

Unit-1

Introduction to Web :-

1. The Web is short word for world wide web
2. It is a system of interconnected documents that are accessed with internet.
3. The Web is based on client server architecture where user's web browser acts as client and communicates with server with internet.
4. The Web address also known as URL(uniform resource locator) browser send request to server then its sends back requested web page.
5. Web pages are written in hyper text markup language (HTML)
6. It is a markup language that developers create structured content with linking pages, images.
7. Webpages also include styling & layout information using cascading style sheets (css) & interface behaviour using Javascript.
8. The Web has given rise to various web based technologies such as e-commerce, social media, online education.

Overview of Web technologies:-

1. Web technologies refer to software or tools used to create and maintain websites and web applications.
2. These technologies include programming languages, web development frameworks and web servers
3. common web technologies :-
 1. HTML :- Hyper text markup language (HTML) is the standard markup language used to create webpages.
 2. CSS :- cascading style sheets (css) is a style sheet language used to describe the presentation of document written in HTML.
 3. Java script :- A high-level programming language used to create dynamic web pages.
 4. PHP :- Hypertext Preprocessor is a scripting language used to create dynamic web pages.
 5. python :- A high level programming language used to write programs.
 6. Ruby on rails :- A webdevelopment framework that uses ruby language to create web applications.

React :- A Java script library used to create user interfaces.

Angular :- A type script open source web application framework used to create webpages.

MySQL :- A popular open source relational database management (RDBMS) used for storing & retrieving data.

MongoDB :- A NoSQL database program used for storing and retrieving data.

→ These web-technologies are updating to provide better performance, security.

HTML introduction:

1. HTML stands for hyper text markup language
2. HTML is standard markup language for creating webpages.
3. HTML describes structure of webpages.
4. HTML consists of series of elements.
5. HTML tell how browser should display content.
6. HTML elements label pieces of content such as heading, paragraph, link.

```
<!DOCTYPE html>
```

```
<html>
```

```
<head>
```

```
<title> Title name </title>
```

```
</head>
```

```
</html>
```

<DOCTYPE HTML> :- it is an html 5 document.

<html> :- element is the root element of html page

<head> :- element contains meta information about html page

<title> :- element specifies a title for webpage

Need of HTML :-

1. HTML allows images & objects used to create interactive forms.
2. It creates structured documents by indicating structural explanation for text such as headings, lists, links, paragraphs.

Basic terms of HTML :-

Basic Syntax :- HTML uses tags to structure content.

Tags are written using angle brackets and come in pairs with opening tag & closing tag.

ex:- <p> ... </p>

elements:- HTML elements are made of tags. Elements include headings, images, links.

Attributes:- HTML attributes provide additional information about elements.

Document Structure:- HTML documents have standard structure with head section that contains information about document and body contains visible content.

Semantic Markup:- HTML provides a way to create semantic meaning in web documents used to improve accessibility.

case-insensitivity:-

1. In HTML tag and attribute names are case-insensitive.
2. This means that we can use uppercase or lowercase letters when writing HTML code browser will treat them in same way.

<p> This is a paragraph </p>

<P> This is a paragraph </P>

3. Attributes values are generally case-insensitive although there are some exceptions.

Ex:- 'type' attribute in an input element is case-sensitive

`type = "text"` and `type = "TEXT"` are not equivalent.

4. Many developers choose to use lowercase letters for HTML tags & attributes.
5. HTML5 the latest version of HTML which is new web standard is case insensitive.
6. XHTML is an older version of HTML was case sensitive for lowercase names.

platform independency:-

1. platform independency means it can run on any kind of platforms or OS.
2. It has an ability of using on different operating systems & hardware platforms without modification.
3. HTML is a markup language used to create web pages and designed to be platform independent.
4. HTML code can be interpreted by any device that has web browser installed, regardless of OS or hardware platform it is running on.
5. HTML pages can be viewed on different types of devices such as desktop computers, laptops, tablets, smartphones, smart TVs.

- 6. The platform independency of HTML is a essential feature of language.
- 7. The content in HTML helps to ensure that webpages are accessible to users with different types of devices such as mobile devices with small screens.
- 8. HTML is a platform independent technology helped to make world wide web accessible to users.

Doctype declaration:-

- 1. All HTML documents must start with a `<!DOCTYPE>` declaration.
 - 2. It is followed by document type such as HTML, HTML5, XHTML, XHTML5.
- Eg:- `<!DOCTYPE html>`
- 3. This doctype declaration is used for HTML5 document which is current version of HTML.
 - 4. The doctype declaration in HTML is a declaration that specifies the version of HTML or XHTML that webpage is using.
 - 5. It is placed at very beginning of HTML document before `<html>` tag & informs the browser how to interpret the page.

Types of elements :-

1. An HTML element is defined by start tag, some content, end tag.
2. There are several types of elements can be used to structure and display content on web page

HTML elements :-

1. Headings :- There are 6 levels of headings (h1 to h6) used to define importance of content.
2. Paragraphs :- The "p" element used to define a paragraph of text.
3. Lists :- HTML supports ordered lists (ol) and unordered lists (ul) for displaying list of items.
4. Links :- <a> The 'a' element used to create link to other pages or resources.
5. Images :- The "img" element is used to display images on web page.
6. Tables :- The 'table' element used to create tables with rows & columns. Table cells are defined using 'td' & 'th' elements.

Forms:- <form> The "form" element used to create forms for user input. It contains text, inputs, radio buttons, checkboxes.

Divisions:- <div> The "div" element used to group and organize content within web page.

span:- The "span" is used to group and apply styles to inline elements.

head:- <head> The "head" element contains metadata about webpage i.e title and links to stylesheets.

Body:- <body> The "body" element contains main content of web page.

HTML elements - attributes:-

1. An HTML elements have attributes that provide additional information about element or modify its behaviour.
2. Attributes are added to an element's opening tag and written as name value pairs separated by equal sign.

name = "value"

id :- This attribute provides a unique identification for HTML element on webpage.

href :- The href attribute specifies the URL of the page.

src :- The src attribute specifies the URL of external resource such as image or script.

```
<img src = "img-gui1.jpg">
```

class :- Specifies one or more class names for an element used to apply styles to multiple elements at once.

width and **height** :- The tag should also contain the width & height attributes (pixels).

```
<img src = "img-gui1.jpg" width = "500"  
height = "600">
```

alt :- Specifies alternative text for an image which is displayed if image cannot displayed.

```
<img src = "img-gui1.jpg" alt = "girl with  
Jacket">
```

style :- Style attribute used to add styles to an element such as color, font.size.

<p style="color: red; > This is paragraph. </p>

lang :- include the "lang" attribute inside <html> to declare language of webpage.

```
<!DOCTYPE html>
<html lang="en">
  <body>
    ...
  </body>
</html>
```

title :- title attribute defines some extra information about element.

<p title =

Metadata element :-

1. Metadata is data (information) about data.
2. <meta> tag always go inside <head> element.
used to specify character set.
3. Metadata will not be displayed on page.

Metadata elements:-

<title> :- This element is used to define the title of document appears in browser's title bar.

<meta charset = " " > :- This element is important for displaying non ASCII characters correctly.

< meta name = "description" content = " " > :- This element specifies brief description about document.

< meta name = "Keywords" content = " " > :- This element specifies a common separated list of keyword that are relevant to document.

Sectioning elements:-

1. A section is a semantic element for creating sections in web page.
2. These sections should be made up of related content.
3. The section element should only use if there is more specific element to represent related content.

Sectioning elements

<header> :- This element is used to define the header of document.

<nav> :- used to define navigation links.

<section> :- describes section of document that is grouped together.

<article> :- describes piece of content.

<footer> :- describes footer of document it contains copyright, contact details or other closing content.

Paragraph element :-

→ A paragraph element is made up of content text, images or other content. that appears b/w an opening tag & closing tag `<p> ... </p>`

→ A paragraph always starts on new line and browser automatically add some white spaces before & after paragraph.

`<p> paragraph </p>`

Division & Span elements:-

- <div> :- The div tag is known as division tag
→ The div tag is used to make divisions of content on web page like (text, images, etc)
→ Div tag has both opening (<div>) and closing </div> tags and it is mandatory to close tag.

```
<!DOCTYPE html>
<html>
  <head>
    <title> Div tag </title>
    <style>
      div {
        color: white;
        background-color: #009;
        margin: 2px;
        font-size: 25px;
      }
    </style>
  </head>
  <body>
    <div> div tag </div>
    <div> div tag </div>
  </body>
</html>
```

 tag:- The span element is a inline container for inline elements and content.

- Used to group elements for styling purposes.
- Span tag is very similar to div tag, but div is a block-level tag and span is inline tag.

```
<span class = " " > Some text </span>
```

```
<!DOCTYPE html>
<html>
<body>
    <h2> WELCOME TO Geeks </h2>
    <p>
        Geeks for Geeks is a
        <span style = "color : red">
            computer science
        </span> portal for
        <span style = "background-color : light green">
            Geeks
        </span>
    </p>
    </body>
</html>
```

List element :- lists allow web developers to group a set of related items in lists.

unordered list :-

1. An unordered list starts with `` tag.
2. Each list item starts with `` tag.
3. The list items will be marked with bullets (small block circles).

Ex:- ``

` coffee `

` Tea `

` milk `

``

Output:-

• coffee

• Tea

• milk

Ordered list :-

1. An ordered list starts with `` tag.
2. Each list item starts with `` tag.
3. The list items will be marked with numbers.

Ex:- `<!DOCTYPE html>`

`<html>`

`<body>`

`<h2> An ordered list </h2>`

``

` coffee `

` milk `

` </body> </html>`

Description lists:-

1. A description list is a list of terms with a description of each term.
2. The `<dl>` tag defines the description list.
`<dt>` tag defines the name
`<dd>` tag defines each term

Ex:-

```
<!DOCTYPE html>
<html>
<body>
<h2> description list </h2>
<dl>
    <dt> coffee </dt>
    <dd> black hot drink </dd>
    <dt> milk </dt>
    <dd> white drink </dd>
</dl>
</body>
</html>
```

Link elements:-

1. The `<link>` tag defines the relationship b/w the current document and external resource.
2. The `<link>` tag is used to link to external style sheets.
3. The `<links>` element is empty element, it contains

attributes only.

```
<head>
<link rel = "stylesheet" href = "style.css">
```

```
</head>
```

Character entities:-

1. Character entities are used to display reserved characters in HTML &# entity-number

2. To display less than sign(<) we write(<) or <. An entity name is easy to remember.

& entity-name;

or

&# entity-number;

| symbol | description | Name | number |
|--------|-----------------------|---------|---------|
| < | less than | <; | <; |
| > | greater than | >; | >; |
| & | ampersand | &; | &; |
| " | double quotation mark | "; | "; |
| ' | single quotation mark | '; | '; |
| © | copyright | ©; | ©; |
| ® | trademark | ®; | ®; |

```
<!DOCTYPE html>
<html>
<body>
<h1> Entity example </h1>
<h2> copy right sign: &copy; </h2>
</body>
</html>
```

→ Entity names are case sensitive

HTML Global attributes:-

1. accesskey :- specifies a shortcut key to activate focus on element.
2. class :- specifies one or more classnames for an element.
3. contenteditable :- specifies whether the content of an element is editable or not.
4. data* :- used to store custom data.
5. dir :- specifies the text direction.
6. draggable :- specifies whether an element is draggable or not.
7. hidden :- specifies than an element is not yet

id :- Specifies a unique id for element.

lang :- Specifies the language of element.

style :- Specifies the inlinecss style for element.

title :- Specifies extra information about element.

translate :- Specifies whether the content of element is translated or not.

Creating table elements :-

1. The `<table>` tag defines HTML table.
2. An HTML table consists of one `<table>` element and one or more `<tr>`, `<th>`, `<td>` elements.
3. The `<tr>` element describes table row.
`<th>` element describes table header
`<td>` element describes table cell.
4. The table also contains
 - `<caption>`
 - `<colgroup>`
 - `<thead>`
 - `<tfoot>`
 - `<tbody>`

```
<!DOCTYPE html>
```

```
<html>
```

```
<head>
```

```
<style>
```

```
table, th, td {
```

```
border: 1px solid black;
```

```
}
```

```
</style>
```

```
<head>
```

```
<body>
```

```
<h1> The table element </h1>
```

```
<table>
```

```
<tr>
```

```
<th> Month </th>
```

```
<th> Savings </th>
```

```
<tr>
```

```
<td> January </td>
```

```
<td> 100 </td>
```

```
<tr>
```

```
<td>
```

```
February </td>
```

```
<td> 80 </td>
```

```
</tr>
```

```
</table>
```

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

The table element

| Month | Savings |
|----------|---------|
| January | 100 |
| February | 80 |

Table elements :-

Rowspan & colspan :-

colspan :- To produce more than 1 column merge multiple rows.

```
<!DOCTYPE HTML>
```

```
<html>
```

```
<head>
```

```
<style>
```

```
table, th, td {
```

```
border: 1px;
```

```
border-collapse: collapse;
```

```
}
```

```
</style>
```

```
<thead>
```

```
<body>
```

```
<h1> colspan </h1>
```

```
<table>
```

```
<tr>
```

```
<th colspan="2"> Name </th>
```

```
<th> Age </th>
```

2.1.3

<td> Smith </td>

<td> 43 </td>

</tr>

<tr> Jack </td>

<td> 57 </td>

</tr>

<table>

<tbody>

<tr>>

colspan

| Name | Age |
|-------|-----|
| Smith | 43 |
| Jack | 57 |

rowspan :- To extend row over multiple columns

<tr>> <td rowspan="2">

<td>

<td>

<td>

table, th, td {

border: 1px;

border-collapse: collapse;

}

<style>

<head>

<body>

<tr> rowspan <th>

<table>

<tr>

<th> Name </th>

<td> Jill </td>

<tr>

<th rowspan="2">phone

<th>

<td> 555-1234 </td>

<tr>

<tr>

<td> 555-8754 </td>

<tr>

<table>

<tbody>

<tr>>

| | |
|-------|----------|
| Name | Jill |
| phone | 555-1234 |

555-8754

Boorder :- The boorder is used to set a visible boorder width to himi elements in body.

Types of boorder :-

dotted :- defines dotted boorder

dashed :- defines dashed boorder

Solid :- defines solid boorder

double :- defines double boorder

none :- defines no boorder

hidden :- defines hidden boorder

cell padding :-

→ cell padding is the space b/w the cell edges and cell content.

→ By default the padding is set to 0.

→ To add padding on table cells we use padding property.

<html>

<head>

< style >

table, th, td {

boorder = 1px;

}

th, td {

padding = 15px;

```
</style>
```

```
</head>
```

```
<body>
```

```
<h1> cell padding </h1>
```

```
<table>
```

```
<tr>
```

```
<th> First name </th>
```

```
<th> Last name </th>
```

```
<th> Age </th>
```

```
<tr>
```

```
<tr>
```

```
<td> A </td>
```

```
<td> a </td>
```

```
<td> 10 </td>
```

```
</tr>
```

```
<tr>
```

```
<td> B </td>
```

```
<td> b </td>
```

```
<td> 20 </td>
```

```
</tr>
```

```
</table>
```

```
</body>
```

```
</html>
```

| First name | Last name | Age |
|------------|-----------|-----|
| A | a | 10 |
| B | b | 20 |

Cell spacing:- Cell spacing is the space b/w each cell

- By default cell spacing is set to 2 pixels
- We use border spacing on table element.

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

```
table, th, td {
```

```
    border: 1px;
```

```
}
```

```
</style>
```

```
<body>
```

```
<table> {
```

```
    border-spacing: 30px;
```

```
<th> First name </th>
```

```
<th> Last name </th>
```

```
<th> Age </th>
```

```
<tr>
```

```
<td>
```

```
A </td>
```

```
<td>
```

```
a </td>
```

```
<td>
```

```
10 </td>
```

```
</tr>
```

```
<tr>
```

```
<td>
```

```
B </td>
```

```
<td>
```

```
b </td>
```

```
<td>
```

```
20 </td>
```

```
</tr>
```

```
<table>
```

```
<body>
```

```
<html>
```

Creating form elements:-

The <form> element can contain one or more of form elements.

i, input:- The input element can be displayed in several ways depending on type attribute.

<form>

<body>

<div> <input element> </div>

<input type = "text"> → creates single line text input.

<input type = "password"> → creates password input field.

<input type = "radio"> → creates radio button for selecting 1 option from choice.

<input type = "checkbox"> → creates checkbox for selecting multiple options.

<input type = "submit"> → creates submit button for submitting the form.

ii, label:- The <label> tag defines label element for input element.

```
<html>
<head>
<title> Simple form </title>
</head>
<body>
<h1> Simple form </h1>
<form action = "submit" method = "post">
<label for = "username"> Username </label>
<input type = "Text" id = "username" name = "username">
<br> <br>
<label for = "password"> Password </label>
<input type = "password" id = "password" name = "password">
<br> <br>
<label for = "email"> Email </label>
<input type = "email" id = "email" name = "email"> <br>
<label for = "gender"> Gender </label>
<input type = "radio" id = "male" name = "gender" value = "male" checked="checked"/>
<input type = "radio" id = "female" name = "gender" value = "female"/>
<input type = "Submit" value = "Submit">
</form>
</body>
</html>
```

Input elements:-

Attributes:-

1. Value attribute:- The input value attribute specifies initial value.

```
<html>
```

```
<body>
```

```
<form action = "action-page">
```

```
<label for="fname"> First name <label>
```

```
<br>
```

```
<input type = "text" id = "fname" value = A>
```

```
<input type = "submit" value = "submit.">
```

```
</form>
```

```
</body>
```

```
</html>
```

First name:

A

submit

2. Readonly attribute:- The input readonly attribute specifies that input field is read only.

→ A readonly input field cannot be modified.

3. Disabled attribute:- The input disabled attribute specifies that input field should be disabled.

→ A disabled input field is inactive.

4. Size attribute:- The input size attribute specifies the visible width.

→ The default size is 20.

5. Max length attribute:- The input max length attribute specifies the maximum no:of characters allowed in input field.

6. Multiple attribute:- The input multiple attribute specifies that user is allowed to enter more than one value in input field.

7. Required attribute:- The input required attribute specifies that input field must be filled out before submitting the form.

color & date pickers:-

We can use `<input type = "color">` for color pickers
`<input type = "Date">` for date pickers.

color picker:-

`<label for = "color"> Red </label>`

`<input type = "color" id = "color" name = "color">`

Date picker :-

- <label for="date"> select date </label>
- <input type="date" id="date" name="date">
- color picker may show as a color wheel or a dropdown with color options.
- Date picker may show as a calendar or text input depending on browser support.

<html>

<head>

<title> color and Date pickers </title>

</head>

<body>

<label for="color"> choose color </label>

<input type="color" id="color" name="color">

<label for="Date"> choose date </label>

<label for="Date" id="Date" name="Date">

<input type="Date" id="Date" name="Date">

</body>

</html>

Select and datalist elements :-

Select :- it creates a dropdown list of options where users can select one or more values from set of options.

```
<label for="select element"> choose option </label>
<select id="select element" name="option">
    <option value="option 1"> option 1 </option>
    <option value="option 2"> option 2 </option>
</select>
```

Datalist :- It provides list of predefined options on element.

→ When users type into the input they will see the suggestions.

```
<label for="Datalist"> choose from list </label>
<input list="options" id="input element" name="Select option">
<datalist id="options">
    <option value="option 1">
    <option value="option 2">
</datalist>
```

Editing elements:- The ability to edit elements depends on the type of element and its attributes.

Common ways to edit elements:

1. Input fields:- use <input> elements with appropriate types such as text, number, email, allow users to input and edit data directly.
2. Text area:- use <text area> elements to allow users to input and edit directly.
3. contenteditable attribute:- Add the contenteditable attribute to any HTML element to make it editable by users.
4. editable Regions:- use the "design mode" property in Java script to make entire document (or) specific element to be editable.

Media:- We can embed various types of media content as images, audio, videos and iframes using specific elements.

1. Image:- use the element to display images.
→ we specify the image source using 'src' attribute

```

```

2. Audio :- use the `<audio>` element to embed audio files.

→ we can specify the audio source using 'src' attribute.

`<audio>`

`<source src = "audio.mp3" type = "audio">`

`</audio>`

3. Video :- use the `<video>` element to embed video files.

→ we can specify the video source using the 'src' attribute.

`<video>`

`<source src = "video.mpu" type = "video">`

`</video>`

4. Iframes :- use the `<iframe>` element to embed another HTML document with current document.

`<iframe src = " - "></iframe>`

Why HTML security :-

1. HTML security is important because HTML is a fundamental block of web pages & applications.

8. Security vulnerabilities in HTML can lead to various cyber threats and cross site scripting attacks.

3. These attacks can steal sensitive data to launch malicious activities.

4. So security for HTML is important for user information.

HTML injection:- It is a type of attack where the malicious code is permanently stored on target server.

Types of HTML injections-

1. Stored XSS injection:-

1. The malicious code is permanently stored on the server.

2. When others users access the page the code executes in their browsers.

2. Reflected XSS:- Reflected XSS is a type of cyber attack where a malicious script is sent to website then reflected back to user's browser and finally executed.

3. Dom based XSS:- "The Dom based XSS injection occurs within the document Object model.

4. Blind XSS:- The blind XSS injection is the attacker injects malicious code into web application client side Template injection; The client side template injection occurs within the client side templates.

Clickjacking:- Clickjacking is an attack that makes users into thinking they are clicking on one thing when they are actually clicking on other. → The other name is user interface redressing.

Types of Clickjacking:-

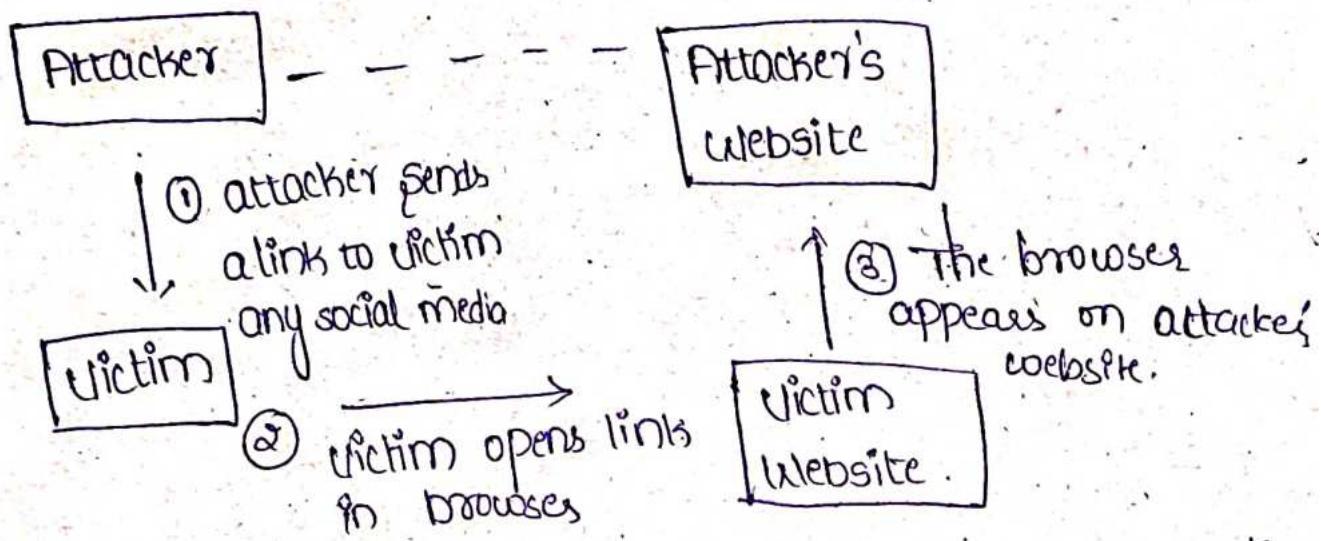
1. Likejacking:- Likejacking tricks social media users into liking things which they don't want to do.

2. cursorjacking:- cursorjacking changes the user's cursor position to a different place.

3. Filejacking:- Filejacking allows the attacker to access the victim's local file system & take files.

Ways for clickjacking prevention:-

1. Do not download any suspicious apps
2. Avoid clicking on facebook ads
3. Install anti clickjacking browser extensions
4. Use robust antivirus



HTML 5 attributes:- It provides additional information or functionality of html elements.

1. id :- specifies a unique identifier for an html element.
2. src :- specifies an URL for an external resource.
3. href :- specifies an external link to navigate using anchor tag `<a>`
4. alt :- specifies an alt description for image when image is not displayed.

Required:- Specifies that mandatory & should fill.

Placeholder:- Specifies an short hint that describes the expected value for input field.