

Hello friends, now as we have completed this unit, you should be able to learn the concept and Concept, Growth, Process Life Cycle of CSS Attributes in HTML Document. In addition to this CSS Features, Categories, Selectors and its utilization should have been understood.

1.6 CHECK YOUR PROGRESS

- Full Form of CSS is _____
- What is the extension of external CSS? (.js , .css , .html)
- Which type of CSS does not require any selector?
- Which type of CSS use for single web page only?
- Which type of CSS need more time to load in browser?
- Which type of CSS required minimum time to load in browser?
- Which type of CSS required just <style> to perform?
- Inline CSS can directly use in HTML element [True / False]

- What are the main elements of CSS Selector?
- In `h1 {color : red ; fone-size: 20px;}` 'color' is _____. [Declaration, Property, Value]
- In `h1 {color : red ; fone-size: 20px;}` 'red' is _____. [Declaration, Property, Value]
- In `h1 {color : red ; fone-size: 20px;}` `color: red;` is _____ [Declaration, Property, Value]
- In `h1 {color : red ; fone-size: 20px;}` 'h1' is _____ [Selector, Property , Value]
- _____ Selector canbe applied to all elements in the document / Webpage.
- _____ Selector can matches element names.
- _____ Selector can matches an element whose class attribute has a value with the one specified after the period (or full stop) symbol.

1.7 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Full Form of CSS is **Cascading Style Sheet**
- What is the extension of external CSS? - **.css**
- Which type of CSS does not require any selector? - **Inline**
- Which type of CSS use for single web page only? - **Internal**
- Which type of CSS need more time to load in browser? - **Internal**
- Which type of CSS required minimum time to load in browser? - **External**
- Which type of CSS required just `<style>` to perform? - **Internal**
- Inline CSS can directly use in HTML element. **True**
- Main elements for CSS Selector are - **Selector , Declaration , Property And Value**
- in `h1 {color : red ; fone-size: 20px;}` 'color' is **Property.**
- in `h1 {color : red ; fone-size: 20px;}` 'red' is **Value.**
- In `h1 {color : red ; fone-size: 20px;}` `color: red;` is **Declaration.**
- in `h1 {color : red ; fone-size: 20px;}` 'h1' is **Selector.**
- **Universal** Selector can applies to all elements in the document / Webpage.
- **Type** Selector can matches element names.

- **Class**Selector can matches an element whose class attribute has a value with the one specified after the period (or full stop) symbol.

1.8 FURTHER READING

Online Reference Reading as PDF:

- <http://www.wufai.edu.tw/%E7%B6%B2%E9%A0%81%E6%8A%80%E8%A1%93%E4%B8%AD%E5%BF%83/datasheet/HTML%20and%20CSS%20design%20and%20build%20websites.pdf> [About CSS 226 to 406]
- <https://education.fsu.edu/wp-content/uploads/2015/04/Learning-PHP-MySQL-JavaScript-and-CSS-2nd-Edition-1.pdf> [About CSS Pg. 385 to 421]
- https://www.tutorialspoint.com/css/css_tutorial.pdf

Online Reference Reading as Video:

- https://www.youtube.com/watch?v=k1ktEGt6gl0&list=PLx_KyK8sU66WADyw7TY_LKwIFXB5JXcxA [Introduction about CSS]
- <https://www.youtube.com/watch?v=INep3qv2IO8>[Introduction about CSS]

1.9 ASSIGNMENTS

Answer the below questions:

- 1) What is CSS? Discuss pros and cons of it.
- 2) Write difference between.
- 3) Compare and Contrast :
 - 2.1) HTML and CSS
 - 2.2) Inline CSS and Internal CSS.
 - 2.3) Internal CSS and External CSS.
 - 2.4) Inline CSS and External CSS.
 - 2.5) Universal selector and Type Selector.
- 4) Explain the growth of CSS.
- 5) What are Selector in CSS? Explain any 3 types of selector with its meaning and example.

1.10 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement.

- Draw Time-line of CSS as history of it.
- Explain CSS working with HTML with diagram.
- Write syntax of CSS declaration for Universal Selector and Type Selector.
- Class Selector is really object oriented give argument with your own words.

Code Zone:

Note: All the activities can be performed taking web reference.

Write a CSS Program in CSS for HTML Document for:

- Inline CSS.
- Internal CSS.
- External CSS.
- Universal Selector.

Unit 2: Attributes of Cascading Style Sheet

2

Unit Structure:

- 2.1. Learning Objectives.
- 2.2. Introduction to attributes of Cascading Style Sheets.
- 2.3. Font and Text Attribute
- 2.4. Color and Background Attribute.
- 2.5. Border Attribute.
- 2.6. Margin and Padding Attribute.
- 2.7. List Attribute.
- 2.8. Table Attribute
- 2.9. Float Attributes.
- 2.10. Let us sum up.
- 2.11. Check Your Progress
- 2.12. Check your Progress: Possible Answers.
- 2.13. Further Reading.
- 2.14. Assignment.
- 2.15. Activities.

2.1 LEARNING OBJECTIVES

The Block 3 - Unit 2 aims to implement Attributes of Cascading Style Sheet (CSS) Language. After studying this Unit student should be able to:

- Understand the basic CSS Attributes concept and its importance in HTML document.
- Implement CSS Attributes: Font and Text Attribute; Color and Background Attribute; Border Attribute; Margin and Padding Attribute; List Attribute; Table Attribute; and Float Attributes.

2.2 INTRODUCTION TO ATTRIBUTES OF CASCADING STYLE SHEETS

Cascading Style Sheet (CSS) is the standard design language mainly intended to simplify the process of making Webpages presentable of Website that can even be called as a Web Application. The Web Application is viewed in Web Browser that receives the Webpages designed in either from the local Computer System Storage or a Web Server and transforms it to multimedia Web-pages.

Facts to Ponder:

- All CSS elements properties have Attributes.
- Attributes provide addition information about an element and CSS elements provide addition styling information about an element and webpage.
- Attributes are always defined in the starting of the tag.
- Usually the Attributes come in NAME / Value pair as: **name = "value"**.

2.3 FONT AND TEXT ATTRIBUTE

- **Font Attribute**

Explanation: The CSS FONT Attribute/properties specifies the font type, boldness, size, and the style of a text. It supports to modify font's size, color, style, type etc. It facilitates to make words and text more impactful to user.

Purpose:The Font attribute has various properties that facilitate to set Font and Font styling in HTML Document.

Type:The Font Family Family-Namethat plays a proper role in any font is categorized into two types:

- **Font-Family:** Includes Font like,"TIMES", "COURIER", "ARIAL" and others.
- **Generic-Family:**IncludesFont like, "SERIF", "SANS-SERIF", "CURSIVE", "FANTASY", "MONOSPACE".

Syntax:font: font-style font-variant font-weight font-size/line-heightfont-family|caption|icon|menu|message-box|small-caption|status-bar|initial|inherit;

Properties:The Font Attribute has the following properties as displayed in the Table 1.

Table 1: Font Attributes Properties

Property	Description
FONT-FAMILY	Indicates Font Face.
FONT-SIZE	Indicates Font size.
FONT-STYLE	Indicates Font style as Italic or Oblique
FONT-VARIANT	Indicates Text display either or not in small-caps Font.
FONT-WEIGHT	Indicates the Font Weight.

- **Note for Practical:** All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.

Example1:HTML Program to demonstrate CSS Font Attribute.

Solution:

```
<BODY>
```

```
    <h1>The CSS Font Attribute</h1>
```



```

<p style="font:caption">The Font is in captioned form.</p>
<p style="font:icon">The Font is in icon labels form.</p>
<p style="font:menu">The Font is in dropdown menus form.</p>
<p style="font:message-box">The Font is in dialog boxes form.</p>
<p style="font:small-caption">The Font is in a smaller version of the caption
Font form.</p>
<p style="font:status-bar">The Font is in the status bar form.</p>
<p><b>Note:</b> Note: The outcome of the Font Attributes is even Web
Browser dependant.</p>

```

</BODY>

OUTPUT	<h2 style="text-align: center;">The CSS Font Attribute</h2> <p>The Font is in captioned form.</p> <p>The Font is in icon labels form.</p> <p>The Font is in dropdown menus form.</p> <p>The Font is in dialog boxes form.</p> <p>The Font is in a smaller version of the caption Font form.</p> <p>The Font is in the status bar form.</p> <p>Note: Note: The outcome of the Font Attributes is even Web Browser dependant.</p>
---------------	--

- **Text Attribute**

Explanation:The CSS TEXTAttribute/properties specifies the Text Enhancement by underline, overline, and strikethrough; Text Transformation for managing Text Case; Text Spacing for required formatting; and other in a HTML Document.

Purpose:The purpose of CSS TEXTAttribute/properties is Text Enhancement, Transformation and Spacing in a Webpage.

Type:The CSS TEXT Attribute has various types used to enhance the Text as listed below:

- Text-decoration property: Used to underline, overline, and strikethrough text.
- Text-transform property: used to capitalize text or convert text to uppercase or lowercase letters.
- White-space property: Used to control the flow and formatting of text.
- Other are Text color, Text Alignment, Text decoration properties.

Syntax: HTMLtag{
 attribute-name : Value;
 }

Properties: The CSS TEXT Attribute has the below listed property for enhancing text:

- Color: Specifies color of a text.
- Direction: Specifies Text direction.
- Letter Spacing: Specifies adding or subtraction of space between the letters that make up a word.
- Word Spacing: Specifies adding or subtraction of space between the words of a sentence.
- Text Indent: Specifies indentation the text of a paragraph.
- Text Align: Specifies alignment of the text of a document.
- Text Decoration property: Specifies underline, overline, and strikethrough of Text.
 - Text Transform: Specifies capitalization text or converting text to uppercase or lowercase letters.
 - White Space: Specifies the control of the flow and formatting of text.
 - Text Shadow: Specifies text shadow around a text.

Example 2: HTML Program to demonstrate CSS Text Attribute.

Solution:

```
<HEAD>  
    <STYLE>  
        div {
```

```

        border: 1px solid gray;
        padding: 8px;
    }
    h1 {
        text-align: center;
        text-transform: uppercase;
        color: RED;
    }
    p {
        text-indent: 50px;
        text-align: justify;
        letter-spacing: 3px;
    }
    a {
        text-decoration: none;
        color: BLUE;
    }
</STYLE>
</HEAD>
<BODY>
    <div>
    <h1>CSS Text Attribute </h1>
    <p>The purpose of CSS TEXT Attribute/properties is Text Enhancement,
    Transformation and Spacing in a Webpage.
    </div>
</BODY>

```

OUTPUT	 <p style="text-align: center;">CSS TEXT ATTRIBUTE</p> <p style="text-align: center;">The purpose of CSS TEXT Attribute/properties is Text Enhancement, Transformation and Spacing in a Webpage.</p>
---------------	---

2.4 COLOR AND BACKGROUND ATTRIBUTE

- **Color Attribute**

Explanation:The CSS Color Attribute/Property specifies the foreground color of the text content for an element or the color of the text content for an element in HTML Document. In CSS the colors are particularly specified by using predefined color names, or RGB, HEX, HSL, RGBA, HSLA values.

Purpose:The purpose of CSS Color Attribute is to modify the fonts, border, background, and other themes with different color to design an attractive catchy Webpage.

Type:The CSS ColorAttribute property can be presented in any of the color notation forms as displayed in the Table 2.

Table 2: CSS Color Notations of Color Attribute

Specification	Description
#RRGGBB	Indicates Hexadecimal representation of the color p { color: #FF0000; }
rgb()	Indicates RGB representation of the color p { color: rgb(255,0,0); }
name	Indicates Name of the color (ie: red, blue, black, white) p { color: red; }
inherit	Indicates Element will inherit the color from its parent element p { color: inherit; }

Syntax: color:value;

Properties: The CSS Color Attribute/Property has the below listed properties:

- Background Color: Specifies Background Color.
- Text Color: Specifies Text Color.
- Border Color: Specifies Border Color.

- Color values: Specifies which Color is required to be applied.
- Other general properties..

Examples 3:HTML Program to demonstrate CSS Color Attribute.

Solution:

```
<BODY>
```

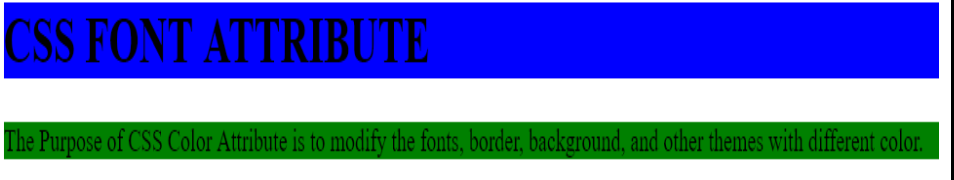
```
<h1 style="background-color:Blue;">CSS FONT ATTRIBUTE</h1>
```

```
<p style="background-color:green;">
```

The Purpose of CSS Color Attribute is to modify the fonts, border, background, and other themes with different color.

```
</p>
```

```
</BODY>
```

OUTPUT	 <p>The screenshot shows the rendered output of the HTML code. It features a blue header with the text "CSS FONT ATTRIBUTE" and a green paragraph below it with the text "The Purpose of CSS Color Attribute is to modify the fonts, border, background, and other themes with different color."</p>
---------------	---

- **Background Attribute**

Explanation:The CSS backgroundAttribute/Property specifies all background style properties at once, such as background-color, image, clip, origin, position, repeat some feature, attachment for an element in HTML Document.

Purpose:The purpose of this attribute is to make attractive and user friendly background by using the Background Attribute Properties.

Syntax:

- BACKGROUND-COLOR: background:green
- BACKGROUND-IMAGE and BACKGROUND-REPEAT : background:url("shribaba_image.jpg" repeat-y
- BACKGROUND-IMAGE and BACKGROUND-REPEAT

- BACKGROUND-COLOR&BACKGROUND-BORDER:
background:border-box green

Properties:

- BACKGROUND: Specifies all the background properties in one declaration.
- BACKGROUND-CLIP: Specifies the painting area of Webpage.
- BACKGROUND-COLOR: Specifies Webpage background Color of element.
- BACKGROUND-IMAGE: Specifies Webpage background Image.
- BACKGROUND-ORIGIN: Specifies Webpage background image i/are positioned.
- BACKGROUND-POSITION: Specifies Webpage background's starting position.
- BACKGROUND-REPEAT: Specifies Webpage background image repeating feature.
- BACKGROUND-SIZE: Specifies Webpage background Image Size.
- BACKGROUND-ATTACHMENT: Specifies whether the Webpage background is fixed or scrolling with rest of Webpage.

Example 4: HTML Program to demonstrate CSS Background Attribute.

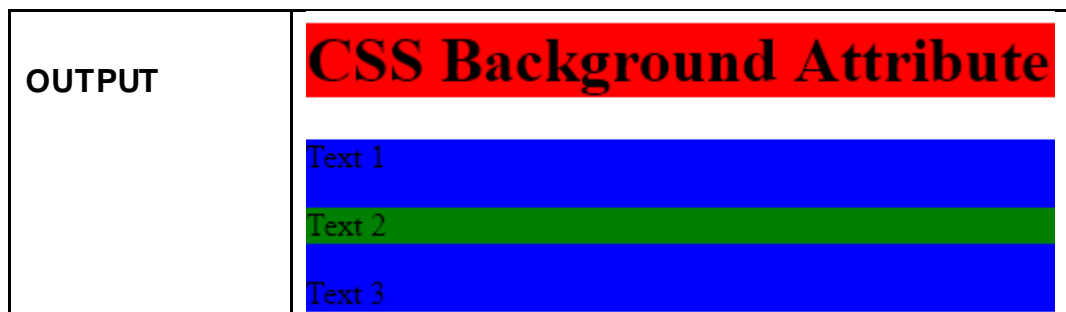
Solution:

```
<HEAD>
<STYLE>
    h1 {
        background-color: red;
    }
    div {
        background-color: blue;
    }
    p {
        background-color: green;
```

```

    }
</STYLE>
</HEAD>
<BODY>
    <h1>CSS Background Attribute </h1>
    <div>
        Text 1
    <p>Text 2</p>
        Text 3
    </div>
</BODY>

```



2.5 BORDER ATTRIBUTE

Explanation: The CSS BORDER Attribute/Property specifies all Border styles, width and color for an element in HTML Document.

Purpose: The purpose of this attribute is to make enhance Border style in different borders to make it attractive by using the Border Attribute Properties.

Syntax:

```

p{
    border-bottom: solid;
}

```

Properties: The CSS Border Attribute Properties are listed in Table 3.

Table 3: CSS Border Attribute Properties

Property	Description
<u>BORDER</u>	Defines all the border properties in one specification.
<u>BORDER-BOTTOM</u>	Defines all the bottom border properties in one specification.
<u>BORDER-BOTTOM-COLOR</u>	Defines color of the bottom border.
<u>BORDER-BOTTOM-STYLE</u>	Defines the style of the bottom border.
<u>BORDER-BOTTOM-WIDTH</u>	Defines width of the bottom border
<u>BORDER-COLOR</u>	Defines color of the four borders.
<u>BORDER-STYLE</u>	Defines the style of border like: <ul style="list-style-type: none">○ DOTTED : Specifies dotted border○ DASHED: Specifies a dashed border○ SOLID : Specifies a solid border○ DOUBLE : Specifies a double border○ GROOVE: Specifies a 3D grooved border based on border-color value.○ RIDGE: Specifies a 3D ridged border based on border-color value.○ INSET: Specifies a 3D inset border based on border-color value.○ OUTSET: Specifies a 3D outset border based on border-color value.○ NONE: Specifies no border.

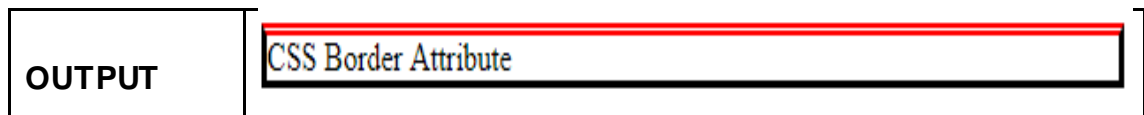
	○ HIDDEN: Specifies a hidden border.
--	--------------------------------------

Example 5:HTML Program to

demonstrate CSS Border Attribute.

Solution:

```
<HEAD>
<STYLE>
    p {
        border-style: solid;
        border-top: thick double #ff0000;
    }
</STYLE>
</HEAD>
<BODY>
    <p>CSS Border Attribute</p>
</BODY>
```



2.6 MARGIN AND PADDING ATTRIBUTE

- **Margin Attribute**

Explanation:The CSS MARGIN Attribute/Property specifies space around HTML Elements in HTML Document. It uses use negative values to overlap content in a Webpage. Margin Attribute specification of Parent element are not inherited by its Child elements

Purpose:The purpose of this attribute is to enhance element by generating space around element content outside a defined border by using the Margin Attribute Properties such as Top, Bottom, Left and Right.

Syntax:

```
p {  
    margin-top: 150px;  
    margin-bottom: 150px;  
    margin-right: 500px;  
    margin-left: 100px;  
}
```

Properties:

- MARGIN-BOTTOM: Defines Bottom margin.
- MARGIN-TOP: Defines Top margin.
- MARGIN-LEFT: Defines Left margin.
- MARGIN-RIGHT: Defines Right margin.

Example 6: HTML Program to demonstrate CSS Margin Attribute.

Solution:

```
<HEAD>  
<STYLE>  
    div {  
        border: 1px solid black;  
        margin-top: 100px;  
        margin-bottom: 100px;  
        margin-right: 150px;  
        margin-left: 80px;  
        background-color: lightblue;  
    }  
</STYLE>  
</HEAD>  
<BODY>  
    <h2>CSS Margin Attribute</h2>  
    <div>CSS Margin Attribute Demonstration</div>  
</BODY>
```

OUTPUT	<h2 style="margin: 0;">CSS Margin Attribute</h2> <div style="border: 1px solid black; width: fit-content; margin: 20px auto; padding: 2px 10px; background-color: #e0f0ff;">CSS Margin Attribute Demonstration</div>
---------------	--

- **Padding Attribute**

Explanation:The CSS PaddingAttribute/Property specifies the space between the content and border of an element in an element of HTML Document. The values of this attribute can be either:

- Length: Lengthwise space.
- Percentage: Percentage of containing box.
- Inherit: Padding same as parent element

Purpose:The purpose of this attribute is to enhance element by generating space around element content within a defined border by using the Padding Attribute Properties such as Top, Bottom, Left and Right.

Syntax:

- All four sides: padding:1em;
- Vertical and Horizontal: padding:5% 10%;
- Top, Horizontal, Bottom: padding:1em 2em 2em;
- Top, Right, Bottom, Left: padding:5px 1em 0 2em;
- Global values: padding: inherit;
- padding: initial
- padding: unset;

Properties: The CSS Padding Attribute Properties are listed in Table 4.

Table 4: CSS PaddingAttribute Properties

Property	Description
----------	-------------

PADDING	Defines all the padding properties in one specification.
PADDING-BOTTOM	Defines bottom padding of an Element.
PADDING-LEFT	Defines left padding of an Element.
PADDING-RIGHT	Defines right padding of an Element.
PADDING-TOP	Defines top padding of an element

Example 7:HTML Program to demonstrate CSS Padding Attribute.

Solution:

```

<HEAD>
<STYLE>
    div {
        border: 1px solid black;
        background-color: lightblue;
        padding-top: 50px;
        padding-right: 30px;
        padding-bottom: 50px;
        padding-left: 80px;
    }
</STYLE>
</HEAD>
<BODY>
    <h2>CSS Padding Attribute</h2>
    <div>CSS Padding Attribute Demonstration</div>
</body>
</html>

```

OUTPUT	<h2 style="margin: 0;">CSS Padding Attribute</h2> <div style="border: 1px solid black; background-color: #ADD8E6; padding: 20px; margin: 10px auto; width: 80%;"> <p style="text-align: center;">CSS Padding Attribute Demonstration</p> </div>
---------------	---

2.7 LIST ATTRIBUTE

Explanation:The CSS ListAttribute/Property specifies a set of either numbered unnumbered listing styles for an element in HTML Document. Its Property specifies List Type, Position, Style and other. This Tag has very much similarity life the HTML List Tag.

Purpose:The purpose of this attribute is to add value to the content of a webpage by listing it with different patterns of list by using the List Attribute Properties. It has inbuilt functions like circle() to shorten an element to a circle or to produce circle for text to flow around, and the calc() function that provides a calculated value for a property.

Type: There are 2 types of listing:

1. Ordered List: Having defined Numbers and alphabets in different variation.
2. Unordered List: having shapes like circle, square and other

Syntax:

```
<UL style= "list-style: inside circle;">
```

```
    <li>Android</li>
```

```
    <li>IOS</li>
```

```
    <li>Windows</li>
```

```
    <li>Blackberry</li>
```

```
</UL>
```

```
<OL style= "list-style: inside 1;">
```

```

<li>Android</li>
<li>IOS</li>
<li>Windows</li>
<li>Blackberry</li>
</OL>

```

Properties: The CSS List Attribute Properties are listed in Table 5.

Table 5: CSS ListAttribute Properties

Property	Values	Description
DECIMAL	1,2,3,4,5	Specifies Number.
DECIMAL-LEADING-ZERO	01, 02, 03, 04, 05	Specifies 0 before the number as two digit number.
LOWER-ALPHA	a, b, c, d, e	Specifies Lowercase alphanumeric characters in a List.
UPPER-ALPHA	A, B, C, D, E	Specifies Uppercase alphanumeric characters in a List.
LOWER-ROMAN	i, ii, iii, iv, v	Specifies Lowercase Roman numerals in a List.
UPPER-ROMAN	I, II, III, IV, V	Specifies Uppercase Roman numerals in a List.
LOWER-GREEK	alpha, beta, gamma	Specifies that marker is lower-greek in a List.
LOWER-LATIN	a, b, c, d, e	Specifies that marker is lower-latin in a List.
UPPER-LATIN	A, B, C, D, E	Specifies that marker is upper-latin in a List.

Example 8:HTML Program to demonstrate CSS List Attribute.

Solution:

```

<HEAD>
  <STYLE>
    ul.demo {
      list-style-type: none;
      margin: 0;
      padding: 0;
    }
  </STYLE>
</HEAD>
<BODY>
  <p>Default list:</p>
  <p>CSS List Attribute</p>
  <p>Default list:</p>
  <ul>
    <li>Android</li>
    <li>IOS</li>
    <li>Windows</li>
    <li>Blackberry</li>
  </ul>
  <p>Display after removing bullets, margin and padding:</p>
  <ul class="demo">
    <li>Android</li>
    <li>IOS</li>
    <li>Windows</li>
    <li>Blackberry</li>
  </ul>
</body>

```

OUTPUT	<p>CSS List Attribute</p> <p>Default list:</p> <ul style="list-style-type: none"> • Android • IOS • Windows • Blackberry <p>Display after removing bullets, margin and padding:</p> <p>Android IOS Windows Blackberry</p>
---------------	---

2.8 TABLE ATTRIBUTE

Explanation: The CSS Table Attribute/Property specifies a structured set of data split as rows and columns for an element in HTML Document.

Purpose: The purpose of this attribute is to make rapidly and effortlessly look up values that specify some kind of association between dissimilar types of data imprecise border table having solid line borders. It Facilitate feature comparison, Decision making and it is an optimum means for any product specification sheet.

Syntax:

```
table {
    border: 2px solid black;
}
```

Properties: The CSS TableAttribute Properties are listed in Table 6.

Table 6: CSS TableAttribute Properties

Property	Description
BORDER	Defines all border properties in one specification.
BORDER-COLLAPSE	Defines either/not Table Borders must collapsed/not.

BORDER-SPACING	Defines the spacing between adjoining cells.
CAPTION-SIDE	Defines the positioning of Table Caption.
EMPTY-CELLS	Defines either/not to display border/background on empty cells in a Table.
TABLE-LAYOUT	Defines the Layout algorithm that can be used for Table.

Example 9:HTML Program to demonstrate CSS Table Attribute.

Solution:

```
<STYLE TYPE="text/css">
table.gridtable {
    font-family: verdana,arial,sans-serif;
    font-size:11px;
    color:#333333;
    border-width: 2 px;
    border-color: #666666;
    border-collapse: collapse;
}
table.gridtable th {
    border-width: 2 px;
    padding: 8px;
    border-style: dashed;
    border-color: #666666;
    background-color: #dedede;
}
table.gridtable td {
    border-width: 2 px;
    padding: 8px;
    border-style: dashed;
    border-color: #666666;
    background-color: #ffffff;
```

```

}
</STYLE>
<p>CSS Table Attribute</p>
<TABLE CLASS="gridtable">
  <tr>
    <th>Header 1</th><th>Header 2</th><th>Header 3</th>
  </tr>
  <tr>
    <td>Row 1 Column 1</td><td>Row 1 Column 2</td><td>Row 1
    Column 3</td>
  </tr>
  <tr>
    <td>Row 2 Column 1</td><td>Row 2 Column 2</td><td>Row 2
    Column 3</td>
  </tr>
</TABLE>

```

OUTPUT	CSS Table Attribute		
	Header 1	Header 2	Header 3
	Row 1 Column 1	Row 1 Column 2	Row 1 Column 3
	Row 2 Column 1	Row 2 Column 2	Row 2 Column 3

2.9 FLOAT ATTRIBUTE

Explanation: The CSS Float Attribute/Property specifies the floating pattern of element in HTML Document. Its Properties specifies what element and which direction can float besides cleared element.

Purpose:The purpose of this attribute is to specify the way the element is taken enhanced from the regular/normal flow and positioned left or right side of its

containing box. The other element will wrap around this element by using the Float Attribute Properties.

Syntax:

Keyword Values:

- float:left;
- float:right;
- float:none;
- float:inline-start;
- float:inline-end;

Global Values:

- float:inherit;
- float:initial;
- float:unset;

Properties: The CSS Float Attribute Properties are listed in Table 7.

Table 7: CSS Float Attribute Properties

Property	Description
BOX-SIZING	Specifies the calculation of element's width and height and presence of padding or borders.
CLEAR	Defines that besides Cleared Element what element and which side it must float.
FLOAT	Defines the element's method of floating.
OVERFLOW	Defines the outcome if content overflows in element Box
OVERFLOW-X	Defines the method of positioning left/right edges of Content if it overflows from Element Content Area.
OVERFLOW-Y	Defines the method of positioning Top/Bottom edges of Content if it overflows from Element Content Area.

Example 10:HTML Program to demonstrate CSS Float Attribute.

Solution:

<HEAD>

```

<STYLE>
    .div1 {
        float: left;
        width: 100px;
        height: 50px;
        margin: 10px;
        border: 3px solid blue;
    }
    .div2 {
        border: 1px solid red;
    }
    .div3 {
        float: left;
        width: 100px;
        height: 50px;
        margin: 10px;
        border: 3px solid green;
    }
    .div4 {
        border: 1px solid red;
        clear: left;
    }
</STYLE>
</HEAD>
<BODY>
    <p><b>CSS Float Attribute</b></p>
    <br>
    <h2>Without Clear Property</h2>
    <div class="div1">First</div>
        <div class="div2">Display Specification: Second is after First in HTML
            Code and First floats to left then the text in second floats around
            First.</div>
    <br><br><br><br><br><br><br><br>

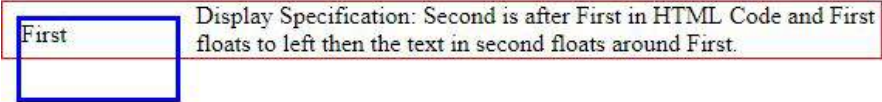
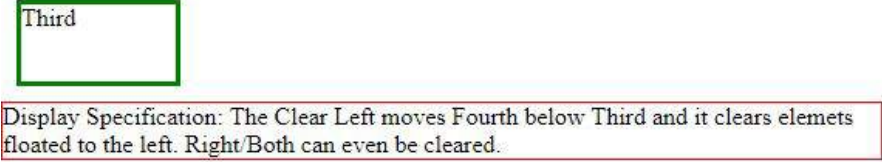
```

```
<h2>With Clear Property</h2>
```

```
<div class="div3">Third</div>
```

```
<div class="div4">Display Specification: The Clear Left moves Fourth  
below Third and it clears elemets floated to the left. Right/Both can  
even be cleared.</div>
```

```
</BODY>
```

OUTPUT	CSS Float Attribute
	Without Clear Property 
	With Clear Property 

2.10 LET US SUM UP

Hello friends, now as you have completed this unit, you should be able to learn the concept and importance of CSS Attributes IN HTML Document. The various CSS Attributes: Font and Text; Color and Background; Border; Margin and Padding; List; Table; and Float purpose and implementation should have been understood.

2.11 CHECK YOUR PROGRESS

- Define the following :
 - Font Attribute
 - Text Attribute
 - Color Attribute
 - Background Attribute
 - Border Attribute
 - Margin Attribute
 - Padding Attribute
 - List Attribute
 - Table Attribute
 - Float Attribute

2.12 Check your progress: Possible Answers

➤ **Definition:**

- **Font Attribute:**The CSS FONT Attribute/properties specifies the font type, boldness, size, and the style of a text. It supports to modify font's size, color, style, type etc. It facilitates to make words and text more impactful to user.
- **Text Attribute:**The CSS TEXT Attribute/properties specifies the Text Enhancement by underline, overline, and strikethrough; Text Transformation for managing Text Case; Text Spacing for required formatting; and other in a HTML Document.
- **Color Attribute:** The CSS Color Attribute/Property specifies the foreground color of the text content for an element or the color of the text content for an element in HTML Document. In CSS the colors are particularly specified by using predefined color names, or RGB, HEX, HSL, RGBA, HSLA values.
- **Background Attribute:** The CSS background Attribute/Property specifies all background style properties at once, such as background-color, image, clip, origin, position, repeat some feature, attachment for an element in HTML Document.
- **Border Attribute:** The CSS BORDER Attribute/Property specifies all Border styles, width and color for an element in HTML Document.

- **Margin Attribute:** The CSS MARGIN Attribute/Property specifies space around HTML Elements in HTML Document. It uses use negative values to overlap content in a Webpage. Margin Attribute specification of Parent element are not inherited by its Child elements
- **Padding Attribute:**The CSS PaddingAttribute/Property specifies the space between the content and border of an element in an element of HTML Document.
- **List Attribute:**The CSS List Attribute/Property specifies a set of either numbered unnumbered listing styles for an element in HTML Document. Its Property specifies List Type, Position, Style and other. This Tag has very much similarity life the HTML List Tag.
- **Table Attribute:**The CSS Table Attribute/Property specifies a structured set of data split as rows and columns for an element in HTML Document.
- **Float Attribute:**The CSS Float Attribute/Property specifies the floating pattern of element in HTML Document. Its Properties specifies what element and which direction can float besides cleared element.

2.13 FURTHER READING

Online Reference Reading as PDF:

http://www.stylinwithcss.com/resources_css_properties.php/web.stanford.edu/class/cs142/lectures/CSS.pdf [About CSS Properties and Attributes]

Online Reference Reading as Video:

<https://www.youtube.com/watch?v=GVocONem9lw>[About CSS Attribute]

2.14 ASSIGNMENTS

Answer the following questions:

- (1) Write a note on CSS Attribute and its importance.
- (2) Explain the purpose of :
 - (2.1) Font and Text Attribute
 - (2.2) Color and Background Attribute.
 - (2.3) Border Attribute.
 - (2.4) Margin and Padding Attribute.

- (2.5) List Attribute.
- (2.6) Table Attribute.
- (2.7) Float Attributes.

2.15 ACTIVITIES

Creative Zone:

Note: For activities Learners can use search engine as their reference for supportive knowledge enhancement

Design a Webpage of your on the “Internet of Things” application using maximum of CSS Attributes.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a CSS Attribute Program in HTML for HTML Document to demonstrate and display:

- Font and Text Attribute
- Color and Background Attribute.

Border Attribute.

- Margin and Padding Attribute.
- List Attribute.
- Table Attribute.
- Float Attributes.

Unit 3:Effects of Cascading Style Sheet

3

Unit Structure:

- 3.1. Learning Objectives.
- 3.2. Introduction to Effects in Cascading Style Sheets.
- 3.3. Pseudo-Elements Effects
- 3.4. Layer Effects
- 3.5. DropDown Effects
- 3.6. Let us sum up.
- 3.7. Check Your Progress
- 3.8. Check your Progress: Possible Answers.
- 3.9. Further Reading.
- 3.10. Assignment.
- 3.11. Activities.

3.1 LEARNING OBJECTIVE

Hello Learners, after completing this chapter you will be able to learn the following topics:

- Providing various types of category based effects in Cascading Style Sheet (CSS).
- Applying Pseudo-Elements Effects in Webpage of a Website.
- Applying Layer Effects on Layer of Webpage in a Website.
- Applying DropDown Effects using Dropdown, Menu, Click, Image, and Animated component.

3.2 INTRODUCTION TO EFFECTS IN CASCADING STYLE SHEET

Friends, the other purpose of Cascading Style Sheet is to enhance the HTML Document by the use of various CSS Effects. CSS contains a set of novel properties categorized under CSS Effects that allow us to generate advanced graphical effects in the Web Browser; these properties are called as Effects of Cascading Style Sheets.

Facts to Ponder:

- CSS Effects can be applied using a few lines of code.
- The effects are applied without using any alternative to graphics editors to achieve those effects.
- Using these effects CSS now allows us to do more graphical work right in the text editors.
- Some Graphical effects that we can produce using CSS include Text based effects, image effects like color editing/tweaking, Image-Element blending, clipping Text to random shapes and many more.
- CSS even has characteristics that allow us to create graphical effects—namely blend modes and filter effects.
- The animations in HTML Document are most commonly obtained by using JavaScript or Flash, however by using CSS effects such features can be applied on the webpage to make it attractive.

- Main Objective of CSS effects is that, it easily attract viewers of the website and supports the design a user friendly and attractive Interface.
- The Transitions in CSS offers a way to manage animation speed while altering CSS properties.

3.3 PSEUDO-ELEMENTS EFFETS

Explanation:The CSS Pseudo-Elements specifies addition of special effects to some selectors, without using JavaScript or any other script to apply these effects.

Purpose: A CSS pseudo-element is used to specify style to particular parts of an HTML element, for instance it applies:

- Style to the first letter/Line/an Element.
- Insertion of content before/after/within an Element.

Syntax:

SELECTOR:PSEUDO-ELEMENT {PROPERTY:VALUE}

Attributes:

To apply the Pseudo Elements Effects specific selectors are required like First letter/first line/before/after/selection for are listed in Table 1.

Table 1: Pseudo Elements Effects Selectors

Selector	Example	Description
::FIRST-LETTER	p::first-letter	Specifies selection of the first letter of each <p> element
::FIRST-LINE	p::first-line	Specifies selection of the first line of each <p> element
::BEFORE	p::before	Specifies inserting before the content of each

		<p> element
::AFTER	p::after	Specifies inserting after the content of each <p> element
::SELECTION	p::selection	Specifies selection of the portion of an element that is selected by a user

Among all selectors the: selection Pseudo-Element selector is most commonly used to handling all selections. ::SELECTION pseudo-element matches the portion of an element that is selected by a user.

The following CSS properties can be applied to ::SELECTION - COLOR, BACKGROUND, CURSOR and OUTLINE. To make the selected text red on a yellow background the code is:

```
::SELECTION {
  COLOR: RED;
  BACKGROUND: YELLOW;
}
```

To apply the Pseudo Elements Effects specific the attributes listed in Table 2 can be used.

Table 2: Pseudo Elements Effects Attributes

Attribute	Example	Description
<u>:ACTIVE</u>	a:active	Specifies Active link selection
<u>:CHECKED</u>	input:checked	Specifies every checked <input> element selection

:DISABLED	input:disabled	Specifies every disabled <input> element selection
:EMPTY	p:empty	Specifies every <p> element that has no children selection
:ENABLED	input:enabled	Specifies every enabled <input> element selection
:FIRST-CHILD	p:first-child	Specifies every <p> elements that is the first child of its parent selection
:FIRST-OF-TYPE	p:first-of-type	Specifies every <p> element that is the first <p> element of its parent selection
:FOCUS	input:focus	Specifies the <input> element that has focus selection
:HOVER	a:hover	Specifies links on mouse over selection

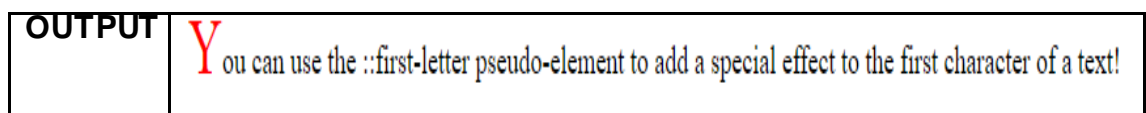
Example 1: Program to demonstrate CSS Pseudo Elements Effects.

Solution:

```
<HEAD>
<STYLE>
  p::first-letter {
    color: #ff0000;
    font-size: xx-large;
  }
</STYLE>
</HEAD>
<BODY>
```

```
<P>You can use the ::first-letter pseudo-element to add a special effect to the first
      character of a text!</p>
```

```
</BODY>
```



Note for Practical: All the Sample code given in Examples must be typed in notepad with entire HTML Structure saved with .html or .htm extension and finally open in web browser to get the output.

3.4 LAYER EFFECTS

Explanation: The Layers are the section of HTML that is positioned on top of the regular page with pixel accuracy. CSS provided feasibility to execute Layers effects in HTML Document. The challenge with the CSS Layers is that even though the Layers hold an importance in HTML Document, however some Web Browsers has very restricted support and even if gives support it executes the Layer Effect with malfunction. Looking into this limitation the CSS Layer Effects target its applicability to all variety of Web Browsers.

Purpose: CSS Layer Effect provides an opportunity to create layers of various divisions in a HTML Document. It can be used when there is requirement of:

- Creating Menu on Bar as well as Popup Menu that on clicking opens a sub menu overlapping it,
- Moving an object while designing or playing games.
- Inserting Floating elements in Advertisements/Banners.

Syntax:

z-index: auto|number|initial|inherit;

Attributes:

In CSS Layer Effects there is only one type of property the *Z-INDEX* property that is applied to elements that overlap with each other in HTML Document. A Z-INDEX property supports to create more complex webpage layouts according to the requirement of the User. The Z-INDEX property is applied using POSITION property to create Layer Effects. It specifies the location of the element that can be either Top or Bottom.

To apply the Layer Effects specific the attributes listed in Table 3 can be used.

Table 3: Layer Effects Attributes

Attribute	Description
AUTO	Position the stack order equal to its parents. It is listed as default.
NUMBER	Position the stack order of the element. Does not allow Negative numbers.
INITIAL	Position this property to its default value.

INHERIT	Succeed/Inherits this property from its parent element.
---------	---

Example 2:Program to demonstrate CSS Layer Effects.

Solution:

```
<BODY>
```

```
<STYLE>
```

```
  DIV {
```

```
    WIDTH: 80PX;
```

```
    HEIGHT: 100PX;
```

```
    POSITION: RELATIVE;
```

```
  }
```

```
  .INFRONT {
```

```
    BACKGROUND-COLOR: RED;
```

```
    TOP: 10PX;
```

```
    LEFT: 80PX;
```

```
    Z-INDEX: 2;
```

```
  }
```

```
  .BEHIND {
```

```
    BACKGROUND-COLOR: GOLD;
```

```
    TOP: -60PX;
```

```
    LEFT: 35PX;
```

```
    Z-INDEX: 1;
```

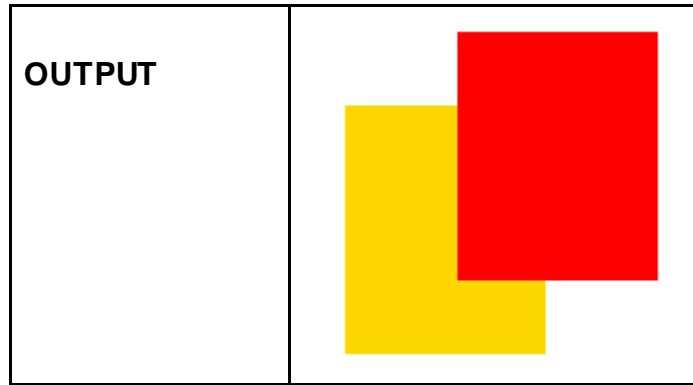
```
  }
```

```
</STYLE>
```

```
<DIV CLASS="INFRONT"></DIV>
```

```
<DIV CLASS="BEHIND"></DIV>
```

```
</BODY>
```



Example 2-5: Program to demonstrate CSS Layer Effects with additional attributes. The other variations in the attributes of DIV tag that can be applied in CSS Layer Effects are displayed in below Table 4:

Solution:

Note: To implement the give code in the Table 4 you should replace the entire <DIV {...} Section only in the Example 2 with the Code Logic of Table 4.

Table 4: Additional Attributes of CSS Layer Effects

Attribute & Value	Code Logic	Output
Position: relative	<pre> DIV { WIDTH: 80PX; HEIGHT: 100PX; POSITION: ABSOLUTE; } </pre>	
BACKGROUND-REPEAT: NO-REPEAT/REPEAT; BACKGROUND-IMAGE: URL("IMAGE1NAME"), URL("IMAGE1NAME");	<pre> DIV { WIDTH: 400PX; HEIGHT: 400PX; POSITION: RELATIVE; BACKGROUND-REPEAT: NO-REPEAT, REPEAT; BACKGROUND-IMAGE: URL("SHRIBABA_IMAGE.JPG"), </pre>	

	<pre>URL("BAOU_LOGO_N.PNG"); }</pre>	
<p>BACKGROUND-BLEND-MODE: MULTIPLY/ MULTIPLE/SCREEN/OVERLAY/DARKEN/COLOR-DODGE/SATURATION/COLOR/LUMINOCITY/NORMAL</p>	<pre>DIV { WIDTH: 400PX; HEIGHT: 400PX; POSITION: RELATIVE; BACKGROUND-REPEAT: NO-REPEAT, REPEAT; BACKGROUND-IMAGE: URL("SHRIBABA_IMAGE.JPG"), URL("BAOU_LOGO_N.PNG"); BACKGROUND-BLEND-MODE: SCREEN; }</pre>	
	<pre>DIV { WIDTH: 400PX; HEIGHT: 400PX; POSITION: RELATIVE; BACKGROUND-REPEAT: NO-REPEAT, REPEAT; BACKGROUND-IMAGE: URL("SHRIBABA_IMAGE.JPG"), URL("BAOU_LOGO_N.PNG");</pre>	

	BACKGROUND- BLEND-MODE: OVERLAY; }	
--	---	--

3.5 DROPDOWN EFFECTS

Explanation: Friends, all interactive website contains DropDown element that denotes a prime feature of it. CSS can also be used to design the drop-down menus in a HTML Document. The various variations of DropDown elements that can be included to enhance the interactive Website are:

- Menu DropDown: Menu and Sub-Menu are displayed directly on Webpage.
- Clickable DropDown: Menu and Sub-Menu are displayed on Webpage after clicking the DropDown.
- Image DropDown: Menu and Sub-Menu are displayed and implemented on Webpage in the form of an Image.
- Card DropDown: Menu and Sub-Menu are displayed and implemented on Webpage in the form of a Card.
- Animated DropDown: Menu and Sub-Menu are displayed and implemented on Webpage in the form of interactive Animated DropDown.

The DropDown elements can be included in the Webpage using any of the method:

- Usually, a DropDown is a bundle of Unordered List generate with HTML Tag. The DropDown Structure is prepared using Nested list Tags incorporated in the Tag. To generate such structure CSS DropDown Effect can be used, as CSS is very simple property used to create the DropDown menu.
- The overall content of DropDown is present in the .dropdown-content class of CSS. The Hoverable DropDown can be created using the dropdown class. The default min-WIDTH is set to 160px that can be updated. CSS has BOX-SHADOW property is used instead of BORDER to design a DropDown menu

look like a Card. :HOVER SELECTOR element show the DropDown menu when the user moves the mouse over the dropdown button.

Purpose: Usually, a DropDown is a bundle of Unordered List generate with HTML Tag. The DropDown Structure is prepared using Nested list Tags incorporated in the Tag. To generate such structure CSS DropDown Effect can be used, as CSS is very simple property used to create the DropDown menu.

Syntax:

```
.dropdown {  
position: relative;  
display: inline-block;  
}
```

Elements: To produce different types of CSS DropDown some main DropDown Elements are listed in Table 5.

Table 5: DropDown Elements

Element Name	Description
w3-dropdown-hover	Specifies Hoverable DropDown
w3-dropdown-content	Displays DropDown part
w3-dropdown-click	Specifies Clickable DropDown

Example 6: Program to demonstrate CSS DropDown Effects using Listing Tag.

Solution:

```
<HTML>  
  <HEAD>  
  <TITLE>DROPDOWN PROPERTY</TITLE>  
  </HEAD>  
  <BODY>  
    <UL>  
      <LI CLASS  
</UL> ="LEV-1">  
      <A HREF="">LEVEL-1</A>
```

```

<UL>
<LI>LEVEL 1.1</A></LI>
<LI>LEVEL 1.2</A></LI>
<LI>LEVEL 1.3</A></LI>
<LI>LEVEL 1.4</A></LI>
</UL>
</LI>
</BODY>

```

OUTPUT	<ul style="list-style-type: none"> • Level-1 <ul style="list-style-type: none"> ◦ Level 1.1 ◦ Level 1.2 ◦ Level 1.3 ◦ Level 1.4
---------------	---

Example 7:Program to demonstrate CSS DropDown Effects using DROPDOWN CLASS

Solution:

```

<HEAD>
<STYLE>
.DROPBTN {
    BACKGROUND-COLOR: BLUE;
    COLOR: RED;
    PADDING: 16PX;
    FONT-SIZE: 16PX;
    BORDER: NONE;
}
.DROPDOWN {
    POSITION: RELATIVE;
    DISPLAY: INLINE-BLOCK;
}
.DROPDOWN-CONTENT {
    DISPLAY: NONE;
    POSITION: ABSOLUTE;
    BACKGROUND-COLOR: GREEN;

```

```

        MIN-WIDTH: 160PX;
        BOX-SHADOW: 0PX 8PX 16PX 0PX
        RGBA(0,0,0,0.2);
        Z-INDEX: 1;
    }
    .DROPDOWN-CONTENT A {
        COLOR: BLACK;
        PADDING: 12PX 16PX;
        TEXT-DECORATION: NONE;
        DISPLAY: BLOCK;
    }
    .DROPDOWN-CONTENT A:HOVER {BACKGROUND-
COLOR: #DDD;}
    .DROPDOWN:HOVER .DROPDOWN-CONTENT {DISPLAY:
BLOCK;}
    .DROPDOWN:HOVER .DROPBTN {BACKGROUND-COLOR:
#3E8E41;}
</STYLE>
</HEAD>
<BODY>
<H2>CSS HOVERABLE DROPDOWN</H2>
<P>!!! NOTE: TO OPEN DROPDOWN HOVERABEL MENU MOVE
THE MOUSE OVER THE BUTTON!!!</P>
<DIV CLASS="DROPDOWN">
<BUTTON CLASS="DROPBTN">MAIN MENU
DROPDOWN</BUTTON>
    <DIV CLASS="DROPDOWN-CONTENT">
    <A HREF="#">SUB MENU 1</A>
    <A HREF="#">SUB MENU 2</A>
    <A HREF="#">SUB MENU 3</A>
    </DIV>
</DIV>
</BODY>

```

Output

CSS Hoverable DropDown

!!! Note: To open DropDown Hoverabel Menu move the mouse over the button.!!!

Main Menu DropDown

CSS Hoverable DropDown

!!! Note: To open DropDown Hoverabel Menu move the mouse over the button.!!!

Main Menu DropDown

SUB MENU 1

SUB MENU 2

SUB MENU 3

3.6 LET US SUM UP

Hello friends, now as you have completed this unit, you should be able to learn the concept, working and importance of CSS Effects in HTML Document. Applying Pseudo-Elements Effects, Layer Effects on Layer and DropDown Effects using Dropdown, Menu, Click, and Image, Animated component and its purpose and implementation should have been understood.

3.7 CHECK YOUR PROGRESS

Q 1 - Which of the following selector matches a particular element only when it lies inside a particular element?

A - Type Selector

- B** - Universal Selector
- C** - Descendant Selector
- D** - Class Selector

Q 2 - Which of the following is a way to associate styles with your HTML document?

- A** - External CSS - The Element
- B** - Imported CSS - @import Rule
- C** - Both of the above.
- D** - None of the above.

Q 3 - Which of the following defines a measurement in millimeters?

- A** - in
- B** - mm
- C** - pc
- D** - pt

Q 4 - Which of the following property is used to make a font italic or oblique?

- A** - Font-Family
- B** - Font-Style
- C** - Font-Variant
- D** - Font-Weight

Q 5 - Which of the following property is used to underline, overline, and strikethrough text?

- A** - Text-Indent

- B** - Text-Align
- C** - Text-Decoration
- D** - Text-Transform

Q 6 - Which of the following property is used to set the width of an image border?

- A** - Border
- B** -Height
- C** -Width
- D** - Moz-Opacity

Q 7 - Which of the following property of a table element allows browsers to speed up layout of a table by using the first width properties it comes across for the rest of a column rather than having to load the whole table before rendering it?

- A** - :TABLE-LAYOUT
- B** -:BORDER-SPACING
- C** -:CAPTION-SIDE
- D** -:EMPTY-CELLS

Q 8 - Which of the following property changes the style of bottom border?

- A** - :BORDER-BOTTOM-STYLE
- B** - :BORDER-TOP-STYLE
- C** - :BORDER-LEFT-STYLE
- D** - :BORDER-RIGHT-STYLE

Q 9 - Which of the following property specifies an image for the marker rather than a bullet point or number?

A - LIST-STYLE-TYPE

B - LIST-STYLE-POSITION

C - LIST-STYLE-IMAGE

D - LIST-STYLE

Q 10 - Which of the following value of cursor shows it as crosshair or plus sign?

A - Crosshair

B - Default

C - Pointer

D - Move

3 .8 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

Q 1 - Which of the following selector matches a particular element only when it lies inside a particular element?

C - The Descendant Selector

Q 2 - Which of the following is a way to associate styles with your HTML document?

C - Both of the above.

Q 3 - Which of the following defines a measurement in millimeters?

B - mm

Q 4 - Which of the following property is used to make a font italic or oblique?

B - FONT-STYLE

Q 5 - Which of the following property is used to underline, overline, and strikethrough text?

C - TEXT-DECORATION

Q 6 - Which of the following property is used to set the width of an image border?

A - Border

Q 7 - Which of the following property of a table element allows browsers to speed up layout of a table by using the first width properties it comes across for the rest of a column rather than having to load the whole table before rendering it?

A - :TABLE-LAYOUT

Q 8 - Which of the following property changes the style of bottom border?

A - :BORDER-BOTTOM-STYLE

Q 9 - Which of the following property specifies an image for the marker rather than a bullet point or number?

C - LIST-STYLE-IMAGE

Q 10 - Which of the following value of cursor shows it as crosshair or plus sign?

A - Crosshair

3.9 FURTHER READING

Online Reference Reading as PDF:

<http://bedford-computing.co.uk/learning/wp-content/uploads/2016/07/>

[No.Starch.CSS.2nd.Edition.pdf](#)[About CSS Effects .1-78]

Online Reference Reading as Video:

https://www.youtube.com/watch?v=k1ktEGt6gl0&list=PLx_KyK8sU66WADyw7TY_LKwIFXB5JXcxA [All about CSS Effects and Layers]

3.10 ASSIGNMENTS

Answer the below questions

- 1) What are CSS Effects? Explain.
- 2) What is Pseudo-Elements Effects? Explain with suitable example.
- 3) What do you mean by CSS Layer effect? Explain with necessary attributes.
- 4) What is CSS Drop-Down Effects? Explain with suitable example.

3.11 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

- Write with your own words important of effects of CSS.
- List out various effects of CSS that are used with HTML in Webpage.
- Give the difference between SINGLE LINE PSEUDO v/s SINGLE CHARACTER PSEUDO elements effects.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a CSS Effects Program in HTML for HTML Document to:

- Apply Pseudo Element Effect.
- Apply Layer Effect in.
- Apply DropDown Effect using HTML List Tag.
- Apply DropDown Effect using HTML DropDown Class.

Unit 4: Other Effects of Cascading Style Sheet

4

UNIT STRUCTURE

- 4.1. Learning Objectives.
- 4.2. Introduction to other Effects in Cascading Style Sheets.
- 4.3. Image Opacity
- 4.4. Rounded Corners
- 4.5. Shadows
- 4.6. Transitions
- 4.7. Animations
- 4.8. 2D/3D Transforms
- 4.9. Let us sum up.
- 4.10. Check Your Progress
- 4.11. Check your Progress: Possible Answers.
- 4.12. Further Reading.
- 4.13. Assignment.
- 4.14. Activities.

4.1 LEARNING OBJECTIVE

The Block 3 - Unit 4 aims to develop skills of styling Webpages using Cascading Style Sheet (CSS) Language. After studying this Unit student should be able to:

- Understand the basic concept of other effects of Cascading Style Sheet that describes the style of an HTML document.
- Style a Webpage of Websites using various other effects like: Image Opacity, Rounded Corners, Shadows, Transitions, Animations, 2D/3D Transforms.

4.2 INTRODUCTION TO OTHER EFFECTS IN CASCADING STYLE SHEET

Cascading Style Sheet (CSS) is the standard design language mainly intended to simplify the process of making Web-pages presentable of Website that can even be called as a Web Application. The Web Application is viewed in Web Browser that receives the Web-pages designed in either from the local Computer System Storage or a Web Server and transforms it to multimedia Web-pages. CSS has many more additional Effects to embed in the HTML Document and enhance its cognizance.

Facts to Ponder:

- **CSS Effect saves time:** CSS Effect code is written once and then it can be reused in same sheet as well as in different multiple HTML pages. A CSS Effect can be defined once and it can be applied to as many Web-pages as much we want.
- **Pages load faster:** If you are using CSS effects, you do not need to write HTML tag and Properties every time to apply effects in the Web-pages. You just have to write one CSS rule of a tag and apply it to all the occurrences of that tag. Therefore less code means faster download times.
- **Superior styles to HTML:** CSS has much wider range of effect and Properties than HTML, so you can style and design web-pages easily.

4.3 IMAGE OPACITY

Explanation: In any Webpages images play an important role. Although it is not mandatory to include a lot of images, but still it is important to use good images wherever it is required.

Purpose:Sometimes you need your images to be vibrant to brighten up your webpage.

In other cases, you need transparent images and text for a more soft and restrained professional look. To make an HTML element you add a CSS opacity styling property to create a CSS transparent background it is easy by CSS opacity styling property. In any web-page CSS plays an important role to control an image display. You can set the following images properties using CSS effect to set:

- Border of an image using the BORDER property.
- Height of an image using the HEIGHT property.
- Width of an image using the WIDTH property.
- Transparency of an image in webpage using OPACITY property.

Syntax:

Opacity: number|initial|inherit;

Properties: The Image Opacity has the following Properties as listed in Table 1.

Table 1: Properties of Image Opacity

Properties	Description	Example
NUMBER	Specifies the opacity from 0.0(fully transparent) to 1.0(fully opaque).	<pre>img{ opacity: number(0.0 – 1.0); filter:alpha(opacity=x); }</pre>

INITIAL	Sets CSS property to its default value. It can be used for any CSS property and on any HTML documents.	div{ color : blue; } h1{ color: initial; }
INHERIT	Specifies that a property should inherit its value from its parent element (base element). It can also be used for any CSS property and on any HTML documents.	span{ color: green; } .extra span{ color: inherit; }


Example 1: HTML Program to demonstrate CSS effect – OPACITY property making an image only 40% opacity / transparency.

Solution:

```
<HEAD>
<STYLE>
    img {
        opacity: 0.4;
        filter: alpha(opacity=40);
    }
</STYLE>
</HEAD>
<BODY>
    <H1>Image Transparency</H1>
    <P> In CSS opacity property specifies the transparency of an image or
    element. The lower the value of opacity the more transparent it will be. </P>

    <P>Image with 40% opacity</P>
    <IMG SRC="img_forest.jpg" alt="Forest" width="348" height="145">

</BODY>
```


OUTPUT	<p>Image Transparency</p> <p>In CSS opacity property specifies the transparency of an image or element. The lower the value of opacity the more transparent it will be.</p> <p>Image with 40% opacity</p> 
---------------	--

4.4 ROUNDED CORNERS

Explanation: CSS Rounded corners are used to add special colored corner to body or text by using the border-radius property.

Purpose: It allows element's outer border edge to get rounds from the corners. To make circular corners you can set a single radius or two radii to make elliptical corners.

Syntax: A simple syntax for rounded corners is as below:

```
#RCORNERS1 {
    BORDER-RADIUS: 25PX;
    BACKGROUND: #73AD21;
    PADDING: 20PX;
    WIDTH: 200PX;
    HEIGHT: 150PX;
}
```

Properties: The Rounded Corners has the following properties as listed in Table 2.

Table 2: Rounded Corners Properties

Properties	Description
------------	-------------

BORDER-RADIUS	Specifies shorthand property for setting all of the four border-*-*-radius property.
BORDER-TOP-LEFT-RADIUS	Defines the shape of the top – left corner of the border.
BORDER-TOP-RIGHT-RADIUS	Defines the shape of the top – right corner of the border.
BORDER-BOTTOM-LEFT-RADIUS	Defines the shape of the bottom – left corner of the border.
BORDER-BOTTOM-RIGHT-RADIUS	Defines the shape of the bottom – right corner of the border.


Example 2: CSS Effects program to show the rounded corners for an element with specific background color.

Solution:

```

<HEAD>
  <STYLE>
    #rcorners1 {
      border-radius: 25px;
      background: blue;
      padding: 20px;
      width: 200px;
      height: 150px;
    }
  </STYLE>
</HEAD>
<BODY>
  <h1>The CSS Rounded Corners Effect with border-radius Property</h1>
  <p>Rounded corners for an element with a specified background color:</p>
  <p id="rcorners1">Rounded corners!</p>
</BODY>

```

OUTPUT T	<p>The CSS Rounded Corners Effect with border-radius Property</p> <p>Rounded corners for an element with a specified background color:</p> 
---------------------------	---

4.5 SHADOWS

Explanation: This feature in CSS adds extra decoration to webpage using Text shadow and Box shadow. It gives shadow effect to the text as well as to the box also. There are two types of shadow effects as below:

- Text shadow
- Box shadow

Purpose:

- **Text shadow:**To add shadow to the text you can use text – shadow CSS property. To apply it to text and any of its decorations it is accepted in a comma – separated list of shadows. Each shadow applied is described by some of combination of X and Y offsets from the element, its blur radius and its color.
- **Box shadow:**To add shadow effects around any element’s frame you can use box - shadow CSS property. You can set multiple effects by comma – separated list. Each box shadow applied is described by some of X and Y offsets combinations relative to the element, blur and spread radii, and color.

Syntax:

- **Box shadow:** It specify the Horizontal Shadow (2px), Vertical Shadow (2px), Blur (5px) and color (blue or any other color) of box’s shadow.
 - `h1{`
 - `box – shadow: 10px 10px 5px grey;`
 - `}`

- **Text shadow:** It specify the Horizontal Shadow (2px), Vertical Shadow (2px), Blur (5px) and color (blue or any other color) of text's shadow.

```

o h1{
    text – shadow: 2px 2px 5px blue;
}

```

Properties:The CSS ShadowEffect has the followingproperties as listed in Table 3.

Table 3: CSS Shadow Effect Properties

Properties	Description
Box – Shadow	Adds one or more shadows types to an element.
Text – Shadow	Adds one or more shadows types to a text.

Example 4: The HTML Program which displays the CSS Box-shadow and Text-shadow effects property.

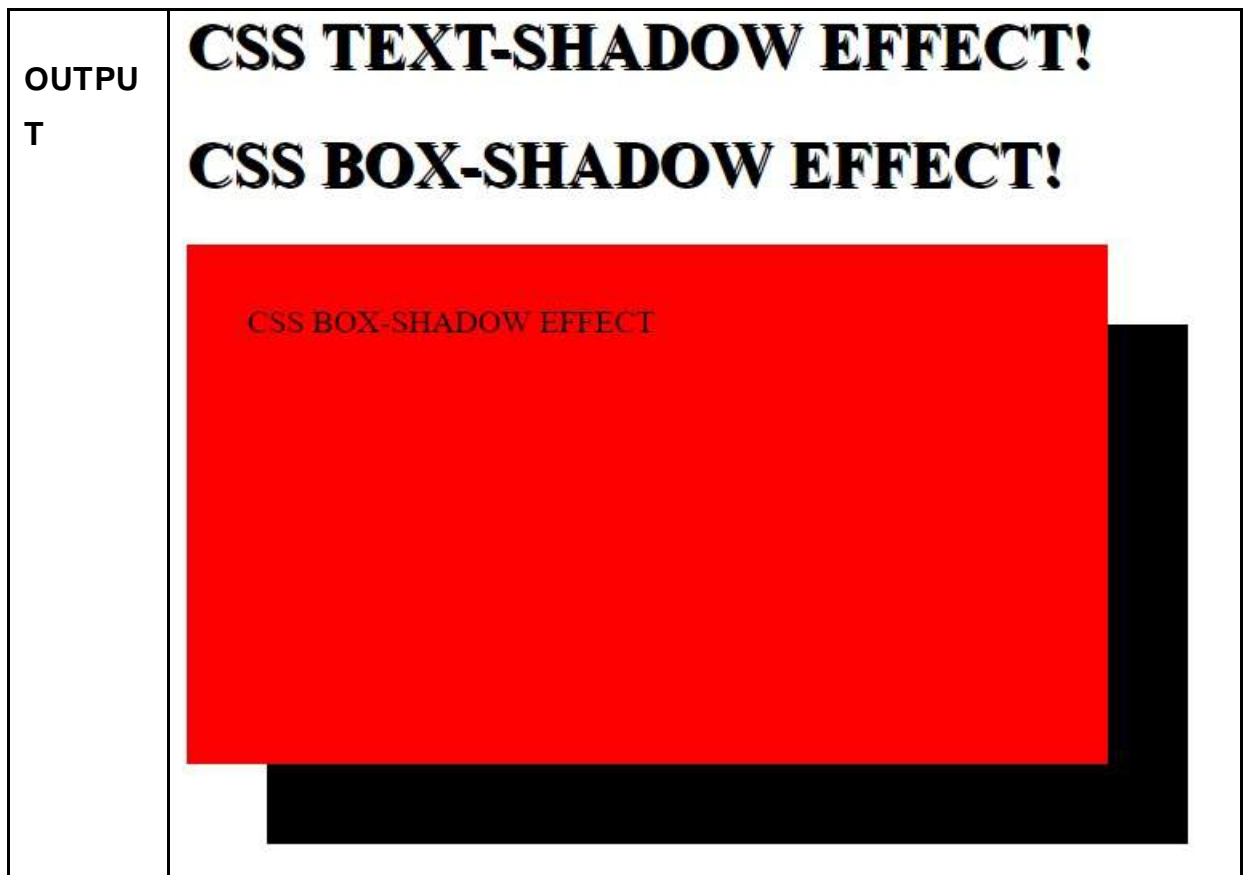
Solution:

```

<HEAD>
<STYLE>
    h1 {
        text-shadow: 1.5px 1.5px;
    }
/* Internet Explorer 9 and earlier versions, do not support the text-shadow
property. */
    div {
        width: 400px;
        height: 200px;
        padding: 30px;
        background-color: red;
        box-shadow: 40px 40px;
    }
</STYLE>
</HEAD>
<BODY>
    <H1>CSS TEXT-SHADOW EFFECT! </H1>
    <H1>CSS BOX-SHADOW EFFECT! </H1>
    <div>CSS BOX-SHADOW EFFECT! </div>

```

</BODY>



4.6 TRANSITIONS

Explanation:Through CSS transitions you can change the property values smoothly (from one value to another) over a given duration. Two things that can be specified to create a transition effect are:

- First is the CSS property you want to add an effect.
- Second is the duration of the effect.

Purpose:The way to control animation speed when changing CSS properties, it is provided by CSS transitions. Over a period of time you can cause the changes in a property to take effect immediately. For Instance we can change the color of an element from black to white normally the changes takes place instantaneously. But

with CSS transitions enabled, changes occurred at time intervals that will follow an acceleration curve by which all of can be customized.

Syntax:The following syntax shows 100px * 100px red <div> element. This <div> element has also specified a transition effect for the width property, with duration of 2 seconds.

```
div {
    width: 100px;
    height: 100px;
    background: red;
    -webkit-transition: width 2s;
    transition: width 2s;
}
```

Properties: The CSS Transition Effect has the following properties as listed in Table 4.

Table 4: CSS Transition Effect Properties

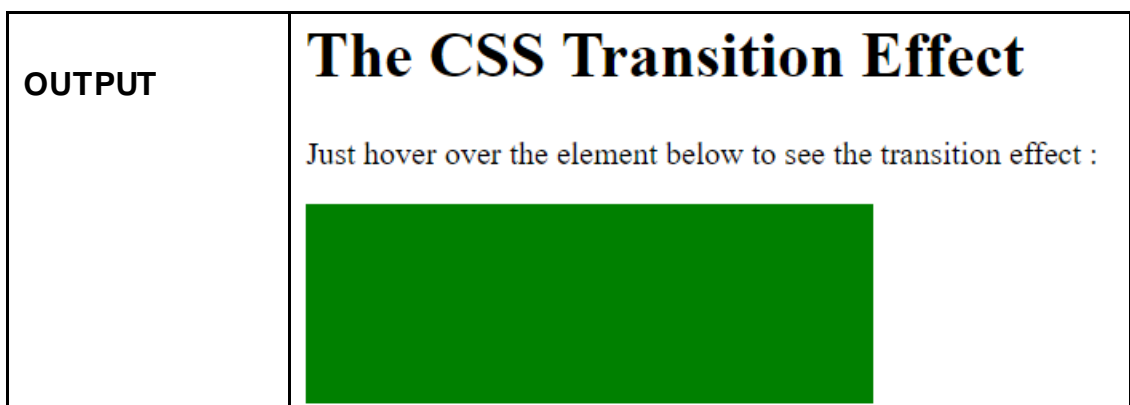
Properties	Description
TRANSITION	Specifies shorthand property which sets the 4 transitions properties into a single property.
TRANSITION – DELAY	Specifies that how much delay (in seconds) occurred for the transition effect.
TRANSITION – DURATION	Specifies that how much seconds or milliseconds a transition effect takes to complete.
TRANSITION – PROPERTY	Specifies the name of CSS property for which transition effect is for.
TRANSITION – TIMING FUNCTION	Specifies the speed curve of the transition effect.

Example 5: HTML program which shows the CSS property which shows transition effects.

Solution:

```
<HEAD>
<STYLE>
div {
    width: 150px;
    height: 100px;
    background: red;
    -webkit-transition: width 3s;
    transition: width 3s;
}

div:hover {
    width: 400px;
}
</STYLE>
</HEAD>
<BODY>
    <H1> The Transition Property</H1>
    <P> Just hover over the element below to see the transition effect : </P>
    <div></div>
</BODY>
```



4.7 ANIMATIONS

Explanation:The process of making shape changes and creating motions with elements is known as Animation.In HTML, CSS animations allow animation of the most HTML elements without using JavaScript or with the Flash.

Purpose: In CSS, CSS animations give platform and make it possible to animate the transitions from one CSS style configuration to another configuration. CSS Animations are consists of two components one is a style describing the CSS animation and second is a set of key frames that indicates starting and ending state of the animation's style as well as the possible in intermediate waypoints.

Syntax:

```
#box {  
    -webkit-animation: NAME-YOUR-ANIMATION 5s infinite;  
    -moz-animation: NAME-YOUR-ANIMATION 5s infinite;  
    -o-animation: NAME-YOUR-ANIMATION 5s infinite;  
    animation: NAME-YOUR-ANIMATION 5s infinite;  
}
```

Properties: The CSS Animations has the following properties as listed in Table 5.

Table 5: CSS Animation Properties

Properties	Description
@KEYFRAMES	Specifies the code of animation.
ANIMATION	Specifies shorthand property for setting all the animation properties.
ANIMATION DELAY	Specifies the delay happen for the start of an animation.
ANIMATION DIRECTION	– Specifies that weather an animation should be played forwards, backwards or in

		alternate cycle.
ANIMATION – DURATION	–	Specifies that long it will take time an animation should take to complete one cycle.
ANIMATION – FILL – MODE	–	When the animation is not playing, it specifies a style for the element (before it starting/ after ending or both).
ANIMATION – ITERATION - COUNT	–	Gives and specifies the number of times an animation should be played.
ANIMATION – NAME		Specifies the name of the @keyframes animation.
ANIMATION – PLAY – STATE	–	Specifies that whether the animation is running or paused.
ANIMATION – TIMING – FUNCTION		Specifies the speed curve of the Animation.

Example 6: CSS Program which demonstrate Animation Effect.

Solution:

```

<HEAD>
<STYLE>
    div {
        width: 300px;
        height: 300px;
        background-color: blue;
        -webkit-animation-name: example;
        -webkit-animation-duration: 5s;
        animation-name: Demo;
        animation-duration: 5s;
    }
    @-webkit-keyframes Demo {
        from {background-color: red;}
        to {background-color: green;}
    }
    @keyframes Demo {
        from {background-color: red;}
        to {background-color: green;}
    }
</STYLE>
</HEAD>
<BODY>

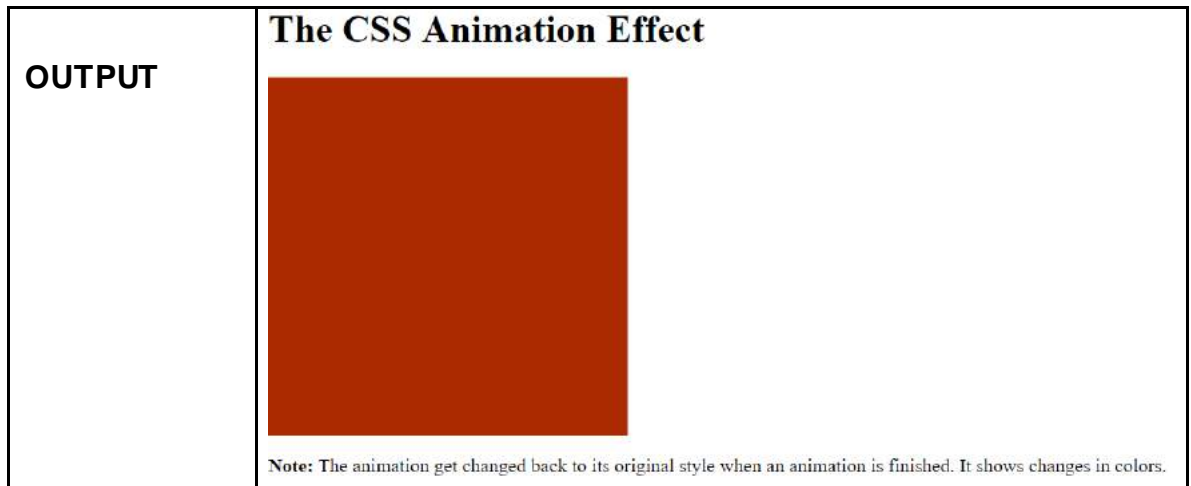
```

```
<H1> The CSS Animation Effect</H1>
```

```
<div></div>
```

```
<p><b>Note:</b> The animation get changed back to its original style when an  
animation is finished. It shows changes in colors. </p>
```

```
</BODY>
```



4.8 2D/3D TRANSFORMS

Explanation: The Transform property used for 2D transforms is use same for 3D Transforms. You'll find the basic 3D transform functions similar if you are familiar with 2D transformer. However, TRANSLATEX() positions an element along the horizontal X axis, TRANSLATEY() positions an element along the horizontal Y axis, TRANSLATEZ() positions an element along the horizontal Z axis, which runs front to back in 3D space, the other variations are:

- ROTATEX(ANGLE)
- ROTATEY(ANGLE)
- ROTATEZ(ANGLE)
- TRANSLATEZ(TZ)
- SCALEZ(SZ)

Purpose: By using 3D transforms we can rotate and move element to x- axis, y-axis and z-axis.

Syntax: TRANSFORM: ROTATE3D(0);
 TRANSFORM: ROTATE3D(1, 1, 1, 45DEG);
 TRANSFORM: ROTATE3D(2, -1, -1, -0.2TURN);
 TRANSFORM: ROTATE3D(0, 1, 0.5, 3.142RAD);

Properties: The CSS 2D/3D Transform has the following properties as listed in Table 6.

Table 6: CSS 2D/3D Transform Properties

Properties	Description
TRANSFORM	Specifies and applies a 2D or 3D transformation to an element.
TRANSFORM-ORIGIN	Allows changing the position on transformed elements.
TRANSFORM-STYLE	Specifies how nested elements are rendered in 3D space.
PERSPECTIVE	Specifies the perspective on viewing of 3D elements.
PERSPECTIVE-ORIGIN	Specifies the bottom position of 3D elements.
BACKFACE-VISIBILITY	Defines whether or not an element should be visible when not facing the screen.

Example: CSS Program which demonstrate Transform Effect.

Solution:

```
<HEAD>
```

```
<STYLE>
```

```
div {
```

```
    width: 300px;
```

```

        height: 100px;
        background-color: yellow;
        border: 1px solid black;
    }
    #myDiv {
        -webkit-transform: rotateX(150deg); /* Safari */
        transform: rotateX(150deg); /* Standard syntax */
    }
</STYLE>
</HEAD>
<BODY>
<H1>The rotateX() Transformation</H1>
<P>The rotateX() Transform rotates an element around its X-axis at a given
        degree.</P>
<div>BEFORE TRANSFORM</div>
<div id="myDiv">AFTER TRANSFORM</div>
</BODY>

```

OUTPUT	<h2 style="text-align: center; margin: 0;">The rotateX() Transformation</h2> <p style="margin: 0;">The rotateX() Transform rotates an element around its X-axis at a given degree.</p> <div style="border: 1px solid black; background-color: yellow; padding: 5px; margin: 5px 0;">BEFORE TRANSFORM</div> <div style="border: 1px solid black; background-color: yellow; padding: 5px; margin: 5px 0;">AFTER TRANSFORM</div>
---------------	---

4.9 LET US SUM UP

Hello friends, now as you have completed this unit, you should be able to learn the concept, working and importance of CSS Effects to develop skills of styling Webpages in HTML Document. Applying Image Opacity, Rounded Corners,

Shadows, Transitions, Animations, 2D/3D Transforms properties, purpose and implementation should have been understood.\

4.10 CHECK YOUR PROGRESS

- Define: Transitions, Animations and 2D/3D Transforms.
- _____ CSS styling property to create a CSS transparent background. [Image Opacity, Rounded Corner, Shadows, Transitions]
- CSS Rounded corners are used to add special colored corner to body or text by using the border-radius property. (True/False)
- List the Properties of Shadows.

4.11 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Define:
 - Transitions: The way to control animation speed when changing CSS properties, it is provided by CSS transitions.
 - Animations: CSS animations give platform and make it possible to animate the transitions from one CSS style configuration to another configuration.
 - 2D/3D Transforms: By using 3D transforms we can rotate and move element to x- axis, y-axis and z-axis.
- **Image Opacity** CSS styling property to create a CSS transparent background.
- CSS Rounded corners are used to add special colored corner to body or text by using the border-radius property. **True**
- **Properties of Shadows** are:
 - Box – Shadow: Adds one or more shadows types to an element.
 - Text – Shadow: Adds one or more shadows types to a text.

4.12 FURTHER READING

Online Reference Reading as PDF:

https://www.dmxzone.com/Downloads/Tutorial_dmxAnimator_Manual.zip/Advanced_CSS_Animator_Manual.pdf[About CSS Advanced Effects Pg.1-45]

Online Reference Reading as Video:

<https://www.youtube.com/watch?v=yI0X4e7bxHU> [About All CSS Effects]

4.13 ASSIGNMENTS

- Explain with suitable examples the below CSS Effects:
 - Image Opacity
 - Rounded Corner
 - Shadows
 - Transitions
 - Animations
 - 2D/3D Transforms

4.14 ACTIVITIES

Creative Zone:

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Design a single Webpage having CSS Effects - Image Opacity, Rounded Corner, Shadows, Transitions, Animations and 2D/3D Transforms.

.

Code Zone:

Note: All the activities can be performed taking sequential reference of all Examples provided in this Unit.

Write a CSS Effects Program in HTML for HTML Document to demonstrate and display:

- Image Opacity.
- Rounded Corner.
- Shadows.
- Transitions.
- Animations.
- 2D/3D Transforms.

Block-4

Introduction to Java Script

Unit 1: Introduction to JavaScript

1

Unit Structure

- 1.1. Learning Objectives.
- 1.2. Introduction to JavaScript.
- 1.3. Data Types – Literals-Variables-Array-Objects in JavaScript.
- 1.4. Operators and Constructors of JavaScript.
- 1.5. Condition Statement of JavaScript.
- 1.6. Looping Statement of JavaScript.
- 1.7. Branching Statement of JavaScript.
- 1.8. Let us sum up.
- 1.9. Check Your Progress.
- 1.10. Check your Progress: Possible Answers.
- 1.11. Further Reading.
- 1.12. Assignment.
- 1.13. Activities.

1.1 LEARNING OBJECTIVE

After studying this unit student should be able to understand:

- JavaScript use in Web Page.
- JavaScript data types, variables, literals, operators as scripting language.
- As object oriented scripting language concept of constructor.
- Data control statement like Decision making, Looping and Branching.

1.2 INTRODUCTION TO JAVASCRIPT

Friends , You might heard about HTML (Hyper Text Markup Language) that based on various tags , HTML can create various Data Input tags like creating Textbox , Text area, Radio button , Checkbox Etc It can also create Button to perform Event (Click on Button it is called Click event) but HTML has a big limitation that cannot take data from user because HTML is not full features of Language. It does not have any Data Types or Variable declaration with data types.

So, JavaScript is much more beyond HTML. Let's define with what is actual JavaScript

“A client side portable scripting language that accept data from user from HTML and response quickly is known as JavaScript”

As per above concept lets we understand the each terms.

Client Side: When we open any browser some response directly available from browser only it means Client Side (when we enter some data in HTML form and click on button of HTML webpage some validation response directly available from browser itself – properly observe at downside of taskbar there is not green progress bar visualize and response available is known as Client Side)

Portable: It means it is light weight and portable means we can use `<script>.... </script>` tag in `<HEAD> </HEAD>` as well as `<BODY>.... </BODY>`.

Accept Data : By JavaScript we can declare variable , it has data types so we can easily accept data from webpage various input tools like textbox , text area , dropdown, etc.

Comparing HTML with JavaScript.

HTML	JavaScript
<ul style="list-style-type: none"> • It is Markup language. • It does not have any data types or traditional variable declaration method. • It can't take data from user (It can create Form by <FORM>). • It has basic structure like <HTML><HEDA>, <BODY>...tag base markup language. • It has limited scope of development • Main use is to develop Static web page. • It defines the basic structure of web page on how it should look. 	<ul style="list-style-type: none"> • It is scripting language. • It has data types, variable declaration method. • It can take data from user from <FORM> by data types and variable. • It is Object Oriented base client side scripting language. • It has large scope of development like it can work with any web platform as resource. • Main use is to develop Dynamic web page. • It defines to interactive to web page. (i.e. data interaction)

Friends now you have question in your mind that

Is Java and JavaScript are same? Answer is No

Let's take comparison between these both

Java	JavaScript
<ul style="list-style-type: none"> • General purpose computer programming language. • Developed by James Gosling in 1995 at Sun Microsystems. • Require JVM (Java Virtual Machine) for execute any program. • Strongly define data type. • Objects are Class based. • To execute java program we need to set the path. • Provide multithreading. • File extension is .java • It stands as own independent. • It has wide scope to develop as desktop, web and mobile application. 	<ul style="list-style-type: none"> • High level data interaction Web platform based scripting language. • Developed by Brendan Eich in 1995 at Netscape. • Require just web browser for displaying web page. • No strongly define data type. • Objects are prototype based. • To open JavaScript based web page we need just web browser. • Does not support multithreading. • File extension is .js or .html • It is coded as in HTML or other web platform. (Not independent) • It has very limited scope to develop as only web platform (web page)

Advantages and Disadvantages of JavaScript.

Hey guys before start to learn JavaScript we need to understand why should we learn JavaScript? What are the benefits of JavaScript? So let's take a look at this.

Advantages:

Executed on the Client side: for instance, you can validate any user input before sending a request to the server. This makes fewer loads on the server.

Relatively simple language: this can be quite easy to be told and also the syntax that's getting ready to English.

Instance response to the visitors: with none server interaction, you don't have to be compelled to sit up for a page reload to urge your want result.

Fast to the tip user: because the script is dead on the user's laptop, reckoning on task, the results area unit completed nearly instantly.

Interactive increased: making interfaces that may react once the user hovers over them or activates them mistreatment the keyboard.

Rich interfaces: Drag and drop parts or slider could provide a wealthy interface to your web site guests.

Embedded within HTML:It can be written in any text editor i.e. notepad. It appropriate HTML tags and all this saved in *filename.html*.

Performance:It is very compact and quite small simple language. It performs very faster because no compiler and no interpreter use so when it load in browser it is faster than any web development.

Very easy to Debugging and Testing:It tested line by line and when it shows errors are listed as they encountered.

Platform Independent:It is completely independent of the hardware or network so it can execute on any machine.

Disadvantages:

Security:Code of JavaScript can be easily view and trance on any browser so it is not reliable as aspect of security.

File Access Denied:It is client side so cannot read or write data from the File

Backend Support Disabled:It cannot support database connectivity so data transmission from / to database not possible.

Search Engine unsupported:It cannot support search engine and easily disable from browser.

Not fully Support OOPS:It cannot support Multi-threading or Multiprocessor so Object Oriented Programming System full features does not allow.

How JavaScript interact with Web Browser.

As we know that HTML – JavaScript as well as CSS (Cascade Style Sheet) interact with any web browser it need only COM (Component Object Modeling) and DCOM (Decomponent Object Modeling) that also known as JavaScript engine.

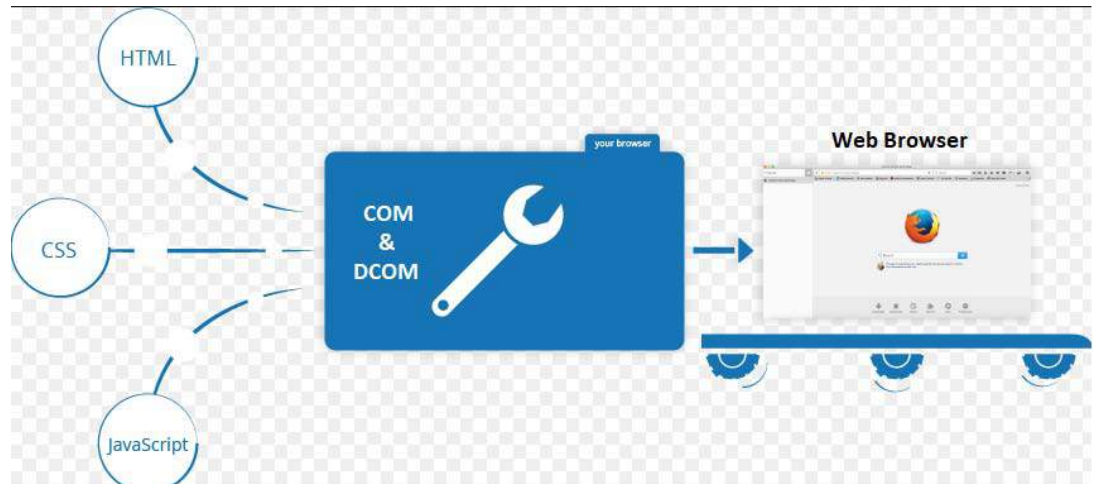


Figure -1: Interaction of HTM – JavaScript and CSS with web browser

A **JavaScript engine (COM & DCOM)** is a program which executes JavaScript code. A JavaScript engine can be implemented as a standard interpreter, or just-in-time compiler that compiles JavaScript to byte code in some form.

This is some popular projects that are implementing a JavaScript engine:

V8—open source, developed by Google, developed in C++

Rhino—managed by the Mozilla Foundation, open source, developed entirely in Java

SpiderMonkey—the first JavaScript engine, which back in the days powered Netscape Navigator, and today powers Firefox

JavaScriptCore—open source, marketed as Nitro and developed by Apple for Safari

KJS—KDE's engine originally developed for Konqueror web browser

Chakra (JScript9)—handled and manage internet Explorer

Chakra (JavaScript)—handled and manage in Microsoft Edge

JerryScript—is a lightweight engine for the Internet of Things

1.3 DATA TYPES – LITERALS-VARIABLES-ARRAY-OBJECTS IN JAVASCRIPT.

JavaScript support two types of Data Types.

1) Primitive Types

2) Non Primitive Complex Types.

1) **Primitive Types** : “ A data types that assigned and declared as single literal values is known as primitive data types”

In JavaScript four Primitive Data Types before understanding that it is necessary to understand **How variable and Data Types declare** in JavaScript?

Syntax : var <variable name> = value ;

a) Number

It can store integer or floating point values (literals)

Ex.

```
var x = 4;
```

```
var y=18.00;
```

```
var z= 18.67;
```

Friends , when we take output of above value it seems like below

Sample code	Result
<pre><script> var x = 4; var y = 18.00; var z = 18.67; alert (x); alert(y); alert(z); </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>4 18 18.67</p>

Practical Note: All Sample code type in notepad and save it with .html extension and finally open in web browser (i.e. google chrome) you will get output

b) Text / String :

It can store single character or string values (literals). When we declare any text/string base value we can use single quotes (') or double quotes (")

Ex.

```
var x = 'y';
```

```
var y="BAOU";
```

Friends, when we take output of above value it seems like below

Sample code	Result
<pre><script> var x = 'Y'; var y = "BAOU"; alert (x); alert(y); </script></pre>	Result will display as below in alert box when browser load this code Y BAOU

c) Hybrid :

It can store number as well as text type of data as in single literal (variable)

Ex.

```
var x = 18 + "BAOU";
```

```
var y= 18+2 + " BAOU";
```

Friends, when we take output of above value as in program it seems like below

Sample code	Result
<pre><script> var x = 18 + " BAOU"; var y=18+2+ " BAOU"; alert (x); alert (y); </script></pre>	Result will display as below in alert box when browser load this code 18 BAOU 20 BAOU

d) Boolean :

It can return only two values *true* or *false*.

Ex.

```
var x = 18;
```

```
var y= 18;
```

```
var z=20;
```

Friends, when we take output of above value as in program it seems like below

Sample code	Result
<pre><script> var x = 18 ; var y= 18; var z=20; alert (x==y); alert (x==z); </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>true false</p>

2) Non Primitive (Complex Types).

Complex data types are those data types that can able to declare for special purpose like to store multiple value or collection of values less than one structure in JavaScript

a) Array

We have learned that a variable can hold only one value, for example var x= 18, we can assign only one value to x. We cannot assign multiple literal values to a variable x. To overcome this problem, JavaScript provides an array.

“A special data types that can store multiple value under single variable is called Array”

An array is a special type of variable, which can store multiple values using particular syntax. Every value is assigned with numeric index starting with 0. The following figure illustrates how an array arrange values.

value	67	“BAOU”	34.56	“India”
Index	0	1	2	3

In above example various types of value assigned to a single array. Yes, friends we can assign mix types of data values in single array also.

How can we declare array?

```
var <array-name> = [value0, value 1, value 2,... value N];
```

Let's see the proper example of an array

Sample code	Result
<pre><html><body> <script> var x = ["India", " Gujarat", " BAOU"]; var y = [18, 20, 22, 24]; var z = [18, "BAOU", "India", 24]; alert(x); alert (x[0]); alert (y[2]); alert (z[1]); </script></html></body></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>India Gujarat BAOU India 22 BAOU</p>

b) Object:

Objects are **not** a primitive data Type.

An object is a collection of properties. These properties are store in key/value group.

Properties can allocate any type of data, including objects and/or primitive values.

Syntax:

```
var <obj name> = {
  subelement1: 'value1',
  subelement2: 'value2',
  subelement3: 'value3', .....
  subelementN: 'valueN',
}
```

For understanding better let's

Sample code	Result
<pre><script> var person = { x : "BAOU", y : "MSC-IT", z : 88.99, z1 : "ahmedabad" }; alert ("hi "+ person.x + " your degree is " + person.y + " your % is "+ person.z + " your city is "+ person.z1); </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>hi BAOU your degree is MSC-IT your % is 88.99 your city is ahmedabad</p>

Type Of / Typecasting Operator

“A special operator that can define the input data variable / literal type is known as type of “

It is special operator that derived all the data types' identification as well as object identification

Friends, let's see the example

<pre><script> var x = new Date (); alert (typeof "hi") alert (typeof 314) alert (typeof 3.14) alert (typeof x) alert (typeof (3 + 4)); </script></pre>	Result will display as below in alert box when browser load this code String Number Number Object Number
--	---

1.4 OPERATORS AND CONSTRUCTORS OF JAVASCRIPT.

“A symbol that use for various purpose like calculation, comparison, logical process in any programming language is known as operator”

JavaScript is also Client Side Scripting Language so it has also operator.

- 1 **Arithmetic Operator**
- 2 **Comparison Operator**
- 3 **Logical Operator**
- 4 **Assignment Operator**
- 5 **Ternary Operator**

1 Arithmetic Operator

JavaScript supports the following arithmetic operators-

Operator	Name	X Value	Y Value	Example	Result
+	Addition	5	3	x + y	8
-	Subtraction	5	3	x - y	2
*	Multiplication	5	3	x * y	15
/	Division	5	3	x / y	1.66667
%	Modulus	5	3	x % y	2
++	Increment	5		x ++	6
--	Decrement	5		x --	4

Note – Addition operator (+) works for Numeric as well as Strings connector
i.e. "K" + 20 will give "k20".

2 Comparison Operator

JavaScript supports the following comparison operators-

Operator	Name	X Value	Y Value	Example	Result
<	Less than	10	5	$y < x$	True
>	Greater than	10	5	$x > y$	True
<=	Less than equal to	10	5	$x <= y$	False
>=	Greater than equal to	10	5	$x >= y$	True
!=	Not equal to	10	5	$x != y$	True
==	Equal to	10	5	$x == y$	False

3. Logical Operator

JavaScript supports the following logical operators-

Operator	Name	X Value	Y Value	Example	Result
&&	AND	5	3	$X > 3 \ \&\& \ y > 2$	True because condition are true
	OR	5	3	$X > 4 \ \ y < 2$	True because one condition is true (x condition true and y condition is false)
!	NOT	5	3	$x != y$	True because x is not equal to y

4. Assignment / Short hand Operator

JavaScript supports the following assignment operators-

Operator	Name	X Value	Y Value	Example	Result
+=	Addition assignment	10	5	$x += y$ means $x = x + y$	15
-=	Subtraction	10	5	$x -= y$ means $x = x - y$	5
*=	Multiplication	10	5	$x *= y$ means $x = x * y$	50
/=	Division	10	5	$x /= y$ means $x = x / y$	True
%=	Modules	10	5	$x \% = y$ means $x = x \% y$	0

5. Ternary Operator / Special Operator

JavaScript supports the following Ternary operators-

Operator	Name	X Value	Y Value	Example	Result
?	Check condition	10	5	(x > y) ?	True

Constructor in JavaScript

The constructor is special operator that use 'this' keyword with object it is called constructor

<pre><script> // Constructor function for Person objects function Person(first, last, age, eye) { this.firstName = first; this.lastName = last; this.age = age; this.eyeColor = eye; } // Create a Person object var myFather = new Person("abhijeet", "jadeja", 50, "blue"); // Display age alert ("My father eye color is " + myFather.eyeColor); </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>My father eye color is blue</p>
--	---

1.5 CONDITION STATEMENT OF JAVASCRIPT.

Friends, when you want to take decision from machine it are possible by condition statement of any programming language.

“A process of programming language that use various comparison operator with keyword like if – else – else and use some variable / values for taking decision is known as condition statement”

JavaScript has following types of condition statements.

- **If** (1 Condition – 1 Decision)
- **If – else** (1 Condition – 2 Decision)

- **If – else if (N Condition – N+1 Decision)**

So let's understand one by one all

- **If (1 Condition – 1 Decision)**

- It has use only 1 keyword named 'if'
- With 'if' use only one condition and comparison operator.
- As concept of this decision making statement condition that we put with 'if' is true then output will generate.

Syntax of If statement

```
If (condition)
{
    // block of code will execute if condition will true only
}
```

Example of If statement

<pre><HTML> <script> var x=10 if (x > 8) { alert ("Our number is greater than 8"); } </script> </HTML></pre>	<p>Result will display as below in alert box when browser load this code Our number is greater than 8"; [here value of x is 10 so condition true because 10>8 so answer display]</p>
---	--

- **If - else (1 Condition – 2 Decision)**

- It has use 2 keyword named 'if' and other is 'else'
- As concept of this decision making statement condition that we put with 'if' is true then statement block -1 will execute and if condition is false statement block -2 will execute output will generate.

Syntax of If statement

```
If (condition)
{
    // block of code – 1 will execute if condition will true only
}
else
{
    // block of code – 2 will execute if condition will false only
}
```

Example of If-else statement

<pre><HTML> <script> var x=10 if (x > 8) { alert ("number is greater than 8"); } else { alert ("number is less than 8"); } </script> </HTML></pre>	<p>Result will display as below in alert box when browser load this code number is greater than 8</p> <p>[here value of x is 10 so condition true because 10>8 so answer display]</p> <p>[if you change value of x now 5 so condition false because 5>8 is false so output will be 'number is less than 8']</p>
---	--

- **If - else if (N Condition – N+1 Decision)**
 - It has use 2 keyword named 'if' and other is 'else if'
 - Here more than 2 condition you we can use all the condition will check and lastly if all given condition false then lastly after 'else' statement will use.

Syntax of If statement

```
If (condition-1)
{
  // block of code – 1 will execute if condition will True only
}
Else if (condition -2)
{
  // block of code – 2 will execute if condition will True only
}
.
.
Else if (condition -N)
{
  // block of code – N will execute if condition will True only
}
else
{
  // block of code – N+1 will execute if condition will false only
}
```

Example of If - elseif statement

<pre><HTML> <script> var x=10 if (x > 8) { alert ("number is Positive and greater than 8"); } else if (x<8) { alert ("number is Positive and less than 8"); } else if (x == 0) { alert ("number is exact 0"); } else { alert ("number is negative"); } </script> </HTML></pre>	<p>Result will display as below in alert box when browser load this code [here value of x is 10 so condition true because 10>8 so answer display as under] number is Positive and greater than 8 [if you change value of x is 5 so condition x<8 will true because 5<8 so answer display as under] Number is Positive and less than 8 [if you change value of x is 0 so condition x == 0 will true because x == 0 so answer display as under] Number is exact 0</p>
--	---

1.6 LOOPING STATEMENT OF JAVASCRIPT.

Friends, when you want to take multiple values as sequence increment or decrement level you can use looping concept in programming language.

“A process of programming that repeats as increment or decrement from some initial variable / value and provides sequence pattern of output is known as looping”

Looping has mainly 3 types for JavaScript that is as below.

- **while**
- **do – while**
- **for**

- **while (Entry Control Loop structure)**

- Looping concept that use condition with while and before entering to loop block it will check condition that given in while block if condition true than it will enter in loop block and it will execute
- In loop block increment / decrement value assignment is compulsory with given variable (i.e. x++ for increment or x -- for decrement)

Syntax of If statement

```
while (condition)
{
  //code block to be executed if while condition true
  Increment / decrement the value;
}
```

Example of while statement

<pre><script> var i = 0; while (i < 10) { alert(i) i++; }</pre>	<p>Result will display as below in alert box when browser load this code In alertbox 0 to 9 number will display one by one</p>
--	--

• do – while (Exit Control Loop Structure)

- Looping concept that use condition with while at the end of looping block and before entering to loop block there will no condition to check i.e. do-while allows cursor to execute any program one time than condition check so it is known as Exit Control Loop
- In loop block increment / decrement value assignment is compulsory with given variable (i.e. x++ for increment or x -- for decrement)

Syntax of If statement

```
do
{
  //code block to be executed if while condition true
  Increment / decrement the value;
} while (condition)
```

Example of do-while statement

<pre><script> var i = 0; do { alert(i) i++; } while (i < 10)</pre>	<p>Result will display as below in alert box when browser load this code</p> <p>In alertbox 0 to 9 number will display one by one</p>
---	---

• For Loop

- Looping concept that use initial value , comparing value and increment / decrement in a single line with 'for' keyword is 'for' keyword
- It is one of the most using looping statement and it execute faster in comparison than while and do-while

Syntax of If statement

For (initial variable with value; condition to be checked; increment / decrement value)

```
{
// code block to be executed
}
```

Example of for loop statement

<pre><script> var i; for (i = 0; i < 10 ; i++) { alert(i); } </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>In alertbox 0 to 9 number will display one by one</p>
---	---

1.7 BRANCHING STATEMENT OF JAVASCRIPT.

Friends, when you want to take decision from machine it are possible by branching statement of any programming language.

“A process of programming language that use direct mapping of variable / value with keyword like switch – case – break for taking direct decision is known as branching statement”

Condition Statement	Branching Statement
<ul style="list-style-type: none">• It use keyword like – if – else – else if.• It use comparison operator various symbols.• It takes more time to take decision.• It has 3 types: if, if-else, if-else if.	<ul style="list-style-type: none">• It uses keyword like – switch – case – break.• It does not use comparison operator various symbols.• It takes less time to take decision.• It has only 1 type : switch- case

- **Switch – case**
- It use direct condition with switch and match case and execute the statement block as per direct condition.
- It never use comparison operator for match the condition.

Syntax of If statement

```
Switch (variable/literal)
case 1 :
{
  // block of code – 1 if it match with variable
  break ;
}
.
.
.
case N :
{
  // block of code – N if it match with variable
  break;}

```

Example of switch statement

<pre> <script> var x=3; switch (x) { 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"; } alert(day); </script> </pre>	<p>Result will display as below in alert box when browser load this code</p> <p>Wednesday</p> <p>[because of x value is 3 so case 3 is match and so output is 'Wednesday' if you change the value of x with 6 your output will be 'Saturday']</p>
---	---

Practical Note : All Sample code type in notepad and save it with .html extension and Finally open in web browser (i.e. Google chrome) you will get output

1.8 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should able to understand about Web base Client side scripting language called JavaScript. – How It use in web browser – how data types ,variable , operators , literals , array and objects declare in JavaScript. When we provide control statement to any programming language it can be use for decision making , looping and branching as per our need.

1.9 CHECK YOUR PROGRESS

- JavaScript is Client Side language [TRUE / FALSE]
- JavaScript has _____ and _____ types of main Data Types

- Full form for below
 - COM
 - DCOM
 - CSS
- For performing Addition , Multiplication or Finding modules _____ types of operators use in JavaScript
- 'break' keyword use in _____ statement in JavaScript

1.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- JavaScript is Client Side language **TRUE**
- JavaScript has **Primitive** and **Non Primitive** types of main Data Types
- Full form for below
 - COM : Component Object Modeling
 - DCOM : Decomponent Object Modeling
 - CSS : Cascade Style Sheet
- For performing Addition , Multiplication or Finding modules **Arithmetic** types of operators use in JavaScript
- 'break' keyword use in **Branching** statement in JavaScript.

1.11 FURTHER READING

Following are some Online Reference Reading as PDF:

<http://egyankosh.ac.in/bitstream/123456789/41868/1/Block-4.pdf> [About Basic of JavaScript]

YouTube Reference:

<https://www.youtube.com/watch?v=uUhOEj4z8Fo> [About JavaScript Basics]

1.12 ASSIGNMENTS

5. What is JavaScript? Discuss Advantages and Disadvantages of it.
6. How Variable can declare in JavaScript? Explain any 1 Non primitive data type of JavaScript
7. Differentiate the below terms :
 - a. Java v/s JavaScript
 - b. HTML v/s JavaScript
 - c. Operator v/s Variable
8. What is Decision Making Statement? Explain any 1 type of Decision making statement of JavaScript
9. What is Looping Statement? Explain any 1 type of Looping statement of JavaScript
10. What is Branching Statement? Explain any 1 type of Branching statement of JavaScript

1.13 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- Draw JavaScript Development History / Time Line
- How 'this' keyword associate with Constructor of JavaScript discuss with suitable example.
- How many technological flavor of JavaScript is popular now a days

Code Zone:

- Write Code to Check 5 number is Even or Odd using Decision making statement of JavaScript.
- Write Code to print only Odd Number between 5 to 50 using Looping and Decision making statement of JavaScript.
- Write suitable code that use Assignment Operator in JavaScript

Unit 2: Functions and Dialog of JavaScript

2

Unit Structure

- 2.1. Learning Objectives.
- 2.2. JavaScript Input-Output Functions and Dialog Boxes.
- 2.3. User Define Function and Event Handling in JavaScript.
- 2.4. JavaScript Document Object Model.
- 2.5. Form Use by Website
- 2.6. Cookies.
- 2.7. Let us sum up
- 2.8. Check Your Progress
- 2.9. Check your Progress: Possible Answers
- 2.10. Further Reading
- 2.11. Assignment
- 2.12. Activities

2.1 LEARNING OBJECTIVE

After studying this unit student should be able to understand:

- JavaScript all types of Input and Output methods.
- JavaScript all User Define Functions.
- JavaScript Events and DOM.
- JavaScript <FORM> attributes like 'action' and methods like 'get' and 'post' for transmitting data from one web page to other web page.
- For tracking user's Input by cookie in JavaScript

2.2 INPUT – OUTPUT FUNCTIONS AND DIALOG BOXES OF JAVASCRIPT

Hey Friends now you know very well that JavaScript is Client Side Scripting Language so we already know about data types – variable declaration methods – some basic constant level program we see in our previous chapter.

Now we have very normal question that how can we Input various values and display with different format level? The answer is as below.

a) JavaScript Input Methods / Functions.

JavaScript has two main methods for taking data from user during runtime. That are – **Primary Input via Prompt box and Intermediate Input via various tool**

I) Primary Input via Prompt box

- basic method for input that use as one type of dialog box control named 'prompt box'
- In this Input method first dialog box open then user is able to enter data into it.
- Prompt dialog box is not a part of form so it external display at the top of form.

Syntax:

```
var <variable name > = prompt ("message that want to appear on screen ", "<default name /value >")
```

Example:

Sample code	Result
<pre><script> var person = prompt("Please enter your name", 78); alert ("hello "+ person + " wel-come to my home as guest"); </script></pre>	<p>Result will display as below</p> <p>In alert box when browser load this code hello BAOU wel come to my home as guest</p> <p>At runtime if you enter BAOU in prompt box then above output will display as in dialog box</p>

Practical Note: All Sample code type in notepad and save it with .html extension and finally open in web browser (i.e. Google chrome) you will get output

II) Intermediate Input via various tool

- Interaction of data from various tools of HTML like textbox , textarea , radio button this input methods is use.
- It if part of web page because when we input data from web page internal part i.e. textbox , textarea.... Etc so it can be real interactive of data from tool to variable.
- It use main keyword named '**document.getElementById()**' compulsory to transfer the data from specific tool to variable / literal

Syntax :

```
var <variable name > = document.getElementById("tool id").value;
```

Example:

Sample code	Result
<pre><script type="text/javascript"> function getans(){ var name=document.getElementById("name").value; alert("hello "+ name + " you are my guest today"); } </script> <form> Enter Name:<input id="name" />
 <input type="button" value="response" onClick="getans()"/> </form></pre>	<p>Result will display as below in alert box when browser load this code hello BAOU you are my guest today</p> <p>at runtime if you enter BAOU in textbox and then click on button named "response" then above output will display as in dialog box</p>

b) JavaScript Output Methods / Functions.

JavaScript has two main methods for displaying data during runtime. That is **Primary Output via alert box, Intermediate Input via various tool box and Intermediate output using document.write**

I) Primary Output via alert box

- basic method for display that use as one type of dialog box control named 'alert'
- In this output method first dialog box open then user can see the output that formatted as guideline.
- Alert dialog box is not a part of form so it external display at the top of form.

Syntax :

Alert (" customize message "+<variable / value >)

Example:

Sample code	Result
<pre><script> var person = prompt("Please enter your name", 78); alert ("hello "+ person + " wel come to my home as guest"); </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>hello BAOU wel come to my home as guest</p> <p>at runtime if you enter BAOU in prompt box then above output will display as it is due to alert as in dialog box</p>

II) Intermediate Output via various tool

- Interaction of data from various tools of HTML like textbox , textarea , radio button and also display at specific location named <p> or other tag.
- It part of web page because when we want to display at specific position of any tool this method generally use.
- It use main keyword named '**document.getElementById().innerHTML**' compulsory to transfer the data from specific tool to variable / literal

Syntax :

document.getElementById("tool id").innerHTML = variable / value ;

Example:

Sample code	Result
<pre>My answer by innerHTML is = <p id="demo"></p> <script> document.getElementById("demo").innerHTML = 10 + 8 ; </script></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>My answer by innerHTML is = 18</p> <p>Here out is at specific place means it will display as part of <p> because we use 'id' value as parameter as output generate</p>

III) Intermediate Output as Web Page Part (document.write)

- Most common method / function use for generate output as part of webpage
- This method use a keyword named '**document.write()**'
- Whatever customize message or value that we want to display in webpage this method use.

Syntax :

document.write(exp1, exp2, exp3, ...)

Example:

Sample code	Result
<pre><script> var a=32; var b='BAOU'; var c="Ahmedabad" document.write ("my roll number is ="+a+" my university is =+b+" it is in =" + c +" city); </script></pre>	<p>In alert box when browser load this code</p> <p>my roll number is =32 my university is =BAOU it is in =Ahmedabad city</p>

very simple to understand that all the value of a, b and c are respectively display their value in webpage as part using document.write ()

Dialog boxes in JavaScript

JavaScript supports 3 important types of dialog boxes.

- 1) **Alert box.**
- 2) **Prompt box.**
- 3) **Confirm box.**

1) **Alert box** : As already discuss in **Primary Output Via alert box** (read that part for the same)

2) **Prompt box** : As already discuss in **Primary Input Via Prompt box** (read that part for the same)

3) **Confirm box** :

Type : To take confirmation from user at run time.

- A confirmation dialog box is generally used to take user's concern on any option.
- It shows a dialog box with two buttons: OK and Cancel.
- If the user clicks on the OK button, the window method confirm() will return true. If the user clicks on the Cancel button, then confirm() returns false.

Example:

Sample code	Result
<pre><script> var r = confirm("Press a button!"); if (r == true) { document.write("You pressed OK!"); } else { document.write("You pressed Cancel!"); } </script></pre>	<p>Result will display as below in confirm box when browser load this code</p> <p>If user press Ok button at confirm box the output will be</p> <p>'you pressed 'OK!'</p> <p>and</p> <p>if user press Cancel button output will be</p> <p>'you pressed Cancel!'</p>

2.3 USER DEFINE FUNCTION AND EVENT HANDLING OF JAVASCRIPT

Friends, before focus on User Define function and its types we need to understand why we need User Define Function in JavaScript.

Need of User Define Functions?

- It reduces the length of code.
- Once function declares developer can use it many times so reusability is one of the finest advantages.
- Function can handle arguments as well as return values.
- It is handling multiple values as part of data interactions.

JavaScript function has three stages.

1. **Declaring Function**
2. **Calling Function with Event.**
3. **Return Value by Function.**

1. Declaring Function

It's very simple friends User Define functions declare by only keyword named 'function' in JavaScript.

Syntax :

Function <function name> (Argument 1 , Argument 2.... N)

Rules for Declaring Function Name :

- It must start with alphabets only.
- Only _ (underscore) symbol is valid.
- It is case sensitive.
- If function has arguments each arguments values / variables are spate by ',' (comma)
- Function generally executing between <head></head> only.

2. Calling Function with Event.

When functions declaration is completed it is compulsory to make arrangement about function calling or in simple words where function will call as executing.

In JavaScript Functions will execute by the concept as event handling only (Event : A various type of process that perform on as user control is called event i.e. when user press any button then event need as 'click ()' , when user load any web page event need as 'onLoad()' , when user close the web page / browser event need as 'onUnload ()')

Syntax :

Any Specific Event = function name (Argument 1 , Argument 2..... N)

3. Return Value by Function

After executing function sometimes it is required to return some value / variable to specific place at web page it is called return value for User Define Function.

- Return values always perform by 'return' keyword.
- We can enter multiple value or it's equation base process as return value

Ex. : return a1 * a2;

- It always use at the end of function declaration.

Hey Friends as per 2 main parameters (Argument and Return Value) we have 4 types of User Define Functions.

1. No Argument No Return Value
2. With Argument No Return Value
3. No Argument With Return Value
4. With Argument With Return value

1. No Argument No Return Value

When any User Define function Calling without any argument and after executing that function it does not have any return value this process is known as No Argument No Return Value.

Example :

Sample code	Result
<pre><body onLoad="baou ();"> <h2> Example of UDF No argu No</pre>	Result will display as below in alert box when browser load this code

<pre>Return</h2> <script> function baou() { var x=5; var y=6; alert (x*y); } </script> </body ></pre>	<p>30</p> <p>In this example in <body> onLoad is event it means when web browser load it will execute where two static number given 5 and 6 its multiplication will display at alert box</p>
---	--

2. With Argument No Return Value

When any User Define function Calling with one / many arguments and after executing that function it does not have any return value this process is known as With Argument No Return Value.

Example :

Sample code	Result
<pre><body onLoad="baou (5,6);"> <h2> Example of UDF with argument No Return</h2> <script> function baou(x , y) { alert (x*y); } </script> </body ></pre>	<p>Result will display as below in alert box when browser load this code</p> <p>30</p> <p>In this example in <body> onLoad is event it means when web browser load it will execute where two static number given 5 and 6 pass by 'baou' User Define Function and its multiplication will display at alert box in function only.</p>

3. No Argument With Return Value

When any User Define function Calling without any argument and after executing that function always return some value of equation this process is known as No Argument with Return Value.

Example :

Sample code	Result
<pre><h2> Example of UDF with argu No Return</h2> <p id="aj"> <script></pre>	<p>Result will display as below in <p> when browser load this code</p>

<pre>function baou() { var x=5 var y=6; return (x*y); } document.getElementById("aj").innerHTML=baou (); </script></pre>	<p>30</p> <p>In this example in <body> load is event it means when web browser load it will execute where two static number given 5 and 6 its multiplication will display at alert box</p>
--	--

4. With Argument With Return Value

When any User Define function Calling with one or more argument and after executing that function always return some value of equation this process is known as With Argument with Return Value.

Example :

Sample code	Result
<pre><h2> Example of UDF with argu With Return</h2> <p id="aj"> <script> function baou(x,y) { return (x*y); } document.getElementById("aj").innerHTML=baou (5,6,); </script></pre>	<p>Result will display as below in <p> when browser load this code</p> <p>30</p> <p>In this example in <body> Load is event it means when web browser load it will execute where two static number given 5 and 6 its multiplication will display at alert box</p>

2.4 JAVASCRIPT DOCUMENT OBJECT MODEL

It stands for Document Object Modeling

DOM main objective is when web page load to the browser first DOM (Document Object Modeling) creates environment for executing web page on HTML or other web base language.

Friends , by below figure we can understand DOM work very easily.

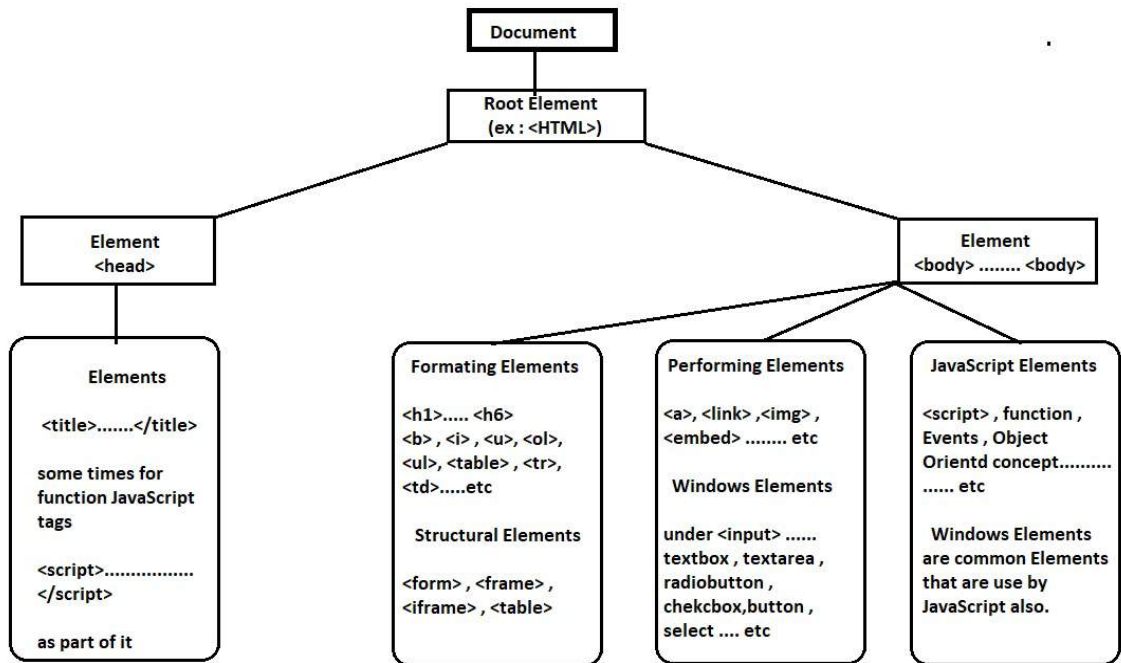


Figure : HTML DOM tree of Various Objects

Need of DOM in JavaScript

- By DOM JavaScript can easily work with all HTML Elements
- By DOM all Elements classify in proper organize manner.
- By DOM all attributes of HTML tags can easily work into JavaScript
- By DOM External format file (ex. <embed>) can easily work with JavaScript.
- By DOM all Events and Functions can manage in collaboration with HTML and JavaScript.
- DOM is W3C (World Wide Web Consortium) standard.
- DOM defines standards for accessing other web base programming language.
- DOM provides support to JavaScript various events handler being Object Oriented Programming System (OOPS) (i.e. events in JavaScript known as Event Handler Class)

JavaScript Event Handlers (list of Events of JavaScript)

<u>JavaScript Event Handler</u>	<u>When It will called (When It perform)</u>
---------------------------------	--

onAbort	The loading of an image is aborted as a result of user action
onBlur	The window, frameset or form element loses current input focus
onChange	In text field , text area , when typing perform it will execute
onClick	A link , client-side image map area or document is clicked by button
onDbIcIck	A link , client-side image map area or document is double clicked by button
onDragDrop	A dragged object is dropped in window or frame
onError	An error occurs during loading of image or frame
onFocus	A document , window , frame se or form element receives the current input focus
onKeyDown	The user presses a key
onKeyPress	The user pressed and releases key
onKeyUp	The user releases a key
onLoad	An image , document or frame set is loaded
onMouseDown	The user presses a mouse button
onMouseUp	The user release a mouse button
onMouseMove	The user moves the mouse
onMouseOver	The mouse is moved over on any object , tool or component
onMouseOut	The mouse is moved out from any object , tool or component
onReset	The user reset a form by clicking on the form reset buttone
onResize	The user resize a web browser , window or frame
onSelect	Text is selected in a test field or text area or select tool
onSubmit	The user presses a form by submit button
onUnload	The user exits a document , frame or from web browser

2.5 FORM USE BY WEBSITE

A web form, also called an HTML form, is an online page that permits user input. It is an interactive pages that transmit a paper document or form, where users fill out some fields. Web forms can be rendered in modern browsers using HTML and related web-oriented languages like HTML as well as JavaScript.

Typically, a web form having some of form elements such as a checkbox, submit button, Radio button, text box, etc. For added interactivity, web designer may use elements or classes such as "input" along with "action" and "method" attributes. They can also use the "GET" or "POST" method for submitting data.

Through we should careful combination of programmed objects, functions and methods, web designers can create web forms that allow for more classy transactions online. Web forms have revolutionize many fields including real estate,

example, one user registration ends once finishing several pages. However a way to maintain users' session info across all the online pages.

In several things, exploitation cookies is that the best technique of memory and trailing preferences, purchases, commissions, and different info needed for higher traveler expertise or website statistics.

How It Works?

Your server sends some information to the visitor's browser within the type of a cookie. The browser could settle for the cookie. If it does, it's hold on as a lucid text record on the visitor's disc drive. Now, once the traveler arrives at another page on your website, the browser sends identical cookie to the server for retrieval. Once retrieved, your server knows/remembers what was hold on earlier.

Create Cookie with JavaScript

```
document.cookie = "username=BAOU Ahemdabad";
```

Read Cookie with JavaScript

```
var x = document.cookie;
```

Delete Cookies with JavaScript

```
document.cookie = "username=; expires=Thu, 01 Jan 1970 00:00:00 UTC; path=/;";
```

2.7 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should able to understand How value can Input and display as Output in JavaScript. In JavaScript how we can utilize UDF with all 4 types – Various Events that use in JavaScript – At last but not list we focus on <FORM> and its key attributes like 'action' and method like 'get' and 'post' for data communications. Cookie is very important for web security and in that we learn – how to set cookie – how to read cookie and how to delete cookie

2.8 CHECK YOUR PROGRESS

- Give the types of User Define Functions in JavaScript

- When we use <FORM> it has action attributes that has _____ and _____ method for Data Interaction.
- Full form for below
 - UDF
 - COM
 - DOM
- What is the use of Prompt , Alert and Confirm Box in JavaScript
- Give only 2 to 3 Names of Events of JavaScript

2.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- 4 Types of User Define Functions
 - No Argument No Return Value
 - With Argument No Return Value
 - No Argument With Return Value
 - With Argument With Return Value
- When we use <FORM> it has action attributes that has **get** and **post** method for Data Interaction.
- Full form for below
 - UDF : User Define Function
 - COM : Component Object Modeling
 - DOM : Document Object Modeling
- What is the use of Prompt , Alert and Confirm Box in JavaScript
 - Prompt : Take value from user at runtime
 - Alert : Display value as output form of message box
 - Confirm : Take Confirmation from user like Ok or Cancel
- Give only 2 to 3 Names of Events of JavaScript
 - onClick

- onBlur
- onFocus

2.10 FURTHER READING

Following are some Online Reference Reading as PDF:

https://nptel.ac.in/courses/nptel_download.php?subjectid=106105084 [Download PDF on JavaScript Part – I]

YouTube Reference:

https://nptel.ac.in/courses/nptel_download.php?subjectid=106105084 [Download mp4 on JavaScript Part – I]

https://nptel.ac.in/courses/nptel_download.php?subjectid=106105084 [Download mp4 on JavaScript Examples (Continued)]

2.11 ASSIGNMENTS

11. What is Dialog Box ? Explain all 3 types of dialog box of JavaScript.
12. What is document.getElementById().value ? where can we use it ?
13. What is document.innerHTML() ? where can we use it ?
14. What is UDF ? Explain any 1 type of User Define Function with suitable example

2.12 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- Main parameters for UDF in JavaScript
- How can we use promptbox and alert as input and output in JavaScript
- How cookie is very sensitive during web data transmission give answer in your word

Code Zone:

- Write code for Check Input number (In prompt box) is prime or not result should display at alter box
- Write code to display only EVEN numbers between 2 to 23 using No Argument No Return value User Define Function.

Unit 3: Event , Method and Properties of JavaScript

3

Unit Structure

- 3.1. Learning Objectives.
- 3.2. Windows Object, Properties and Method of JavaScript.
- 3.3. Document Object, Properties and Method of JavaScript.
- 3.4. Form and Form Control Object, Properties and Method of JavaScript.
- 3.5. Image Object, Properties and Method of JavaScript.
- 3.6. Frames Object, Properties and Method of JavaScript.
- 3.7. Events in JavaScript.
- 3.8. Let us sum up
- 3.9. Check Your Progress
- 3.10. Check your Progress: Possible Answers
- 3.11. Further Reading
- 3.12. Assignment
- 3.13. Activities

3.1 LEARNING OBJECTIVE

After studying this unit student should be able to understand:

- JavaScript is Objects are classify with main component
- JavaScript windows, Document, Form, Image and Frames properties and methods of these components.
- JavaScript actions means events of various tools of HTML

3.2 WINDOWS OBJECT, PROPERTIES AND METHOD OF JAVASCRIPT

- Window object may be a ranking object in Client-Side JavaScript.
- Window object represents the browser's window.
- It represents Associate in Nursing open window during a browser.
- It supports all browsers.
- The document object may be a property of the window object. So, writing window. Is same as.
- **Window Object Properties**

Property	Description
Document	It returns the document object for the window (DOM).
Frames	It returns an array of all the frames including iframes in the current window.
Closed	It returns the Boolean value whether a window has been closed or not.
History	It returns the history object for the window.
innerHeight	It sets or returns the inner height of a window's content area.
innerWidth	It sets or returns the inner width of a window's content area.
Length	It returns the number of frames in a window.
outerHeight	It sets or returns the outer height of a window, including toolbars/scrollbars.
outerWidth	It sets or returns the outer width of a window, including toolbars/scrollbars.
Screen	It returns the screen object for the window.
screenX	It returns the X coordinate of the window relative to the screen.
screenY	It returns the Y coordinate of the window relative to the screen.

Window Object Method

Method	Description
alert()	It displays an alert box.
confirm()	It displays a dialog box.
prompt()	It displays a dialog box that prompts the visitor for input.
setInterval()	It calls a function or evaluates an expression at specified intervals.
setTimeout()	It evaluates an expression after a specified number of milliseconds.
clearInterval()	It clears a timer specified by setInterval ().
clearTimeout()	It clears a timer specified by setTimeout ().
close()	It closes the current window.
open()	It opens a new browser window.
focus()	It sets focus to the current window.
print()	It prints the content of the current window.

3.3 DOCUMENT OBJECT, PROPERTIES AND METHOD OF JAVASCRIPT

- The document object represents the whole html document.
- When html document is loaded in the browser, it becomes a document object. It is the **root element** that represents the html document. It has properties and methods. By the help of document object, we can add dynamic content to our web page.
- As mentioned earlier, it is the object of window. So
- For syntax we can say 'windows.document' is same as 'document'

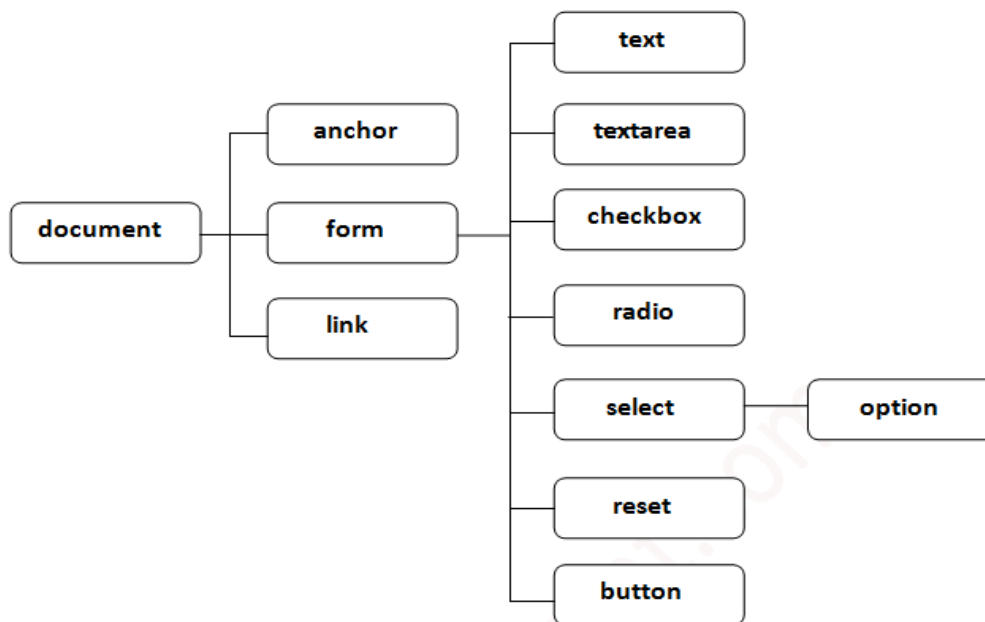


Figure -1: Properties of Document Object

Method	Description
write("string")	Writes the given string on the document.
writeln("string")	Writes the given string on the document with newline character at the end.
getElementById()	Returns the element having the given id value.
getElementsByName()	Returns all the elements having the given name value.
getElementsByTagName()	Returns all the elements having the given tag name.
getElementsByClassName()	Returns all the elements having the given class name.

For reference study: https://www.w3schools.com/jsref/dom_obj_document.asp

3.4 FORM AND FORM CONTROL OBJECT, PROPERTIES AND METHOD OF JAVASCRIPT

Form Object

The Form object represents an HTML <form> element.

Access a Form Object

You can access a <form> element by using getElementById()


```
var x = document.getElementById("myForm");
```

Create a Form Object

You can create a <form> element by using the document.createElement() method:

```
var x = document.createElement("FORM");
```

Form Object Properties

Property	Description
acceptCharset	Sets or returns the value of the accept-charset attribute in a form
action	Sets or returns the value of the action attribute in a form
encoding	Alias of enctype
enctype	Sets or returns the value of the enctype attribute in a form
length	Returns the number of elements in a form
method	Sets or returns the value of the method attribute in a form
name	Sets or returns the value of the name attribute in a form
target	Sets or returns the value of the target attribute in a form

Form Object Methods

Method	Description
reset()	Resets a form
submit()	Submits a form

3.5 IMAGE OBJECT, PROPERTIES AND METHOD OF JAVASCRIPT

The Image object represents an HTML element.

Access an Image Object

You can access an element by using getElementById():

Example:

```
var x = document.getElementById("myImg");
```

Create an Image Object

You can create an element by using the document.createElement() method:

Example:

```
var x = document.createElement("IMG");
```

Image Object Properties

Property	Description
align	Sets or returns the value of the align attribute of an image (style.cssFloat)
alt	Sets or returns the value of the alt attribute of an image
border	Sets or returns the value of the border attribute of an image(style.border)
complete	Returns whether or not the browser is finished loading an image
height	Sets or returns the value of the height attribute of an image
hspace	Sets or returns the value of the hspace attribute of an image
isMap	Sets or returns whether an image should be part of a server-side image-map, or not
name	Sets or returns the value of the name attribute of an image
naturalHeight	Returns the original height of an image
naturalWidth	Returns the original width of an image
src	Sets or returns the value of the src attribute of an image
useMap	Sets or returns the value of the usemap attribute of an image

width	Sets or returns the value of the width attribute of an image
-----------------------	--

3.6 FRAMES OBJECT, PROPERTIES AND METHOD OF JAVASCRIPT

In this JavaScript tutorial, you'll find out about frame object its properties and strategies intimately with example. Frame object, properties of frame object, frames, self, name, length, parent, strategies of frame object, blur (), focus (), setInterval (), clearInterval (), setTimeout (expression, milliseconds), clearTimeout () and events related to frame object.

Frame Object:

The frame object could be a browser object of JavaScript used for accessing hypertext mark-up language frames. The user will use frames array to access all frames at intervals a window. Mistreatment the classification construct, users will access the frames array.

NOTE:

The frames array index continuously starts with zero and not one.

The frame object is really a toddler of the window object. These objects square measure created mechanically by the browser and facilitate users to manage loading and accessing of frames.

The properties and strategies of frame object square measure like that of Window object in JavaScript.

The frame object doesn't support close () technique that's supported by window object.

Using the <FRAMESET> document creates frame objects and every frame created is so a property of window objects.

Properties of frame object:

- frames
- name
- length
- parent
- self

frames:

The frames property of frame object denotes a collection or array of frames in a window and also in a frame set.

name:

The name property of frame object denotes the name of the frame. The method of denoting the name attribute is performed by using the name attribute of the <frame> tag.

length:

The frames array has all the frames present within a window and the length property of the frame object denotes the length of the frames array or gives the number of frames present in a window or a frames array.

parent:

As the name implies, the parent property of frames object denotes the parent frame of the current frame.

self:

As the name implies, the self property of frames object denotes the current frame. Using self property, the user can access properties of the current frame window.

Methods of frame object:

- blur()
- focus()
- setInterval()
- clearInterval()
- setTimeout(expression, milliseconds)
- clearTimeout(timeout)

blur(): - blur() method of frame object removes focus from the object.

focus(): - focus() method of frame object gives focus to the object.

setInterval():

setInterval() method of frame object is used to call a function of JavaScript or to evaluate an expression after the time interval specified in arguments has expired. The time interval in arguments is always specified in milliseconds.

clearInterval():

clearInterval method of frame object is used to cancel the corresponding defined setInterval method. This is written by referencing the setInterval method using its ID or variable.

setTimeout(expression, milliseconds):

setTimeout method of frame object can be used to execute any function, or access any method or property after a specified time interval given to this method as argument.

The time is always specified in milliseconds and in the above statement, the function test() is called after the specified time of 3000 milliseconds (3 seconds). This is stored in variable named exforsys.

There is confusion about the similarity between setTimeout() method and setInterval() method. The main difference between the two methods is the setInterval method will repeatedly call the referenced function or evaluate the

expression until the user leaves the document. In the `setTimeout` method, the call executes only once after the specified time interval given as argument.

clearTimeout():

`clearTimeout` method of frame object is used to clear a specified `setTimeout` method. This is written by referencing the `setTimeout` method using its ID or variable.

3.7 EVENTS IN JAVASCRIPT

“JavaScript is used in HTML pages, JavaScript can **react** on some process is called events.”

Common Events

Here is a list of some common events:

Event	Description
onchange	An HTML element has been changed
onclick	The user clicks an HTML element
onmouseover	The user moves the mouse over an HTML element
onmouseout	The user moves the mouse away from an HTML element
onkeydown	The user pushes a keyboard key
onload	The browser has finished loading the page

Event handlers for Form Elements in JavaScript

Object	Event Name / Event Handler
button	onClick, onBlur, onFocus
checkbox	onClick, onBlur, onFocus.
FileUpload	onClick, onBlur, onFocus
hidden	None
password	onBlur, onFocus, onSelect.
radio	onClick, onBlur, onFocus
reset	onReset.

Object	Event Name / Event Handler
select	onFocus, onBlur, onChange.
submit	onSubmit
text	onClick, onBlur, onFocus , onChange
textarea	onClick, onBlur, onFocus , onChange

Javascript Form Events : Buttons

The main utility of a button object is to trigger an event, say an onClick() event, but a button object has no default action.

There are several types of buttons associated with a form:

- submit
- reset

These events are fired when some click related activity is registered.

Event handlers for Mouse in JavaScript

Event Handler	Triggered When
onBlur	The form's select, text, or textarea field loses focus.
onChange	A select , text or textarea field has lost the focus and values are changed.
onClick	An object on a form gets clicked.
onFocus	a field gets input focus.
onReset	The the form is reset
onSelect	text within the textarea field is selected
onSubmit	A form is submitted

3.8 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should be able to understand various types of objects that are key elements of JavaScript. Very first 'windows' object has some main properties and methods that use major windows

components that easy to use in web platform. Same like as we learn for some minor input and output process using 'document' object. Form object property are useful for developing form element and input output as well as data transmission by various method like 'get' and 'post' and action method. Frame object is useful when we distribute our web page in frame and iframe so its property and method we learnt. In JavaScript image plays key role either it is in slider or individual element so we focus some properties and method of image object. Last but not least we learnt action perform by JavaScript and we see classification of event in general event , form element event and event handler process.

3.9 CHECK YOUR PROGRESS

- Alert, Confirm and Prompt box are the method of _____ object of JavaScript
- Document and History are the property of _____ object of JavaScript.
- Windows.document is same like document ? [True / False]
- Textbox , Textarea , Checkbox ... etc are the property of _____ object of JavaScript.
- write() and writeln() is method of _____ object of JavaScript
- getElementById() is main method of _____ object (form)
- How can we create element of Form object [document.createElement("FORM")]
- Action and target are the _____ of Form Object. [property]
- Reset and submit are the _____ of Form Object. [method]
- Align , height , width are the property of _____ object of JavaScript. [image]
- Parent , length and self are the _____ of Frame Object.
- Blur () and focus () are the _____ of Frame Object
- Give just name of any 3 common event of JavaScript
- _____ and _____ are mouse base event of JavaScript.
- Give any 2 event names that related with button

3.10 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- Alert, Confirm and Prompt box are the method of window object of JavaScript
- Document and History are the property of Window object of JavaScript.
- Windows.document is same like document ? [True]
- Textbox , Textarea , Checkbox ... etc are the property of document object of JavaScript.
- write() and writeln() is method of document object of JavaScript
- getElementById() is main method of form object
- How can we create element of Form object
[document.createElement("FORM")]
- Action and target are the property of Form Object.
- Reset and submit are the method of Form Object.
- Align , height , width are the property of image object of JavaScript.
- Parent , length and self are the property of Frame Object.
- Blur () and focus () are the method of Frame Object
- Give just name of any 3 common event of JavaScript
Answer is : onClick , onLoad , onMouseOver
- onMouseOver and onMouseOut are mouse base event of JavaScript.
- Give any 2 event names that related with button
- Answer is : onClick , onFocus

3.11 FURTHER READING

Following are some Online Reference Reading as PDF:

<http://www.site.uottawa.ca/~gvj/Courses/CSI3140/lectures/DOM.pdf>
[About document objects and events of JavaScript]

<http://miageprojet2.unice.fr/@api/deki/files/1333/=JavaScript.pdf>
[About JavaScript Object properties and Methods]

YouTube Reference:

<https://www.youtube.com/watch?v=uUhOEj4z8Fo&t=1543s>
[About JavaScript Objects and Methods]

3.12 ASSIGNMENTS

1. What is the use of windows object property ? give the use of 2 property and 2 method of windows object
2. What is the use of getElementById() ?
3. Give the use of 2 property and 2 method of document and image object of JavaScript.
4. What is event ? discuss 3 general event with its use
5. Discuss any 3 event handler of 'mouse' process

3.13 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- Make list of main purpose of windows Object of JavaScript.
- Make list of main purpose of form Object of JavaScript.
- Why we use Image Object of JavaScript

Code Zone:

- Write your choice code for getElementById() and document.createElement() of JavaScript
- Write your choice code for events like onClick () , onBlur () and onChange() of JavaScript.
- Write suitable code for 'select' control with the use of onChange event.

Unit 4: Built In Function

4

Unit Structure

- 4.1. Learning Objectives.
- 4.2. String Built In Function.
- 4.3. Mathematical Built In Functions.
- 4.4. Date-Time Built In Functions.
- 4.5. Array Built In Functions.
- 4.6. JavaScript Objects and Boolean.
- 4.7. Let us sum up
- 4.8. Check Your Progress
- 4.9. Check your Progress: Possible Answers
- 4.10. Further Reading
- 4.11. Assignment
- 4.12. Activities

4.1 LEARNING OBJECTIVE

After studying this unit student should be able to understand:

- JavaScript is scripting language so it has inbuilt library.
- We will learn String, Mathematical, Date – Time, Array built in library function for JavaScript.
- Each function has its own identity and we will learn by proper example of built in function of JavaScript.
- Some special object use to represent group of data that we will study at last point named 'Objects' methods to access data.
- Last we will focus on Boolean as object to retrieve the decision using logical decision for some condition.

4.2 STRING BUILT IN FUNCTIONS.

In JavaScript string built in Functions are represent by two ways

- 1) By string literal
- 2) By string object (using 'new' keyword)

If we take example it is like below.

```
var x="BAOU";
```

```
document.write (x); // it will show 'BAOU' as output
```

[This is string as literal]

And other example as object is as below

```
var x= new String("BAOU");
```

```
document.write (x); // it will show 'BAOU' as output
```

[This is string as object]

JavaScript has some built in functions for string class that explain as below

charAt ()	It returns the character at the given index position
Example :	
<pre>var str="BAOU"; document.writeln(str.charAt(1));</pre>	
Output :	

A
 Because string 'BAOU' the first character index starts with '0' (zero) so at index '1' character 'A' available

charCodeAt ()	It returns ASCII value of character at the given index position
Example : <pre>var str="BAOU"; document.writeln(str.charCodeAt(1));</pre>	
Output : 65 Because 65 is an ASCII value of 'A' available	

concat ()	It joins two or more string as one string
Example : <pre>var str="BAOU"; document.writeln(str.concat(" Ahmedabad"));</pre>	
Output : BAOU Ahmedabad Here two string concat / join as BAOU Ahmedabad	

indexOf ()	It provides the index value of character in the given string.
Example : <pre>var str="BAOU Ahmedabad M.Sc.-IT"; document.write(str.indexOf('A')); // Then output will be '1' because index position document.write(str.indexOf('a')); // Then output will be '10' because index position</pre>	
Note : This is case sensitive as you see in example	

Other functions are as below...

Method	Description
search()	It provides the index value of string in the given string.
match()	It provides similar characters is compare with the given string or not. If characters not match it will return 'null'
replace ()	It replace a given string with new string

substr()	It will return some characters from the given string on basis of starting position index value and length
substring()	It will return some characters from the given string on basis of starting index position and ending index position
slice()	It will return some characters from the given string on basis of starting index value to ending index position in between characters
toLowerCase()	It convert upper characters to lower case characters
toUpperCase()	It convert lower case characters to upper characters

4.3 MATHEMATICAL BUILT IN FUNCTIONS.

In JavaScript Numeric / Mathematical built in functions are execute with base library called 'Math' so each and every functions use with 'Math' as base library and then function execute.

Some of the main Mathematical functions are as below.

abs ()	It convert negative number to positive [Any negative number convert to positive]
<p>Example :</p> <pre>document.writeln(Math.abs(-4)+"
"); document.writeln(Math.abs(-7.8)+"
"); document.writeln(Math.abs('-4'));</pre>	
<p>Output :</p> <pre>4 7.8 4</pre>	

ceil ()	Returns the value of x rounded up to its nearest highest integer
<p>Example :</p> <pre>document.writeln(Math.ceil(0.3)+"
"); document.writeln(Math.abs(4.1)+"
"); document.writeln(Math.abs(7.7));</pre>	

Output : 1 5 8

floor ()	Returns the value of x rounded down to its nearest lowest integer
Example : document.writeln(Math.floor(0.3)+" "); document.writeln(Math.floor(8.9)+" "); document.writeln(Math.floor(7.7));	
Output : 0 9 7	

pow (x,v)	Returns the value of x to the power of y
Example : document.writeln(Math.floor(3,2)+" "); document.writeln(Math.floor(4,2)+" "); document.writeln(Math.floor(5,3));	
Output : 8 16 125	

Other functions are as below...

Method	Description
exp(x)	Returns the value of E raise x value
log(x)	Returns the natural logarithm (base E) of given number x
max(x, y, z, ..., n)	Returns the number with the highest value from given numbers
min(x, y, z, ..., n)	Returns the number with the lowest value from given numbers
random()	Returns a random number between 0 and 1
round(x)	Returns the value of given number rounded to its nearest integer
sqrt(x)	Returns the square root of given number x

Some value conversion built in functions that are also known as type casting is mention as below

isInteger ()	Returns Boolean value 'True' or 'False' if integer value then 'True'
<p>Example :</p> <pre>var x1=0; var y1=1.9; var z1=-1; document.writeln(Number.is Integer(x1)); document.writeln(Number.is Integer(y1)); document.writeln(Number.is Integer(z1));</pre>	
<p>Output :</p> <pre>True False True</pre>	

isFinite ()	Returns Boolean value 'True' or 'False' if any number then 'True'
<p>Example :</p> <pre>var x1=-12.67; var y1=1.9; var z1=-"BAOU";</pre>	


```
document.writeln(Number.is Integer(x1));  
document.writeln(Number.is Integer(y1));  
document.writeln(Number.is Integer(z1));
```

Output :

True

True

False

parseInt ()	It converts any value to Integer form
-------------	---------------------------------------

Example :

```
var a="50.78";
```

```
var b=78.99;
```

```
var c="BAOU";
```

```
var d="50BAOU";
```

```
var e="20.25CS"
```

```
document.writeln(Number.parseInt(a)+"<br>");
```

```
document.writeln(Number.parseInt(b)+"<br>");
```

```
document.writeln(Number.parseInt(c)+"<br>");
```

```
document.writeln(Number.parseInt(d)+"<br>");
```

```
document.writeln(Number.parseInt(e));
```

Output :

50

78

Nan

50

20

parseFloat ()	It converts any value to Float / Decimal form
<p>Example :</p> <pre>var a="50.78"; var b="BAOU"; var c="26.99BAOU"; var d="-38.25CS" document.writeln(Number.parseFloat(a)+"
"); document.writeln(Number.parseFloat(b)+"
"); document.writeln(Number.parseFloat(c)+"
"); document.writeln(Number.parseFloat (d)+"
");</pre>	
<p>Output :</p> <pre>50.78 Nan 26.99 -38.25</pre>	

4.4 DATE-TIME BUILT IN FUNCTIONS.

The **JavaScript date** object can be used to get date , month year,and day. You can display a timer or time base value like Hour , Minute , seconds and milliseconds on the webpage by the help of JavaScript date object.

In JavaScript 'date-time' built in functions use as object declaration so it use 'new' keyword for declaring date or time value.

Example :

```
var d1 =new Date(); // for declaring current date / system date
```

and other one is

```
var d2 =new Date("November 17, 1975 20:22:10"); // for declaring choice date / time
```

now let's see some built in function of Date – Time

getDate ()	Return the date as number of the month (1 – 31)
<p>Example :</p> <pre>var date=new Date("November 17, 1975 20:22:10");</pre>	

<code>document.writeln(date.getDate());</code>
--

Output :

17

Note : It is 17th date of November so return 17 as output

<code>getMonth ()</code>	Return the month as number output (0 – 11)
--------------------------	--

Example :

```
var date=new Date("November 17, 1975 20:22:10");
```

```
document.writeln(date.getMonth());
```

Output :

10

Note : Because as mention above month ' January ' start as – 0 ... December - 11

<code>getFullYear ()</code>	Return the year value as four digit
-----------------------------	-------------------------------------

Example :

```
var date=new Date("November 17, 1975 20:22:10");
```

```
document.writeln(date.getFullYear());
```

Output :

1975

Note : Because as mention above month ' January ' start as – 0

<code>getDay ()</code>	Return the day of week (i.e Sunday -0 , range 0 – 6)
------------------------	--

Example :

```
var date=new Date("November 17, 1975 20:22:10");
```

```
document.writeln(date.getDay());
```

Output :

1

Note : Because as mention above week Sunday – 0 Saturday – 6

Same like above functions below functions are mention for Time zone

Method	Description
getHours ()	Return the Hour value as output
getMinutes ()	Return the Minute value as output
getSeconds ()	Return the Second value as output
getMilliseconds ()	Return the Milliseconds value as output

4.5 ARRAY BUILT IN FUNCTIONS.

concat ()	Joins two or more arrays and return as joined one array
<p>Example :</p> <pre>var x1 = ["BCA", "MCA"]; var x2 = ["M.SC-IT", "BAOU"]; var x3 = x1.concat(x2); alert (x3);</pre>	
<p>Output :</p> <p>BCA MCA M.SC-IT BAOU</p> <p>Will show in alert box as output join array x1 and x2 to x3</p>	

find ()	Returns the value of the first element in an array that given range
<p>Example :</p> <pre>var arr1=[5,20,19,25,34]; var ans=arr.1find(x=>x>20); alert (ans);</pre>	
<p>Output :</p> <p>25</p> <p>Note : Here x will compare each element of array and finally 25 is greater than 20 so it return as output</p>	

push ()	Adds new elements to the end of an array, and returns the new array with add of new element
<p>Example :</p> <pre>var x1=["BAOU","Ahmedabad"]; x1.push("M.Sc.-IT"); alert (x1);</pre>	

Output :
 BAOU Ahmedabad M.Sc.-IT
 Note : Here x will expand with new element adding of 'M.Sc.-IT and display new array in alert box

pop ()	Remove last element from array and return new array with one less elements
Example : <pre>var x1=["BAOU","Ahmedabad" , "M.Sc.-IT"]; alert("Orginal array: "+x1+"
"); alert("Extracted element: "+x1.pop()+"
"); alert("New Array: "+ x1);</pre>	
Output : Orginal array: BAOU Ahmedabad M.Sc.-IT Extracted element : M.Sc.-IT New Array : BAOU Ahmedabad Note : Here x1 is reduce with last element 'M.Sc.-IT and display new array in alert box with reducing one last array element	

Method	Description
fill()	Fill the elements in an array with a static value
from()	Creates an array from an object
includes()	Check if an array contains the specified element
isArray()	Checks whether an object is an array
reverse()	Reverses the order of the elements in an array
shift()	Removes the first element of an array, and returns that element
slice()	Selects a part of an array, and returns the new array
sort()	Sorts the elements of an array

4.6 JAVASCRIPT OBJECTS AND BOOLEAN

A JavaScript object is an entity having state and behavior (properties and method).

For example: pen , pencil , eraser , book etc.

JavaScript is simply an object-based language. Everything is an object in JavaScript language. JavaScript is template based not class based. Here, it is not necessary to create class to get the object. But, we directly create objects.

Creating Objects in JavaScript

There are 3 ways to create objects.

1. By object literal
2. By creating instance of Object directly (using new keyword)
3. By using an object constructor (using new keyword)

1) By Object literal

Syntax :

Object name = {property1:value1,property2:value2.....propertyN:valueN}

As you can observe , property and value is separated by : (colon).

Let's see very simple example of creating object in JavaScript.

```
<script>
emp={id:107,name:"BAOU",salary:40000}
document.write(emp.id+" "+emp.name+" "+emp.salary);
</script>
```

Output : 107 BAOU 40000

2) By creating instance of Object directly

Syntax :

```
var objectname=new Object();
```

Here, new keyword is used to create object.

Let's see very example of creating object directly.

```
<script>
var emp=new Object();
emp.id=107;
emp.name="BAOU";
emp.salary=40000;
document.write(emp.id+" "+emp.name+" "+emp.salary);
</script>
```

Output : 107 BAOU 40000

3) By using an Object constructor

Hey Friends, we need to create function with arguments. Each argument value can be assign in the given object by using 'this' keyword.

The 'this' keyword represents to the current object.

The simple example of creating object by object constructor is given below.

```
<script>
function employee(id,name,salary){
this.id=id;
this.name=name;
this.salary=salary;
}
e=new employee(107,"BAOUI",40000);

document.write(e.id+" "+e.name+" "+e.salary);
</script>
```

Output : 107 BAOU 40000

Boolean as object built in Library

As we know Boolean is data type of JavaScript but here by Boolean object creation we can use as built in library as decision making process, As we know Boolean

always return either 'True' or 'False' same here Boolean as object we can find the results.

Syntax :

```
Boolean b=new Boolean(value);
```

Note : by default value of Boolean is always 'False'

Let's take quick look upon some simple example.

Example :

```
<script>  
document.write(30<80);// Return true as output  
document.write(30<5);// Return false as output  
</script>
```

4.7 LET US SUM UP

Hey Friends now you complete this unit after completing this unit you should be able to understand various types of built-in library functions. Built-in library functions we learnt as some main types of as per main process, first we learnt 'string built-in' in this we perform some basic string-level processes like convert upper case, lower case, finding some characters from given string and so many other functions. The very second we learnt numeric built-in functions in this we find that one core library required known as 'Math' so for all mathematical functions that convert negative value to positive, find square root, finding power value, and so many functions. The next we learnt 'Date-Time' by these functions we can get various date and time-level outputs like we find date of month, month, full year same like hour, minute, second... etc. The scripting language has array so we focused on collection of same type of elements under one named means array and in this built-in function various processes we understand like how to join two or more arrays, adding new element, removing last element of array, sorting of array... etc. The very last we learnt some object-based declaring and Boolean short function in this how various types of objects declare and their examples.

and Boolean is data type but we can use as decision making because it returns only two value either 'True' or 'False'.

4.8 CHECK YOUR PROGRESS

- can javascript string declare as object with 'new' keyword [True / False]
- it returns specific character of given index position [charAt()]
- it returns specific ASCII code of character of given index position [charCodeAt()]
- is indexOf() of string function is case sensitive ? [true/false] true
- to get some characters from given string how many string functions we use? [substr , substring , slice]
- for all mathematic functions _____ base library is important to attach before mathematical function [Math]
- Find highest number of given numbers _____ mathematical function use [max]
- Find lowest number of given numbers _____ mathematical function use [min]
- to find square root _____ mathematical function use [sqrt]
- if we want to know day of week _____ date time function use [getDay]
- Month function always return ___ to ___ for entire month [0-11]
- in getDay function if answer is 0 means _____ day [sunday]
- to view year in 4 digit _____ date time function use [getFullYear]
- to find internal element from array _____ array function use [.find]
- to add new element at last position of array _____ function use [push]
- to remove last element from array _____ function use [pop]
- to arranging array element we use _____ function of array [sort]
- can boolean work as object ? [true / false] - true
- boolean object use as decision making ? [true / false] - true

4.9 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

- can javascript string declare as object with 'new' keyword **[True]**
- it returns specific character of given index position **[charAt()]**
- it returns specific ASCII code of character of given index position **[charCodeAt()]**
- is indexOf() of string function is case sensitive ? **[True]**
- to get some characters from given string how many string functions we use? **[substr , substring , slice]**
- for all mathematic functions _____ base library is important to attach before mathematical function **[Math]**
- Find highest number of given numbers _____ mathematical function use **[max]**
- find lowest number of given numbers _____ mathematical function use **[min]**
- to find square root _____ mathematical function use **[sqrt]**
- if we want to know day of week _____ date time function use **[getDay]**
- Month function always return ___ to ___ for entire month **[0-11]**
- in getDay function if answer is 0 means _____ day **[sunday]**
- to view year in 4 digit _____ date time function use **[getFullYear]**
- to find internal element from array _____ array function use **[.find]**
- to add new element at last position of array _____ function use **[push]**
- to remove last element from array _____ function use **[pop]**
- to arrange array element we use _____ function of array **[sort]**
- can boolean work as object ? **[true]**
- boolean object use as decision making ? **[true]**

4.10 FURTHER READING

Following are some Online Reference Reading as PDF:

<http://miageprojet2.unice.fr/@api/deki/files/1333/=JavaScript.pdf>
[About JavaScript Object properties and Methods]

YouTube Reference:

<https://www.youtube.com/watch?v=dpZehyrqgK0>[About JavaScript string function]

4.11 ASSIGNMENTS

1. What is String built in library function? Explain any 5 functions with suitable example.
2. What is Numeric built in library function? Explain any 5 functions with suitable example.
3. What is Date-Time built in library function? Explain any 5 functions with suitable example.
4. What is Array built in library function? Explain any 5 functions with suitable example.
5. What is Object? Discuss various method of declaring object in JavaScript with suitable example.
6. 'We can use Boolean data type as built in function as decision making' prove this sentence with suitable example.

4.12 ACTIVITIES

Note: For Activities Learners can use search engine as their reference for supportive knowledge enhancement

Creative Zone:

- Short difference between substr , substring and slice.
- Compare charAt () and charCodeAt() of string object.
- Why we need 'Math' keyword for mathematical functions
- What is the main purpose of array functions of JavaScript

Code Zone:

- Write your choice code for explain charAt() and charCodeAt() string library function of JavaScript
- Write your choice code for explain substr , substring and slice function of string library function of JavaScript.
- Write your choice code for explain Boolean object as function for decision making



BAOU
Education
for All

युनिवर्सिटी गीत

स्वाध्यायः परमं तपः

स्वाध्यायः परमं तपः

स्वाध्यायः परमं तपः

शिक्षण, संस्कृति, सद्भाव, दिव्यबोधनुं धाम
डॉ. बाबासाहेब आंबेडकर ओपन युनिवर्सिटी नाम;
सौने सौनी पांज मणे, ने सौने सौनुं आत्म,
दशे दिशां स्मित वडे डो दशे दिशे शुभ-लाभ.

अज्ञान रही अज्ञानना शाने, अंधकारने पीवो ?
कडे बुद्ध आंबेडकर कडे, तुं था तारो दीवो;
शारदीय अजवाणा पडोंच्यां गुर्जर गामे गाम
ध्रुव तारकनी जेम जणहणे अकलव्यनी शान.

सरस्वतीना मयूर तमारे इणिये आवी गडेके
अंधकारने हडसेलीने उजसना झूल मडेके;
बंधन नहीं को स्थान समयना जवुं न धरथी दूर
घर आवी मा हरे शारदा दैन्य तिभिरना पूर.

संस्कारोनी सुगंध मडेके, मन मंदिरने धामे
सुभनी टपाल पडोंचे सौने पोताने सरनामे;
समाज केरे दरिये डांकी शिक्षण केरुं वडाण,
आवो करीये आपण सौ
भव्य राष्ट्र निर्माण...
दिव्य राष्ट्र निर्माण...
भव्य राष्ट्र निर्माण

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