**Module: HTML, Image Maps, XML**

**MODULE 3**

1. What is the difference between HTML and DHTML?

Ans. HTML (HyperText Markup Language): HTML is the most widely accepted language used to build websites. It is the main structure of a website. It builds tables, creates divisions, gives a heading message (In the title bar of programs), and actually outputs text.

DHTML(Dynamic HyperText Markup Language): is a combination of different technologies to make HTML interactive. Common languages used are HTML ,Javascript and Stylesheets. DHTML is not a language, but the art of using HTML, JavaScript, DOM and CSS together to create dynamic things, such as navigation menus.

1. What is the difference between Network and Internet?

Ans. Difference between Network and Internet is that a network is a collection of computers and devices connected together, often wirelessly, via communications devices and transmission media. When a computer connects to a network, it is online. Networks allow computers to share resources, such as hardware, software, data, and information. The Internet is a worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals.

1. What is the relationship between internet and world wide web?

Ans. The internet is a massive network of networks, a networking infrastructure. It connects millions of computers together globally, forming a network in which any computer can communicate with any other computer as long as they are both connected to the internet. Information that travels over the internet does so via a variety of languages known as protocols.

The World Wide Web, or simply web, is a way of accessing information over the medium of the internet. It is an information-sharing model that is built on top of the internet. The web uses the HTTP protocol, only one of the languages spoken over the internet, to transmit data. Web services, which use HTTP to allow applications to communicate in order to exchange business logic, use the the web to share information. The web also utilizes browsers, such as Internet Explorer or Firefox, to access Web documents called webpages that are linked to each other via hyperlinks. Web documents also contain graphics, sounds, text and video.

1. Define Markup tags. Why HTML is called markup language?

Ans. A markup tag is a directive that contains snippet of code with a relative reference to an object, such as a variable, URL, image, or block. Markup tags can be used anywhere the editor is available and incorporated into the HTML of content pages, blocks, email templates, newsletters, and so on.

Markup tags are enclosed in double, curly braces, and can either be generated by the Widget tool, or typed directly into HTML content.

HTML is called hypertext markup language because it is a language that allows users to organize, improve the appearance of, and link text with data on the internet.

1. What is JavaScript? Why is it mostly used in web browser?

Ans. JavaScript is the Programming Language for the Web. JavaScript can update and change both HTML and CSS. JavaScript can calculate, manipulate and validate data.

1. What is defined by <!doctype> in html?

Ans. All HTML documents must start with a document type declaration: <!DOCTYPE html>.

The <!DOCTYPE html> declaration is used to inform a website visitor's browser that the document is an HTML document. While not actually an HTML element itself, every HTML document should being with a DOCTYPE declaration to be compliant with HTML standards.

1. What is the use of href attribute in html?

Ans. The HREF is an attribute of the anchor tag, which is also used to identify sections within a document. The HREF contains two components: the URL, which is the actual link, and the clickable text that appears on the page, called the "anchor text.". HTML links are defined with the <a> tag. The link address is specified in the href attribute.

1. Explain importance of Frame tag in HTML.

Ans. HTML frames are used to divide the browser window into multiple sections where each section can load a separate HTML document. A collection of frames in the browser window is known as a frameset. The window is divided into frames in a similar way the tables are organized: into rows and columns. An iframe is used to display a web page within a web page. An HTML iframe is defined with the <iframe> tag.

1. In XML what is equivalent to a database schema? What is the purpose of XML parser?

Ans. An XML schema, commonly known as an XML Schema Definition (XSD), formally describes what a given XML document can contain, in the same way that a database schema describes the data that can be contained in a database (i.e. table structure, data types, constraints etc.).

XML parser is a software library or a package that provides interface for client applications to work with XML documents. It checks for proper format of the XML document and may also validate the XML documents. The goal of a parser is to transform XML into a readable code.

1. Why XML is superior to HTML?

Ans. In XML, information becomes more accessible and reusable, because the more flexible markup of XML can be used by any XML software instead of being restricted to specific manufacturers as has become the case with HTML. XML files can be used outside the Web as well, in existing document-handling environments (eg publishing).

1. When a markup tag is used, what instruction goes to web browser?

Ans. A markup tag is a directive that contains snippet of code with a relative reference to an object, such as a variable, URL, image, or block. Markup tags can be used anywhere the editor is available and incorporated into the HTML of content pages, blocks, email templates, newsletters, and so on.

Markup tags are enclosed in double, curly braces, and can either be generated by the Widget tool, or typed directly into HTML content.

1. What are the advantages of JavaScript over HTML?

Ans. HTML is static and used to define the content of web page .Javascript is dynamic which can change the content of html,css and many more means to say change content in dynamic ways .This is also considered as a programming language and this is not simple as html, it require logic to how to implement it.

1. What are <ul> and <ol> tags to describe HTML Lists?

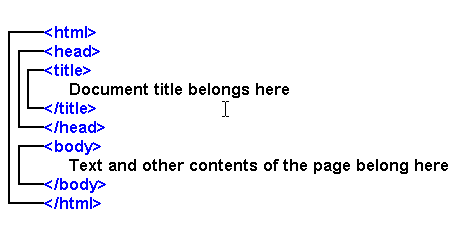
Ans. HTML lists are defined with the <ul> (unordered/bullet list) or the <ol> (ordered/numbered list) tag, followed by <li> tags (list items). If <ul> is used, the displayed items are unordered/bullet list. If <ol> is used, the displayed items are ordered/numbered list.

1. Why is it advised to use alternative text (alt) while displaying an html image?

Ans. Alternate text (Alt text) is a text description that can be added to an image's HTML tag on a Web page. It is used when the image in the Web page cannot be displayed, in which case the Alt text is shown instead.

1. Explain Nested HTML elements.

Ans. HTML tags should be “nested” in a proper order, meaning that the tag opened most recently is always the next tag to close. In the following example, the HTML code is nested correctly, and we’ve drawn lines to connect opening and closing tags:



1. What are Inline elements in HTML? Give 2 examples of HTML Inline elements.

Ans. Every HTML element has a default display value depending on what type of element it is. The default display value for most elements is block or inline. An inline element does not start on a new line and only takes up as much width as necessary.

Example: <a>,<abbr>,<acronym>,<b>,<bdo>,<big>,<br>,<button>,<cite>,<code>,<dfn>,<em>,<i>,<img>,<input>,<kbd>,<label>,<map>,<object>,<q>,<samp>,<script>,<select>,<small>,<span>,<strong>,<sub>,<sup>,<textarea>,<time>,<tt>,<var>

1. What are block-level elements in HTML? Give 2 examples of HTML block-level elements.

Ans. Every HTML element has a default display value depending on what type of element it is. The default display value for most elements is block or inline. A block-level element always starts on a new line and takes up the full width available (stretches out to the left and right as far as it can).

Example: <address>,<article>,<aside>,<blockquote>,<canvas>,<dd>,<div>,<dl>,<dt>,<fieldset>,<figcaption>,<figure>,<footer>,<form>,<h1>-<h6>,<header>,<hr>,<li>,<main>,<nav>,<noscript>,<ol>,<output>,<p>,<pre>,<section>,<table>,<tfoot>,<ul>,<video>

1. How to set the background color in HTML?

Ans. One can set the background color for HTML elements in the following way:

<h1 style="background-color:DodgerBlue;">Hello World</h1>  
<p style="background-color:Tomato;">Lorem ipsum...</p>

1. What is <form> element? What is the use of it in HTML?

Ans. The HTML <form> element defines a form that is used to collect user input. It has the following structure:

<form>  
.  
form elements  
.  
</form>

Form elements are different types of input elements, like text fields, checkboxes, radio buttons, submit buttons, and more.

1. What is Image floating in HTML?

Ans. A floated image will allow the text to wrap around the image like a regular book or newspaper would do. Images can also be floated so they appear horizontally on the site. Images can be aligned left, right, and center using the div tag and an inline CSS style.

1. What are different ways to view an XML document?

Ans. XML document can be viewed using a simple text editor (such as Notepad, TextPad, or TextEdit) or any browser (Firefox Browser/Chrome Browser). Most of the major browsers supports XML. XML files can be opened in the browser by just double-clicking the XML document (if it is a local file) or by typing the URL path in the address bar (if the file is located on the server).

1. Name 4 commonly used XML parsers.

Ans. MSXML (Microsoft Core XML Services), System.Xml.XmlDocument, Java built-in parser, Saxon, Xerces.

1. What are the 2 main reasons behind creation of XHTML?

Ans. It creates a stricter standard for making web pages, reducing incompatibilities between browsers. So it is compatible for all major browsers.

It creates a standard that can be used on a variety of different devices without changes.

1. Name 4 commonly used XML Predefined Character Entities.

Ans. Ampersand − &amp;

Single quote − &apos;

Greater than − &gt;

Less than − &lt;

Double quote − &quot;

1. What are various XML comment rules?

Ans. Following rules should be followed for XML comments −

Comments cannot appear before XML declaration.

Comments may appear anywhere in a document.

Comments must not appear within attribute values.

Comments cannot be nested inside the other comments.

**MODULE 3**

1. What is CSS? Why is it needed? Describe different types of CSS with example.

Ans. CSS stands for Cascading Style Sheets.

CSS describes how HTML elements are to be displayed on screen, paper, or in other media.

CSS saves a lot of work. It can control the layout of multiple web pages all at once.

CSS can be added to HTML elements in 3 ways:

* Inline - by using the style attribute in HTML elements
* Internal - by using a <style> element in the <head> section
* External - by using an external CSS file

Inline CSS

An inline CSS is used to apply a unique style to a single HTML element.

An inline CSS uses the style attribute of an HTML element.

This example sets the text color of the <h1> element to blue:

Example:

<h1 style="color:blue;">This is a Blue Heading</h1>

Internal CSS

An internal CSS is used to define a style for a single HTML page.

An internal CSS is defined in the <head> section of an HTML page, within a <style> element:

External CSS

An external style sheet is used to define the style for many HTML pages.

With an external style sheet, one can change the look of an entire web site, by changing one file!

To use an external style sheet, add a link to it in the <head> section of the HTML page.

1. Write an html program to create one web page to display your biodata with the following information: name, DOB, address, father’s name, mother’s name, phone number, email id. Display all of them on left side of the page and your passport size image to be displayed on the right side of the page.

Ans. <*sample code will appear like this*>

<!DOCTYPE html>

<html>

<body>

<h2>HTML Forms</h2>

<form action="/action\_page.php">

First name:<br>

<input type="text" name="firstname" value="Mickey">

<br>

Last name:<br>

<input type="text" name="lastname" value="Mouse"><br><br>

<input type="radio" name="gender" value="male" checked> Male<br>

<input type="radio" name="gender" value="female"> Female<br>

<input type="radio" name="gender" value="other">Other

<br><br>

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

</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".</p>

</body>

</html>

1. What is an HTML element? Write a small html code to display elements showing header, body and paragraph.

Ans. An HTML element usually consists of a start tag and end tag, with the content inserted in between:

<tagname>Content goes here...</tagname>

* The HTML element is everything from the start tag to the end tag.
* HTML elements with no content are called empty elements.
* Empty elements do not have an end tag, such as the <br>element (which indicates a line break).

(*sample example*)

<!DOCTYPE html>  
<html>  
<body>  
<h1>My First Heading</h1>  
<p>My first paragraph.</p>  
</body>  
</html>

1. What is iFrame? How to specify the size of the iFrame? Describe with an example.

Ans. An iframe is used to display a web page within a web page.

* An HTML iframe is defined with the <iframe> tag
* Example:

<iframe src="URL"></iframe>

* The src attribute specifies the URL (web address) of the inline frame page.

Height and width attributes are used to specify the size of the iframe.

The attribute values are specified in pixels by default, but they can also be in percent (like "80%").

Example:

<iframe src="demo\_iframe.htm" height="200" width="300"></iframe>

1. Write short notes on: HTML Image maps

Ans. The <map> tag defines an image-map. An image-map is an image with clickable areas.

* The name attribute of the <map> tag is associated with the <img>'s usemap attribute and creates a relationship between the image and the map.
* The <map> element contains a number of <area> tags, that define the clickable areas in the image-map.

Example:

<img src="workplace.jpg" alt="Workplace" usemap="#workmap">

<map name="workmap">

<area shape="rect" coords="34,44,270,350" alt="Computer" href="computer.htm">

<area shape="rect" coords="290,172,333,250" alt="Phone" href="phone.htm">

<area shape="circle" coords="337,300,44" alt="Coffee" href="coffee.htm">

</map>

1. Write and explain tags to create following HTML form elements with their attributes. (i). textbox (ii). Dropdown list (iii) Checkbox (iv). radio button

Ans.*(sample code for textbox and radio button)*

<!DOCTYPE html>

<html>

<body>

<h2>HTML Forms</h2>

<form action="/action\_page.php">

First name:<br>

<input type="text" name="firstname" value="Mickey">

<br>

Last name:<br>

<input type="text" name="lastname" value="Mouse"><br><br>

<input type="radio" name="gender" value="male" checked> Male<br>

<input type="radio" name="gender" value="female"> Female<br>

<input type="radio" name="gender" value="other">Other

<br><br>

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

</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".</p>

</body>

</html>

1. Explain the following HTML tags with all attributes.

(a)<a> (b)<body> (c) <img> (d) <table> (e) <p>

Ans. <a>HTML links are defined with the <a> tag. The link address is

specified in the href attribute. Example:

<a href="https://www.w3schools.com">This is a link</a>

<body> The visible part of the HTML document is between <body> and </body>.

<img> HTML images are defined with the <img> tag.

The source file (src), alternative text (alt), width, and height are

provided as attributes:

Example

<img src="w3schools.jpg" alt="W3Schools.com" width="104" height="1

42">

<table>An HTML table is defined with the <table> tag.

Each table row is defined with the <tr> tag. A table header is defined with the <th> tag. By default, table headings are bold and centered. A table data/cell is defined with the <td> tag.

<p>HTML paragraphs are defined with the <p> tag:

Example

<p>This is a paragraph.</p>

1. Why do we need to have dynamic webpage? How can we link a style sheet to a webpage?

Ans. On the Web, you can 2 kinds of Web pages : static pages and dynamic pages. A Static Web Page is a web page which is delivered to the user exactly as stored. These pages are often made with HTML. A Dynamic Web Page is a web page whose construction is controlled by an application server processing server-side scripts.

A server-side dynamic web page is a web page whose construction is controlled by an application server processing server-side scripts. ... JavaScript and other scripting languages determine the way the HTML in the received page is parsed into the Document Object Model, or DOM, that represents the loaded web page.

The external Style Sheet (.css file) is always separate from HTML file. One can link this external file (.css file) to HTML document file using the < link >tag .One can place this < link > tag Within the < head > section, and after the < title > element of HTML file.

1. Write down the rules for creating a well formed XML document.

Ans.

* Non DTD XML files must use the predefined character entities for amp(&), apos(single quote), gt(>), lt(<), quot(double quote).
* It must follow the ordering of the tag. i.e., the inner tag must be closed before closing the outer tag.
* Each of its opening tags must have a closing tag or it must be a self ending tag.(<title>....</title> or <title/>).
* It must have only one attribute in a start tag, which needs to be quoted.
* amp(&), apos(single quote), gt(>), lt(<), quot(double quote)entities other than these must be declared.

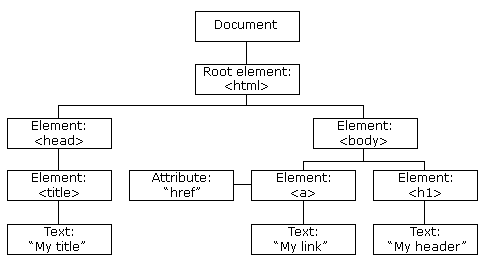
1. Write short notes on HTML DOM.

Ans. The HTML DOM is an Object Model for HTML. It defines:

* HTML elements as objects
* Properties for all HTML elements
* Methods for all HTML elements
* Events for all HTML elements

When a web page is loaded, the browser creates a Document Object Model of the page.

The HTML DOM model is constructed as a tree of Objects:



1. What are the features of scripting language? How markup language is different from scripting language?

Ans.

* Both Batch and Interactive use.
* Lack of declarations; simple scoping rules
* Flexible dynamic typing.
* Easy access to other programs.
* Sophisticated Pattern matching.
* High-level data types.

A markup language is a language which is used to represent structured data. A scripting language is a programming language which is interpreted, rather than compiled, which means that scripting languages represent a subset of all programming languages.

A markup language is used to control the presentation of data, like "represent these user names as a bullet list or as a table".

1. Create a HTML page with following features: Hyperlink, List and Form.

Ans.*(sample code)*

*HTML Form:*

<!DOCTYPE html>

<html>

<body>

<h2>HTML Forms</h2>

<form action="/action\_page.php">

First name:<br>

<input type="text" name="firstname" value="Mickey">

<br>

Last name:<br>

<input type="text" name="lastname" value="Mouse"><br><br>

<input type="radio" name="gender" value="male" checked> Male<br>

<input type="radio" name="gender" value="female"> Female<br>

<input type="radio" name="gender" value="other">Other

<br><br>

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

</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".</p>

</body>

</html>

*HTML List:*

<!DOCTYPE html>

<html>

<body>

<h2>Ordered List with Numbers</h2>

<ol type="1">

<li>Coffee</li>

<li>Tea</li>

<li>Milk</li>

</ol>

</body>

</html>

*HTML link:*

<!DOCTYPE html>

<html>

<body>

<h2>Image Maps</h2>

<p>Click on the computer, the phone, or the cup of coffee to go to a new page and read more about the topic:</p>

<imgsrc="Images/workplace.jpg" alt="Workplace" usemap="#workmap" width="400" height="379">

<map name="workmap">

<area shape="rect" coords="34,44,270,350" alt="Computer" href="computer.htm">

<area shape="rect" coords="290,172,333,250" alt="Phone" href="phone.htm">

<area shape="circle" coords="337,300,44" alt="Cup of coffee" href="coffee.htm">

</map>

</body>

</html>

1. Differentiate Get and Post method.

Ans. HTTP POST requests supply additional data from the client (browser) to the server in the message body. In contrast, GET requests include all required data in the URL. Forms in HTML can use either method by specifying method="POST" or method="GET" (default) in the <form> element. The method specified determines how form data is submitted to the server. When the method is GET, all form data is encoded into the URL, appended to the action URL as query string parameters. With POST, form data appears within the message body of the HTTP request.

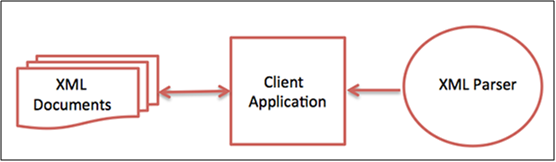
From security point of view, GET is less secure compared to POST because data sent is part of the URL. So it's saved in browser history and server logs in plaintext. POST is a little safer than GET because the parameters are not stored in browser history or in [web server](https://www.diffen.com/difference/Application_Server_vs_Web_Server) logs.

1. Explain different types of parsers used in XML.

Ans.

* Parser is a software library or a package that provides interface for client applications to work with XML documents.
* Checks for proper format of the XML document and may also validate the XML documents.
* Modern day browsers have built-in XML parsers.
* The goal of a parser is to transform XML into a readable code.

Following diagram shows how XML parser interacts with XML document –



Some commonly used parsers −

* MSXML (Microsoft Core XML Services) − Standard set of XML tools from Microsoft that includes a parser.
* System.Xml.XmlDocument − Part of .NET library, containing different classes related to working with XML.
* Java built-in parser − The Java library has its own parser.
* Saxon − Saxon offers tools for parsing, transforming, and querying XML.
* Xerces − Xerces is implemented in Java, developed by open source Apache Software Foundation.

1. State different types of lists with examples in HTML. State the use of <pre> and <del> tags.

Ans. Unordered HTML List

* An unordered list starts with the <ul> tag. Each list item starts with the <li> tag.
* The list items will be marked with bullets (small black circles) by default.

Ordered HTML List

* An ordered list starts with the <ol> tag. Each list item starts with the <li> tag.
* The list items will be marked with numbers by default.
  + type="1“: The list items will be numbered with numbers (default)
  + type="A“: The list items will be numbered with uppercase letters
  + type="a“: The list items will be numbered with lowercase letters
  + type="I“: The list items will be numbered with uppercase roman numbers
  + type="i“: The list items will be numbered with lowercase roman numbers

Use of <pre> and <del> tags:

The HTML <pre> tag is used for indicating preformatted text. The code tag surrounds the code being marked up.

Browsers normally render pre text in a fixed-pitched font, with whitespace in tact, and without word wrap.

The HTML del tag is used for markup of deleted text.

Markup of deleted text can be useful in determining differences between multiple versions of the same document. Browsers will normally strike a line through deleted text and underline inserted text.

1. What is XML tree? Explain in detail.

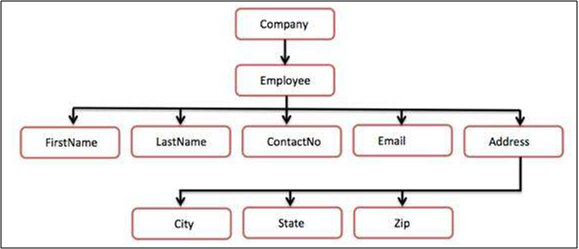
Ans.

* Tree structure helps to describe an XML document easily.
* Contains root (parent) elements, child elements and so on
* Helps to know all succeeding branches and sub-branches starting from the root.
* XML arsing starts at the root, then moves down the first branch to an element, take the first branch from there, and so on to the leaf nodes.

XML Tree Example:



* Following tree structure represents the above XML document −



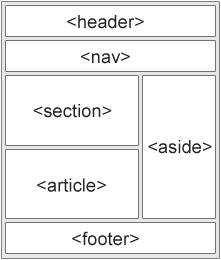
1. Write short notes on HTML tables explaining different table elements.

Ans.

* An HTML table is defined with the <table> tag.
* Each table row is defined with the <tr> tag. A table header is defined with the <th> tag. By default, table headings are bold and centered. A table data/cell is defined with the <td> tag.
* Various HTML table elements are explained below:
  + Use the HTML <table> element to define a table
  + Use the HTML <tr> element to define a table row
  + Use the HTML <td> element to define a table data
  + Use the HTML <th> element to define a table heading
  + Use the HTML <caption> element to define a table caption
  + Use the CSS border property to define a border
  + Use the CSS border-collapse property to collapse cell borders
  + Use the CSS padding property to add padding to cells
  + Use the CSS text-align property to align cell text
  + Use the CSS border-spacing property to set the spacing between cells
  + Use the colspan attribute to make a cell span many columns
  + Use the rowspan attribute to make a cell span many rows
  + Use the id attribute to uniquely define one table

1. What are different types of HTML layout elements? Explain different HTML layout elements with a diagram.

Ans. Websites often display content in multiple columns (like a magazine or newspaper).



* <header> - Defines a header for a document or a section
* <nav> - Defines a container for navigation links
* <section> - Defines a section in a document
* <article> - Defines an independent self-contained article
* <aside> - Defines content aside from the content (like a sidebar)
* <footer> - Defines a footer for a document or a section
* <details> - Defines additional details
* <summary> - Defines a heading for the <details> element

1. What are HTML attributes? What are the utilities? Discuss about the following HTML attributes: style, title.

Ans. All HTML elements can have attributes

* Attributes provide additional information about an element
* Attributes are always specified in the start tag
* Attributes usually come in name/value pairs like: name="value“

The style Attribute

The style attribute is used to specify the styling of an element, like color, font, size

etc. Example:

<p style="color:red">I am a paragraph</p>

The title Attribute

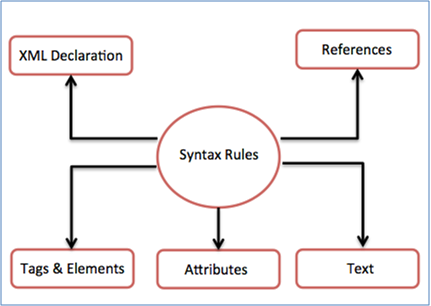
Here, a title attribute is added to the <p> element. The value of the title attribute

will be displayed as a tooltip when you mouse over the paragraph. Example:

<p title="I'm a tooltip">  
This is a paragraph.  
</p>

1. What are various syntax rules available to write different types of markup and text in an XML document? Explain through a diagram.

Ans. The following diagram depicts the syntax rules to write different types of markup and text in an XML document.



**XML Declaration**

* The XML document can optionally have an XML declaration. It is written as follows −
  + <?xml version = "1.0" encoding = "UTF-8"?>

Where *version* is the XML version and *encoding* specifies the character encoding used in the document.

**Syntax Rules for XML Declaration**

* The XML declaration is case sensitive and must begin with "**<?xml>**" where "**xml**" is written in lower-case.
* If document contains XML declaration, then it strictly needs to be the first statement of the XML document.
* The XML declaration strictly needs be the first statement in the XML document.
* An HTTP protocol can override the value of *encoding* that you put in the XML declaration.

**Tags and Elements**

* An XML file is structured by several XML-elements, also called XML-nodes or XML-tags. The names of XML-elements are enclosed in triangular brackets <> as shown below − <element>

**Syntax Rules for Tags and Elements**

* **Element Syntax** − Each XML-element needs to be closed either with start or with end elements as shown below −<element>....</element>

**Nesting of Elements −**An XML-element can contain multiple XML-elements as its children, but the children elements must not overlap. i.e., an end tag of an element must have the same name as that of the most recent unmatched start tag.

**XML Attributes**

* An **attribute** specifies a single property for the element, using a name/value pair. An XML-element can have one or more attributes. For example −
  + <a href = "http://www.tutorialspoint.com/">Tutorialspoint!</a>

Here **href** is the attribute name and **http://www.tutorialspoint.com/** is attribute value.

**Syntax Rules for XML Attributes**

* Attribute names in XML (unlike HTML) are case sensitive. That is, ***HREF***and ***href*** are considered two different XML attributes.
* Same attribute cannot have two values in a syntax. The following example shows incorrect syntax because the attribute *b* is specified twice
  + <a b = "x" c = "y" b = "z">....</a>
* Attribute names are defined without quotation marks, whereas attribute values must always appear in quotation marks. Following example demonstrates incorrect xml syntax as the attribute value is not defined in quotation marks:
  + <a b = x>....</a>

**XML References**

* References usually allow to add or include additional text or markup in an XML document. References always begin with the symbol **"&"** which is a reserved character and end with the symbol **";".** XML has two types of references −
  + **Entity References** − An entity reference contains a name between the start and the end delimiters. For example **&amp;** where *amp* is *name*. The *name* refers to a predefined string of text and/or markup.
* **Character References** − These contain references, such as **&#65;**, contains a hash mark (“#”) followed by a number. The number always refers to the Unicode code of a character. In this case, 65 refers to alphabet "A".

1. What is XML encoding? Explain the 2 major XML encoding types.

Ans.

* Process of converting unicode characters into their equivalent binary representation.
* When the XML processor reads an XML document, it encodes the document depending on the type of encoding.
* Hence, we need to specify the type of encoding in the XML declaration.

**Encoding Types**

* There are mainly two types of encoding −
* UTF-8
* UTF-16
* UTF stands for *UCS Transformation Format*, and UCS itself means *Universal Character Set*.
* The number 8 or 16 refers to the number of bits used to represent a character.
* They are either 8(one byte) or 16(two bytes).
* For the documents without encoding information, UTF-8 is set by default.

**Syntax:**

<?xml version = "1.0" encoding = "UTF-16" standalone = "no" ?> or

<?xml version = "1.0" encoding = "UTF-8" standalone = "no" ?>

* The XML files encoded with UTF-8 tend to be smaller in size than those encoded with UTF-16 format.

1. What are various validation rules for well-formed XML document?

Ans. An XML document is said to be well-formed if it adheres to the following rules −

* Non DTD XML files must use the predefined character entities for amp(&), apos(single quote), gt(>), lt(<), quot(double quote).
* It must follow the ordering of the tag. i.e., the inner tag must be closed before closing the outer tag.
* Each of its opening tags must have a closing tag or it must be a self ending tag.(<title>....</title> or <title/>).
* It must have only one attribute in a start tag, which needs to be quoted.
* amp(&), apos(single quote), gt(>), lt(<), quot(double quote)entities other than these must be declared.

1. What is XML DTD? Explain in detail two major types of XML DTD.

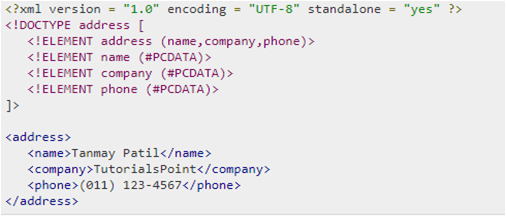
Ans.

* A way to describe XML language precisely
* DTDs check vocabulary and validity of the structure of XML documents against grammatical rules of appropriate XML language
* An XML DTD can be either specified inside the document, or it can be kept in a separate document and then liked separately

**Two types:**

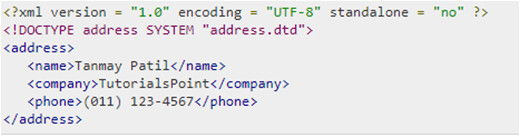
* Internal (elements are declared within the XML files): To an internal DTD, *standalone* attribute in XML declaration must be set to **yes**. This means, the declaration works independent of an external source.

Example:



* External (DTD elements are declared outside the XML file): They are accessed by specifying the system attributes which may be either the legal *.dtd* file or a valid URL. To refer it as external DTD, *standalone* attribute in the XML declaration must be set as **no**. This means, declaration includes information from the external source.

Example:



1. Write short notes on XHTML.

Ans.

* XHTML stands for **EXtensibleHyperText Markup Language.**
* XHTML is introduced to combine the strengths of HTML and XML.
* XHTML is almost identical to HTML but it is stricter than HTML.
* XHTML is HTML defined as an XML application, HTML redesigned as XML.
* XHTML doesn't facilitate to make badly formed code to be XHTML compatible.
* It is supported by all major browsers.
* XHTML is stricter than HTML in syntax and case sensitivity.
* XHTML documents are well-formed and parsed using standard XML parsers, unlike HTML, which requires a lenient HTML-specific parser.

|  |
| --- |
|  |

**MODULE 3**

1. Write an html program to create one web page to display the following:
   1. Text field to enter Name, Phone No, Email ID, Registration No.
   2. Radio button to enter gender (Male/Female), check boxes for hobbies like playing, travelling, reading books etc.
   3. 2 drop down list for stream like B.Tech, M. Tech, MCA and for branch like CSE, ECE, ME, CIVIL etc.
   4. Text area to enter address.
   5. Html table to display your degree from Class X till last semester showing degree name, year of passing, grade/percentage in a tabular format.

Ans. (sample code)

<!DOCTYPE html>

<html>

<body>

<h2>HTML Forms</h2>

<form action="/action\_page.php">

First name:<br>

<input type="text" name="firstname" value="Mickey">

<br>

Last name:<br>

<input type="text" name="lastname" value="Mouse"><br><br>

<input type="radio" name="gender" value="male" checked> Male<br>

<input type="radio" name="gender" value="female"> Female<br>

<input type="radio" name="gender" value="other">Other

<br><br>

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

</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".</p>

</body>

</html>

(for drop down)

<!DOCTYPE html>

<html>

<body>

<select>

<option value="volvo">Volvo</option>

<option value="saab">Saab</option>

<option value="opel">Opel</option>

<option value="audi">Audi</option>

</select>

</body>

</html>

(for table)

<!DOCTYPE html>

<html>

<head>

<style>

table, th, td {

border: 1px solid black;

}

</style>

</head>

<body>

<h2>Bordered Table</h2>

<p>Use the CSS border property to add a border to the table.</p>

<table style="width:100%">

<tr>

<th>Firstname</th>

<th>Lastname</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>

1. Write short notes on any three of the following:
   1. XML
   2. HTML Color
   3. HTML Forms
   4. HTML Layout

Ans.

1. XML: XML is a text-based markup language derived from Standard Generalized Markup Language (SGML). XML tags identify the data and are used to store and organize the data.

An XML file is structured by several XML-elements, also called XML-nodes or XML-tags. The names of XML-elements are enclosed in triangular brackets <>.

Root Element − An XML document can have only one root element as shown below:

<root>

<x>...</x>

<y>...</y>

</root>

XML Attributes

An attribute specifies a single property for the element, using a name/value pair. An XML-element can have one or more attributes. For example −

<a href = "http://www.tutorialspoint.com/">Tutorialspoint!</a>

Here href is the attribute name and http://www.tutorialspoint.com/ is attribute value.

1. HTML Color:

Color Names

In HTML, a color can be specified by using a color name.

HTML supports 140 standard color names.

Background Color

One can set the background color for HTML elements in the following way:

<h1 style="background-color:DodgerBlue;">Hello World</h1>  
<p style="background-color:Tomato;">Lorem ipsum...</p>

Text Color

One can set the background color for HTML elements in the following way:

<h1 style="color:Tomato;">Hello World</h1>  
<p style="color:DodgerBlue;">Lorem ipsum...</p>

Border Color

One can set the border color for HTML elements in the following way:

<h1 style="border:2px solid Tomato;">Hello World</h1>  
<h1 style="border:2px solid DodgerBlue;">Hello World</h1>

Color values

In HTML, colors can also be specified using RGB values, HEX values, HSL values, RGBA values, and HSLA values:

Same as color name "Tomato":<h1 style="border:2px solid Tomato;">Hello World</h1>  
<h1 style="border:2px solid DodgerBlue;">Hello World</h1>

1. HTML Forms:

The <form> Element

The HTML <form> element defines a form that is used to collect user input:

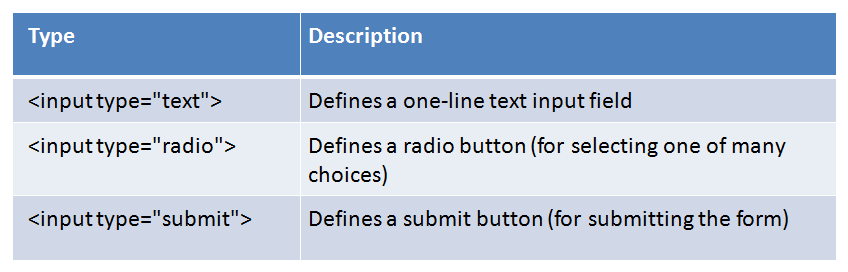
<form>  
.  
form elements  
.  
</form>

The <input> Element

The <input> element can be displayed in several ways, depending on the type attribute.

Form elements are different types of input elements, like text fields, checkboxes, radio buttons, submit buttons, and more.

Some examples:



The Action Attribute

The action attribute defines the action to be performed when the form is submitted.

Normally, the form data is sent to a web page on the server when the user clicks on the submit button.

The Target Attribute

The target attribute specifies if the submitted result will open in a new browser tab, a frame, or in the current window.

The default value is "\_self" which means the form will be submitted in the current window.

To make the form result open in a new browser tab, use the value "\_blank"

The <select> Element

The <select> element defines a drop-down list.

The <option> elements defines an option that can be selected.

By default, the first item in the drop-down list is selected.

1. HTML Layout:

Websites often display content in multiple columns (like a magazine or newspaper).

<header> - Defines a header for a document or a section

<nav> - Defines a container for navigation links

<section> - Defines a section in a document

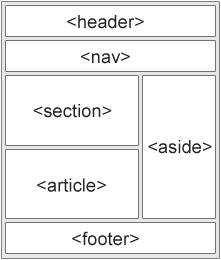
<article> - Defines an independent self-contained article

<aside> - Defines content aside from the content (like a sidebar)

<footer> - Defines a footer for a document or a section

<details> - Defines additional details

<summary> - Defines a heading for the <details> element



1. Answer the following:
   1. What is the meaning of the term “Hypertext Transfer Protocol” in World Wide Web Environment?
   2. What is URL? Explain different components of URL.
   3. Distinguish between GET and POST method in HTTP.
   4. Explain different File Transmission Mode across FTP data connection. [2+5+4+4]

Ans.

1. HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web. As soon as a Web user opens their Web browser, the user is indirectly making use of HTTP. HTTP is an application protocol that runs on top of the TCP/IP suite of protocols (the foundation protocols for the Internet).
2. URL is an acronym for Uniform Resource Locator and is a reference (an address) to a resource on the Internet.

A URL has two main components:

* + Protocol identifier: For the URL http://example.com, the protocol identifier is http.
  + Resource name: For the URL http://example.com, the resource name is example.com.

The protocol identifier and the resource name are separated by a colon and two forward slashes. The protocol identifier indicates the name of the protocol to be used to fetch the resource. Hypertext Transfer Protocol (HTTP), which is typically used to serve up hypertext documents. HTTP is just one of many different protocols used to access different types of resources on the net. Other protocols include File Transfer Protocol (FTP), Gopher, File, and News.

The resource name is the complete address to the resource. The format of the resource name depends entirely on the protocol used, but for many protocols, including HTTP, the resource name contains one or more of the following components:

Host Name

The name of the machine on which the resource lives.

Filename

The pathname to the file on the machine.

Port Number

The port number to which to connect (typically optional).

Reference

A reference to a named anchor within a resource that usually identifies a specific location within a file (typically optional).

1. HTTP POST requests supply additional data from the client (browser) to the server in the message body. In contrast, GET requests include all required data in the URL. Forms in HTML can use either method by specifying method="POST" or method="GET" (default) in the <form> element. The method specified determines how form data is submitted to the server. When the method is GET, all form data is encoded into the URL, appended to the action URL as query string parameters. With POST, form data appears within the message body of the HTTP request.

From security point of view, GET is less secure compared to POST because data sent is part of the URL. So it's saved in browser history and server logs in plaintext. POST is a little safer than GET because the parameters are not stored in browser history or in web server logs.

1. The following transmission modes are defined in FTP:
   * STREAM MODE: The data is transmitted as a stream of bytes.
   * BLOCK MODE: The file is transmitted as a series of data blocks preceded by one or more header bytes.
   * COMPRESSED MODE.
2. (a) Using the FORM tag of HTML create a registration form having the below mentioned fields:
   1. First Name (Using Text boxes)
   2. Last Name (Using Text boxes)
   3. Email Id (Using Text boxes)
   4. Gender (Using radio button)
   5. Hobbies (Using check boxes)
   6. Submit button and reset button.

(b) In a browser there will be a textbox to enter name and a SUBMIT button. If the name field is empty an alert message to be displayed stating the name field is empty. If the name is more than 30 characters long an alert message to be displayed stating that names should be less than 30 characters. Otherwise display the name in CAPITAL, BOLD and red color. [8+7]

Ans.

1. (sample code for FORM)

<!DOCTYPE html>

<html>

<body>

<h2>HTML Forms</h2>

<form action="/action\_page.php">

First name:<br>

<input type="text" name="firstname" value="Mickey">

<br>

Last name:<br>

<input type="text" name="lastname" value="Mouse"><br><br>

<input type="radio" name="gender" value="male" checked> Male<br>

<input type="radio" name="gender" value="female"> Female<br>

<input type="radio" name="gender" value="other">Other

<br><br>

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

</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".</p>

</body>

</html>

1. (sample code)

<!DOCTYPE html>

<html lang="en"><head>

<meta charset="utf-8">

<h1>Registration Form</h1>

Use tab keys to move from one input field to the next.

<form name='registration' onSubmit="return formValidation();">

<ul>

<li><label for="userid">User id:</label></li>

<li><input type="text" name="userid" size="30" /></li>

<li><input type="submit" name="submit" value="Submit" /></li>

</ul>

</form>

</body>

</html>

1. (a) What is XML? What is the basic structure of an XML element?

(b)Mention 2 technologies used to display XML data.

(c) Why root tag is a must in XML documents?

(d) Create an XML document with a root element emp. Root element contains more than one number of employee element. Each element has sub-element employee id, employee name, gender and address. Address has the sub element street, city, postal code, state. Street has two sub elements street1 and street2. Write an external DTD to validate this XML. [4+2+2+7]

Ans.

1. XML is a text-based markup language derived from Standard Generalized Markup Language (SGML). XML tags identify the data and are used to store and organize the data.

An XML file is structured by several XML-elements, also called XML-nodes or XML-tags. The names of XML-elements are enclosed in triangular brackets <>.

Root Element − An XML document can have only one root element as shown below:

<root>

<x>...</x>

<y>...</y>

</root>

XML Attributes

An attribute specifies a single property for the element, using a name/value pair. An XML-element can have one or more attributes. For example −

<a href = "http://www.tutorialspoint.com/">Tutorialspoint!</a>

Here href is the attribute name and http://www.tutorialspoint.com/ is attribute value.

1. XHTML (Extensible HTML) ...

XML DOM (XML Document Object Model) ...

XSL (Extensible Style Sheet Language) XSL consists of three parts:

XQuery (XML Query Language) ...

DTD (Document Type Definition) ...

XSD (XML Schema) ...

XLink (XML Linking Language) ...

XPointer (XML Pointer Language)

1. In any markup language, the first element to appear is called the "root element", which defines what kind of document the file will be. In an XML file, there can only be one root element. The root element must encapsulate all other elements--meaning, these other elements must show up after the opening root tag and before the closing root tag.
2. 

External DTD to validate this XML:



1. (a)Create a single web page in a file named <your last name>.html. Compose narrative text about yourself as a student with several details like name, DOB, Department, Year, Phone Number, Aadhar No, Email ID.

Employ the following HTML features:

* Document tags (like HTML, BODY, and HEAD)
* Text structure tags <P> and/or <BR> to achieve reasonable vertical arrangement
* A heading with heading tags
* Style tags (at least one of underlining, bolding, or italicizing)
* Centering with <CENTER> tags
* An unordered (bulleted) list (to capture gender)

(b) Explain the following HTML attributes: style, src [11+4=15]

Ans.

(sample code for FORM)

<!DOCTYPE html>

<html>

<body>

<h2>HTML Forms</h2>

<form action="/action\_page.php">

First name:<br>

<input type="text" name="firstname" value="Mickey">

<br>

Last name:<br>

<input type="text" name="lastname" value="Mouse"><br><br>

<input type="radio" name="gender" value="male" checked> Male<br>

<input type="radio" name="gender" value="female"> Female<br>

<input type="radio" name="gender" value="other">Other

<br><br>

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

</form>

<p>If you click the "Submit" button, the form-data will be sent to a page called "/action\_page.php".</p>

</body>

</html>

(*Also use other features, as applicable)*

The style Attribute

The style attribute is used to specify the styling of an element, like color, font, size etc. Example:

<p style="color:red">I am a paragraph</p>

The src Attribute

HTML images are defined with the <img> tag.

The filename of the image source is specified in the src  attribute.

Example: <img src="img\_girl.jpg">

1. (a) What is iFrame? Why is it used?

(b) Write a HTML program to display your name, address, university, department name as an ordered list within an iFrame. Set the height as 200, width as 300. The content within the iFrame should be captured in a separate file, which needs to be called as a source (src) within iFrame. [3+12=15]

Ans.

1. An IFrame (Inline Frame) is an HTML document embedded inside another HTML document on a website.

The IFrame HTML element is often used to insert content from another source, such as an advertisement, into a Web page. A Web designer can change an IFrame's content without requiring the user to reload the surrounding page.

1. (sample iFrame code)

iFrame target:

<!DOCTYPE html>

<html>

<body>

<h2>Iframe - Target for a Link</h2>

<iframe height="300px" width="100%" src="iframe\_test.htm" name="iframe\_a"></iframe>

<p><a href="https://www.w3schools.com" target="iframe\_a">W3Schools.com</a></p>

<p>When the target of a link matches the name of an iframe, the link will open in the iframe.</p>

</body>

</html>

iframe\_test

<!DOCTYPE html>

<html>

<body>

<h2>HTML Iframes</h2>

<p>You can use the height and width attributes to specify the size of the iframe:</p>

<iframe src="external css.htm" height="200" width="300"></iframe>

</body>

</html>

externalcss

<!DOCTYPE html>

<html>

<head>

<link rel="stylesheet" href="styles.css">

</head>

<body>

<h1>This is a heading</h1>

<p>This is a paragraph.</p>

</body>

</html>

1. (a) What is a layout in HTML? Why is it helpful?

(b)Write a HTML program to demonstrate usage of layout which should have a <title>, <header>, <nav>, <section>, <article>, <footer>. Apply features like background-color, font-size, text-align, color, width, height as applicable. (Choose any content of your choice while demonstrating the above). [3+12=15]

Ans.

1. HTML layout specifies a way in which the webpageis arranged. Every website has a specific layout to display content in a specific manner.Websites often display content in multiple columns (like a magazine or newspaper).

A webpage layout is very important to give better look to a website with great look and feel.

1. (sample code)

<!DOCTYPE html>

<html lang="en">

<head>

<title>CSS Template</title>

<meta charset="utf-8">

<meta name="viewport" content="width=device-width, initial-scale=1">

<style>

\* {

box-sizing: border-box;

}

body {

font-family: Arial, Helvetica, sans-serif;

}

/\* Style the header \*/

header {

background-color: #666;

padding: 30px;

text-align: center;

font-size: 35px;

color: white;

}

/\* Create two columns/boxes that floats next to each other \*/

nav {

float: left;

width: 30%;

height: 300px; /\* only for demonstration, should be removed \*/

background: #ccc;

padding: 20px;

}

/\* Style the list inside the menu \*/

navul {

list-style-type: none;

padding: 0;

}

article {

float: left;

padding: 20px;

width: 70%;

background-color: #f1f1f1;

height: 300px; /\* only for demonstration, should be removed \*/

}

/\* Clear floats after the columns \*/

section:after {

content: "";

display: table;

clear: both;

}

/\* Style the footer \*/

footer {

background-color: #777;

padding: 10px;

text-align: center;

color: white;

}

/\* Responsive layout - makes the two columns/boxes stack on top of each other instead of next to each other, on small screens \*/

@media (max-width: 600px) {

nav, article {

width: 100%;

height: auto;

}

}

</style>

</head>

<body>

<h2>CSS Layout Float</h2>

<p>In this example, we have created a header, two columns/boxes and a footer. On smaller screens, the columns will stack on top of each other.</p>

<p>Resize the browser window to see the responsive effect (you will learn more about this in our next chapter - HTML Responsive.)</p>

<header>

<h2>Cities</h2>

</header>

<section>

<nav>

<ul>

<li><a href="#">London</a></li>

<li><a href="#">Paris</a></li>

<li><a href="#">Tokyo</a></li>

</ul>

</nav>

<article>

<h1>London</h1>

<p>London is the capital city of England. It is the most populous city in the United Kingdom, with a metropolitan area of over 13 million inhabitants.</p>

<p>Standing on the River Thames, London has been a major settlement for two millennia, its history going back to its founding by the Romans, who named it Londinium.</p>

</article>

</section>

<footer>

<p>Footer</p>

</footer>

</body>

</html>

1. (a) What is an Image Map in HTML? Explain various attributes of Image Map.

(b) Write an HTML program containing 3 different Images: Computer, Phone and Coffee having respective Images with shapes and coordinates. On clicking any of the Images, a new page will open with relevant description and image of the topic and a corresponding Wikipedia link like: [*https://en.wikipedia.org/wiki/Telephone*](https://en.wikipedia.org/wiki/Telephone)*.*  [5+10=15]

Ans.

1. An image-map is an image with clickable areas.The **<map>** tag defines an image-map.

* The **name** attribute of the <**map**> tag is associated with the <**img**>'s **usemap** attribute and creates a relationship between the **image** and the **map**.
* The <**map**> element contains a number of <**area**> tags, that define the clickable areas in the image-map.
* **Example**:

<img src="workplace.jpg" alt="Workplace" usemap="#workmap">

<map name="workmap">

<area shape="rect" coords="34,44,270,350" alt="Computer" href="computer.htm">

<area shape="rect" coords="290,172,333,250" alt="Phone" href="phone.htm">

<area shape="circle" coords="337,300,44" alt="Coffee" href="coffee.htm">

</map>

1. Code:

Image\_map.html

<!DOCTYPE html>

<html>

<body>

<h2>Image Maps</h2>

<p>Click on the computer, the phone, or the cup of coffee to go to a new page and read more about the topic:</p>

<imgsrc="Images/workplace.jpg" alt="Workplace" usemap="#workmap" width="400" height="379">

<map name="workmap">

<area shape="rect" coords="34,44,270,350" alt="Computer" href="computer.htm">

<area shape="rect" coords="290,172,333,250" alt="Phone" href="phone.htm">

<area shape="circle" coords="337,300,44" alt="Cup of coffee" href="coffee.htm">

</map>

</body>

</html>

computer.html

<!DOCTYPE html>

<html>

<link rel="stylesheet" href="/w3css/4/w3.css">

<body>

<div class="w3-container">

<h1>Computer</h1>

<imgsrc="Images/mac.jpg" style="width:600px;max-width:100%;">

<p>Wikipedia says:</p>

<blockquote cite="https://en.wikipedia.org/wiki/Computer"><i>A computer is a device that can be instructed to carry out arbitrary sequences of arithmetic or logical operations automatically.</i></blockquote>

<p>Read more about computer on <a href="https://en.wikipedia.org/wiki/Computer">https://en.wikipedia.org/wiki/Computer</a></p>

</div>

</body>

</html>

coffee.html

<!DOCTYPE html>

<html>

<link rel="stylesheet" href="/w3css/4/w3.css">

<body>

<div class="w3-container">

<h1>Coffee</h1>

<imgsrc="Images/coffeehouse2.jpg" style="width:600px;max-width:100%;">

<p>Wikipedia says:</p>

<blockquote cite="https://en.wikipedia.org/wiki/Coffee"><i>Coffee is a brewed drink prepared from roasted coffee beans, which are the seeds of berries from the Coffea plant.</i></blockquote>

<p>Read more about coffee on <a href="https://en.wikipedia.org/wiki/Coffee">https://en.wikipedia.org/wiki/Coffee</a></p>

</div>

</body>

</html>

phone.html

<!DOCTYPE html>

<html>

<link rel="stylesheet" href="/w3css/4/w3.css">

<body>

<div class="w3-container">

<h1>Phone</h1>

<imgsrc="Images/cellphone.jpg" style="width:600px;max-width:100%;">

<p>Wikipedia says:</p>

<blockquote cite="https://en.wikipedia.org/wiki/Telephone"><i>A telephone, or phone, is a telecommunications device that permits two or more users to conduct a conversation when they are too far apart to be heard directly.</i></blockquote>

<p>Read more about phone on <a href="https://en.wikipedia.org/wiki/Telephone">https://en.wikipedia.org/wiki/Telephone</a></p>

</div>

</body>

</html>

1. What is XML? Explain how to write an XML document? What are the goals of XML? Clearly explain the XML Schema and XML parsing in detail. [2+4+3+6=15]

Ans.

* XML stands for Extensible Markup Language
* A text-based markup language derived from Standard Generalized Markup Language (SGML)
* XML tags identify the data and are used to store and organize the data (rather than specifying how to display it like HTML tags)
* XML introduces new possibilities by adopting many successful features of HTML.

How to write an XML document

*Write a Declaration Statement*

The XML document can optionally have an XML declaration. It is written as follows −

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

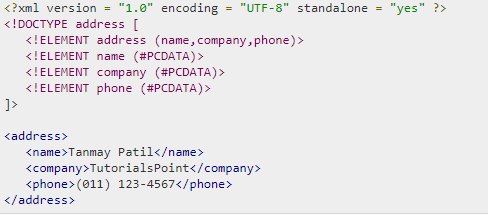
Where *version* is the XML version and *encoding* specifies the character encoding used in the document.

*Create a Root Element*

The root element is a container that holds all other elements. It is the first elemental tag for any XML file.

*Establish the Child Elements*

Child elements nest inside the root element.



* The above example is said to be well-formed as −
  + It defines the type of document. Here, the document type is element type.
  + It includes a root element named as address.
  + Each of the child elements among name, company and phone is enclosed in its self explanatory tag.
  + Order of the tags is maintained.

XML Goals:

* XML shall be straightforwardly usable over the internet
* XML shall support a wide variety of applications
* XML shall be compatible with SGML
* It shall be easy to write programs which process XML documents
* XML documents should be human readable and reasonably clear
* The XML should be prepared quickly
* XML should be easy to create

XML schema:

* An XML Schema describes the structure of an XML document.
* The XML Schema language is also referred to as XML Schema Definition (XSD).

**Purpose:**

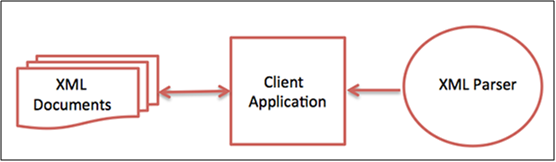
* The purpose of an XML Schema is to define the legal building blocks of an XML document:
* the elements and attributes that can appear in a document
* the number of (and order of) child elements
* data types for elements and attributes
* default and fixed values for elements and attributes
* **Why Learn XML Schema?**
* In the XML world, hundreds of standardized XML formats are in daily use.
* Many of these XML standards are defined by XML Schemas.
* XML Schema is an XML-based (and more powerful) alternative to DTD.
* **Some benefits of using XML schema**
* XML Schemas use XML Syntax (need not learn a new language)
* Secure Data Communication
* **Example of XML Schema Definition (XSD):**

<?xml version="1.0"?>  
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">  
<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>  
</xs:schema>

XML parsing

* A software library or a package that provides interface for client applications to work with XML documents
* Checks for proper format of the XML document and may also validate the XML documents.
* Modern day browsers have built-in XML parsers.
* The goal of a parser is to transform XML into a readable code.

Following diagram shows how XML parser interacts with XML document –



* Some commonly used parsers −
  + MSXML (Microsoft Core XML Services) − Standard set of XML tools from Microsoft that includes a parser.
  + System.Xml.XmlDocument − Part of .NET library, containing different classes related to working with XML.
  + Java built-in parser − The Java library has its own parser.
  + Saxon − Saxon offers tools for parsing, transforming, and querying XML.
  + Xerces − Xerces is implemented in Java, developed by open source Apache Software Foundation.

1. (a) Explain an internal valid XML document with example.

(b) Write the differences between DOM and SAX parser in XML.

(c) Explain why XML is NOT a programming language.

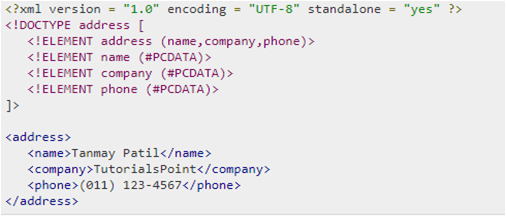
(d) What is a Reference in XML? Explain two types of XML references. [4+4+3+4=15]

Ans.

1. If an XML document is well-formed and has an associated Document Type Declaration (DTD), then it is said to be a valid XML document.

In Internal valid XML documents, elements are declared within the XML files.

Example:



* SAX:

- It is an event-driven online algorithm for parsing XML documents.

- SAX stands for Simple API for XML Parsing.

- It provides interfaces on handlers.

- It does not create any internal structure.

- SAX is developed especially for java programs.

- It implements a model that is memory resident.

- To access data from XML file, SAX follows top to bottom approach.

* DOM:

- It is an official recommendation of the World Wide Web Consortium (W3C).

- It provides interfaces on components of a tree which is a DOM document.

- It creates a tree structure in memory from the input document and then waits for requests from the client.

- It always serves the client application with the entire document no matter how much is actually needed by the client.

- DOM is an open standard.

- The XML file is arranged in a tree fashion.

- DOM supports random access to the data of XML file.

1. XML is not a programming language because:

* A programming language consists of grammar rules and its own vocabulary which is used to create computer programs.
* XML does not qualify to be a programming language as it does not perform any computation or algorithms.
* It is usually stored in a simple text file and is processed by special software that is capable of interpreting XML.

1. **XML References**

* References usually allow to add or include additional text or markup in an XML document. References always begin with the symbol **"&"** which is a reserved character and end with the symbol **";".** XML has two types of references −
  + **Entity References** − An entity reference contains a name between the start and the end delimiters. For example **&amp;** where *amp* is *name*. The *name* refers to a predefined string of text and/or markup.
  + **Character References** − These contain references, such as **&#65;**, contains a hash mark (“#”) followed by a number. The number always refers to the Unicode code of a character. In this case, 65 refers to alphabet "A".

1. (a) What are the differences between SGML, HTML and XML? How are they related with each other?

(b) What is XHTML? Why is it introduced? What are the 2 main reasons for using XHTML?

(c) Write the Tree structure corresponding to the following XML document:

<?xml version ‘ “1.0”?>

<Company>

<Employee>

<FirstName>Rajib</FirstName>

<LastName>Das</LastName>

<Phone>1234567890</Phone>

<Email>[Rajib.Das@xyz.com</Email](mailto:Rajib.Das@xyz.com%3c/Email)>

<Address>

<Street>1 MG Road</Street>

<City>Mumbai</City>

<Zip>400001</Zip>

</Address>

</Employee>

</Company> [5+4+6=15]

Ans.(a) XML is a generic markup language suitable for representing arbitrary data, while HTML is a specific markup language suitable only for representing web pages. HTML and XHTML are both subsets only of SGML, except that XHTML has additional specifications so that it also validates as XML.

HTML and XML are both markup languages (hence the \*ML). XML is a generic markup language suitable for representing arbitrary data, while HTML is a specific markup language suitable only for representing web pages.

Because of this relationship to SGML across HTML and XML, there are a lot of similarities, but they are all considered different languages. However, much of what defines these languages is their restrictions on SGML.

* HTML restricts SGML by defining a list of tags that are allowed to be used.
* XML restricts SGML by not allowing unclosed or empty start and end tags, and forces attributes to be explicit. XML also has a large number of additional restrictions that are not found in SGML.

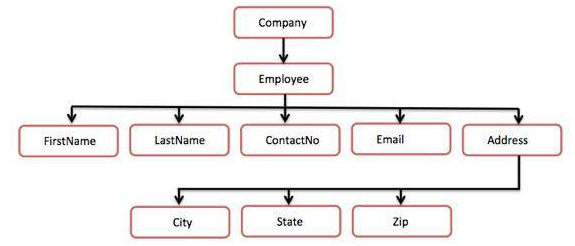
(b) XHTML stands for EXtensibleHyperText Markup Language.

XHTML is introduced to combine the strengths of HTML and XML.

XHTML was developed to make HTML more extensible and increase interoperability with other data formats.

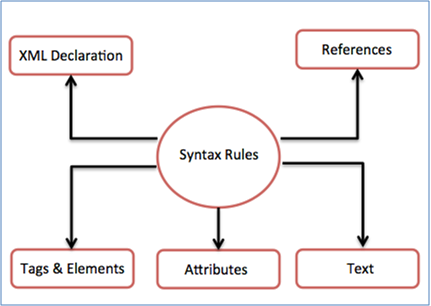
* The two main reasons behind the creation of XHTML are:
  + It creates a stricter standard for making web pages, reducing incompatibilities between browsers. So it is compatible for all major browsers.
  + It creates a standard that can be used on a variety of different devices without changes.

(c) Use the below example:



1. What are the major 5 types of syntax rules in XML? Explain in detail varioustypes of XML syntax rules. [5\*3=15]

Ans. The following diagram depicts the syntax rules to write different types of markup and text in an XML document.



**XML Declaration**

* The XML document can optionally have an XML declaration. It is written as follows −
  + <?xml version = "1.0" encoding = "UTF-8"?>

Where *version* is the XML version and *encoding* specifies the character encoding used in the document.

**Syntax Rules for XML Declaration**

* The XML declaration is case sensitive and must begin with "**<?xml>**" where "**xml**" is written in lower-case.
* If document contains XML declaration, then it strictly needs to be the first statement of the XML document.
* The XML declaration strictly needs be the first statement in the XML document.
* An HTTP protocol can override the value of *encoding* that you put in the XML declaration.

**Tags and Elements**

* An XML file is structured by several XML-elements, also called XML-nodes or XML-tags. The names of XML-elements are enclosed in triangular brackets <> as shown below − <element>

**Syntax Rules for Tags and Elements**

* **Element Syntax** − Each XML-element needs to be closed either with start or with end elements as shown below −<element>....</element>

**Nesting of Elements −**An XML-element can contain multiple XML-elements as its children, but the children elements must not overlap. i.e., an end tag of an element must have the same name as that of the most recent unmatched start tag.

**XML Attributes**

* An **attribute** specifies a single property for the element, using a name/value pair. An XML-element can have one or more attributes. For example −
  + <a href = "http://www.tutorialspoint.com/">Tutorialspoint!</a>

Here **href** is the attribute name and **http://www.tutorialspoint.com/** is attribute value.

**Syntax Rules for XML Attributes**

* Attribute names in XML (unlike HTML) are case sensitive. That is, ***HREF***and ***href*** are considered two different XML attributes.
* Same attribute cannot have two values in a syntax. The following example shows incorrect syntax because the attribute *b* is specified twice
  + <a b = "x" c = "y" b = "z">....</a>
* Attribute names are defined without quotation marks, whereas attribute values must always appear in quotation marks. Following example demonstrates incorrect xml syntax as the attribute value is not defined in quotation marks:
  + <a b = x>....</a>

**XML References**

* References usually allow to add or include additional text or markup in an XML document. References always begin with the symbol **"&"** which is a reserved character and end with the symbol **";".** XML has two types of references −
  + **Entity References** − An entity reference contains a name between the start and the end delimiters. For example **&amp;** where *amp* is *name*. The *name* refers to a predefined string of text and/or markup.
* **Character References** − These contain references, such as **&#65;**, contains a hash mark (“#”) followed by a number. The number always refers to the Unicode code of a character. In this case, 65 refers to alphabet "A".

**XML Text**

* The names of XML-elements and XML-attributes are case-sensitive, which means the name of start and end elements need to be written in the same case.
* To avoid character encoding problems, all XML files should be saved as Unicode UTF-8 or UTF-16 files.
* Whitespace characters like blanks, tabs and line-breaks between XML-elements and between the XML-attributes will be ignored.
* Some characters are reserved by the XML syntax itself. Hence, they cannot be used directly. To use them, some replacement-entities are used, which are listed below

