

HTML

Handwritten Notes

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Youtube = Point of Programming

FUNDAMENTALS OF WEB

Vinton Cerf

Bob Kahn

* 1m ✓ Computer network

A computer network is a group of devices connected with each other through a transmission medium such as wires, cables etc. These devices can be computers, printer, scanners, fax machines etc. in order to share the resources.

Protocol

Rules

Sender

Message

Protocol

Rules

Receiver

Transmission medium

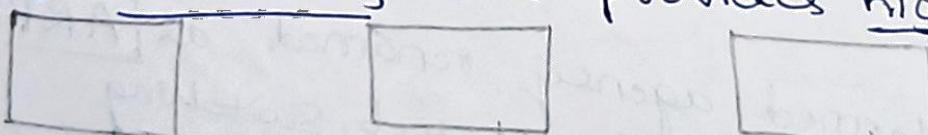
Types of Computer network.

3 types

- ① LAN (Local Area Network)
- ② MAN (Metropolitan Area Network)
- ③ WAN (Wide Area Network)

① LAN

- * LAN is a group of computers connected to each other in a small area such as building, office.
- * It is less costly and provides higher security.

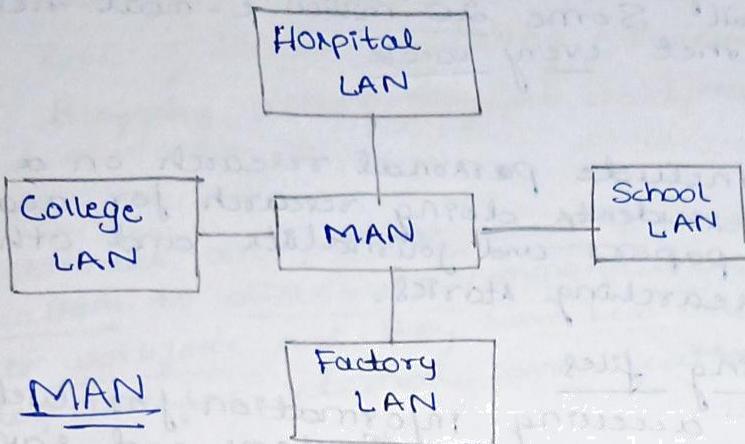


Ethernet

LAN

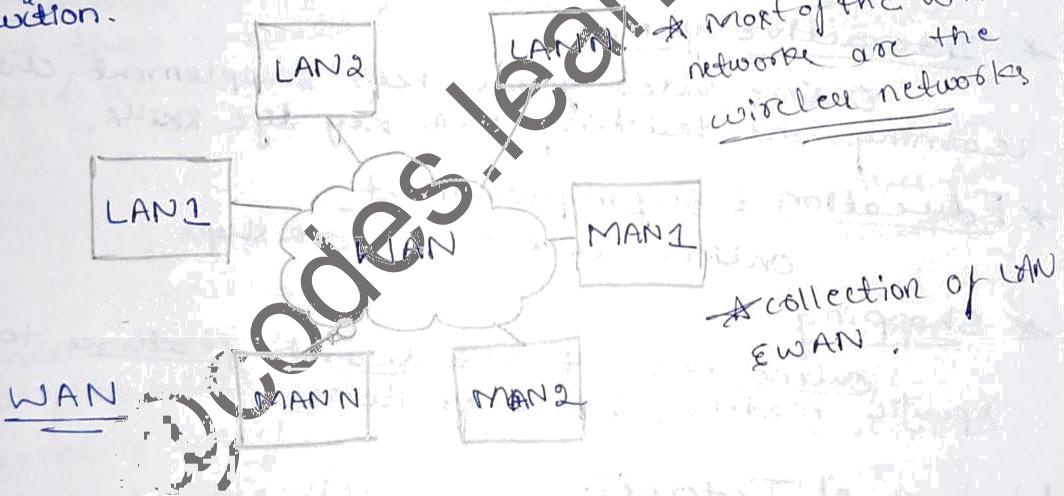
② MAN

- * MAN is a network that covers large geographical areas by interconnecting different LAN to form a large network.
- * It has a higher range than LAN.



③ WAN

- * A WAN is a network that extends over a large geographical areas such as states or countries.
- * WAN is widely used in the field of business, govt., & education.



* In

Internet

The internet is the large network that connects computers all over the world.

- * Through the internet, people can share information, communication from anywhere through internet connection.
- * The Internet carries large range of information, resources and services.
- * The internet consists of millions of private, public, business and government networks.

Use of Internet

* Electronic mail

At least 5% of inhabitants of cyber space send and receive e-mail. Some 20 million e-mail messages cross the internet every week.

* Research

It includes personal research on a particular or subject, students doing research for academic projects and papers and journalists and other writers researching stories.

* Downloading files

It is accessing information for web browser, e-mail browser or other systems and saving it to computer.

* Group discussion

These include public & private mailing lists.

* Interactive games

Online video games help supplement child's learning and teaching them key life skills.

* Education & self improvement

Online courses & workshops.

* Shopping

Online stores to use search features to find specific models, brand or items.

History of Internet

1958

Under president Eisenhower, the US formed an Advanced Research Projects Agency (ARPA) to facilitate more research in science and which could meet military requirements.

1969

Introduced with ARPANET to implement Packet switching

1974

Vint Cerf and Robert E Kahn introduced the Transmission Control Protocol / Internet Protocol (TCP/IP suite)

- 1991 Tim Berners Lee introduced World Wide Web (www) which runs on http.
- 1995 Internet Service Providers (ISP) allowed the public to subscribe to the internet.
- 2000 - Rise of social networking (Facebook, Twitter),
- 2020 Blogging sites (Blogspot, WordPress).

* (CIM)

Intranet

Intranets are private networks used by the organizations to distribute communications exclusively to their workforce and they have been used for decades by enterprises for internal communications.

Differences b/w Internet and Intranet.

Internet

- * The Internet is the large network that connects computers all over the world.
- * In Internet, there are multiple users.
- * Internet is ~~closed~~.
- * In Internet, there are more no. of visitors.
- * Anyone can access internet.
- * Internet provides unlimited information.

Intranet

- * Intranets are the private networks used by the organizations to distribute communications exclusively to their workforce and they have been used for decades by enterprises for internal communication.
- * In intranet, limited no. of users.
- * Intranet is safe.
- * In intranet, there are limited ~~closed~~ less no. of visitors.
- * In this, not everyone can access intranet.
- * Intranet provides limited information.

WWW * 1m

- * www is abbreviated as World Wide Web
- * www is a collection of webpages on the network access via internet.
- * Tim Berners Lee, the British scientist invented www in 1989, while working at CERN.
- * With a web browser, a user views a webpage that may contain text, images and other multimedia and navigate between them using hyperlinks.
- * www is the information sharing model that is built on top of the internet.

Internet Protocol * 1m

IP (Internet Protocol) is a set of rules for routing and addressing packets of data so that they can travel across the networks and arrive at the correct destination.

Every machine on the internet has a unique identifying number called an IP address. 4:4:4:4

Eg:- 123.123.12.1

The format of IP address is a 32 bit numeric address written as four numbers separated by ~~dots~~ periods. Each no. can be ~~0~~ to 255

$$(2^4) = 32 \text{ CM}$$

Domain Names

A domain name is the textual address where internet users can access website.

The most people type the domain name in the browser than IP address as it is easy to remember name than numbers.

Eg:- IP address of www.google.com is 209.89.148.105.

Top Level Domains

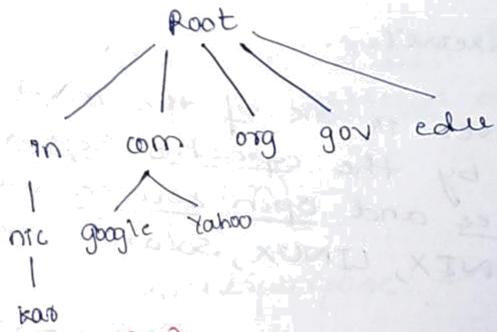
.com	commercial business organizations (typically, non profit)
.org	government agencies
.gov	Educational institutions
.edu	Network organizations
.net	Military organizations
.mil	International organizations
.int	

Country Code Domains
A unique two letter combinations for every country.

Country Code Domains	
.in	India
.au	Australia
.uk	United Kingdom
.us	United States

Sub-domains are the third level domains that are used to organize the websites containing in a systematic manner.
They are just like folders under a root directory.

Eg:- www.kar.nic.in



web :- "collection of networks"

Web Browser. ~~*(m)~~
A web browser is a software application used to locate and display the web pages.

It is able to retrieve, view, find and send information over the internet.

When request is made by our computer then that computer is called client and when the request gets served by another computer then that computer is called server.

Eg:- google chrome, Mozilla Firefox, Microsoft internet explorer, opera.

Basic functions of web Browser

- * Provide a way for user to access and navigate web pages.
- * Display webpage properly.
- * Provides technology to enable multimedia features.
- * Provides access to internet services (E-mail, FTP, Telnet etc.)

Web Server ~~(lm)~~

A webserver is a computer that hosts websites.
The primary function of a webserver is to store, process
and deliver webpage to clients.
The communication b/w client and server takes place
using HTTP (Hyper Text Transfer Protocol)

Types of web servers (3m/5m) ~~3m/5m~~

5 types

- ① Apache Web Server
- ② Microsoft Internet Information Service (IIS)
- ③ Nginx
- ④ Lighttpd
- ⑤ Sun Java System Web Server.

(5m)

IIS

Apache webserver.

Apache webserver is one of the most popular
webservers developed by the Apache Software
Foundation. It is free and open source webserver for
Windows, Mac OS X, UNIX, Linux, Solaris and other
operating systems.

Microsoft Internet Information Service (IIS)

It is developed by Microsoft for Microsoft platforms.
It is open sourced but widely used.

Nginx

Nginx is the fastest webserver. It is open source.
This is for administrators because of its light
resource utilization and scalability.

Lighttpd

A free webserver that comes with FreeBSD
operating system. It is fast and secure, while
consuming less CPU power.

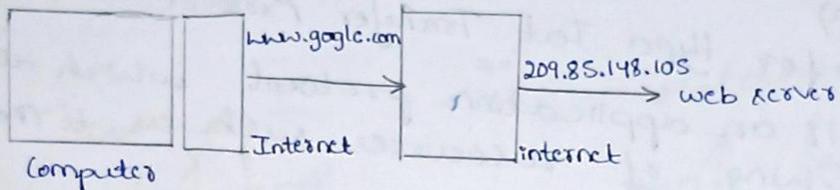
Sun Java System Web Server

A free webserver from Sun Microsystems that
can run on Windows, UNIX, Linux. It is well equipped
to handle medium to large website.

Domain Name Server (DNS) ~~(1m)~~

Domain Name Server is a software system that translates a computer's fully qualified domain name into IP address.

The main function of DNS is to translate domain names into IP addresses, which computers can understand.



URL ~~(1m)~~

URL is abbreviated as Uniform Resource Locator

URL is used to specify addresses on the world wide web.

MIME (1m) Sm

MIME "Multipurpose Internet Mail Extensions".

MIME is a way of identifying files on the internet according to their nature and format.

MIME is an ~~internet~~ standard that extends the format of email messages to support text in character sets other than ASCII, as well as attachments of audio, video, images and application programs.

MIME enables to send and receive graphics, audio and video files via the internet mail system. ~~(MIME is a supplementary protocol or a system, added on which allows non ASCII data to be sent through the email using SMTP).~~

Syntax:- type / subtype

Type	Subtype	Example
Text	Plain or html	text/plain
Image	Gif @ Jpeg	Image/gif or image/jpeg
Video	Mpeg	video/mpeg
Application	PDF	Application/pdf
Application	DOC	Application/doc

SMTP :- (1m)

* SMTP stands for "Simple Mail Transfer Protocol".

It is a standard protocol on a TCP/IP network for sending emails through servers from one computer to another computer.

HTTP (1m)

* Stands for Hyper Text Transfer Protocol.
HTTP is an application protocol which allows the fetching of resource such as HTML documents.

CGI (1m) (5m) (7m)

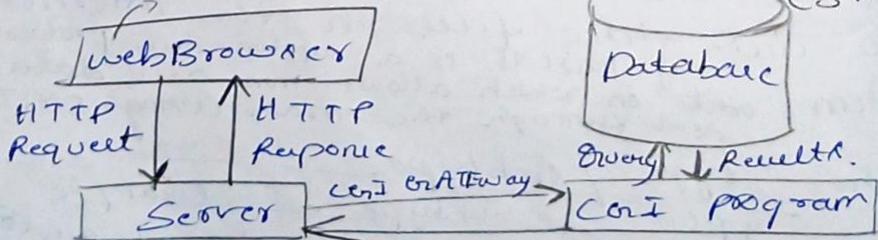
CGI stands for Common Gateway Interface

CGI is a server extension that extends the capability of web server.

It is the technology allows the web browser to submit forms and connect to programs over a web server.

Eg - when we fill up the form and submit the form applying click the submit button and it goes, what are the results ~~form +~~ from server level is CGI.

Q: How dynamic document is created and proceeded? / Working of CGI



~~Ways to connect~~

- * In the first step the web client connects to the web server.
- * The webserver runs a CGI program on the server side.
- * The webserver sends that particular web document as a response to the web client.
- * As a fresh document is generated for each request; the content of the dynamic document can vary from one request to another.
Eg - getting the date and time from the webserver.

Advantages of CGI

- * used for simple interactive applications
- * CGI programs are server side programs
- * CGI programs can be written in programming language like Perl, PHP, python, Java, C++.
- * It is simple
- * It is light weight and speedy bcoz it doesn't required any particular library to make a CGI program.

Search Engine (im)

A search engine is a software system that is designed to search for information on the www

Eg's of search engine

① Google

② YouTube

③ Facebook

④ Amazon (Launched in 1995. One of the first large companies to sell goods online)

⑤ Bing

Internet Security

Internet Security is a standard for protecting data that gets sent through the internet.

The most common security issues are

① Privacy

② Authentication

③ Integrity

④ Non repudiation

⑤ Encryption & Decryption

④ SGML (Standard Generalized Markup Language) is
* a language for defining markup languages like
HTML and for specifying the rules for tagging
elements in a document

Explaining @background

background attribute can be used to control
the background of an HTML element,
especially page body and table backgrounds.

type → Background color property

→ "image" →

→ "position" →

→

Use of Reset Button

to reset the fixed values of a form to
its initial values.

Chapter 2 : Introduction to HTML

Definition of HTML

- * HTML stands for Hyper Text Markup Language
- * HTML is the standard markup language used for creating webpages
- * HTML is used to define the structure and layout of web page by different tags which have different attributes.
- * As a viewer of a webpage, we see only contents not HTML code. It is hidden from view.
- * HTML consists of series of elements. These elements tell the browser how to display the content.

History and versions of HTML

forms - used to collect user input. Often sent to a server for processing

Year	Version
1989	Tim Berners Lee invented <u>WWW</u>
1991	Tim Berners Lee invented <u>HTML</u>
1993	HTML 1.0 is released. It is released for <u>sharing information</u> that can be <u>readable</u> and <u>accessible</u> via <u>browsers</u> . It <u>didn't support background colors</u> or <u>background images</u> of the <u>page</u> .
1995	HTML 2.0 is released. It contains all the features of HTML 1.0. <u>Background color</u> and <u>image</u> could be set. <u>Forms</u> are available in limited set of fields. <u>First time visitor</u> to the webpage can <u>submit the information</u> . <u>Tables</u> also came in picture
1997	HTML 3.2 is released by <u>Dave Raggett</u> , who introduced a <u>fram paper on draft</u> on HTML. HTML 3.2 supports <u>CSS level 1</u> . HTML 3.2 <u>didn't include</u> support for the <u>frames</u> but browser makers implemented them anyway.
1999	W3C recommendation: HTML 4.01. HTML 4.01 also provides the basis for meaning of XHTML elements and attributes, reducing the size of XHTML 1.0 specification.
2008	WHATWG HTML 5 First Public Draft. HTML 5 improves <u>interoperability</u> and <u>reduces</u> the <u>development costs</u> by <u>making precise rules</u> on how to handle all HTML elements and how to recover from errors. HTML 5 included functions for.

embedding audio, video, graphic, client-side data and interactive documents.

2015

XHTML 1.0

- * XHTML is the formal specification for the HTML and XML cross breed.
- * XHTML document can be manipulated by any program that understands XML.

2018

XHTML 2.1

XHTML 1.1 breaks features of XHTML 1.0 down into separate modules which browser may or may not choose to implement depending on their appropriateness for the web browser devices.

(3m)

About W3C

- * W3C stands for World Wide Web Consortium.
- * The World Wide Web Consortium is the main international standards organization for the world wide web.
- * It is founded in 1994 and currently led by Tim Berners Lee.
- * The Primary function of the consortium is to made up of Organization (member organization) to maintain full time staff working together in the development of standards for the world wide web.

(5m)

Web Standards

- * Web Standards is defined as the formal set of standards and technical specifications used to describe the aspects of world wide web.
- * These are the best practice standards used by organizations to build web applications and websites.
- * The commonly referenced web standards are HTML, XML 1.0, XHTML, CSS.

Advantages of and Disadvantages of HTML (5m)

Advantages:

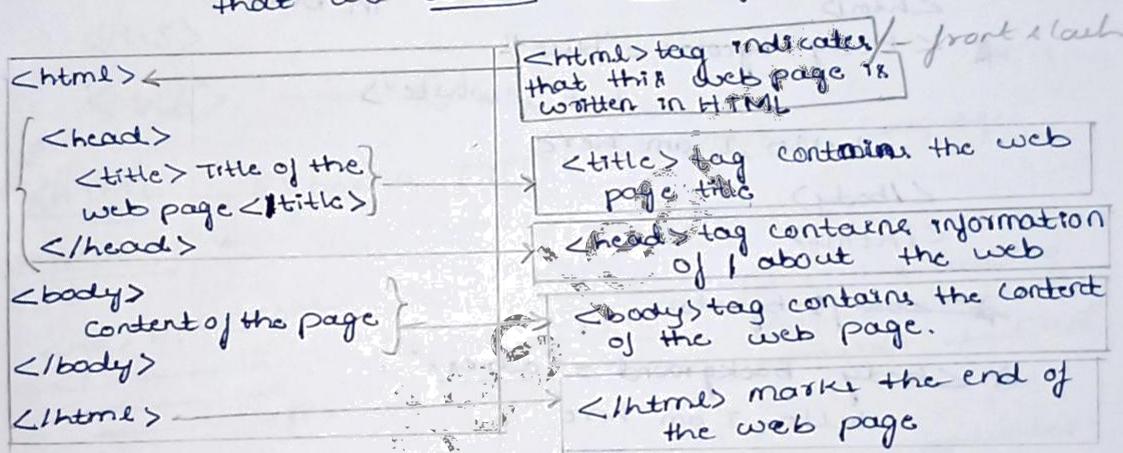
- * HTML is easy to learn and use.
- * HTML is free software.
- * HTML is supported by all ~~websites~~ the browsers.
- * HTML is user friendly (small codes).
- * HTML is easy to edit / simple to edit.

- ## Disadvantages
- * HTML can create only static and plain page so if we need dynamic pages then HTML is not useful.
 - * Need to write lot of codes for making simple web pages.
 - * Security features are not good in HTML.
 - * If we need to write long code for making webpage it produces some complexity.

Basic Structure of HTML Document (3m 7m)

An HTML document has two main parts.

1. head : The head element contains title and meta data of a web document.
2. body : The body element contains the information that we want to display on the web page.



The <html> tag:

An HTML document starts with <html> element and ends with its corresponding closing element </html>. We put everything in blue these elements.

<head> and <body> tag

Every properly-coded HTML document has <head> and <body> tag. The <head> contains some basic information about the document, such as title. The <body> contains the part of the document that ^{the browser} display in the main viewing area.

Most of the content in the <head> is invisible. The only thing that viewer can see is the title, which shows up in the title bar at the very top of the browser window.

The closing tags of these tags are </body> and </head>.

- Definition of XHTML (1 mark)
- * XHTML stands for Extensible Hyper Text Markup Lang.
 - * XHTML is a stricter, more XML based version of HTML
 - * XHTML is defined as an XML application.
 - * XHTML is supported by all major browsers.
- Difference b/w HTML and XHTML : (3 marks)

A (5m) HTML	XHTML
① The tag names and attribute names are <u>case insensitive</u> .	① The tag names and attribute names are <u>case sensitive</u> .
② In HTML, we can use <u>Capital letters</u> for element, <u>lower case</u> for attribute.	② In XHTML, all tags must be written in <u>lowercase</u> .
③ Not required in HTML that every element we use in HTML have both <u>an opening</u> and <u>closing tag</u> .	③ Every element we use in XHTML must have both <u>an opening</u> and <u>closing tag</u> .
④ Not required It is optional	④ In XHTML, <u>empty element</u> may use either the empty element syntax (<code><bs></code>) or have an end tag <u>immediately follow</u> the start tag (<code><bs></bs></code>)
⑤ Not required	⑤ All attributes in XHTML must be contained in quotes. <code><input type = "submit" name = "submit button" /></code>
⑥ Some elements have attributes that do not appear to require a value.	⑥ In XHTML, all attributes must be <u>expressed in attribute name and attribute value pair</u> with <u>quote marks</u> surrounding the attribute value - part <code><input type = "checkbox" name = "chkNewsletter" checked = "checked" /></code>
⑦ It allows minimization The use of "checked" in this way is referred to as <u>attribute minimization</u> . This means the author has used the attribute name but has not specifying a value.	⑦ It <u>doesn't allow</u> attribute minimization.
⑧ It is not required in HTML	⑧ In XHTML, the <u>opening <html> tag requires an XML attribute (XML Namespace)</u> .
⑨ It is optional	⑨ XHTML requires certain characters/characters to appear as named entities. Eg:- We can't use the character, it must be expressed using an HTML entity.

Advantages of XHTML over HTML (3m)

There are some advantages of XHTML over HTML

- ① Sustainability: XHTML will sustainableability - meeting our own needs without compromising the ability of future generations, long time till web applications we can use XML for their development.
- ② Wide range of applications: XHTML can use to create more complex websites. Bcz of this it can support large no. of different application such as MathML, SVG (Scalable vector graphics).
- ③ Compatibility: The XHTML documents are written in compliance with the rule of XML and XML processing programs can convert XHTML document into PDF, RTF. Because of this it supports wide range of file formats.
- ④ Closing tags: XHTML supports closing tag. It makes our source code clean and readable.
- ⑤ XHTML is easier to teach and to learn: The syntax rules defined by XML are more consistent, compare to HTML and therefore it is easier to explain XHTML.
- ⑥ XHTML is ready for the future: XHTML 1.0 document will be easily upgradable to this new version, to allow taking advantages of its existing new features.
- ⑦ Extensibility: XML documents are required to well formed. In the XML-based DTD, a new set of elements simply needs to be internally consistent and well-formed to be added to an existing DTD.

HTML Comments :

We can place a comment anywhere in the HTML document like this

<! - Here's a comment ->

(or)

<!-- -->
-- -->

} Non executable statements.

There will be nothing change in some of the variability. It is just simple notice to anyone looking at code of the webpage.

Standard XHTML Document Structure

An XHTML document consists of 3 main parts:-

- ① Doctype
- ② Head
- ③ Body

The Basic document structure is

<!DOCTYPE --->

<html --->

<head> --- </head>

<body> --- </body>

</html>

The head area contains information about the document, such as ownership, copyright & keywords; and the <body> area contains the content of the document to be displayed.

Eg -

<?xml version="1.0"?>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">

<head>

<title> My XHTML Sample Page </title>

</head>

<body>

<h1> Welcome to XHTML </h1>

</body>

</html>

Explanation

Line 1: - Since XHTM LIX, when HTML exposed with XML document. So it must include initial XML declaration <?xml version = "1.0"?> at the top of the document.

Line 2 and Line 3: - XHTML document must be identified by one of 3 standard set of rule. These rules are stored in a separate document which is called Document Type Declaration (DTD) and it is utilized to validate the accuracy of the XHTML document structure. The purpose of DTD is to describe the language and syntax allowed in XHTML with precise terms.

Line 4: - The second tag in an XHTML document must include the opening <html> tag with the XML namespace identified by the xmlns = http://www.w3.org/1999/xhtml attribute.

Lines 5 - 7: - XHTML document must include a full header area. This area contains an opening head tag and the title tag (<title></title>) and is then completed with the closing </head> tag.

Line 8 - 10: - XHTML document must include opening and closing <body></body> tag. Within these tags we can place traditional HTML coding tags.

Line 11: - Finally, the XHTML document is completed with the closing </html> tag.

(P), etc

Rules of XHTML

Write syntax for each if possible.

- ① XHTML elements must be properly nested.
- ② It is a case sensitive, tag name should be in lowercase.
- ③ All the attributes that are used in XHTML must be in lowercase.
`<p>This Right</p>`
- ④ All the elements must be closed.
- ⑤ All the attributes must be quoted.
- ⑥ The documents in HTML @ XHTML must always be well formed. [First it should start with <html> tag]
- ⑦ self closing tag need not require a closing tag.
`` Wrong
`` Correct
- ⑧ don't overlap the elements.
- ⑨ Attribute values must be quoted.
- ⑩ It is a mandatory for XHTML elements - ALL XHTML documents must have a DOCTYPE declaration.
The `<html>`, `<head>`, `<title>` & `<body>` elements must be present.

(Image is a self closing element)

- ⑪ In HTML, language in the document must be expressed using the lang attribute.
- ⑫ HTML must be served as text/html.

- ⑩ In XHTML, language in the document must be expressed using the xml:lang attribute.

- ⑪ XHTML must be served with an XML MIME type, such as application/xml or application/xhtml+xml.

XHTML Doc Types (3 marks)

Doctype

DOCTYPE defn line in an XHTML document specifies the document type. The syntax & legal elements of an XHTML documents are specified by DTD.

DTD

The purpose of DTD (Document Type Definition) is to define the legal building blocks of XML document.

XHTML 1.0 document type definitions are corresponding to 3 DTD's : strict, Transitional and frameset.

① XHTML 1.0 Strict:-

If we are planning to use strictly CSS and avoiding XHTML attributes, then it is recommended to use this DTD. If we want to use XHTML 1.0 Strict DTD then we need to put following line at the top of the XHTML document.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"  
      "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

② XHTML 1.0 Transitional:-

If we are planning to use many XHTML document as well as new CSS properties then we should use this DTD, and we should write XHTML document according to the DTD :-

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"  
      "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

③ XHTML 1.0 Frameset:-

If we can use ^{this} DTD when want to use XHTML frames to partition the browser window into two or more frames.

If we want to use this DTD then we should put the following line at the top of the XHTML Document.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Frameset//EN"  
      "http://www.w3.org/TR/xhtml1/DTD/xhtml1-frameset.dtd">
```

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 ①
 <!-- --->

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Elements of HTML Documents

<body> tag :

The body element contains all the contents of the document.

Attribute of body tag :

Attribute name	Description	Example
background	Specifies the path of an image	<body background = "C:/image.jpg">
bgcolor	Sets of the background colour of the document	<body bgcolor = "green">
text	It specifies the color of normal text in the document	<body text = "blue">
leftmargin	It sets the left margin for a page in pixels	<body leftmargin = "100">
topmargin	It sets the top margin for a page in pixels Top margin (TM) (Margin) TB Border + Top Padding + content + Bottom Padding + Bottom Margin (BM)	<body topmargin = "100">

Basic Formatting Elements

Paragraph element :

- * The <p> tag in HTML defines a paragraph.
- * This tag has both opening and closing tag.
- * It is a block-level element and always starts on a new line.

The HTML <p> tag supports the following attributes

Attribute	value	Description
align	left right center justify	Specifies text alignment within a paragraph

Syntax : <p align = "value"> paragraph body </p>

Example program to illustrate Paragraph tag:

```
<html>
<body>
<p align="left"> this tag in HTML defines a paragraph. There have both opening and closing tag.  
It is a block-level element and always starts on a new line.
</body>
</html>
```

o/p

this tag in HTML defines a paragraph. There have both opening and closing tag. It is a block level element and always starts on a new line.

Headings H1 to H6 are a title / subtitle which we want to display on the web page

- * HTML defines 6 levels of headings.
- * The heading elements are H1, H2, H3, H4, H5 and H6.
- * H1 is the largest heading tag and H6 is the smallest one.
- * When you place text within the heading tag <h1> --- </h1>, it is displayed on the browser in the bold format and size of the text depends on the no. of heading.

Syntax: <h1> Headings </h1>

Example program to illustrate Headings H1 to H6.

```
<html>
<body>
<h1> Heading no. 1 </h1>
<h2> Heading no. 2 </h2>
<h3> Heading no. 3 </h3>
<h4> Heading no. 4 </h4>
<h5> Heading no. 5 </h5>
<h6> Heading no. 6 </h6>
</body>
</html>
```

Output:

Heading no. 1

Heading no. 2

Heading no. 3

Heading no. 4

Heading no. 5

Heading no. 6

- Preserving white space <pre> tag:
- * The <pre> tag in HTML used to define the Preformatted text which preserves the text & spaces, line breaks, tabs, and other formatting characters which are ignored by web browser.
 - * The <pre> tag requires a starting and ending tag.

Syntax: <pre> preformatted text </pre>

Example program to illustrate Headings h1 to h6: <pre>

```
<html>
<body>
<pre>
    This text is
    in a fixed-pitch
    font, and it preserves
    both spaces and line breaks
</pre>
</body>
</html>
```

Output:

```
This text is
in a fixed-pitch
font, and it preserves
both spaces and line breaks
```

Line Break:

- * HTML tag
 element defines a line break.
- * The
 tag is an empty tag which means that it has no end tag.
- * Line break ends the line we are currently on and returns on the next line.

Syntax:

Example program to illustrate Line Break:

```
<html>
<body>
<h1> The br element </h1>
<p> To force <br> line break <br> in a text, <br> use the
    br <br> element. </p>
</body>
</html>
```

Output:

The br element

To force
line break
in a text,
use the br
element.

Horizontal Rule:

- * The <hr> tag in HTML defines or stands for horizontal rules across the page.
- * This is used to insert a horizontal rule in an HTML page to divide or separate document sections.
- * The <hr> tag is an empty tag and it does not require an end tag.

hr tag attributes:

Attribute	value	Description
Align	left center right	Used to specify the alignment of the horizontal rule
noshade	noshade	Used to specify the bar without shading effect
size	pixels	Used to specify the height of the horizontal rule
width	pixels	Used to specify the width of the horizontal rule

Example program to illustrate horizontal line

```
<html>
<body>
<p> Normal horizontal line.</p>
<hr>
<p> Horizontal line with height of 30 pixels  
and noshade.</p>
<hr size="30" noshade>
</body>
</html>
```

Output

Normal horizontal line.

Horizontal line with height of 30 pixels and noshade.

Presentation elements / Text Formatting Tag
HTML contains several elements for defining text with a special meaning, whenever user wants to format the element the presentation elements are used.

Tag	Description	Physical Text Elements
<code> --- </code>	Defines <u>bold</u> text	<u>bold</u>
<code><i> --- </i></code>	Defines <u>italic</u> text	<u>italic</u>
<code><u> --- </u></code>	Defines <u>underlined</u> with a simple line.	<u>underline</u>
<code><sub> --- </sub></code>	Defines <u>subscripted</u> text. Subscripted text appears <u>half a character below the normal line</u> and is sometimes rendered in a smaller font.	<u>subscript</u>
<code><sup> --- </sup></code>	Defines <u>superscripted</u> text. Superscripted text appears <u>half a character above the normal line</u> and is sometimes rendered in a smaller font.	<u>superscript</u>
<code><s> --- </s></code> <code> --- </code>	Displayed with a strike-through , which is a <u>thin line through the text</u> @ text has been <u>deleted</u> from a document.	strike-through
<code><big> --- </big></code>	It is used to make the contents of the element <u>one font size larger</u> than the rest of the text surrounding it.	<u>font size</u>
<code><small> --- </small></code>	It is used to make the contents of the element <u>one font size smaller</u> than the rest of the text surrounding it.	<u>font size</u>
<code><mark> --- </mark></code>	Defines <u>marked</u> text. <u>highlight</u> the text	

`` - bold text :

The text written within `` tag display in bold size

Example program to illustrate Bold tag :

```
<html>
<body>
This text is normal. <b>
<b> This text is bold. </b>
</b>
</body>
</html>
```

Output:

This text is normal.
This text is bold.

**** - Important text:

The HTML **** element defines text with strong importance. The content inside is typically displayed in bold.

Example program to illustrate **strong** tag:

```
<html>
<body>
This text is normal <b>
<strong> This text is important! </strong>
</body>
</html>
```

Output:

This text is normal

This text is **important!**

<i> - Italic text:

Italic text is used to write the content in italic format.

Example program to illustrate **italic** tag.

```
<html>
<body>
This text is normal <b>
<i> This text is italic </i>
</body>
</html>
```

Output:

This text is normal

This text is **italic**

**** - Emphasized text:

The HTML **** element defines emphasized text. The content inside is typically displayed in italic.

Example program to illustrate **Emphasized text**:

```
<html>
<body>
<p> This text is normal. </p>
<p> <em> This text is emphasized. </em> </p>
</body>
</html>
```

Output:

This text is normal.

This text is **emphasized**.

<u> - underline:

The <u> tag in HTML handle for underline and it's used to underline the text enclosed within the <u> tag.

Example program to illustrate underline tag:

```
<html>
<body>
<h1> Heading </h1> <br>
<u> This text will be underlined </u>
</body>
</html>
```

Output:

Heading

This text will be underlined

<small> - Smaller text :

The HTML <small> element defines smaller text.

Example program to illustrate <small> tag:

```
<html>
<body>
<p> This is some normal text. </p>
<p> <small> This is some smaller text </small> </p>
</body>
</html>
```

Output

This is some normal text

This is some smaller text

<sub> - subscript text :

The HTML <sub> element defines subscript text. Subscript text appears half a character below the normal line, and is sometimes rendered in a smaller font.

Subscript text can be used for chemical formulas, like H_2O .

Example program to illustrate <sub> tag.

```
<html>
<body>
<p> This is <sub> subscripted </sub> text. </p>
</body>
</html>
```

Output

This is subscripted text

<sup> - Supercript text:

The HTML <sup> element defines supercript text.
Superscript text appears say a character above the
normal line, and is sometimes rendered in a smaller font.
Superscript text can be used for footnotes, like www.

Example program to illustrate <sup> tag:

Chromes

<body>

<p> This is ^{superscripted} text. </p>

</body>

</html>

Output:

This is superscripted text

<style>

u {text-decoration: red wavy underline;}

</style>

<p> This is defined in <u> </u> format </p>

→ text-decoration style double; } → for double line

 tag used to represent the range of content which
no longer accurate

=) <body>

<h2> Example for & tag </h2>

<p> The last date 12/22/2023 </p>

Example for & tag
the last date is 12/22/2023

<tt> tag used to define the text in monospaced form
fixed width form.

(width)

<body>

<h2> Example for <h1> tag </h2>

<p> The last date is 12/2/22 </p> </body>

O/P

The last date is 12/2/22

<big>

Used to increase the font size one level bigger than document based font size.

<body>

<big> ---

<p> <big> ---

</body>

Output

The last date is 12/2/22

including <pre>

<&mals>

<ins>

inserted

delete

Phrase Elements / Logical Text elements

Phrase elements are used to indicate that a block of text has structural meaning.

Tag

Description

<code> --- </code>

Defines the computer code

<kbd> --- </kbd>

Defines the keyboard input

<var> --- </var>

Defines a variable.

Defines emphasized text

Defines important text

<address> --- </address>

Defines used to contain address

<abbr> </abbr>

abbreviation

automatically

will break the line

* <html>

where the cursor is

<head>

an icon complete

<title> My HTML Page </title>

ly in a new

</head>

line.

<body>

<P> The following word has been & strong

 typeface </P>

<body>

* <body>

<P> welcome to <abbr title = "Tutorial Point">

TP </abbr>. </P>

</body>

<meta> tag

- * The metadata means information about data.
- * The <meta> tag in HTML provides information about HTML Document.
- * <meta> tags always go inside the <head> tag.
- * It used to specify character set, page description, keywords, author of the document and viewport settings.
- * Metadata will not be displayed on the page but will be machine parseable.

Attributes of <meta> tag

Attribute name	Description	Example
charset	Specify the character encoding for the HTML document	<meta charset="UTF-8">
content	Gives the value associated with the http-equiv attribute ① name attribute	<meta name="description" content="webcloud">
name	Specify the name of the attribute	<meta name="author" content="arun">
scheme	Specifies a scheme to be used to interpret the value of the content attribute	<meta name="date" content="2019-06-28" scheme="yyyy-MM-dd">

Character Entities

Character entities are used to display the special character in HTML.

Syntax : &entity-name
 ①
 &entity_code ;

registered
Trade Marketing
Trade

Symbols	Entity name	Entity code
a	α	α
B	β	β
(R)	®	®
<	<	<
>	>	>
©	©	©

A	•	8-#948;
T	‣	8-#982;

~~GM~~ ~~A~~ ~~T~~ ~~•~~ ~~‣~~ ~~8-#948;~~ ~~8-#982;~~ ~~marquee tag : Marquee tag supports scrollable texts and images within webpage. Scrolling either from left to right (vice versa), or top to bottom (vice versa).~~

Syntax: <marquee> scrollable text/images</marquee>

Attributes :

Attribute	Description
width	Provides width (breadth) of a marquee.
height	Provides height (length) of a marquee.
direction	Provides the direction (way) in which your marquee will allow you to scroll. The value of this attribute can be : left, right, up, down.

Example :

```

<html>
<body>
<marquee>scrolling text</marquee>
<h4>scrolling image</h4>
<marquee>
<img src = "C:\Users\WU86\Downloads\img.jpg">
</marquee>
</body>
<html>

```

IDE=Source

```

<html>
<body>
<p>character entities</p>
the example of a alpha symbol &#945;
<br>
the example of a beta symbol &#946;
<br>
the example of copywright symbol &#169;
<br>

```

o/p
Character Entities
the example of alpha symbol
- " - alpha
- " - beta

```

    <html>
    <body>
    <marquee width="200" height="100" direction="left">scrolling text</marquee>
    </body>
    <html>

```

Lists, Images and Hyperlinking in HTML

Lists

- * HTML lists are used to specify lists of information.
- * All lists may contain one or more list elements.

There are 3 different types of HTML lists.

- ① Ordered List (ol)
- ② Unordered List (ul)
- ③ Description List (dl)

HTML Ordered List (ol)

- * It is known as Numbered List.
- * The ordered list starts with `` tag and ends with `` tag.
- * Each list item starts with `` tag.
- * The list items are marked with numbers by default.
- * The type attribute of the `` tag defines the type of the list item.

Attributes

5.

Type	Description
<code>type = "1"</code>	The list items will be numbered with numbers (default).
<code>type = "A"</code>	The list items will be numbered with uppercase letters.
<code>type = "a"</code>	The list items will be numbered with lowercase letters.
<code>type = "I"</code>	The list items will be numbered with uppercase roman numbers.
<code>type = "i"</code>	The list items will be numbered with lowercase roman numbers.

Example program to illustrate ~~the~~ Order List:

<html>

<body>

<h2> Ordered List with default type </h2>

 Bread

 Eggs

 Milk

 coffee

Letters

<h2> Ordered List with numbers </h2>

<ol type = "A">

 Bread

 Eggs

 Milk

 coffee

<h2> Ordered List with Roman numbers </h2>

<ol type = "I">

 Bread

 Eggs

 Milk

 coffee

</body>

</html>

O/P

Ordered List with default type

1. Bread
2. Eggs
3. Milk
4. coffee

Ordered List with letters

- A. Bread
- B. Eggs
- C. Milk
- D. coffee

Ordered List with Roman Numbers.

- I. Bread
- II. Eggs
- III. Milk
- IV. coffee

The Unordered HTML List

- * Unordered lists provide an activity of sequence of unordered steps for an activity.
- * An unordered list starts with `` tag and ends with `` tag.
- * Each list item starts with `` tag.
- * The list items are marked with bullet i.e. small black circle by default.
- * The type attribute of `` tag, defines the type of list item markers.

Attributes

Type	Description
disc	Sets the list item marker to a bullet (default)
circle	Sets the list item marker to a circle
square	Sets the list item marker to a square
none	List items will not be marked.

Example program to illustrate Unordered List

```
<html>
```

```
<body>
```

```
<h2> Unordered list by default </h2>
```

```
<ul>
```

```
<li> Bread </li>
```

```
<li> Eggs </li>
```

```
<li> Milk </li>
```

```
<li> Coffee </li>
```

```
</ul>
```

```
<h2> Unordered list with Square bullet </h2>
```

```
<ul type = "Square">
```

```
<li> Bread </li>
```

```
<li> Eggs </li>
```

```
<li> Milk </li>
```

```
<li> Coffee </li>
```

```
</ul>
```

```
<h2> Unordered list with circle </h2>
```

```
<ul type = "Circle">
```

```
<li> Bread </li>
```

```
<li> Eggs </li>
```

```
<li> Milk </li>
```

```
<li> Coffee </li>
```

```
</ul>
```

```
</body>
```

```
</html>
```

Output

Unordered list by default

- Bread
- Eggs
- Milk
- Coffee

Unordered list with Square Bullet

- Bread
- Eggs
- Milk
- Coffee

Unordered list with circles

- Bread
- Eggs
- Milk
- Coffee

HTML definition lists

* HTML supports Definition List is the ideal way to present name (term name) and description (definition) list.

Defn list make use of following three tags.

① `<dl>` - Define the start of the list

`<dt>` - A term

`<dd>` - Term definition

`</dl>` - Define the end of the list

Syntax:- `<dl>`

`<dt>` term name `<dd>`

`<dd>` definition of term `</dd>`

`</dl>`

Example program to illustrate definition list.

```
<html>
```

```
<body>
```

```
<dl>
```

```
<dt><b>HTML</b></dt>
```

```
<dd>This stands for Hyper Text Markup Language</dd>
```

```
<dt><b>HTTP</b></dt>
```

```
<dd>This stands for Hyper Text Transfer Protocol</dd>
```

```
</dl>
```

```
</body>
```

```
</html>
```

Output

HTML

This stands for Hyper Text Markup Language

HTTP

This stands for Hyper Text Transfer Protocol

Images

Images can improve the design and the appearance of the webpage.

Adding Images using `` TAG:

- * The HTML `` tag used to add an Image in the web page.
- * The `` tag is empty element tag, it contains attributes only and doesn't have a closing tag.
- * The `` tag has two required attributes
- * `src`: src stands for source. Every image has a src attribute which tells the location of the image and where the image is stored.
- * `alt`: If the image cannot be displayed, then the alt attribute specifies an alternate text for the image.

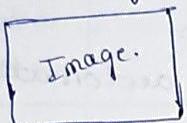
Attribute	Value	Description
src	With pathname	Specifies the URL of an image.
alt	Text	Specifies an alternate text for an image.
align	top bottom middle left right	Specifies the alignment of an image w.r.t to surrounding elements.
border	pixels	Specifies the width of the border around the image.
height	pixels	Specifies the height of an image.
width	pixels	Specifies the width of an image.

Example program to illustrate tag.

```
<html>
<body>
<p> Simple Image Insert </p>
<img src = "C:\Users\VVFErc\Downloads\img.jpg" alt =
width = 100 height = 120> "Text Image".
</body>
</html>
```

O/P

Simple Image Insert



Setting image as background :-

The background attribute of <body> tag specifies a background image for a document.

Example :-

```
<html>
<body background = "C:\Users\VVFErc\Downloads\img.jpg">
<p> HTML is a markup language </p>
</body>
</html>
```

Embedding a multimedia on to a webpage :-

- * Multimedia content in many different formats.
- * It can be almost anything you can hear & see, like images, music, sound, video, records, films, animations and more.
- * The easiest way to add video & audio to the website is to include the special html tag called <embed>.

* <embed> tag causes the browser itself to include controls for the multimedia automatically provided by the browser supports.

Attributes:-

Attribute	value	Description
align	left right center	Determine how to align the object
autoStart / autoplay	yes/no	It indicates if the media should start automatically.

loop	true pixels false	Specify if the sound should be played continuously (Set loop to true), a certain number of times (a positive value) or not at all (false)
width	pixels	Specify the width of the object
height	pixels	Specify the height of the object
alt	text	Specify alternate name.

HTML <bg sound> tag :-

- * The <bg sound> tag is used to embed sound file into a webpage.
- * The sound file play background automatically when the page loads.
- * The <bg sound> tag only supports in Internet Explorer

* Attributes :

Attribute	value	Description
balance	pixels	Specify how the audio file is split between speakers
loop	pixels	Specify that audio file should continuously repeat
src	URL pathname	Specifies the URL of the audio file
volume	pixels	Specifies the volume for audio file.

Example :-

```

<html>
<head>
<title> bg sound tag </title>
</head>
<body>
<bg sound src = "C:\Folder\sleep.mp3" loop = "5">
<p> the audio is playing background </p>
</body>
</html>

```

<marquees behaviour :-

* An HTML <marquee> tag is a scrolling piece of text or image displayed either horizontally across or vertically down the web page.

Attributes.

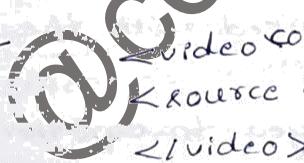
Attribute	value	Description.
width	pixels	Specifies the width of the marquee.
height	pixels	Specifies the height of the marquee.
direction	up down left right	Specifies the direction in which marquee should scroll.
scrolldelay	pixels	Specifies how long to delay between each jump.
scrollamount	pixels	Specifies the speed of the marquee.
loop	pixels	Specifies how many times to loop.
bcolor	colorname colordcode	Specifies the background colors.

Inserting audio files and video files:-

HTML video Tag

The HTML <video> element is used to show a video on a web page.

Syntax:-


`<video controls>
 source src="movie.mp4" type="video/mp4"
</video>`

HTML Audio Tag

It is used to define sounds such as music and other audio clips.

Syntax:-

`<audio controls>
 source src="koyal.mp3" type="audio/mpeg"
</audio>`

- ## Hyperlinking in HTML
- How to create hyperlinks
- * Hyperlinks are the mechanism which allows the navigation from one page to another.
 - * Hyperlinks allow visitors to navigate between websites by clicking on words, phrases and images.
 - * The HTML `<a>` tag defines a hyperlink.
 - * You can click on the link and jump to another document.
 - * When you move the mouse over the link, the mouse arrow will turn into a little hand.
- Syntax:- ` Link text `

Example program to illustrate `<a>` tag:

```
<html>
<body>
<a href = "C:/Users/WFerl/Desktop/app.html">
click here to fill the Application form.
</a>
</body>
</html>
```

Output:

click here to fill the Application form

Internal links

- * HTML internal link is linked with the same webpage.
- * An internal link takes you to another page on your website.
- * HTML internal link name is followed by head (#). HTML `<a>` tag value for anchor point name, which is referred to a internal link into a same page.

These links are usually relative and are in the form of

```
<a href = "/web/resources.html">
<b> web design resources </b>
</a>
```

- External links
External HTML link is linked to external web page
- < a href = "https://facebook.com" > facebook
- Types of hyperlink.
- Link can point to other web pages, websites, graphics, files, sounds, e-mail addresses, and other locations on the same web page
- There are four types of hyperlinks.
- ① Text hyperlink
 - ② Image hyperlink
 - ③ Bookmark hyperlink
 - ④ E-mail hyperlink
- ① Text hyperlink :- Use a word / phrase to take visitors to another web page, file or document.
- Eg:-
click here

- ② Image hyperlink :- Use a image to take visitors to another web page, file or document.
-

- ③ Bookmark hyperlink :- uses a phrase / image to take visitors to another page, file or document part of the web page
- ④ Email hyperlink :- Allow visitors to send an email message to the displayed e-mail address.
-
Send E-mail

anchor <a> tag

- * A link is specified using HTML tag `<a>`. This tag is called anchor tag.
- * Anything b/w the opening `<a>` tag and the closing `` tag becomes part of the link and a user can click that part to reach the linked document.
- Syntax:- ` Link text `
- * By default, link will appear as follows in all browsers.
 - An unvisited link is underlined and blue
 - A visited link is underlined and purple
 - An active link is underlined and red

Attributes

Attribute	Value	Description
<code>href</code>	<code>url</code>	Specify the URL of the page the link goes to
<code>name</code>	<code>section-name</code>	Specify the name of the anchor
<code>target</code>	<ul style="list-style-type: none"> -blank -parent -self -top 	Specify where to open the linked document.

Tables and forms in HTML

Tables

- A table is a collection of information (a) data arranged into columns and rows.
- * content of cell can be any elements including text, an image, link and a nested table etc.
 - * Tables are defined with the <table> tag.

Basic table tags

Basic ~~contents~~ HTML tags are <table>, <tr>, <th>, <td>, <caption>

- * An HTML table is defined with <table> tag.
- * A table heading can be created using <caption> tag.
- * Each table row is defined with the <tr> tag.
- * A table header is defined with <th> tag.
- * By default, table headings are bold and centered.
- * The table data cell is defined with the <td> tag.

Attributes :-

Attribute	values	Description
align	left center right	Specify the alignment of the table w.r.t to the surrounding text.
bcolor	colorname	Specify the background color for the table.
border	pixels	Specify the width of the borders around the table.
cellpadding	pixels	Specify the amount of space b/w the border of the cell and its content.
cellspacing	pixels	Specify the space b/w cells.

Example program to illustrate Basic table tags:-

```
<html>
<body>
<table border="1">
<caption> Student details </caption>
<tr>
    <th> First name </th>
    <th> Second name </th>
    <th> Age </th>
</tr>
<tr>
    <td> Jill </td>
    <td> Smith </td>
    <td> 50 </td>
</tr>
<tr>
    <td> Eve </td>
    <td> Jackson </td>
    <td> 94 </td>
</tr>
<tr>
    <td> John </td>
    <td> Doe </td>
    <td> 80 </td>
</tr>
</table>
</body>
</html>
```

O/p
Student details

First name	Last name	Age
Jill	Smith	50
Eve	Jackson	94
John	Doe	80

Basic Attributes of <table> tag.

* **borders** :-

This attribute determines the border of the table and size of the border.

<table borders="3">

* **height** :-

This attribute determines the height of the overall table.

Eg:- <table height="200">

* **width** :-

This attribute determines the width of the overall table Eg:- <table width="30">

The align and valign attributes.

* The align and valign attributes specify the placement of the content within the table cell.

* <th> and <td> tags can use these attributes.
The align attribute has the possible values left, right and centre with the horizontal placement of the content within a cell. The default alignment for <th> cell is centre and for <td> cell is left.

* The valign attribute of the <th> and <td> tags has the possible values top and bottom. The default vertical alignment for both heading & data is center.

the height and width value should be more for getting the desired output (Eg: H=200, W=500)

O/P

NAME	AGE	BRANCH
Balu	22 22	CSF
RAKESH	25	EC

Example program to illustrate align and valign attributes of table tags

```
<html>
</body>
<table border="1" height="200" width="500">
<tr>
    <th> Name </th>
    <th> Age </th>
    <th> Branch </th>
</tr>
<tr>
    <td> v-align = "top" </td> Balu </td>
    <td> v-align = "center" </td> 22 </td>
    <td> v-align = "bottom" </td> CSE </td>
</tr>
<tr>
    <td> v-align = "bottom" </td> RAKESH </td>
    <td> v-align = "center" </td> 25 </td>
    <td> v-align = "top" </td> EC </td>
</tr>
</table>
</body>
</html>
```

The rowspan and colspan attributes

rowspan - used to specify the number of rows a cell should merge. rowspan attribute have numeric value. <th> and <td> tags can use this attribute.

For example,

```
<td colspan="2" rowspan="2" >
```

Above example say two rows of data is going to merge.

colspan - used to specify the number of columns a cell is going to / cell should merge. colspan attribute have numeric value. <th> and <td> tags can use this attribute.

Eg :- <td colspan=2>
Above example says two cells of data will be going
Example program to illustrate align and valign
attribute of table tags to merge.

```
<html>
<body>
<table border="1">
<tr>
<td colspan="2">Subject :</td>
<td> chapters </td>
</tr>
<tr>
<td> 1 sem </td>
<td> 2 sem </td>
<td rowspan="2">10</td> O/P
</tr>
<tr>
<td> C </td>
<td> C++ </td>
</tr>
</table>
</body>
</html>
```

Subject :		
1 sem	2 sem	
C	C++	10

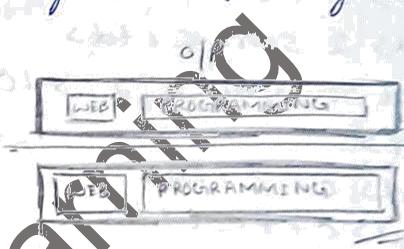
The cellpadding and cellspacing attributes
* (cellpadding) It is the distance b/w the
border of the edges of the cell to its content,
which you will use to adjust the white space
in your table cells. Numerical value must be given
for cellpadding.

* (cellspacing) - It is the distance b/w cells which
you will use to adjust the white space on your
table cells. Numerical values must be given for
cellspacing.

Eg - <table cellspacing="5" cellpadding="10">

Example program to illustrate cellpadding and cellspacing attributes of table tags:-

```
<html>
<body>
<table border="3" cellspacing="10" cellpadding="5">
<tr>
<td>WEB</td>
<td>PROGRAMMING</td>
</tr>
<table>
<tr>
<td>WEB</td>
<td>PROGRAMMING</td>
</tr>
<table border="3" cellspacing="5" cellpadding="10">
<tr>
<td>WEB</td>
<td>PROGRAMMING</td>
</tr>
</table>
</body>
</html>
```



<caption> tag and its attributes

- * The <caption> tag defines a table caption
- * The <caption> tag serves as a title or explanation of a table
- * The <caption> tag must be inserted immediately after the <table> tag
- * By default, a table caption will be center aligned above the table

Managing Forms

- * A form is a usual way of information, it contains different kind of information such as username, password, contact number, email ID etc.
- * HTML provides various tags like checkbox, text, radio buttons, submit buttons etc., these elements are used to submit the information from web browser to webserver.

<Form> tag

The form tag is used to create an HTML form. This tag has many attributes. The most required attributes are the action and method attribute.

Action attribute :-

Action attribute is required to provide the path to the database \oplus server \oplus script \oplus page program that will process the form data when the user submits the form.

Form action = "data.asp"

(Action
Server
Page)

Eg:- <form action = "/bu-bin/student.bu">

Method attribute :-

At this attribute tells the web server how to process the data values.

* It specifies two techniques :- get and post

* get method :- which is used to request data from the specified resource / server.

* post method :- which is used to send data to a server to locate / update a resource.

Eg:- <form action = "/bu-bin/student.bu" method = "GET">

<form action = "/bu-bin/student.bu" method = "Post">

Form Controls

The different types of form controls are:-

- * File select boxes
- * Hidden controls
- * Image buttons.

* Text box

* Text area

* Password input controls

* Buttons

* Checkboxes and radio buttons

* Select boxes (Sometimes referred to as drop down menus and list boxes)

input element or `<input>` tag in HTML :-

- * Input elements are the most common elements which are used in HTML forms.
- * Various user input fields can be created such as text, checkbox, password field, radio button, submit button etc.
- * The `<input>` element can be displayed in several ways, depending on the type attribute

Attributes of `<input>` tag.

- * type :- The type attribute is used to specify the type of input element. It's default value is text.
- * Placeholder :- Placeholder attribute is used to specify hint that describes the expected value of an input field.
- * maxlength :- This property is used to specify the maximum number of characters allowed in an `<input>` element.
- * size :- This property is used to specify the width in characters of an `<input>` element.

Attribute value	Description	Example
button	This allows buttons to be included in the form that performs tasks other than submitting or resetting form.	<code><input type="button"></code>
submit	This creates a button that automatically submits a form.	<code><input type="submit"></code>
reset	This creates a button that automatically resets form controls to their initial values.	<code><input type="reset"></code>
checkbox	This denotes a checkbox, a simple selectable element in a form.	<code><input type="checkbox"></code>
radio	This denotes one of a set radio buttons, which is a collection of	

Selectable check boxes where only one for the group can be chose.

`<input type="radio">`

text

This denotes a simple text entry fields

`<input type="text">`

password

This denotes a text field where content is masked, such as password fields

`<input type="password">`

file

This allows the user to select the file on their computer for submission to the server

`<input type="file">`

`<input>` elements Diff type of Input present here.
`<input>` elements can be displayed in several ways, depending on the type attribute, are listed below.

Text:- create horizontal box for text input.
Default size which can be changed with
size @ maxlength attribute.

Eg:-

`<form>`
First Name : `<input type="text"/>` `
`
Last Name : `<input type="text"/>` `
`

`</form>`

Output

First Name :
Last Name :

Password :- If the contents of the textbox should not be displayed when user types it then password control should be used. It cannot be read usually by replacing each character with a symbol such as the asterisk (*) or a dot (.).

Eg - <form>

```
<password><input type="password"><br>
<username><input type="text">
</form>
```

o/p

Radio button

Radio buttons are typically visible as small circles, which are filled @ highlighted when selected. Only one button can be checked at a time

Eg -

```
<form>
```

```
<input type="radio">
```

```
<label> Male </label><br>
```

```
<input type="radio">
```

```
<label> Female </label><br>
```

```
<input type="radio">
```

```
<label> Other </label>
```

```
</form>
```

o/p

checkbox - Checkboxes are used for lists, where the user can make more than one @ more selections from a list of options.

Example

```

<form>
  <input type="checkbox">
  <label> I have a bike </label> <br>
  <input type="checkbox">
  <label> I have a car </label> <br>
  <input type="checkbox">
  <label> I have a boat </label> <br>
</form>

```

O/P

I have a bike

I have a car

I have a boat

Date :- Date element is used for entering a date.
 Once you run your HTML code date picker will available like calendar.

Ex:-

```

<form>
  <input type="date">
</form>

```

O/P

mm/dd/yyyy

December 2020

SU	Mo	Tu	We	Th	Fri	Sa
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

Submit :- Submit element used for submit the form, it looks like button on webpage if you click on that, form is submitted.

Eq:- <form>

&

<input type = "text">

Last name :

<input type = "text">

<input type = "submit" value = "Submit">

</form>

O/P

First name:	<input type="text" value="Abz"/>
Last name:	<input type="text" value="Z"/>
<input type="button" value="Submit"/>	

Reset : rect button that will reset all form values to their default value or clear all the fields of form.

Eq:- <form>

Name :

<input type = "text">

<input type = "submit"><input type = "reset">

</form>

O/P

name:	<input type="text"/>
<input type="button" value="Submit"/>	<input type="button" value="Reset"/>

<select> tag:-

The <select> tag defines a drop-down list

or a menu of options

Eg:-

<form>

* Select your fav. car:

<select>

<option> volvo </options>

<option> Saab </option>

<option> Fiat </option>

<option> Audi </option>

</select>

</form>.

O/P

Select your fav. car :

VOLVO	<input checked="" type="checkbox"/>
volvo	<input type="checkbox"/>
Saab	<input type="checkbox"/>
Fiat	<input type="checkbox"/>
Audi	<input type="checkbox"/>

FRAMES

HTML Frames are used to divide your browser window (or webpage) into multiple sections, where each section can load a separate HTML Document.

* To use frames on a page we use <frameset> tag instead of <body> tag.

* The <frameset> tag defines how to divide the window into frames.

The rows attribute of <frameset> tag defines the horizontal frames and cols attribute defines vertical frames.

* Each frame is indicated by <frame> tag and it defines which HTML Document shall open into the frame.

Attribute	Description
cols	Specifies how many frames the window will be split into vertically and specifies the width of each frame. The default width is 100% = one column taking up the whole width.
rows	Specifies how many frames the window will be split into horizontally and specifies the height of the frame. The default height is 100% = one row taking up the whole height.

Example:-

```
<html>
<frameset rows = "20%,80%">
<frame src = "test 1.html"/>
<frame src = "test 2.html"/>
</frameset>
</html>
```

~~<frame> and <frameset> tag attributes :-~~

~~<frameset> tag must have either rows attribute~~

② cols attribute. The possible values for rows and cols attributes are numbers, percentage and asterisks. A number value specifies the row height in pixels, a percentage specifies that percentage of total window height for a row, and an asterisk takes remaining spaces.

~~<frame> tag attributes are many types, few among them includes src, scrolling, frameborder and many more.~~

Attributes	Description
frameborder	Specifies whether a three dimensional border should be displayed between frames.
marginheight	Determines the amount of space above and below the frame.
marginwidth	Determines the amount of space on either side of the frame.
src	Reference to the document that will initially be displayed in that frame.

Example :-

test.html.

```
<html>
<frameset rows = "30%, 80%">
<frame src = "C:\Users\DELL\Desktop\head.html"/>
<frameset cols = "20%, * ">
<frameset ><!-- = "C:\Users\DELL\Desktop\list.html"/>
<frame src = "main.html"/>
</frameset>
</frameset>
</html>
```

head.html.

```
<html>
<body bgcolor = "pink">
<center>
<h2> Advaith Hyundai</h2>
Earing for you always
</center>
</body>
</html>
```

list.html

```
<html>
<body>
<ul>
<b><i>
<li>Hyundai Santro
<li>Hyundai Grand i10
<li>Hyundai Elite i20
<li>Hyundai Aura
<li>Hyundai All New Verna
</i></b>
</ul>
</body>
</html>
```

main.html

```
<html>
<body>
<p align = "center">
<b>Welcome to Advaith Hyundai</b>
By choose, Service , Your Dream Hyundai Cars </b>
</p> <h3>
<p align = "center">
Advaith Hyundai has a rich legacy and it is
world's largest Hyundai Dealer with gigantic
network of 24 showrooms, 29 service centers
and 4 pre-owned cars & showroom spread across
Karnataka.
</p>
<img alt = "C:\Users\Dee\Desktop\Display-Image.jpg" />
<p align = "center">
The focus and vision of Advaith Hyundai
has always been to provide the widest range
of Hyundai cars and services, and
build a service organization that truly cares
for the customers.
</p>
</body>
</html>
```

-
- Hyundai Santro
 - Hyundai Grand i10
 - Hyundai Elite i20
 - Hyundai Xcent
 - Hyundai Verna

Advaith Hyundai
Caring for you Always

Welcome to Advaith Hyundai in your dream

Advaith has rich legacy -
across Karnataka

Car Image

The focus and vision of
for customer

Chapter 6

XML - Extensible Markup Language

CSS - Cascading style sheet

CSS

- * CSS is a language that applies style to a HTML document and its elements (tags) to change the look and feel.
- * It is usually stored in separate css style which can be used for all the web pages.
- * A website is made up of HTML for content plus CSS for appearance.
- * HTML + CSS = Web Page
(content) (presentation)

Advantages

- ① CSS saves time -
 - * You can write CSS once and then reuse same sheet in multiple HTML pages.
 - * You can define a style for each HTML element and apply it to many webpages as you want.
- ② Page load faster -
 - * If you are using CSS, you don't need HTML tag attributes all the time everytime.
 - * Just write one CSS rule of a tag and apply to all the occurrences of that tag, so less code means faster download times.
- ③ Easy maintenance -
 - * To make a global change, simply change the style, and all the elements in all the webpages will be updated automatically.
- ④ Superior style to HTML -
 - * CSS has a much wider array of attributes than HTML, so you can give far better look to your HTML page in comparison of HTML attributes.

⑤ Multiple Device Compatibility

Style sheets allow content to be optimized for more than one type of device. By using the same HTML document, different versions of a website can be presented for handheld devices such as PDAs and cell phones.

⑥ Global web Standards :-

New HTML attributes are being deprecated and it's being recommended to use CSS. So, it's good idea to start using CSS in all the HTML pages to make them compatible for future browsers.

Disadvantage

Browser Compatibility

Some style sheet features are supported & some are not supported by all the browsers.

Basic CSS syntax

The CSS syntax consists of a set rules have parts :

selector { property : value ; }

declaration declaration

(h1) `color : blue ; font-size : 12px ; }`

selector

declaration

declaration

color blue ; font-size 12px ; }
property value property value

* A selector points to the HTML element tag

You want to style

* A selector is an HTML tag at which style will be applied. This could be any tag like `<h1>`, ``, `<p>` etc.

* The declaration block contains one or more declarations separated by semicolons.

* Each declaration includes a CSS property name and value, separated by colon,

- A property is a type of attribute of HTML tag.
put simply, all the elements' HTML attributes are converted into CSS properties.
- values are assigned to properties. For example color property can have ^{value} either blue or red.
- * Multiple CSS declarations are separated with semicolon and declaration blocks are surrounded by curly braces.

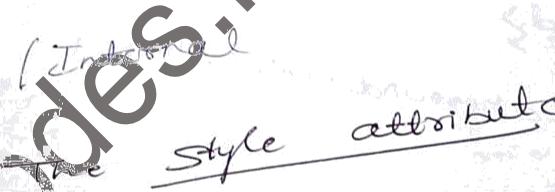
Eg:- You can define a table border as follows.

```
table { border : 1px ; }
```

Ques: Levels of Style Sheet CSS (Inheritance)

There are 3 levels of style sheet used to associate CSS style with your HTML document.

- ① Inline
- ② Document (Internal)
- ③ External

- ① Inline CSS - 
- * Inline style sheet rules will be applied to the content of one element tag.
 - * Inline style sheet rules are specified as the value of the style attribute.

Syntax :- `<element style = "... style rules ..." >`

Eg :- `<h1 style = "color : red;" > This is inline <h1>`

Eg:-

```
<html>
<head>
</head>
<body>
<h2>
<h1 style="color: navy;"> This is heading <h1>
<p> This is paragraph </p>
</body>
</html>
```

② Document Level ③ Internal CSS - The <style> element

- * Document level style sheet rule will be applied to all the elements available in the document.
- * The internal style is defined inside the <style> element, inside the head section.

Eg:-

```
<html>
<head>
<style>
body {
    background-color: linen;
}
h2 {
    color: maroon;
    margin-left: 40px;
}
</style>
</head>
<body>
<h2> This is heading </h2>
<p> This is paragraph </p>
</body>
</html>
```

③ External CSS:

- * with an external style sheet, you can change the look of the entire website by changing just one file.
- * Each HTML page must include a reference to the external style sheet file inside the <link> element, inside the head section of an HTML page.
- * External styles are defined within the <link> element, inside the <head> section of an HTML page.
- * An external style sheet can be written in any text editor, and must be saved with a .css extension.
- * The external .css file should not contain any HTML tags.

Eg:-

s.css

```
body {  
    background-color: lightblue;  
}  
  
h2 {  
    color: navy;  
    margin-left: 20px;  
}
```

pgm.html

```
<html>  
<head>  
<link rel="stylesheet" href="s.css">  
</head>  
<body>  
<h2> This is heading </h2>  
<p> This is paragraph </p>  
</body>  
</html>
```

rel - relates
href - reference

Type of Selectors

CSS Selectors are used to select the content you want to style. Selectors are the part of CSS rule set. CSS Selectors select HTML elements acc to the id, class, type, attribute, etc.

There are several diff. types of selectors in CSS

① CSS External

② CSS Element selector

③ CSS Id selector

④ CSS Class selector

⑤ CSS Universal selector

⑥ CSS group selector.

⑦ CSS Element selector.

* The element selector selects the HTML element by name.

Eg:

```
<html>
  <head>
    <style>
```

```
  p {
    text-align: center;
    color: black;
  }
```

```
</style>
```

```
</head>
```

```
<body>
```

```
  <h1> This is heading </h1>
```

```
  <p> Two style will be applied to every
      paragraph </p>
```

```
</body>
```

```
</html>
```

② CSS Id selector

- * The id selector selects the id attribute of an HTML element to select a specific element.
- * An id is always unique within the page so it is chosen to select a single, unique element.
- * It is written with the # (hash character), followed by the id of the element.

Eg:-

```
<html>
<head>
<style>
#para1{
    text-align : center;
    color : blue;
}
```

↳

```
<style>
</head>
<body>
<p id="para1">Hello Javascript.com </p>
<p> This paragraph will not be affected. </p>
</body>
</html>
```

③ CSS class Selector

- * The class selector selects HTML elements with a specific class attribute.
- * It is used with a period character (full stop symbol) followed by the class name.

Eg:-

```
<html>
<head>
<style>
.class
```

Eg:-

```
<html>
<head>
<style>
.center {
    text-align: center;
    color: blue;
}
```

```
</style>
```

```
</head>
```

```
<body>
```

<h2 class="center"> this heading is blue and
center-aligned. <h2>

<p class="center"> this paragraph is blue and
center-aligned. </p>

```
</body>
```

```
</html>
```

④ CSS universal selector

* The universal selector is called as a wildcard character

* It selects all the elements on the page

Eg:-

```
<html>
<head>
<style>
* {
    color: green;
    font-size: 20px;
}
```

```
</style>
```

```
</head>
```

```
<body>
```

<h2> this is heading <h2>

<p> this style will be applied on every para-
graph </p>

<p id="para1"> Me too! </p>

<p> And me! </p>

```
</body></html>
```

- ③ CSS group selector
- * The grouping selector is used to select all the elements with the same style definition.
 - * Grouping selector is used to minimize the code.
 - * Commas are used to separate each selector in grouping.

Eg:-

```
<html>
<head>
<style>
h2, h2, p {
    color: blue;
    text-align: center;
}
</style>
<head>
<body>
<h1> Hello javacode.com </h1>
<h3> Hi </h3>
<h2> Hello javascript </h2>
<p> This is a paragraph. </p>
</body>
</html>
```

XML - Extensible Markup Language

what is XML?

XML is a short document used mainly for distributing the data on internet b/w different applications.

It's structured document for storing and transporting of data, mainly used for interchanging the data on the internet.

(Q)

XML stands for Extensible Markup language.

* XML is a Markup language much like HTML.

* XML was designed to store and transport data.

* XML was designed to be self-description.

* XML tags are not predefined like HTML.

* XML is W3C Recommendation.

Difference b/w XML and HTML

XML and HTML were designed with different goals.

* XML was designed to carry data - with focus on what data is.

* HTML was designed to display data - with focus on how data looks.

* XML tags are not predefined like HTML tags.

* XML allows to creating our own tags.

XML Usage @ Need @ Characteristics

* XML can work behind the scene to simplify the creation of HTML documents for large website.

* XML can be used to exchange the information between organizations and systems.

* XML can be used for offloading and reloading of databases.

- * XML can be used to store and arrange the data, which can automate your data handling needs.
- * XML can easily be merged with style sheets to create almost any desired output.
- * virtually any type of data can be expressed as XML document.

(a)

- * Common Data store.
- * wireless communications
- * Remote automation
- * E-commerce
- * Multimedia.

Advantages

- * Easy data exchange
- * self describing data
- * create our own language
- * compatible with other application.
- * compatible with other language
- * Extremely portable language
- * platform independent language
- * platform independent and system independent also.
- * vendor independent also.

XML Document Syntax

The following are the content of the XML document.

- ① XML declaration
- ② comments
- ③ Root element opening tag
- ④ Root element and content
- ⑤ Root element closing tag.

```
<?xml version="1.0" encoding = "UTF-8"?>
```

```
<books>
```

```
<book>
```

```
<title> Internet programming </title>
```

```
<author> Kumar </author>
```

```
</book>
```

```
</books>
```

① XML Declaration:-

* The XML declaration indicates that the document written in XML and specifies which version of XML

* The XML declaration must be the first line of the document.

* The XML declaration can also specify language and encoding for document.

* E.g. <?xml version="1.0" encoding = "UTF-8"?>

② Root element :

* All XML documents must have one root element. All other elements must be nested inside this root element.

* The first tag in the document will always be the opening tag of the root element and the closing tag will always be at the bottom of the element.

* XML document contains an element which is the parent of all other child elements.

* The first element of the document is called the root element.

Eg. <books> --. </books>

③ Child elements:

- * there are the elements that are contained within the root element. Elements are usually represented by an opening and closing tag.
- * Tags have attributes to provide information about tag, `<books>` - - - `</books>`
- * there are three types:
 - Start tag (Eg. `<books>`)
 - End tag (Eg. `</book>`)
 - Empty-element Tag :- This is also known as body less tag. It has start tag but doesn't have a matching end tag.
Eg. `<book/>`

④ Element

- * the content between start tag and end tag including tag is called Element. An element can contain other child elements.
- * Eg:- `<book>`
`<title>Incorrect Programming </title>`
~~`<author> abc </author>`~~
`</book>`

⑤ Attributes

- * Elements can also contain one or more attributes
- * An attribute is a name / value pair that we place within the opening tag, which allows us to provide extra information about an element.
- * Attribute often provide information that is not the part of the data attribute values must always be enclosed in either single / double quotes
- Eg:- `<book type="technical">`
`</book>`

⑥ Comments :-

- * XML comments begin with `<!--` and end with `-->`
- * The XML comment allows us to write the comments within the document and comments are ignored by XML parser.
- * we write comment as a note to ourselves another programmer. It can appear anywhere in within the document.

Eg:-

<! This file is related to books information>

⑦ Root element closing tag.

- * The last tag of the document will always be the closing tag of the root element.
- * This is because all other elements are nested inside the root element.

Example :-

</books>

XML Syntax Rules

XML allows creating our own tags. It follows stricter rules of document.

- These rules are follows,
- ① All XML document must have ~~a root tag~~
→ All XML document contains must one root element and all other elements are nested inside the root element.

Eg:-

<root>

 <child>

 <subchild>

 <subchild>

 </child>

<root>

 case Sensitive.

- * XML is case Sensitive.

Eg:- <Authors> This is incorrect <authors>
<author> This is correct </author>.

- * All XML elements must have a closing tag

<book> This is incorrect

<books> This is correct </book>

- * All XML elements must be properly nested.

Eg:-

<book>
<@titles> Internet Programming </titles>
</book>

⑤ Attribute values must always be quoted.
wrong:- <book type="technical">
 <book type="technical">

⑥ XML restricts the use of certain characters.
XML tags use angle bracket (< and >) symbol) for enclosing tag name. we can use this character doesn't appear & instead for in the element data.

Eg:-
wrong:- <num> 25&25 </num>
correct:- <num> 25&25 </num>

⑦ Elements in an XML document can be nested
An XML document consists of several element declarations.
* The document starts with a root element and all other elements appear under this root.
* The elements declaration can be nested.
* we must observe proper scoping while nesting the elements.

⑧ Rules for Naming tags in XML:
* XML documents are extensible, its author's responsibility to create and name the markup tags.
* The first character of each tag name must be a letter & the " " character, but not number.
* wrong: <1title> IP </1titles>
 <titles> IP </titles>
* Tag name cannot contain spaces
wrong: <Employee Name> </Employee Name>
Correct: <EmployeeName> </EmployeeName>

Eg:- program

Pgm2.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/css" href="books.css"?>
<books>
  <book>
    <title>Web</title>
    <author>abc </author>
  </book>
</books>
```

Book.css

```
books
{
  margin: 10px; font-family: verdana;
}
title
{
  font-weight: bold;
  font-size: large;
  color: red;
}
author
{
  font-weight: bold;
  font-size: large;
  color: blue;
}
```

XML CDATA

- * CDATA is about text data which should not be parsed by the XML parser
- * characters like "<" and "&" are illegal in XML elements
- * Java script contains a lot "<" or "&".
- * To avoid the error script code can be defined as CDATA.
- * Everything inside a CDATA section can be ignored by the Parser.
- * A CDATA section starts with
`<![CDATA[and ends with]]>`

Eg:-

```
<html>
<head> <title> CDATA Demo </title>
<script type = "text/javascript">
<![CDATA[
    function greatest(a,b)
    {
        if (a>b) then
            return b
        else
            return a
    }
]]>
</script>
</head>
<body>
<h1> Greatest of two no. </h1>
</body>
</html>
```

Type of XML Document and Validation

There are two types of XML document and validation.

① well formed

② valid document.

① well formed :

"well formed" XML document is a document that conforms to the XML syntax rules ^{obey}.

② valid document : "well formed" is "well formed" & XML valid "XML document" is "well formed" & rule of a DTD document which conforms to the rule of a DTD.

Example for well formed

```
<?xml version="1.0" encoding="UTF-8"?>
<books>
  <book>
    <title>web Programming & <title>
    <author> Sourabh Kumar <author> IIT & IIT
  <book>
</books>
```

Example for valid document : <?xml version="1.0" encoding="UTF-8"?>
 <!DOCTYPE note SYSTEM "InternalNote.dtd">
 <!-- This file is related to book information -->
 <books>
 <book>
 <title> web Programming <title>
 <author> Sourabh Kumar <author>
 </book>
 </books>

Document Type Definition (DTD)

- * A DTD consists of a list of syntax definitions for each element in the XML document.
- * When we create a DTD it means, we are creating the syntax rules for any XML document that uses DTD.
- * In this, we specify which element name can be included in the document.
- * Element have attributes that are required or optional.

DTD of books.xml

```
<!ELEMENT books (book)*>
<!ELEMENT book (title, author)>
<!ELEMENT title (#pcdata)>
<!ELEMENT author (#pcdata)>
```

- books can have one or more book elements.
- Each book element have title and author.
- the title and author contains PCDATA and which means, element data is going to persist.

DTD is not extensible

DOCTYPE Syntax

We can declare a DTD at the top of the XML document using the `<!DOCTYPE rootname [DTD]>`

The basic syntax is:-

```
<!DOCTYPE rootname [DTD]>
```

where rootname is the root element.

[DTD] is the actual definition.

There are variations depending on 2 types of DTD.

- internal written into the same document
- external located in another

Both public and private

Internal DTD

An internal DTD is the DTD which is defined between the square brackets within the XML document.

Address.xml

```
<?xml version="1.0" encoding="UTF-8" standalone="YES" ?>
<?xmlstylesheet type="text/css" href="address.css"?>
<!DOCTYPE address[
    <!ELEMENT address (name, company, phone)>
    <!ELEMENT name (#PCDATA)>
    <!ELEMENT company (#PCDATA)>
    <!ELEMENT phone (#PCDATA)>
    <!ENTITY email 123 "abc123@gmail.com">
]>
<address>
    <name> neethu joy </name>
    <company> wipro </company>
    <phone> (011) 23-4567 </phone>
    <email> &email;123; </email>
</address>
```

Rules:-

- ① The document type declaration must be written in between the XML declaration and the root element.
- ② Keyword DOCTYPE must be followed by the root element.
- ③ Keyword DOCTYPE must be in upper case.

External DTD

External DTD is same as internal DTD except that it defines in the external file.

We create DTD in notepad and save this file with .dtd and it can use with more than one XML document.

Address13.xml

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<?xml-stylesheet type="text/css" href="address.css"?>
<!DOCTYPE address SYSTEM "address.dtd">
<address>
<name> neetu joy </name>
<company> wipro </company>
<phones> (011) 123 - 4567 </phones>
<emails> &email123; </emails>
</address>
```

XML Namespaces

(A logical grouping of name).
XML namespaces are used for providing uniquely named attributes and elements in an XML document.

In XML, A namespace is used to prevent any conflict with element names → defined on a W3C recommendation → defined by an xmlns attribute → Syntax: - `xmlns:prefix="URI"`

* Namespace means by which we can differentiate elements and attributes of different XML document types from each other when combining them together into other document or even processing multiple documents simultaneously.

For eg:

```
<table>
<name>Coffee Table </name>
<width>10 </width>
<length>20 </length>
</table>
```

} looks like
} furniture table

```
<table>
<tr>
<td> Apples </td>
<td> Bananas </td>
</tr>
</table>
```

} HTML Table

And this is all fine if these two tables / XML documents are used separately in any way. However, if we happen to combine two XML's together then there will be a conflict in element names.

To resolve this conflict we use prefix in our element.

```
<f:table>
<f:name> Coffee Table </f:name>
<f:width> 10 </f:width>
<f:length> 20 </f:length>
</f:table>
```

```
<h:table>
```

```
<h:td>
<h:td> Apple </h:td>
<h:td> Banana </h:td>
</h:td>
</h:table>
```

So now these two tables are different
so we can use together, there will be no conflict.

When using prefix" in XML, a namespace for prefix must be defined,

Syntax:- `< xmlns:prefix = "URI">`

Eg:-

```
<root>
<h:table xmlns:h = "http://www.w3.org/TR/html4/">
<h:tr>
  ;
</h:tr>
<h:table>
<f:table xmlns:f = "http://www.w3.org/TR/furniture">
<f:name>
  ;
</f:name>
</f:table>
</h:table>
</root>
```

But we can define XML namespace in the root element itself so no need to define everytime we use

```
<root xmlns:hr = "http://www.w3.org/TR/html4/">
  xmlns:f = "http://www.w3.org/TR/furniture">
```

```
<h:table>
  ;
</h:table>
```

```
<f:table>
</root>
=
```

XML Schema XSD (It doesn't require intermediate processing by a parser)

The purpose of XML schema is to define the building blocks of XML document

* XML schema defines how to structure an XML document and it can be used on the place of DTD

* XML schema language is known as XML schema definition (XSD)

* XML schemas are used to overcome the disadvantages of DTDs

Disadvantages of DTDs

* Syntax is different from XML - cannot be parsed with an XML parser.

* very difficult to deal with 2 different types of syntaxes.

* DTDs do not allow restrictions on the form of data that can be a content of elements like quantity, <time>, etc.

Defining a Schema

Eg:-

```

<xs:element name = "note">
<xs:complexType>
<xs:sequence>
    <xs:element name = "to" type = "xs:string"/>
    <xs:element name = "from" type = "xs:string"/>
    <xs:element name = "heading" type = "xs:string"/>
    <xs:element name = "body" type = "xs:string"/>
</xs:sequence>
<xs:complexType>
<xs:element>

```

Interpretation

Define the element called "note". Note
 Note is complex type, the complex type is
 element is complex type, the complex type is
 a sequence of elements
 element of type string (text) etc.

Applications / Features / Advantages / Characteristics of XML Schema

- ① Supports Data types
- ② Supports Namespaces
- ③ Provide built-in primitive data type which includes byte, string, integer, floating point no., currency codes and language codes etc.
- ④ Provide the ability to define custom data types.
- ⑤ Easy to validate the correctness of data.
- ⑥ Easy to derive allowable content in the document.
- ⑦ Object-Oriented approach like Inheritance and polymorphism encapsulation can be used in creating the document.
- ⑧ Easier to convert data in different types

- ⑨ Easy to define data formats
- ⑩ Easy to define restrictions on data
- ⑪ It is written in XML so any XML editor can be used to edit XML & schema
- ⑫ XML parser can be used to parse the schema file
- ⑬ They are extensible as they are written in XML.

XSLT - Style Sheets.

XSL - Extensible Style Sheet & Language is a simple functional style programming language.

This style sheet of 3 categories:-

- ① XSLT :- transforms XML documents into forms or formats
- ② XPath - XML Path Language identifies the parts of XML document
- ③ XSL - FO - Formatting objects.

XSLT

* To generate the XML file as an HTML file we need to use the XSLT, that's why we want to do the conversion (i.e. from XML to HTML) as such XML describes the information but if we want to display on any browser, so we have to display it as an HTML file so the transformation from XML to HTML has to take place done by XSLT.

* XSLT also cuts down on server load. Since XSLT can do the transformation on client side, the server has to do less work, since we are not querying upon data on database.

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