UNIT II

Technologies for Web Application

❖ WWW:

Full form of www is world wide web and it is an advanced finding information system. it is being developed very fast. WWW is based on hypertext,

The concept of the Web was perfected at CERN (the European Organization for Nuclear Research) in 1992 by a group of researchers which included Tim-Berners Lee, the creator of the hyperlink, who is today considered the father of the Web or Internet.

(handwritten: Council)

The principle of the Web is based on using hyperlinks to navigate between documents (called web pages) with software called a Web Browser. A web page is a simple text file written in a markup language (called HTML) that convert the layout of the document, graphical elements, and links to other documents, all with the help of tags.

Besides the links which connect formatted documents to one another, the web uses the HTTP protocol to link documents hosted on distant computers (called web servers). On the www, documents are identified with a unique address, called a URL, which can be used to locate any resource on the internet, no matter which server may be hosting it.

A URL looks something like this:

http://www.mywebsite.com/webfolder/Home.html

Which means, when the user is browsing on the www he can put up a word or expression within a text and request for more information about it.

WWW can be started by the command www. then domain name of the website and finish with top-level domains .com or .in etc **Ex:**

www.mywebsite.com

Advantages:	Disadvantages:
You can find lot's of information You can purchase things online You can watch or listen to things You can play games You can check your online bank account You can find files You can find friends	You can get computer virus infections You can get hacked Not secure People can steal your privacy People can steal your account

❖ Web Browser:

Web browser is software to provide an interface to displaying, presenting, accessing and browsing information resources of web pages on internet and navigate between one website to another in an easy manner. Now a day's website becomes more popular because it is effective way of advertising and selling products of company.

HTML is simply collection of codes, code means it is collection of some meaningful symbols which is having some structure and format to create a web document. Those structured combination of symbols are only recognized by special software called as web browser, web browser can read HTML symbolic program structure and displays a suitable human readable form on display screen.

The web pages are written in HTML language in the form of code but whenever you open that HTML web page in web browser software you don't see html code, it displays a formatted and readable data. Web page is a document, typically written in plain text mixed together with formatting instructions (tags) of Hyper Text Markup Language (HTML). Web pages are accessed and transported outside the computer in internet with a protocol called as **HTTP** (Hyper Text Transfer Protocol)

Protocol is tiny software which defines rules and regulations to transfer data and communicate another computer across the internet.

Web browser supports numerous protocols such as **HTTP, FTP, TCP/IP,** etc...

Web browser perform various **task as like file downloading, file uploading, email attachment, save web page content, play videos from website, print webpage etc. It also bookmark** (saving address of a web page in web browser) your favorite web page.

> **Available Web browsers in internet:**

1.   **Mosaic:** Mosaic was older browser it was first graphical web browser. Mosaic was developed at the National Center for Supercomputing Applications and released the browser in 1993.

2.   **Netscape Navigator:** It was first released in 1994. Mosaic was developed with another name netscape navigator. This is the first most popular commercial web browser in older days

Microsoft Internet Explorer: Microsoft is a software company which designed and developed a web browser for windows operating system named as Microsoft Internet Explorer. It is present default as web browser in any newly installed windows operating system. Today this is one of the most usable browser on internet.

1. **Mozilla Firefox:** After days creator of Netscape navigator developed a new browser called Mozilla Firefox. Firefox is rapidly gaining ground right behind internet explorer because of its tabbed browsing, superior security features, and fast loading web page.
2. **Google Chrome:** Google specialized in web search engine it is a copyright product of Google. It is a light weight and fast accessing browser.
3. **Mac Safari:** Macintosh (Mac) is a computer system of Apple company. Safari is a web browser works on Macintosh OS. It has a rich graphical appearance.

Opera: It is popular mobile web browser and also available in desktop PC.

Following are some common basic options available on any web browser:

1. **Title Bar:** This title bar is at the top of your browser window; it displays title name of the appropriate web page.
2. **Menu Bar:** This is menu bar provides all kind of available options regarding browser software like file, edit, tool, help etc.

1. **Toolbar Bar:** this contains all shortcut options in the form of shortcut like Home, Back, Forward, Stop, Refresh.

2. **Address Bar:** This is one of the most important bar because it provides URL (Uniform Resource Locator) to enter website's address to which website user wants to display.

3. **Display Window:** your website displays and accessed in this portion of area.

4. **Scroll Bar:** at the right corner of the display window to scroll larger portion of website and navigate hide portion we use scroll bar.

Status Bar: this is bar present at the bottom of each window and shows activity status of each action of web page. It shows information that is web page load? Unload? Transferring to another link? Etc...

Fig. Internet explorer web browser

❖ URL

Several HTML elements or tags may contain an attribute such as <a href="http://www.google.com">, which takes a URL as value. URL stands for Uniform Resource Locators, URL are addresses of Web documents. More generally, URLs can be used on the Web to open website on the Web.

There are two types of URLs:

1) Absolute URL (Full URL)

2) Relative URL (Short URL)

1. Absolute URLs

The general syntax of absolute URLs is the following:

Syntax: protocol://host:port/path/filename

Example: http://www.example.com:8080/WebFolder/index.html

where

scheme or protocol

It specifies the information system to be used to access the resource; possible values include the following:

http a Web document (to be accessed using Hypertext Transfer Protocol, HTTP)

ftp a resource to be retrieved using FTP (File Transfer Protocol), usually a file in a so-called FTP server,

File a file on a particular computer; a file URL is hardly useful on the Web

host

It is the Internet domain host name, e.g. www.google.com Web servers have domain names starting with www.

:port

It is the port number part, all the information can transmit and accept through various port numbers, some information which is more secure such as banking transaction always go through secure port number and some general information send and received by Port no. 8080.

path

It is a directory (folder) path within the host, where your Website, images, css, pdfs are contain.

filename

It is a file name such as webpage.html or image within the directory or actual object which is going to access via url.

2. Relative URLs

What is Relative URL?

A relative URL is a short URL it points to a resource to the current directory or file. A relative URL can take several different forms. When referring to a file that resides in the same directory as the currently referred page, the relative URL can be simple as the name of the file itself. As an example, if you need to create a link in your home page to a file called ContactUs.html, which resides in the same directory as your home page, you can simply use the file name as follows:

 Contact Us

If the file you need to link is within a sub directory of the referring directory of page, you need to include the subdirectory name and the file name in the relative URL. For example if we are trying to link a file my_parents.html that is within a directory called parents, which actually resides inside the directory that contains your home page, the relative URL will look like the following.

My Parents

Additionally, if you want to refer to a resource that resides on a directory that is in a higher level in the directory structure than the directory that contains the referring page, you can use two dots. For example, if you want to refer to a file called home.html that in a directory above your home page, you can use a relative URL as follows.

Home

❖ Web Server :

Web server, can refer as both term the hardware (the computer) or the software (the computer application).

It helps to deliver web content that can be accessed through the Internet

- When a the client's web browser request a website, The web server then reads the request and check the web page file, if it exists then sends a response to the client's web browser. The response will describe the content of the file and contain the file itself if an error occur then error message will transmit to saying that the file does not exist or is unavailable.

Web browser request

Internet / LAN

Web browser request

Web server response

Web Server   Web server response   Web User/Client
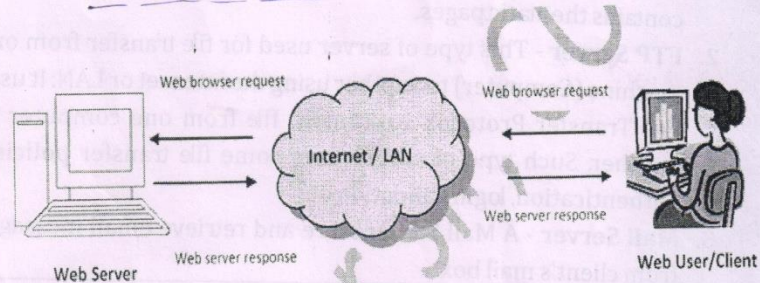
- If web server is considered as hardware web servers are not always used for serving the World Wide Web. They can also be found embedded in devices such as printers, routers, webcams and serving only a local area network. The web server may then be used as a part of a system for monitoring and/or administering. This usually means that no additional software has to be installed on the client computer, since only a web browser is required (which now is included with most operating systems).

History

The world's first web server, a NeXT Computer workstation worked under LAN and used in 1990.

In 1989 Tim Berners-Lee proposed a new project to CERN, with the goal of easing the exchange of information between scientists by using a hypertext system. The project resulted in Berners-Lee writing two programs in 1990

1. A browser called World Wide Web.

2. The world's first web server, later known as CERN http, which ran on NeXTSTEP Between 1991 and 1994, the simplicity and effectiveness of early technologies used to surf and exchange data through the World Wide Web it helped to send them to many different areas to spread their use among

----

scientific organizations and universities, and then to business industry.

**Some of the popular category of web servers are -**

1. **HTTP Server** - It handles HTTP request coming from client's browser and transfer the static web pages to client in response to their request. This pages runs on the client browser. It generally contains the static pages.

2. **FTP Server** - This type of server used for file transfer from one machine (Computer) to another using the internet or LAN. It uses File Transfer Protocols to transfer file from one computer to another. Such type of server uses some file transfer policies, authentication, login validation etc

3. **Mail Server** - A Mail Server store and retrieve email messages from client's mail box.

❖ Web Protocols:

1) HTTP:

Hypertext Transfer Protocol (In short HTTP) is a communications protocol. It is used to send and receive webpages and files on the internet. It was developed by Tim Berners-Lee. HTTP version 1.1 is the most common used version today. This is the foundation for data communication for the World Wide Web (i.e. internet) since 1990.

HTTP is client/server protocol. Basically, HTTP is a TCP/IP based communication protocol, that is used to deliver data (HTML files, image files, query results, etc.) on the World Wide Web. **The default port is TCP 80**, but other ports can be used as well. It provides a standardized way for computers to communicate with each other. HTTP specification specifies how clients' request data will be constructed and sent to the server, and how the servers respond to these requests.

HTTP request
URL

Internet

HTML
document
response

Web Server

Client's Web Browser
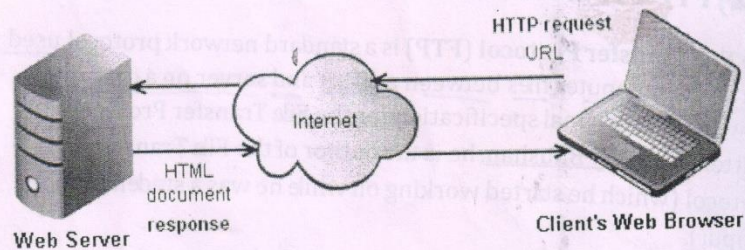
Basic Features:

There are three basic features of HTTP

- **HTTP is connectionless:** The HTTP client, i.e., a browser creates an HTTP request and after a request is made, the client disconnects from the server and waits for a response. The server processes the request and re-establishes the connection with the client to send a response back.

- **HTTP is media independent:** It means, any type of data can be sent by HTTP as long as both the client and the server know how to handle the data content.

- **HTTP is stateless:** As mentioned above, HTTP is connectionless and it is a direct result of HTTP being a stateless protocol. The server and client are aware of each other only · during a current request. Afterwards, both of them forget about each other. Due to this nature of the protocol, neither the client nor the browser can retain information between different requests across the web pages. Browser send request and wait for response for that there is no need to create and maintain current live connection.

2) FTP Protocol:

The **File Transfer Protocol** (**FTP**) is a standard network protocol used to transfer computer files between a client and server on a computer network. The original specification for the File Transfer Protocol was written by Abhay Bhushan, he is the author of the File Transfer Protocol (which he started working on while he was a student at IIT-Kanpur).

FTP is state-full connection protocol that means FTP is built on a client-server model architecture and uses separate online live data connections between the client and the server.

FTP use port 21 by default.

FTP users may authenticate themselves with a clear-text sign-in with login window with the help of username and password, and another can connect anonymously if the server is configured to allow it. For secure transmission that protects the username and password, and encrypts the content for security.

The first FTP client applications were older concept, earlier in old days ftp were command-line programs developed before operating systems which had graphical user interfaces like windows, and are still worked with most Windows, Unix, and Linux operating systems.

Many FTP clients and automation utilities have since been developed for desktops, servers, mobile devices, and hardware, and FTP has been incorporated into productivity applications, such as web page editors.

FTP Client on Client PC — FTP Commands / FTP Replies / Data Connection — FTP Server
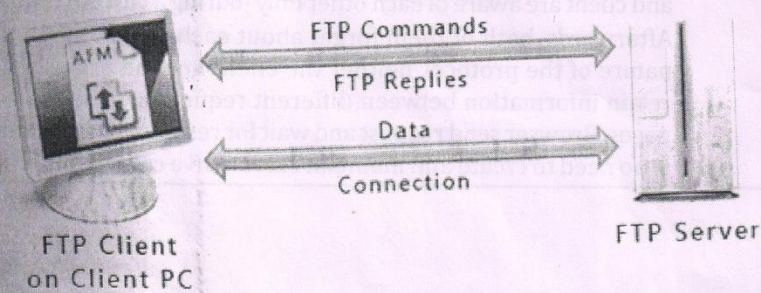
FTP protocol having two types

     a. **Login FTP**

     b. **Anonymous FTP**

Login FTP:

FTP login uses a normal username and password scheme for granting access. The username is sent to the server using the USER command, and the password is sent using the PASS command. If the information provided by the client is accepted by the server, the server will send a greeting to the client and the session will established. If the server supports it, users may log in without providing login credentials, but the same server may authorize only limited access for such sessions.

Anonymous FTP:

Anonymous means unknown. A host that provides an FTP service may provide anonymous FTP access. Users typically log into the service with an 'anonymous' account when prompted for user name. Although users are commonly asked to send their email address instead of a password, no verification is actually performed on the supplied data. Many FTP hosts whose purpose is to provide software updates will allow anonymous logins.

3) Telnet Protocol:

Telnet is a protocol used to log in to remote (longer distance) computer on the internet. Telnet was developed in 1969. Historically, Telnet provided access to a command-line interface (Text mode like DOS operating system) on a remote host, but now telnet concept becomes remote desktop login with graphical interface.

There are a number of Telnet clients having user friendly user interface. The following diagram shows a person is logged in to computer A, and from there, he remote logged into computer B. now

whatever commands and task performed by user in computer A all actions actually implement in Computer B at same time. **Telnet is connection oriented protocol that means it work on state-full principle and compulsory need current online live data connection.** The result of this request would be an invitation to log on with a userid and a prompt for a password. If accepted, you would be logged on like any user who used this computer every day. **Telnet use port no 23.**

Telnet is most likely to be used by program developers and anyone who has a need to use specific applications or data located at a particular host computer.

Security:

most users of networked computers were in the computer departments of academic institutions, or at large private and government research facilities. In this environment, security is a major issue. The rise in the number of people with access to the Internet, and by extension the number of people attempting to hack other people's servers, made encrypted alternatives necessary. Due to this security-related issues have seen the usage of the Telnet protocol drop rapidly. Especially on the public <u>Internet</u>. For that reason telnet become more secure with the help of the Secure Shell (SSH) protocol.

❖ Anchor Tag -

The HTML *anchor* element is used to create a link to a resource (another web page, a file, etc.) or to a specific place within a web page.

Syntax: text

Example: text

The anchor tag alone won't do anything without an attribute and value, so let's look at the attributes we can use.

➢ **HREF Attribute:**

Href is short for *hypertext reference*. To create a link, you have to know

---

the web address url of the file you want to link to, whether it's another web page of your own site, another website, or a link to file such as a PDF document, sound file, image, or another type of file.

Suppose you want to link to the front page of website site.

The web address is: *http://www.google.com*. You'd code the link like this:

`<a href="http://www.google.com">Use this link to search Google</a>`

This is the text in between the opening and closing a tags in the example code.

When a visitor to your web site moves the mouse over a link, it usually changes to a hand to show the text can be clicked.

Use this link to search Google.

http://www.google.com
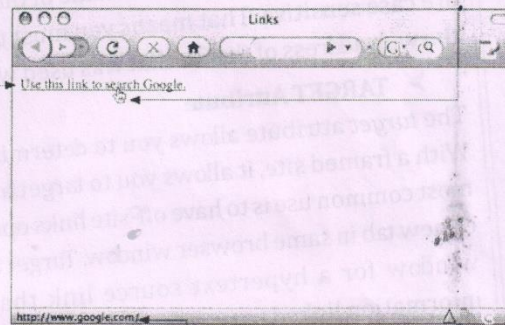
The location of the link is usually printed in the bottom part of the browser window, which is also called the status bar

The *href* part, shown in dark blue text with underlined. This is the attribute that defines the address of the file you want to link to.

The equal sign always connects an attribute to the attribute's value. So in this case, *href* is the attribute, and *http://www.google.com* is the value. The value is always enclosed in quotation marks.

Click here to visit Google is the anchor text, or sometimes called the link text. This is the part of a link that is clickable.

If you link to a page on another site you need to use the full web address as shown in the example above. If you're linking to a different page on your own same site you only need to use the page name and extension if the page is keep in the same directory.

For example, suppose you want to link to a page you've saved with the name of *HomePage.html*. You'd code it like this:

```
<a href="HomePage.html">Home Page</a>
```

By linking to your own internal pages *without* using the full web address your pages will load faster. If you use the full web address the browser goes back out to the Internet to find your site all over again, which takes longer. If you don't use the full path the browser only checks on your site for the file.

File names, which includes the name of the web page and the extension, are case sensitive. That means you must use the same capitalization in the web address of the file that was used when the file was saved.

➤ TARGET Attribute

The *target* attribute allows you to determine where the link will open. With a framed site, it allows you to target a link to a specific frame. The most common use is to have off-site links open in a new browser window or new tab in same browser window. Target attribute specifies the target window for a hypertext source link that references frames. The information linked to target will be displayed in the named window.

- ❑ **_blank,** it open clicked web url webpage in new window of web browser;
- ❑ **_parent,** which indicates the parent frame set containing the source link;
- ❑ **_self,** which indicates the frame containing the source link; and _top, which indicates the full browser window.

Here's how to open a link in a new window:

```
<a href="http://www.site.com" target="_blank">Link Text</a>
```

By adding the part **target="_blank"** to a link, the link will open in a new window or a new tab, depending on the browser in use and how it's configured.

❖ mailto anchor: Add Links to E-Mail Addresses

Although links to and within web pages are the most common types of links you'll create, you can also link to other types of content on the Internet.

E-Mail Addresses

When you want to give someone easy access to your e-mail address, you can include it on your page as a mailto link. This means instead of using http://in front of your link, you use the e-mail protocol mailto:to preface your e-mail address.

Open the a tag.   Preface your e-mail address with the protocol mailto:.   Add the information you want your visitors to click to send you an e-mail.

`<a href="mailto:name@emailaddress.com">Email Me!</a>`

Use the href attribute.   Enter your e-mail address after the colon.   Close the a tag.

Clicking this link in a browser causes the visitor's e-mail program to launch. Then it opens a new e-mail message and places your e-mail address in the To: box of that message.

NOTE :

- For a mailto link to work, visitors to your web site must have an offline e-mail program (such as Microsoft Outlook or Mac Mail) set up on their computers. E-mail links like these may not work if the visitor uses only a web-based e-mail service such as Gmail or Hotmail.

- There actually is not a separate HTML tag for creating an HTML email link.

Email Link:
- By adding a couple extra onto the email address in *href* you can have both the SUBJECT and the BODY of the email automatically populated for your visitors. This is great when receiving emails from a website to an email account that handles more mail than just from that one link on your site.

- By defining a uniform subject that people will automatically have when clicking the link you will be able to tell right away whether or not an email came from the website or from another source (as long as your visitors don't mess with the subject that you give them).
- **Subject** - Insert the subject of the email with the information that you provide.
- **Body** - Insert the body of the email with the information that you provide.

Complete email HTML Code:

```
<a href= "mailto: companyemailid@gmail.com ?subject=Regarding
Something &body=Dear sir," >Email Us</a>
```

Mailto: The anchor <A> tag can also be used for enabling emailing, which helps visitors to send feedback through your web site. This is all fine as long as the visitor has his email client configured to send emails. However, if this is not the case, his computer will inform to him about it and the email will not be sent till an email client is configured.

Using the mailto value along with an email address in the HREF attribute of the anchor tag will create a link, which when clicked will open the default email client email compose window with already filling to part then subject part and body part with above data.

❖ The HTML Image Tag

The image tag is used to place an image on the web page.

There are two ways to access image.

1. Inline Image
2. External Image

1) Inline Image: It means use image in between line of text inside the web page.

```
<img src="image1.jpg"></img>
```

The Basics - How it Works

It is very important to understand that images are not technically "part" of the web page file, they are separate files which are inserted into the page when it is viewed by a browser. So a simple web page with one image is actually two files - the HTML file and the image file. The example on the right illustrates this.
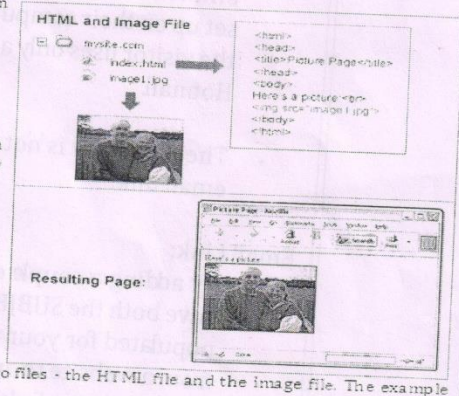
In this example the two files are both located in the same folder. The HTML file includes an image tag which refers to *image1.jpg*.

When the HTML file is displayed in a browser, it requests the image file and places it on the page where the tag appears.

Attributes of <img> tag:

1) Src (Source) Attribute:

As you can see, the most important attribute of the image tag is **src**, which means *source* and tells the browser where the image file is.

Ex: `<img src="image1.jpg"></img>`

1) Size Attributes:

The size attributes define the width and height of the image. They look like this:

`<img src="image.jpg" width="200" height="150"></img>`

If your image is present on c drive of your computer then you have to mention c:\ in front of image name in src attribute. These attributes are optional but strongly recommended as to set the size of width and height for image.

You can mention width and height attribute values either in Percentage or in Pixel value such as

In Percentage: `<img src="image.jpg" width="30%" height="20%"></img>`

In Pixel: `<img src="image.jpg" width="200" height="150"></img>`

1) Alt Attributes

These two attributes are very similar and can be confusing. Basically, it makes sense to treat them as the same thing and use them both.

Alt attribute define a short piece of text which appears instead of the image if the image cannot be displayed (for whatever reason), and as a "tool-tip" when you hold your mouse over the image it appears as text.

Beside image is a alt attribute output. ➡️

Hold your mouse over this image to see which tag your browser displays.

`<img src="image.jpg" alt="Photo of Mr and Mrs Jones"></img>`

If no alt or title tag is specified, the results vary depending on the browser and user settings. Some will show nothing, some will show the file name.

1) Alignment attribute:

You can use the align attribute to position the image:

`<img src="image.jpg" align="left"></img>`

The following alignment options are available: **left, right, center.**

2) Border attribute:

The border attribute places a border around the image. In the following example a 1-pixel border is applied:

`<img src="image.jpg" border="1"></img>`

If no border attribute is specified, no border is applied, *except* when the image is used as a hyperlink. In this case a 1-pixel border is applied. If you want to make an image into a hyperlink without a border, specify a zero border like so:

`<img src="image.jpg" border="0"></img>`

➢ **Image Formats for the Web:**

There are four basic formats you will find on the Web. Each denoted to the browser by a different suffix extension.

→ **.jpeg or .jpg**: JPEG stands for **J**oint **P**hotographic **E**xperts **G**roup

→ **.gif**: This is an acronym for **G**raphics **I**nterchange **F**ormat.

→ **.png** Pronounced   as   'ping',   this   stands for **P**ortable **N**etwork **G**raphic.

→ **.bmp** (pronounced "bimp") This is a "bitmap."

External Images:

Linking to External Images

It mentioned that external images are images that don't appear inline with other content on a Web page. Instead, they are referenced externally and viewed separately from the page where they are referenced.

→ The main difference between an external image and an **inline image is that an external image isn't displayed automatically. You must click a link to view it.**

→ External images are coded using the <a> tag, which establishes a hyperlink to the image.

→ The idea behind the <a> tag is to enclose content that will serve as a hyperlink to some other Web page or **resource** (refer note below), or in this case an image.

→ To reference an external image, you simply sandwich HTML content between <a> start and end tags, and reference the image using the href attribute. Following is an example:

<p>

Here is a picture of me jumping to open jump.jpg image in browser.

</p>

NOTE:
A *resource* is a general term that describes any piece of Web content, such as an image, audio clip, or another Web page.

Generally it displayed in most Web browsers when the viewer clicks the word and open image in separate window.

Notice that the href attribute is used to specify the URL of the external image, in this case the image filename, a relative path. Following is an example of how you might use a small thumbnail image, SmallJump.jpg, to reference a larger external image in browser after clicking:

<img src="SmallJump.jpg">

This is Smalljump image working as hyperlink image after clicking this image another image will open named as Longjump.jpg

Smalljump.jpg   Longjump.jpg

❖ Tables:

Table is a two-dimensional matrix consisting of rows and columns. Classification of data we use table.

HTML tables are used for displaying data in rows and columns on webpage. Tables are useful to display data in tabular format. Tables are much more powerful. They do not just format and present textual information but can also contain images, forms, hyperlinks and much more.

❑ Components of the table:

1) **Table Caption:-** this is a title of the table which you want to create. For this use <caption> tag

2) **Table Row :** this is a row of the table which you want to create. For this use <TR> tag

3) Table Heading Cell:- these are the titles given to a table row/ column. They are usually displayed as bold. For this use <TH> tag.

4) Table Data Cell:- this is a section made by a table row and column. A table cell can contain text, image or even another table within it. For this use <TD> tag.

5) Table Content:- The text, image, another table, anything itself within the cell is table data.

❖ **Table Tags:**

Steps to create table:

- A table created using <TABLE> and </TABLE> tags this is the main tag for creating a table and all other tags are present in between these two tags.
- The other tags will be ignored if they are not placed in <TABLE> and </TABLE>.
- Once table is created, the next step is to define the rows within the table and then cells from left to right then second row and its cells and so on. By default, table has no border.
- To create a empty table row <tr> tag is used. A table row starts with <TR> and ends with </TR>.

➤ **Table row <TR> can have two types of cell tags.**

1)   cell heading <TH>————</TH>:
- Cell heading is used to give heading to the fields or cells.
- Its data by default present in bold and center aligned in table.
- <TH> and </TH> tags are used to do this.

2) cell data <TD>————</TD>:
- Cell data is used to display the data in the cell.
- Cell data starts with <TD> tag and end of cell data is indicated by </TD>.

❑ **General format of a 3x3 table:**

```
<HTML>
    <HEAD>
        <TITLE>Table Example</TITLE>
    </HEAD>
<BODY>
    <TABLE>
        <CAPTION>Student List</CAPTION>
        <TR>
            <TH> Roll No </TH>
            <TH> Name </TH>
            <TH> Class </TH>
        </TR>
        <TR>
            <TD>01</TD>
            <TD>Amit</TD>
            <TD>BCA FY</TD>
        </TR>
        <TR>
            <TD>02</TD>
            <TD>Ganesh</TD>
            <TD>BCA FY</TD>
        </TR>
    </TABLE>
</BODY>
</HTML>
```

Output:

Student List		
Roll No	Name	Class
01	Amit	BCA FY
02	Ganesh	BCA FY

❖ All Attributes of TABLE tag:-

1) BORDER:-

Border attribute is used with <TABLE> tag to display lines around rows and columns.

BORDER attribute can take value depending upon the thickness of the border that you want, value can start with 0 to increased order (0 value represent no border,1 thin border, 5 Thick border and so on...).

Ex. <TABLE BORDER="1">

2) BORDERCOLOR:-

The BORDERCOLOR attribute sets color to the border of the table. This attribute takes name of color or the equivalent hexadecimal value.

Ex. <TABLE BORDER="1" BORDERCOLOR="RED">

3) BGCOLOR:-

To change the background of the entire table BGCOLOR attribute is used.

BGCOLOR attribute takes the value as name of color or its equivalent hexadecimal value.

Ex. <TABLE BGCOLOR="PINK">

4) ALIGN:-

We can align the table to left, right or center location.

Left   Center   Right

By default, tables are displayed at left margin.

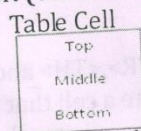ALIGN attribute take values as LEFT, RIGHT or CENTER.

Ex. <TABLE ALIGN="CENTER">

Table Cell

Left	Center	Right

5) VALIGN (vertical align):-

Table Cell

Top	Top
Middle	
Bottom	

Middle
Bottom

We can align table cell data vertically in terms of TOP, MIDDLE, and BOTTOM.

VALIGN attribute is used with TOP, BOTTOM, MIDDLE values.

This attribute is also used with table data <td> and table heading <th>.

Ex-   <TABLE VALIGN ="TOP"> Or
      <TH VALIGN="TOP"> Or <TD VALIGN="TOP">

Note: We can use both attributes together align and valign

6) WIDTH and HEIGHT:-

WIDTH and HEIGHT attribute defines how table appears on the screen.

Width and Height can be given a value either absolute width in pixel such as <TABLE WIDTH="300" HEIGHT="200"> or width in percentage value such as <TABLE WIDTH="30%" HEIGHT="20%">.

Ex-<TABLE WIDTH="300" HEIGHT="200">

7) CELLPADDING:-

Cellpadding is the value that determines the amount of spaces within each cell border and its content data. It tells the browser that how much space to provide between border and text or data within the cell. It is placed in the <TABLE> tag with a value defined in pixels.

Ex-<TABLE BORDER="1" cellpadding="5">

8) CELLSPACING:-

Cellspacing is used to create space in between all cells in a table.
Use of cell spacing also effects on spacing of the entire table.
Ex-<TABLE cellspacing="5">

- ### ROWSPAN and COLSPAN:-

We can use the ROWSPAN and COLSPAN attribute within the table
row <TR>, table heading <TH> or table data <TD>.
These attributes are used to span (Expand in space) multiple number of
rows or column.
In these spanned cells, you can include any content that you want to
display.

9) ROWSPAN:-

ROWSPAN attribute is used with <TR>,<TH> and <TD> Tags.
ROWSPAN attribute is used to create a cell that have size of two or
more cells in different row, that means visitor thought it merges the
two or more cells of different rows in a single cell of column.

ROWSPAN increase or span cell in vertical way.

It takes the numeric value i.e how many cells you want to merge and
make a single cell.

```
Ex-
<html>
<head><title>Table with rowspan attribute</title></head>
<body>

<table border="1">
    <caption>Yearly report</caption>
      <tr>
            <th>Month</th>
            <th>Roll No</th>
            <th>Name</th>
```

```
            </tr>
            <tr>
                <td rowspan="2">Jan</td>
                <td>01</td>
                <td>Suraj</td>
            </tr>
            <tr>
                <td>02</td>
                <td>Pooja</td>
            </tr>
            <tr>
                <td rowspan="2">Feb</td>
                <td>01</td>
                <td>Sumit</td>
            </tr>
            <tr>
                <td>02</td>
                <td>Rajesh</td>
            </tr>
        </table>
    </body>
</html>
```

Output :-

Yearly report

Month	Roll No	Name
Jan	01	Suraj
	02	Pooja
Feb	01	Sumit
	02	Rajesh

10) COLSPAN:-

COLSPAN attribute is used with <TH> and <TD> elements.
COLSPAN attribute is used to create a cell that have size of two or more cells of different columns, that means visitor thought it merges the two or more cells of different columns in a single cell of column.
COLSPAN increase or span cell in horizontal way.
COLSPAN attribute takes numeric value i.e how many cells in a column you want to merge.

```
Ex-
<html>
<head><title>Table with rowspan attribute</title><head>
<body>
    <table border="1">
    <caption>Class BSc(CS) FY Student List</caption>
      <tr>
            <th colspan="2">Div-A</th>
            <th colspan="2">Div-B</th>
      </tr>
      <tr>
            <td>01</td>
            <td>Prakash</td>
            <td>01</td>
            <td>Suraj</td>
      </tr>
      <tr>
            <td>02</td>
            <td>Pooja</td>
            <td>02</td>
            <td>Sumit</td>
      </tr>
      <tr>
    </table>
</body>
</html>
```

Output:

Class BSc(CS) FY Student List

Div-A		Div-B	
01	Prakash	01	Suraj
02	Pooja	02	Sumit

-------------------- The End --------------------