

Chapter 4

Web Technology



What is Web Page?



- Web pages are developed using **HTML**(Hyper Text Markup Language). It is called language of the internet.
- HTML tell the browser how to display the contents on a browser window.
- Any page created using HTML are viewed using software known as **Web Browser**. Eg: Chrome, Opera, Firefox, Safari



Tim Berners-Lee



Invented HTML and WWW



- **What is the role of payment gateway in online purchases?**

Payment gateway is a server that acts as a bridge between merchant server and bank server and transfers money in an encrypted format whenever an online payment/money transfer is made. Eg:CCAvenue, Paytm, Google Pay



Some important Protocols



- **(HTTP) Hyper Text Transfer Protocol** is a standard protocol used for communication between client (Browser) and server (Web server).
 - **(HTTPS) Hyper Text Transfer Protocol Secure** encrypts username and password, and then send it to the server.
 - **(SSL) Secure Sockets Layer** provides a standard security technology for establishing an encrypted connection between computers on Internet. SSL provides **security, Privacy and authentication.** capabilities to HTTP.
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What is a Web Server?



- **Web Server** is the **server computer** that hosts websites or deliver services like email, blog etc. It has two components.
- **1) Web Server computer:** It is a powerful computer which is always switched on and connected to a high bandwidth Internet connection. A web server can have single or multiple processors, fast access RAM, high performance hard disks, Ethernet cards that supports fast communication.
- **2) Web Server Software:** Popular **server operating systems** include various Linux distributions (Redhat, openSUSE, Debian, Ubuntu, etc.), Microsoft Windows Server, FreeBSD, Oracle Solaris, etc

Preferred **web server packages** are Apache Server, Microsoft Internet Information Server (IIS), Google Web Server (GWS) and nginx (pronounced as engine-x).

Web Server



What is Software Port ?



- A software port is used to connect a client computer to a server to access its services like HTTP, FTP, SMTP, etc. To distinguish the ports, the software ports are given unique numbers

SL No	Port Number	Service
1	20 and 21	File Transfer Protocol (FTP)
2	22	Secure Shell (SSH)
3	25	Simple Mail Transfer Protocol (SMTP)
4	53	Domain Name System (DNS) service
5	80	Hyper Text Transfer Protocol (HTTP)
6	110	Post Office Protocol (POP)
7	443	HTTP Secure (HTTPS)

What is DNS Server ?



- **Domain Name System (DNS)** server runs a special purpose networking software that contains a database of domain names and their IP addresses.
- DNS runs on a DNS server and **returns the IP address** of a domain name requested by the client computer



How DNS searches and locates the IP address of a domain name or



How DNS resolves IP address.

- a). The browser first searches its **local cache memory** to search whether its IP address is in the recently visited list
 - b). If it is not found it check the **operating system's local cache** for IP address
 - c). If it is not found there, it searches the **DNS server of the local ISP**.
 - d). If IP address is not there , the ISP's DNS server initiate search for IP address starts from **root server**.
 - e). After finding the IP address, The ISP's DNS server **returns this to the browser**.(If it is not found , a Page not found message displayed on browser)
 - f). The browser connects to the web server using the IP address of <http://dhsekerala.gov.in> and the webpage is displayed in the browser window
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What is Web Designing?



- HTML, JavaScript and CSS are the main languages that are used to design a webpage.
- Any text editor can be used to compose the code
- Popular web designing softwares are: Adobe Dreamweaver, Bootstrap, Bluefish, Microsoft Expression Web.
- These softwares are also called as **IDE** (Integrated Development Environment)



Compare Static & Dynamic Web pages



SL No	Static Web Page	Dynamic Web Page
1	The content and layout of a web page is fixed	The content and layout may change during run time
2	Static web pages never use databases	Database is used to generate dynamic content through queries
3	Static web pages directly run on the browser and do not require any server side application program	Dynamic web page runs on the server side application program and displays the results
4	Static web pages are easy to develop	Dynamic web page development requires programming skills



What are Scripts ?



- Scripts are program codes written inside HTML pages.
- Scripting languages like JavaScript, VB script, PHP, Perl are used to create **Dynamic Web Pages**
- Scripting languages are **interpreted by a web browser** or by a web server software



Compare Client Side Scripting & Server Side Scripting or What are the Types of Scripting Languages



SL No	Client Side Scripting	Server Side Scripting
1	Script is copied to the client browser	Script remains in the web server
2	Script is executed in the client browser	Script is executed in the web server and the web page produced is returned to the client browser
3	Client side scripts are mainly used for validation of data and the client	Server side scripts are usually used to connect to databases and return data from the web server
4	Users can block client side scripting	Server side scripting cannot be blocked by a user
5	The type and version of the web browser affects the working of a client side script	The features of the web browser does not affect the working of server side script

What are Scripting Languages? Give Example?



- **a) JavaScript** is a **client side scripting** language used to make web pages interactive. It is developed by **Brendan Eich**. It can be used for validation, simple calculations etc.
 - **b) VBScript** is both a **client side scripting** language and a **server side scripting** language. Developed by **Microsoft Corporation**. It only works with Windows operating system and Internet Explorer.
 - **c) PHP: Hypertext Preprocessor** is a **server side scripting** tool originally created by **Rasmus Lerdorf**. It supports **database programming**
 - **d) Microsoft Active Server Pages (ASP)** is a **server-side scripting** environment that can be used to create and run interactive web applications. It is executed only on Windows operating systems
 - **e) Java Server Pages (JSP)** is a **server side scripting** language that uses Java as programming language developed by Sun Microsystems.
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- **Q) What is Ajax? What is its use?**

Ajax is Asynchronous JavaScript and Extensible Markup Language (XML). With its help a dynamic content can be displayed on web page without reloading the entire page. It reduces data transfer. Ajax works only if the browser is able to handling Javascript.



What is Cascading Style Sheet ?



- Cascading Style Sheets (CSS) is a style sheet language used for **describing the formatting of a document** written in HTML.
- Using CSS, we can control the colour of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, borders and its colours, what background images or colours are used etc.
- A CSS file allows us to separate HTML content from its style.



How to implement Cascading Style Sheet



- CSS can be implemented in three different ways - inline, embedded and linked.
 - **a) Inline:** In inline style, the CSS style is applied to each tag separately using the style attribute in the body part of the web page.
 - **b) Embedded:** Embedded CSS codes are placed within the <HEAD> part of the web page.
 - **c) Linked :** Linked CSS implementation is done using an external file with the file extension .css that contains only CSS code and is linked with the web page.
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Basic concepts of HTML documents



- Hyper Text Markup Language. HTML is the most widely used language to write web pages. Every web page is actually an HTML file.
- Each HTML file is a plain text that defines a set of commands for creating hypertext documents. These commands are known as **HTML tags**.
- While using these tags, some keywords may be attached to them, which make the instruction more specific. These words are known as **attributes**.



Basic Structure of an HTML document



```
<HTML>  
  <HEAD>  
    <TITLE>This is the title of web page</TITLE>  
  </HEAD>  
  
  <BODY>  
    Hello, Welcome to the world of web pages  
  </BODY>  
</HTML>
```



- HTML is not case sensitive.
 - All HTML pages begin with the tag `<HTML>` and end with tag `</HTML>`.
 - There are mainly two sections in an HTML document namely **head section** and **body section**.
 - **1) Head section:** The `<HEAD>` tag is used to define the head section. The head section **contains the information about the document, including the title of the web page**. The `<TITLE>` tag is used to define the title of the page, which will be displayed on the title bar of the browser window.
 - **2) Body Section:** The `<BODY>` tag is used to define the body section. The body section contains the **contents to be displayed in the web page**.
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What are Container tags and empty tags ?



- There are two types of tags:
- **1) Container Tags:** Tags that require opening tag as well as closing tag are known as **container tags**.
Eg: `<HTML>` `</HTML>`
- **2) Empty Tags:** Tags do not require closing tag is called as **Empty tags**. Eg:
`
`, `<HR>`, ``,



What are the Essential HTML tags ?



- 1) `<HTML>`
- 2) `<HEAD>`
- 3) `<TITLE>`
- 4) `<BODY>`



1) <HTML>



- The <HTML> tag identifies the document as an HTML document.
 - <HTML> is always the first tag in an HTML page and the </HTML> is the last tag.
 - Everything else in the web page is in between these two tags.
 - The Head section and the Body section lie inside the <HTML> and </HTML> tags.
 - It is a **container tag pair**.
 - The main attributes of the <HTML> tag are **Dir** and **Lang**.
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- **Dir**

The Dir attribute specifies the direction of the text to be displayed on the web page.

Its values are **ltr** (left-to-right) or **rtl** (right-to-left).

The default value of Dir attribute of HTML tag is Ltr

Eg: `<HTML Dir = "rtl">`

- **Lang**

The Lang attribute specifies the language used within the document. Eg. `<HTML Lang = "en">`

2) <HEAD>



- It contains the head of an HTML document, which holds information about the document such as its **title**, **scripts used**, **style definitions**, etc.
- The tag pair <HEAD> and </HEAD> declares the head section.
- It is also a **container tag pair**.



3) <TITLE>



- It is a container tag pair that contains the title of the HTML document, which will appear in the web browser's title bar.
 - The search engine uses the Title to identify the page.
 - The tag pair <TITLE> and </TITLE> is used inside the tag pair <HEAD> and </HEAD> to mention the document title.
 - It is also a **container tag pair**.
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4) <BODY>



- The body tag pair <BODY> and </BODY> specifies the document body section.
- This section contains the content to be displayed in the browser window. Hence, all other tags, which define the document content are given in the body section.
- The important attributes used in <BODY> tag are
 - a) **Background**
 - b) **Bgcolor**
 - c) **Text**
 - d) **Link, Alink, Vlink**
 - e) **Leftmargin and Topmargin**



a) Background



- This attribute sets an image as background for the documents body.
- The general format is:
`<BODY Background = "URL of the picture">`
- Eg:
`<BODY Background = "Sky.jpg">`
- we have to place the image file in the current working directory.



HTML code to set image as background for a webpage



```
<HTML>
  <HEAD>
    <TITLE>This is the title of web page</TITLE>
  </HEAD>

  <BODY Background="sky.jpg">
    Hello, Welcome to the world of web pages
  </BODY>
</HTML>
```

b) Bgcolor



- This attribute specifies a colour for the background of the document body.
- For example, `<BODY Bgcolor = "grey">` will display the background in grey colour.
- The value of Bgcolor attribute can be given in two ways.
 - 1) **Color_name** - specifies the background colour with a colour name (like "red", "grey" etc.)
 - 2) **Hex_number** - specifies the background colour with a hexadecimal code (like "#ff6080", "#303030" etc.). Each hexadecimal code will be preceded with a hash sign #.





Colour	Colour Name	Colour HEX
	Black	#000000
	Red	#FF0000
	Green	#00FF00
	Blue	#0000FF
	Yellow	#FFFF00
	Aqua	#00FFFF
	Grey	#C0C0C0
	White	#FFFFFF

Table 4.4: List of colours with their Name and Hexadecimal value



c) Text



- This attribute specifies the colour of the text content in the page.
- By default the browser displays the text in black colour on a white/grey background.
- The colour of the text can be changed using the attribute Text.
- For example,

`<BODY Text = "yellow">`

shows the text in yellow colour.

- The value of Text attribute can be given as colour name or hexadecimal code.
For example, Text = "Blue" or Text = "#00FFDD" etc.



d) Link, Alink, Vlink



- A hyperlink is an element, a text or an image that we can click on, and jump into another document or another section of the same document.
 - A hyperlink points to a whole document or to a specific element within a document.
 - **Link:** This attribute specifies the colour of the hyperlinks that are not visited by the viewer. The default colour for Link attribute is blue.
 - **Alink:** It specifies the colour of the active hyperlink. The link remains active only for the moment the mouse is clicked on it. Hence at the time of selection the colour of the link will be changed to Alink value. The default Alink colour is green.
 - **Vlink:** It specifies the colour of the hyperlink which is already visited by the viewer. The default colour for Vlink is purple.
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e) Leftmargin and Topmargin



- The margin refers to the blank area left from the edge of the page.
- **Leftmargin** attribute is used to leave some blank area on the left side of the document
- **Topmargin** refers to the blank area at the top edge of the document window. The value is specified in pixels.



Some common tags



- The tags that are used for formatting the text contents in the body section of the HTML document is called **formatting tags**.
- 1) **<H1>, <H2>, <H3>, <H4>, <H5> and <H6>** - Heading tags
- 2) **<P>** tag - Creating paragraphs
- 3) **
** tag - Inserting line break
- 4) **<HR>** tag - creating horizontal line
- 5) **<CENTER>** tag - Centering the content
- 6) Text formatting tags
- 7) **<PRE>** - Displaying preformatted text
- 8) **<ADDRESS>** - Displaying the address
- 9) **<MARQUEE>** - Displaying text in a scrolling Marquee
- 10) **<DIV>** - Formatting a block of text
- 11) **** - Specifying font characteristics

1) <H1>, <H2>, <H3>, <H4>, <H5> and <H6> - Heading tags



- A heading is a word, phrase, or sentence given at the beginning of a written passage that explains what it is about.
- It is a **container tag**
- HTML has six levels of headings from <H1> to <H6>.
- Here <H1> creates the biggest text and <H6> the smallest. Eg:
`<H1 Align= "left"> This is a Heading type 1 </H1>`
- While displaying any heading, browser adds one line before and one line after that heading.
- The main attribute of this tag is **Align** and the possible values are,
 - i) **Left** : Text is aligned to the left margin.
 - ii) **Right** : Text is aligned to the right margin.
 - iii) **Center**: Text is aligned to the centre of the page.

2) <P> tag - Creating paragraphs



- The <P> tag enables us to organise the text within the <BODY> tag into paragraphs.
- It indicates a new paragraph and instructs the browser to add a blank line before the paragraph.
- It is a **container tag**

Eg:

`<P Align= "right">` This paragraph contains a lot of spaces in the source code, but the browser ignores it. `</P>`

- The main attribute of this tag is **Align** and the possible values are,
 - i) **Left** : Text is aligned to the left margin.
 - ii) **Right** : Text is aligned to the right margin.
 - iii) **Center** or **Justify**: Text is aligned to the centre of the page.

3)
 tag - Inserting line break



- It creates a line break within a block of text in a web page. The
 tag is used to break the current line of text and continue from the beginning of the next line.
- It is an **empty tag**



4) <HR> tag - creating horizontal line



- The <HR> tag produces a horizontal line (rule) spread across the width of the browser window. It is an **empty tag**.
- The attributes are:
 - i) **Size** : Changes the size(thickness) of the line. Value is given in pixels
 - ii) **Width** : Changes the width(length) of the line. Value given in pixels or percentage.
 - iii) **Align** : Values are left, right or center
 - iv) **Noshade** : Applies no shade
 - v) **Color** : Changes the color of line
- EG:
`<HR Size= "10" Width= "30%" Align= "center" Noshade>`



5) <CENTER> tag - Centering the content



- The <CENTER> tag brings the content to the centre of a web page horizontally.
- The content may be text, image, table, etc.
- This is a **container tag**
- There is no attribute for this tag.
- Eg:
<CENTER> Welcome </CENTER>



6) Text formatting tags



- Using text formatting tags we can make texts bold, italics, underline etc
 - i) **** This tag sets the text style to bold.
 - ii) **<I>** It sets the text style to italics.
 - iii) **<U>** Used to underline a text in HTML. *The formatting tags <U>, and <I> can be combined, so that the content will become bold, italicized and underlined.*
 - iv) **<S>** and **<STRIKE>** - They display the text in strike through style.
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6) Text formatting tags



- v) **<BIG>** Making the text big sized.
- vi) **<SMALL>** Making the text small sized.
- Vii) **** Making bold text .It is just the same as **** tag. The strong element is used to emphasize a phrase of text content.
- Viii) **** Used to emphasise the text. Text is usually rendered in italics. Effect is same as that of **<I>** tag.
- ix) **<SUB>** and **<SUP>** tags- Used to create subscripts and superscripts. EG:

H₂O

H**₂**O

(a+b)²

(a+b)**²**

Previous Questions



- 1.The default port number of http is
(a) 20 (b) 80 (c) 110 (d) 53
 - **Ans:** 80
 - 2. Write HTML tag to set the colour of hyperlink to red .
(a) (b)
(c) <BODY LINK="Red" > (d)<BODY ALINK="Red" >
 - **Ans :** c
 - 3.A webpage is created to display the result of engineering entrance examination .
(a)What type of webpage it is ?
(b) Mention any two features of it.
 - **Ans :** Dynamic Web page
 - 4. Write any two features of dynamic web page.
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Previous Questions



- 5..... tag is used to make the size of the text smaller than current text in HTML.
(a) (b) <small> (c) <sub> (d) <sup>
- **Ans: b**
- 6. Compare client side scripting and server side scripting.
- 7. Compare client side scripting and server side scripting languages.
- 8. Compare static and dynamic webpages.
- 9. is a server that act as a bridge between merchant server and bank server.
- 10. DNS stands for

Previous Questions



- 11. Write HTML tags used to insert comments in HTML web pages
- 12. Suppose you are browsing the website www.keralapsc.gov.in explain how DNS resolves this ip address
- 13. What is the port number for the following web services
 - (i) Simple Mail Transfer Protocol
 - (ii) HTTP secure (HTTPS)
- 14. (i) What is the use of reserved characters for HTML entities?
 - (ii) List any four reserved characters and its use

Previous Questions



- 15. Name any two attributes of the following tags
 - (a) <HTML>
 - (b) <MARQUEE>
 - (C)

