Application

1. Every application is having two important components.
    a. Front end
    b. Back end
2. The component of an application which is visible to the user is referred as front end/ user interface.
3. The component of an application which is hidden from user is referred as back end.
4. As a programmer we use Java to develop Back end of an application and web technologies to develop front end of an application.
5. The combination of front-end development and back-end development is called as full-stack-development.

Design & Development

1. As a programmer we have to design the application first and later convert it into an coding.
2. To convert design into coding, we make use of editors.
3. To work with web technologies programmers using "edit plus" as an editor.
4. To install edit plus follow the below steps.
    a. Double click on exe file of edit plus software.
    b. Click on Accept button.
    c. Check the program directory for c drive and then click on start copy.
    d. Click on OK for successful installation.

HTML

1. HTML stands for Hypertext Markup language.
2. Each language will be having their own representation.
    - The representation of HTML is technically referred as "tags".
    - All the tags must be represented using angular brackets. "<tagname>"
    - Opening tag --- <tagname>
    - Closing tag ----- </tagname>
3. Template is a format which is common and fixed for all programmers.
4. The html template starts with <html> tag and ends with </html>.

```
<html>
    <head>
        <title> Document </title>
    </head>
    <body>

    </body>
</html>
```

1. <html> tag ---> The combination of <head> tag & <body> tag is called as HTML Program, which is represent by <html> tag. As a programmer we are calling <html> tag as a root element.
2. <head> tag --> It consists of coding which is responsible to appear on the header section of web page. It is used to mention information about the web page.
3. <body>tag --> It consists of coding which is responsible to appear on the body section of the web page.
4. <title> tag --> It is used to mention or modify tab name of the browser.

Note: The main purpose of web browser is read html file and display it.
<!doctype> it is used to mention the html version for particular file.

HTML forms

As a programmer we used html forms to take values from users into the application.
Programmatically html forms consists two important components.

a. Label
b. Input box.

Labels are the directions provided for users to enter appropriate data whereas input is the actual data which is provided by the user.
Labels are indicated by using <label></label> and to get data from user we have to create input-box and it is represented by using <input></input>.
Break tag ----> It is used to shift the content on the next line. It is represented by
</br>.
Non-breaking space ---> It is used to create space between two html contents & it is represented by " ".
To create HTML forms we have to use "<form></form>" tag.
For example:

```
<form>
    <label>Mobile Number</label>  
        <input ></input>
    <br></br>
</form>
```

To restrict the user and to create different type of input fields on the web-browser programmer have to use "type" attribute with <input> tag.
Attribute means it is special kind keyword which is giving extra information about HTML tags.
For example:

```
<input type = "number"></input>
```

By default if programmer doesn't used "type" attribute with <input> tag then it have default value as "text".

Input type	Behaviour
1. <input type = "text">	User can enter alphabets, numbers and special symbols.
2. <input type = "number">	User can enter only numbers.
3. <input type = "password">	User can enter alphabets, numbers and special symbols but all will be replace by solid sphere.
4. <input type = "submit">	User can submit the form by clicking on it.
5. <input type = "radio">	User will be given with radio button which results in single selection.
6. <input type = "checkbox">	User will be given with check box which result in multiple selections.
7. <input type = "date">	User can give the date in the format dd-mm-yyyy and also gets the calendar view.
8. <input type = "reset">	User can clear the values which entered by them.
9. <input type = "month">	User will get the calendar with only month & year.
10. <input type = "time">	User will get the option to enter the time with different values.
11. <input type = "email">	User can enter valid email-Id in particular input box.

12.	<input type = "file">	User will get option for uploading the file.
13.	<input type = "search">	User will get search bar.

- By default all radio buttons will be having multiple selections but as a programmer to make radio button as a single selector, we have to maintain same values for "name" attribute.

  For example : <input type = "radio" name = "gender">Male</input>
  <input type = "radio" name = "gender">Female</input>

- To change the name of submit button with <input> tag programmers are using "value" attribute.

  Note - 1. as a programmer we can't pass "year" as a value for type attribute.
  b. Date value of type attribute will show the date format depends on users system.

- To make the field as mandatory we should make use of <form> and required attribute within <input>.
- To create watermark on the input box we make use of "placeholder" within <input>
- As a programmers by using "disabled" attribute we can disable HTML elements on the browser. Disable means user can see the html element but unable use it.

  Note - To make any HTML element enabled programmer have to take help of JavaScript code.

  For example -
  <input type = "password" required placeholder = "Enter the password " disabled></input>

TextArea

- It is used to collect larger amount of data from the user.
- As a programmer we can change / expand the dimension of textarea by using following two attributes.
  a. Rows
  b. Cols
- Rows is used to change the height of textarea and represent no. of rows present in it.
- Cols is used to change the width of textarea and represent no. of columns present in it.
- For example :
  <textarea rows = "10" cols = "30"></textarea>

Note: <input> is preferred to collect smaller amount of data from user whereas <textarea> is used to collect larger amount of data from user.

Datalist --->

It is a set of options which will be displayed depending on the users input/data.
In order to work with datalist, programmers have to follow below steps.

- Crate a box using <input> where user can provide the data.
- Create the set of options by using <datalist></datalist> & <option></option>.
- Combine all the options into the input box by providing "id" attribute for <datalist> and "list" attribute for <input>, where id attribute and list attribute must have same values/identifiers.
- For example:
  <label>Enter the state</label>

```
<input list = "state"></input>

<datalist id = "state">
    <option>Telangana</option>
    <option>Andra Pradesh</option>
    <option>Karnataka</option>
    <option>Maharashtra</option>
    <option>Bihar</option>
</datalist>
```

Dropdown list

- It is the input control where user can only select the option.
- In order to create dropdown list, programmers have to make use of <select> tag & <option>tag.

For example:

```
<label>Select State</label>
    <select>
        <option>TS</option>
        <option>MH</option>
        <option>AP</option>
    </select>
```

Difference between datalist & dropdownlist

Pattern Attribute:

- It is used to provide the conditions for user to take input.
- To write condition in the pattern attribute we need two important components. "[]{}".
- [] is used mention contents.
- {} is used mention length of contents.
- As a programmer we can separate maximum & minimum length in {} by using ",".

For example - pattern for mobile Number

```
<input type = "text" pattern = "[0-9]{10}"></input>
```

Note : pattern attribute will work only with type = text & type = password.

- Pattern for to accept 4 digit OTP.
  Ans ---> <input pattern = "[0-9]{4}"></input>
- Pattern for Pancard ---> ASDFG1234A
  Ans ---> pattern = "[A-Z]{5}[0-9]{4}[A-Z]{1}"

3. Pattern for aadhar card number (1234 5678 7890)
   Ans ----> pattern = "[0-9]{4}[ ]{1}[0-9]{4}[ ]{1}[0-9]{4}"
4. Pattern for Password ---> must starts with uppercase alphabet followed by lowercase alphabets , it must contains at least 2 digits and it should end with special symbol.

   Ans ---> pattern = "[A-Z]{1}[a-z]{1,}[0-9]{2,}[@]{1}"

5. Pattern for Password ---> must starts with uppercase alphabet , must contains lowercase alphabets and at least 2 digits and it should end with special symbol.

```
Pattern = "[A-Z]{1}[0-9 a-z]{2, }[@#$_&]{1}"
```

6. Pattern for Password ---> must contain uppercase & lowercase letters along with digits and symbols and password length should be greater than 8.

```
Pattern = "[A-Za-z0-9@#$&_]{9,}"
```

Multimedia tags.

- Programmer prefer multimedia tags in order to provide advertisement on the browser.
- <img> is used to provide images on the browser. It takes four attributes as following.
  i. src : It stands for source attribute which is basically used to provide image filename/ path.
  ii. Width & height : They are used to control the dimension of the image.
  iii. alt : It is stands for "alternate text" used to specify some kind of message if given file name does not exists.
  iv. <img src = "image.extension" width = "100" height = "100" alt = "not found"></img>

  Note: If image and html file is present at different location then for src attribute pass the "path of image".
- <video> & <audio> is used to specify video files and audio files on the browser. The common attribute between tags are "src" & "controls" where controls is used display pause, play buttons for the audio & video.
  Note: As a programmers we can change dimension of video and image by using width & height attribute but it's not best practice.
- For example -

```
<video src = "video.extension" controls></video>
```

HTML Tables

- To overcome from the drawback of html forms, programmers have to use of HTML tables.
- It is used to give the proper alignment to the HTML elements.
- To work with html tables firstly programmers have to decide no. of rows and no. of columns.
- <table> is used to create table.
- <tr> is used to create rows of table, where tr stands for table row.
- <td> is used to create columns of table, where td stands for table data.
- <th> is used to give table heading/ to represent table content into bold format & in center of column. It is stands for "table heading".
- For example -

```
<table>
    <tr>
        <td>Phone number</td>
        <th><input></input></th>
    </tr>
</table>
```

- Colspan attribute is used to combine the columns of table.
  Note: Programmer can use colspan only with <th> & <td>.
- For example.

```
<table>
    <tr>
        <th colspan = "2"></th>
    </tr>
    <tr>
        <td></td>
        <td></td>
    </tr>
</table>
```

Text formatting tags --->

- : It stands for emphasis tag. It is used to make the text contents appear in italic format on the web page.
- : It is used to represent text contents in bold format on the web page.
- <mark> : It is used to highlight the text content by providing yellow background colour. It can be change by using css property.
- : It is used to represent the content at the centre of web browser. But it is outdated tag.
- <ins> : It stands for insertion tag . To give the underline for the text content on the webpage.
- <del> : It stands for deletion tag . It used to give strike on the text contents.

g. : Sup stands for superscript which is used to provide the contents above the text.

h. : Sub stands for subscript which is used to provide the contents below the text

i. <marquee></marquee> : It is used to represent text in scrolling format on the web browser.

It takes two attributes:

a. Scrollamount ----> to control the speed of scrolling of given text.

b. Directions ---> to change the direction of scrolling we used this attribute. It accepts four values left, right, up ,down.

For example

```
<marquee scrollamount = "10"  direction = "up">Sample text</marquee>
```

j. <small> : It is used to decrease the font-size of text contents.

k. <big> : It is used to increase the font-size of the text contents.

l. : It is used to create paragraph on the web pages

m. Heading tags

a. To provide Headings on the browser programmers using heading tags.

b. By using following tags we can provide different kinds of headings.

```
<h1></h1>
<h2></h2>
<h3></h3>
<h4></h4>
<h5></h5>
<h6></h6>
```

c. <h1> gives the largest font-size which is possible in html and also make the contents to appear as bold whereas <h6> gives the smallest font-size possible in html.

d. From <h1> to <h6> font size is decreasing but it makes the contents to appear as bold.

Note:

a. If <small> is combined with <h1> to <h6> then font size will be decrease by 15% comparing to the original text.

b. If <big> is combined with <h1> to <h6> then font size will be increase by 15%comparing to the original text.
c. <h1> to <h6> provides the text contents on the next line without using
.

Hyperlink ---->

a. To link one HTML file with Another HTML file programmers using hyperlink concept.
b. To create the hyperlinks in HTML programmers can use three ways.
    a. Text content
    b. Buttons
    c. Images
c. Hyperlinks can be created by using anchor tag, representation of anchor tag is <a>.
d. It takes two important attributes.
    a. Href - used to mention the next html file name / url which has to be displayed after user clicks.
    b. Target - used to open the hyperlink in the new tab of the browser and takes value as "blank".
e. For example:

```
<a href = "html file name" target = "blank">New User?</a>
```

Note: anchor tag will not work with <form> tag.

Favicons

1. As a programmer we used favicons to provide icons for header section of webpage.
2. Web designers are responsible to create the icons.
3. To create the icons as a programmer we are going to use "favicon-generator.org" website.
4. The steps to work with favicons.
    a. Go to the above website and choose the image file which has to be converted into icon.
    b. Select the file and then click on create favicon button.
    c. Download the generated favicons and extract the icon into the same folder where html file is present.
5. All the icons can be attached to the html file by using <link></link> tag.
    a. It takes two attributes rel and href .
    b. Rel stands for relation which indicates the type of relation which being attach with html file.
    c. Href stands for hyperlink reference which takes icon file name with extension.
    d. For providing the icon programmer passing "icon" as value for rel attribute.
6. For example

```
<link rel = "icon" href = "favicon.ico"></link>
```

Note:

7. Attribute means special kind of keywords which are giving extra information about the html tags.
8. If html files and favicon present in separate folders then for href attribute pass full path of favicon.

HTML List:

1. Programmers prefer Html lists concept to provide different form of "bullets" for the text contents.
2. To list down the html content or text content on web browser, programmers prefer HTML lists.
3. HTML Lists are two types
    a. Ordered list
    b. Unordered list

4. Ordered list - It is represented by using <ol> and on the browser in the form of numbers.
5. Unordered list - It is represented by using <ul> and on the browser in the form of "solid circle".
6. The text which is associated along with any form of bullets is technically referred as "list item" and it is represented by using <li>.
7. As a programmer we can change bullets or remove them by using css properties called it as "list-style-type" for it we can pass different values mentioned as below.
   a. For unordered list programmer can pass value as solid, circle & square values.
   b. For ordered list programmer can pass value as number, upper-alpha, lower-alpha, upper-roman, lower-roman values.
   c. To remove bullets from <ul> and <ol> programmer can pass "none" value.
8. For example-

```
<ul style = "list-style-type : circle">
    <li>first item</li>
    <li>second item</li>
</ul>
```

<fieldSet></fieldSet>

1. It is used give the different formats to the HTML form elements as well as programmer can take input from user.
2. Fieldset is used to represent the group of different fields at one place & it is easier to understand.
3. By default fieldset will extends from starting corner of browser to ending corner.
4. In order to reduce dimension of the feildset programmer have to make use of css properties like "height" & "width" in the "style" attribute.
5. To measure width & height in the css programmers using "pixel" as measurement unit which represented by "px"
6. For example - <fieldset style = "width : 100px ; height : 20px">
7. <legend> is used to provide the content on the line of the fieldset.
8. In order to take the data from user programmers have to make use of <input>.
9. To disappear input box on the browser, we have to make use of css properties as "border : 0px" & "outline : 0px"
10. For example:

```
<fieldset style = "width : 100px ; height : 20px">
    <legend>Email-Id</legend>
        <input style = "border:0px ; outline:0px"></input>
</fieldset>
```

Note: When user click on input tag thick line will appear around the input box it is called as "outline".

a. This tag is used to create different sections on the web-browser for navigation bar , advertisement, display the information, etc.
b. To work with div tag programmers have to make use of css properties like height, width, background-color and float.
c. Height & width are used to change the dimension of div tag.
d. Background- color is used to provide background for div tag.

e. Float is used to fix div tag position. Float css property is mandatory for div tag.
f. For float css property we can pass two values ---> left & right.
g. For example :

```
<div style = "height : 100px ; background-color : blue ; float : left">
        <h1>Section on the browser</h1>
</div>
```

Cascading Style Sheet

1. CSS stands for cascading stylesheets.
2. Programmers prefer css because to enhance the html content/ output on the browser.
3. Css coding can be done in Three ways.
   a. Inline css
   b. Internal css
   c. External css
4. Inline css coding is done by using "style" attribute with in html tag.
   For example : <label style = "color : red">UserName</label>
5. In internal css coding, all the properties and its corresponding values are given within "<style></style>", which must be written in html file inside "<head></head>".
   For example:

```
<style>
    Tagname
    {
        Css-property1 : value1;
        Css-property2 : value2
    }
</style>
```

6. In external css coding, all properties and its corresponding values are given in "separate css file" and linked with html file by using "<link></link>"
   a. <link> consists of two attributes
      i. rel = "stylesheet"
      ii. Href = "css-filename.css"
   For example:
   <link rel = "stylesheet" href = "cssfilename.css"></link>
7. If all the three types of css coding are applied together then priority will be
   Inline >> internal >> external
8. In all the three types of css coding common factor is "usage of properties and its corresponding values."
9. Syntax to define css-properties in internal & external css coding.

```
Selector
{
    Css-property1 : value1 ;
    Css-property2 : value2
}
```

- Types of Selector
  a. There are three types of selectors
     i. Tag-name selector
     ii. Id selector
     iii. Class selector

b. Id selector - It is basically preferred only if css has to be applied on only one html tag. The rules to be followed for ID selector are .
   i. Declare "id" attribute to the html tag to which css has to be applied.
      For example = <mark id = "abc" ></mark> in css file "#abc"
   - All the id's in css file will be represented with "#" followed by identifier given in html file.

   Note: Since ID selector applies only for one html tag, hence it is called as "Unique selector".
c. Tag Name selector - It is also called as "element selector". It applies the css for all the tags which is specified in css file.
   For example : if programmer use 5 tag then for all them same css property get applied.
d. Class selector - It is used to applies the css for more than one tag but not for all tags.
   The rules to be followed to work with class selector are
      i. Declare "class" attribute with same identifier for the html tags.
      ii. Class selector is represented in the css file by using ".(dot)"
   For example :
   <mark class = "abc">This is mark</mark>
   <label class = "abc">This is label</label>
      In css file ".abc"

- CSS Properties

i. Text-shadow
   This is used to create shadow around the given text contents. It takes four different values.
   i. Represents horizontal distance.
   ii. Represents vertical distance.
   iii. Represent the blur amount
   iv. Represents the shadow color

   Note. - If horizontal and vertical distance is 0px then shadow and original text content will be in the same position.

   For example -
   Label
   {
      Text-shadow : 0px 0px 10px red
   }

ii. Color :
   This property is used to change the color of the text contents.
   For example :
   Mark
   {
      Color : red
   }

3. Box-shadow:
   a. This property is used to give the shadow effect to the text box.
   b. It works same as text-shadow, the only difference is text-shadow is used to give shadow for text-content and box-shadow is give shadow around text box.
   c. For example:
      Input
      {
         Box-shadow : 0px 0px 10px red

}

4. Border-radius :
   a. It is used to convert sharp edges corners into curved edges for the html elements.
   b. It accepts value in pixel format, as a programmer we can pass only one value for this property or it will accepts 4 values at a time.
   c. The four values are as follows ---->
      i. Represents left-top corner
      ii. Represents right-top corner
      iii. Represents right-bottom corner
      iv. Represents left-bottom corner
   d. For example

```
Input
{
    Border-radius : 0px 10px 0px 10px or border-radius : 10px
}
```

5. Font-size

   It is used to increase or decrease the size of text contents, as an value use number in the form of pixel.

   For example:

```
Label
{
    Font-size : 50px;
}
```

6. Font-weight

   It is used to make text contents appear in the bold format on browser, as an value specify "bold". If programmer want to remove bold effect from text then pass "normal" value.

   For example:

```
Small
{
    Font-weight: bold;
}
```

7. Font-style

   It is used to represent the text contents in italic format, as an value specify "italic";

   If programmer want to remove italic effect from text then pass "normal" value.

   For example

```
#b
{
    Font-style : italic
}
```

8. Outline-color:
   a. It is used to change the outline color of the text box on the browser.
   b. For example:

```
Input
{
    Outline-color : red
}
```

9. CSS Box Model

   As a programmer we are using css box model to provide spaces around the html contents and make the content look neat and clean.

Css BoxModel involves Three important css properties.

a. Border[optional]
b. Margin
c. Padding

- Border Property --->

a. As a programmer if we want to specify border then we have to use this property.
b. It consists three important values.
   i. Border-type ---> solid, dashed, dotted
   ii. Border-color
   iii. Border-thickess ---> to decide thickness of border.
c. "border property " in css is basically applied for all the 4 sides but it can also be applied for particular side by using below css properties.
   Border-left
   Border-right
   Border-bottom
   Border-top
d. To change individual property of border then use following properties.
   Border-color
   Border-style
   Border-width

Note: If any of the above property is made as "0px" then border does not appear on browser.
For example:

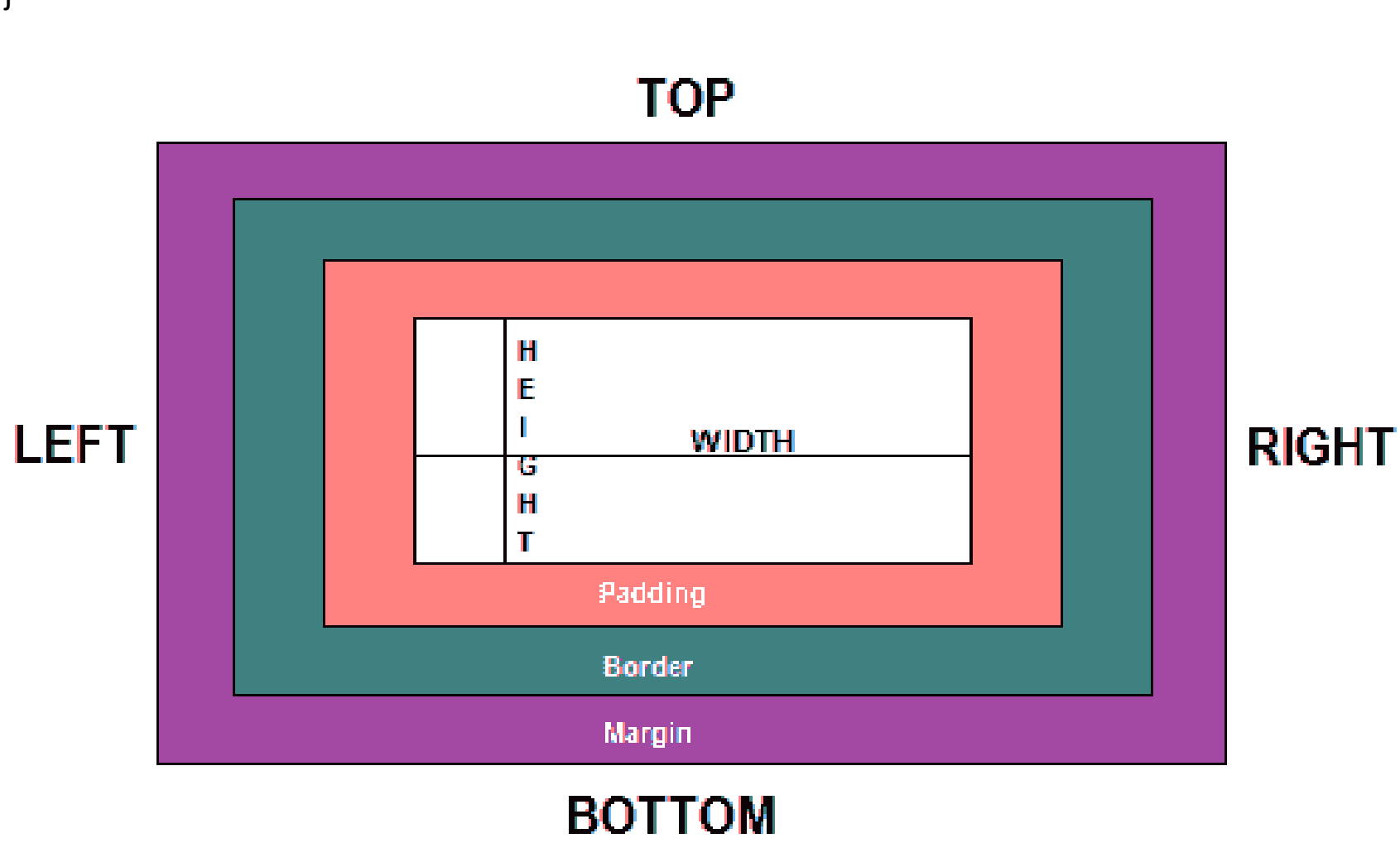
```
form
{
    Border : solid blue 10px;
    Border-left : solid red 2px;
    Border-right : solid blue 3px;
    Border-bottom : none;
    Border-top : none
}
```

- Margin property
- It is used to create the spaces around html elements but outside of the border.
- Programmers can apply margin to all the sides as well as specific side of the element.
- To apply margin for the specific side of the element, we have to make use of following css properties
  i. Margin-left
  ii. Margin-right
  iii. Margin-bottom
  iv. Margin-top
- For example:

```
Div
{
    Margin : 50px;
    Margin-top : 20px;
    Margin-bottom : 0px;
}
```

- Padding property
- It is used to create the space around the html elements or the text contents but inside the border.
- It can be apply for all the four sides as well as for specific side.
- We can use following css properties to apply padding for specific side.
  i. Padding-left
  ii. Padding-right
  iii. Padding-top
  iv. Padding-bottom
- For example:

```
Label
{
    Padding : 10px;
    Padding-right : 20px;
    Padding-left : 0px;
}
```



- Text-align:

It is used to adjust the position for the text contents.
It takes 3 values ---> 1) left 2) right 3) center.
For example:

```
Div
{
    Text-align : center;
}
```

11. Border-collapse

It is used merge the multiple borders in one border.
It takes value as collapse.
For example

```
Table, td, th
{
```

```
    Border-collapse : collapse
}
```

12. Background - image :

    This is used to provide image to the background of html tag while mentioning the image file name programmers make use of "url('image-name.extension')"

13. Background-size:

    It is used to change the dimension of the given image. It takes two different values

    a. background - size : Apx Bpx where apx refers to width of the image and Bpx refer to height of the image.
    b. Background-size : cover -> to provide full background image
    c. Background-size : 100%

n. Background-repeat :

    It is used to avoid repetition of the background image.

    Note: If the given dimension of image is small then background image will be repeated . To avoid this programmers will make use of "no-repeat" value with above css property.

    For example:

```
Body
{
    Background-image : url('image.jpg');
    Background-repeat : no-repeat;
    Background-size: 1000px 1400px
}
```

15. Background:

    It is used to make html elements transparent on the web browser. As a value programmers passing "transparent".

    For example:

```
Input
{
    Background : transparent
}
```

16. Background-position:

    a. It is used to adjust the position of background image on the browser
    b. It takes five values -
        i. Left
        ii. Right
        iii. Center
        iv. Bottom
        v. Top

    Note : as a programmer for this property we can pass combination of two values also.

    For example:

```
Div
{
    Background-position : left bottom
}
```

17. Pseudo classes --->

It is used to provide css properties depends on cursor movement.

a. Hover
When user place the cursor on the content css property will be applied and it is indicated with ":".

For example:

```
H1:hover
{
    Background-color: red
}
```

b. Active
When user clicks on the contents css property will be applied by using this pseudo class.

For example:

```
label:active
{
    Color : purple
}
```

18. List-style-image
It is used to replace the bullets by images.
For example -

```
Li
{
    List-style-image : url('image.extension');
}
```

19. Display property

a. This property is used to display the contents maybe in the same line or in the different line.
b. It takes three important values.
   i. Block : It is used to display the contents on to the next line of the browser.
   ii. Inline : It is used to display the contents on to the same line on the browser.
   iii. None : It is used to hide the contents on the browser and displayed when it is necessary.
   iv. Flex: It is used to remove the space between contents on the browser.
   To get exact functionality of flex value use it with tag.

Note: Display css property is basically used to work with different kind of error messages.
block & inline values only work with child element whereas flex value work with parent element.

Div (parent)	h1 (child)	Input(child)
{	{	{
Display : flex	display : inline	Display : block
}	}	}

t. Css-icon library

- In css all the icons which are necessary are stored under "CSS ICON Library ".
- To use the icon from icon library , programmers have to follow few-steps.
  i. Attach the HTML file with CSS ICON library by using <link> tag.
  <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.min.css"></link>
  - Browse fontawesome.com website and search for appropriate icon required.
  - Copy <i> tag and paste it into html file.
  - In html5 <i> tag is used for represent css icon.

Note : to change color of icon use color css property , To change the size use fa-1x …….. 10x.

21. Navigation Bar
    a. As a programmer to create navigation bar we have to follow the below steps:
       i. Create separate section on browser by using tag for the navigation bar.
       ii. Create the unordered / ordered list of navigation bar contents by using / and <li>.
       iii. Convert the list items into hyperlinks by using <a> tag.
    b. The disadvantages of above steps are-
       i. Bullets appearing in front of navigation bar contents.
       ii. All contents are appearing on the browser in vertical directions.
    c. To overcome from the above drawbacks programmers have to make use of following css properties with specified tag.
       i. tag ---> to remove bullets from list item use list-style-type css property.
       ii. tag ---> to represent contents in horizontal manner use display : flex css property.
       iii. tag ---> to create space between contents use margin-right : value css property.

Note : To remove the underline from hyperlink programmers make use of Text-decoration css property and it takess "none " as a value.

JavaScript

1. Programmers prefer JavaScript to provide **page responsive behaviour** which means web page giving the responses to the users input by telling whether given data is valid or invalid.
2. JS coding can be done in two ways --->
   a. Internal JS
   b. External JS
3. In internal JS coding programmers using **<script></script>** tag within <head></head>.
4. In External JS coding programmers are creating **separate JS file** to write JS code & save the file by using **.js extension**.
5. To link JS file with HTML file we have to use **<script></script>** and within the <script> tag use the **src** attribute which is stands for **source**. For this src attribute programmers passing JS file name with extension.
6. For example -
   <script src = "**externalJS.js**"></script>
7. In the javascript programmers are using variable concept to store the data. To declare the variable in JS we are using only one datatype i.e var.
8. For example :
   var num = 10

Note: By using only one data type programmers can store any type of data in JS.

9. To display JS output on the browser programmers using "document.write()", where document is **represent web browser** & it is inbuilt object in JS.
   write() is inbuilt function of JS which is used to print/display output on the browser without spaces.

10. To display output on the browser with spaces JS provide inbuilt function called it as document.writeln().

11. To use html tags with javascript code programmers have to use concatenation operator & place html tags inside double quotes("").

    For example: document.writeln("" + "Welcome" + "")

Note: to display javascript output on the next line programmers can use
</br>.

Functions in JS---->

1. Programmers prefer functions to perform operation in the program, In order to work with functions programmers have to follow 2 steps.
   a. Declare the function
   b. Call the function.
2. To declare function in Js, Programmers using "**function**" keyword followed by function-Name(), Where function name is an **identifier**.
3. In order to execute the function programmers have to call the function by its name.

For example.

```
 function fname()
{
    //logic
}
//call the function
fname()
```

Note : Javascript is case-sensitive and interpreted language.(executable)

4. Any javascript function can be called from JS file or in HTML file, Calling JS function from HTML file is technically referred as "event handler".
5. "onclick" event handler will be used along with buttons to call the JS function, if user clicks the button.

Operators --->

Assignment ---> =
Arithmetic ----> + , - ,* ,/ (quotient), % (remainder)(modules)
Relational ---> < , > , <= , >= , == , != , === ---> boolean
Logical operator --> && , || , !
Increment & decrement ---> ++ , --

Difference between == & ===

Var a = 10 var b = 20

a == b ----> false ----------> compare values

Var a = 10 var b = "10"

a === b ---> false ---------> compare values & type of variable

Var a= 10 var b = 10

Data flow from browser to JS file -

1. To perform below operation programmer have to follow Three steps.
   a. Provide the ids to the HTML element by using "id" attribute.
   b. Target the HTML elements on the browser by using "getElementById()"
   Function which accepts the argument as id, given to the html tags.
   3. To get value from targeted HTML elements use "value js property".
   4. This property is used in data flow from browser to JS file.

Note: Whenever programmers using addition operator with browser values then it works as a concatenation operator, So to overcome from this drawback
Programmers have to use "parseInt()" function.

innerHTML JS property

1. Document.write statement replaces the old content of html with new content. Hence, It is not a better practice to use.
2. To overcome from above drawback, programmers are prefer "innerHTML" JS property.
3. In order to work with innerHTML JS property, It is must to declare "empty html tag" along with id attribute.
4. Target specified empty html tag by using getElementById("identifier").

Note: It is used to pass the javascript result on the same html page.

Working with Radio Buttons.

1. Radio buttons will be selected from user side.
2. To check whether radio button is selected or not selected, programmer will make use of "checked" Js property.
3. If radio button is selected then checked js property return "true".
4. If radio button is not selected then checked js property return "false".
5. For example :

```
Var radio1 = document.getElementById("radiobtn1").checked

Document.write(radio1)

o/p    true (depends on user selection)
```

Working with buttons--->

1. Buttons will be disabled if user does not enter the valid data. To make it inactive we will make use of "disabled" attribute.
2. To make the buttons enabled , we have to remove the disabled attribute from button.
3. To remove the attribute from any tag, we have to make use of removeAttribute(" attribute name ") inbuilt function, to which we pass the attribute name to be removed as an argument.
4. To add an attribute to any tag, we have to make use of setAttribute(" attribute name ", " value ") . It takes two attributes 1) attribute name to be added. 2) value corresponding to the attribute.
5. For Example:

```
Document.getElementById("identifier").removeAttribute("disabled")

Document.getElementById("identifier").setAttribute("disabled","true")
```

6. Onkeyup event handler -
   a. It is an event handler will call the JS function once after user press and release a key on the keyboard.
   b. For example if user press and release 10 keys then onkeyup event handler will call JS function for 10 times.
7. To count the size / no. of characters present in a variable, programmers are using "length" JS Property.

Working with passwords

1. All the passwords by default are hidden on the browser by using type = "password".
2. If the same password has to be visible on the browser then type attribute should be changed into text.(type = "text").
3. In order to change the value associated with attribute, programmers will make use of setAttribute().
4. getAttribute("attribute name") function is used by programmers to know about the current values associated with an attribute.
   It takes one argument that is "attribute name" of which value has to know.

Javascript Errors --->

1. Programmers prefer javascript errors in order to display whether given user data is invalid or valid.
2. In order to provide js errors, we have to combine css properties along with js file.
3. We can use any css property in the js file by following two important rules.
    a. Using "style" js property.
    b. Using all the css properties in the form of "camelcasing"

4. For example:
   Document.getElementById("btn").style.textShadow = "0px 0px 10px red"

Css properties in css file	Css properties in Js file
1. background-image 2. Background-color 3. Border-radius 4. Color 5. font-size	1. backgroundImage 2. backgroundColor 3. borderRadius 4. color 5. fontSize

Onblur event handler will call the function if user moves the cursor from one field to another field.

Onload event handler will call the function once after user open the webpage or refresh the webpage. Mostly onload event handler programmers are using with <body></body>

Javascript Popup box.

- Programmers prefer popup box in order to notify user about the given inputs, to show welcome messages , etc.
- In Javascript we have two types of popup boxes:
    1. Alert box.
    2. Confirm box
- Alert Box --->
    1. It is used to show the alert messages to the users with "OK" button. By clicking on this button user can proceed.
    2. To create alert box we are using "alert()" function in JS.
- Confirm Box --->
    1. It is used to provide two option to user like "OK" & "Cancel", to verify or accept request from user.
    2. To create confirm Box we have to use "confirm()" function in JS.
    3. If user clicks on "OK" then this function will return "true".
    4. If user clicks on "Cancel" then it will return "false".

Note: To link javascript file to another html file programmer can make use of window.open() function, where it is taking argument as html file name/ path of file / url.

- Prompt Box --->
    1. It is used to get input from user and also to give two option like "OK" and "Cancel".
    2. To create prompt box programmers using "prompt()" function in JS and it will accepts two arguments 1) "message for user" 2) "sample input"
    3. If user clicks on "OK" then it returns value entered by user in input box.
    4. If user clicks on "Cancel" then it returns "null" value.

Focus() function will help the programmer to control the movement of cursor from one field to another field. It is one of inbuilt function of the JS.

For example.
Document.getElementById("ph").focus()

Onfocus() eventhandler will call the function if user place cursor inside input box.

Regular Expression

- regular expression in javaScript is basically used for "validating users data along with programmers condition."
- It is almost similar to pattern attribute of html. The only difference is pattern attribute needs <form> & "submit button" whereas regular expression does not need the <form> tag.
- The syntax to write regular expressions is
  /expressions/ where in place of expression programmers are writing the condition with content.
- For example:
  1. Regular expression to check mobile number having digits or not
  ----> /[0-9]/
- The most important reason for using regular expressions is, it helps programmer in matching the contents whose position is not fixed.
- To work with contents whose position is not fixed , programmers have to use of "Look around concept".
- The syntax used for look around is ---> /(?=.*[contents])/
  For example:
  a. Regular expression to validate first name having only uppercase & lowercase characters.
  ----> /(?=.*[A-Z])(?=.*[a-z])/

Javascript inbuilt objects

Document ---> inbuilt objects

State ---> js property ---> length, value, innerHTML , checked

Behaviour ----> functions ---> getElementById() alert() confirm() prompt() focus() write() writeln()

Windows ---> inbuilt objects. ---> to represent another html file through js

Open() --->

Date object

a. It is used to print current date and time. In order to use this class, programmer have to create an object of class.
b. The syntax to create date class object is-
   var date = new Date()
c. To display only hours, minutes and secs , date class provides three inbuilt functions --->
   i. To get hours = date.getHours()
   ii. To get minutes = date.getMinutes()
   iii. To get secs = date.getSeconds()

iv. To get month = date.getMonth() ----> month is started from 0 and end with 11 in js.
v. To get Year = date.getFullYear()
vi. To get date = date.getDate()
vii. To get Day = date.getDay()

Array object

a. This concept is used to store multiple values in one single variable.
b. Array object we can create in three ways.
   i. By using "[ ]"
      Var array = [1,2,3]
   b. By using new keyword
      Var array = new Array(1,2,3)
      Var array = new Array(size of array)
c. The elements in an array will be accessed based on its index, whereas the index start from "0".
d. Length js property is used to find the no. of elements in an given array.
e. It contains some inbuilt functions.
   i. Sort() ---> used to sort elements of given array in ascending order.
      Var sortArr = array.sort()
   b. Reverse() ----> used to reverse the array elements.
      Var reverse = array.reverse()
   iii. Push(element) ---> used to add an element into an array at the end position.
      array.push(10)
   iv. Pop() ---> used to remove an element at the end of the array.
      array.pop()
   v. Shift() ---> used to remove an element at the beginning of the array.
      array.shift()
   vi. Unshift(element) --->used to add an element at the beginning of the array.
      array.unshift(10)