3 Impressive Web Designing

Let us Learn

- Working of web
- Components of web
- Introduction to HTML5
- Basics related to tags & text-formatting tags
- Heading levels
- Inserting Images in a webpage & creating hyperlinks
- Forms in HTML
- Use of Scripting in HTML
- Basics of JavaScript
- Simple JavaScript programs

3.1 Introduction

Online resources have become a part of our day to day life.

The internet is a powerful media to transmit information. The pages of information displayed on the internet are referred to as webpages. The standards and formats for presenting text and graphics on the internet are developed and approved by WWW governing authorities.

The growing demand for attractive presentation of information using electronic means gave rise to the invention of websites.

3.2 How does the web work ?

WWW stands for world wide web normally referred to as web. **Fig. 3.1** describes the working of web.

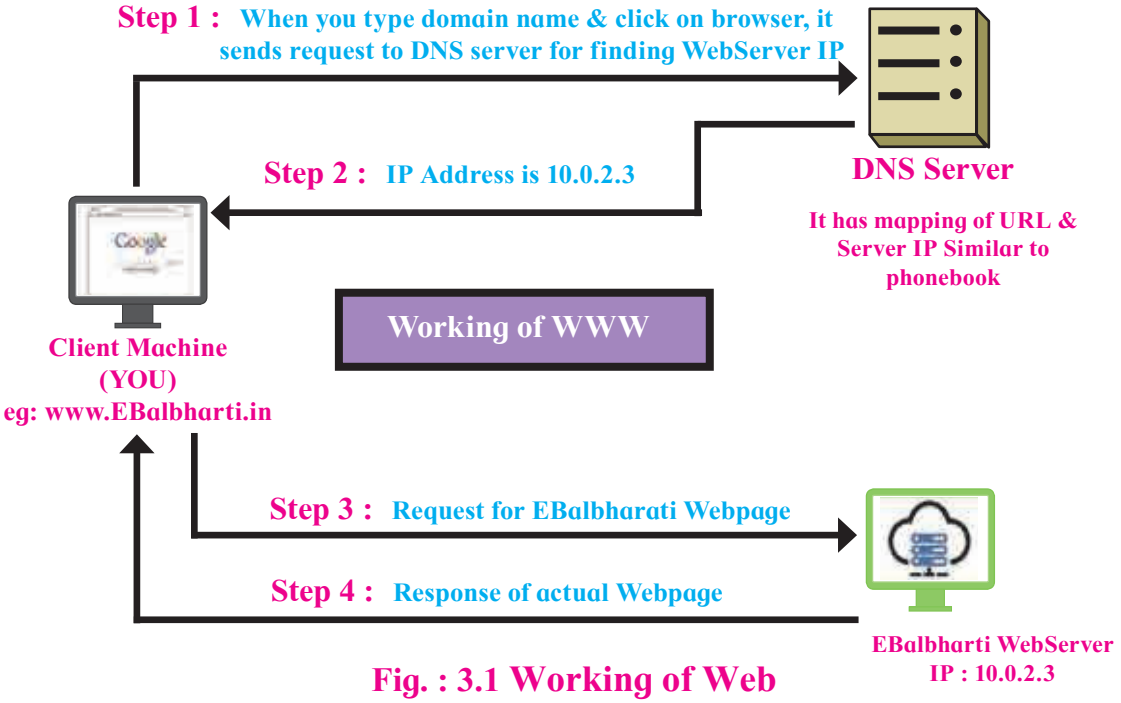


Fig. : 3.1 Working of Web

3.3 Components of web

Web uses the following Terms :

- **Webpage :** A simple text file created using HTML.
- **Website :** A collection of interlinked web pages containing text, images, audio and videos. For Example, www.ebalbharati.in
- **Web Browser :** A web browser is a software used to view web pages or websites available on the internet For Example Internet Explorer, Google Chrome, Mozilla Firefox.
- **Web Server :** A Web server is an application or a computer that sends webpages over the internet using the HTTP protocol. The functionality of website is managed by web server. For Example Apache, nginx, IIS, etc..
- **URL(Uniform Resource Locator) :** It is an address of a web page on the internet. The web pages are retrieved from the original location with the help of URL.
- **HTTP :** HTTP (HyperText Transfer Protocol) is a protocol used by WWW for client server communication.
- **HTML :** Hyper Text Markup Language, enables to write code for a webpage. All the webpages in a website are linked with one another, with the help of hypertext links.

Do it yourself

- A collection of webpages is called...
- .....is an address of a webpage.

3.4 Introduction to HTML5

HTML is a standard language for developing and creating interactive websites, introduced by Tim Berners Lee. HTML documents are created in any text editor for and can be run(executed) on any computer that has a web browser. HTML is compatible with most of the web browsers.

Basic structure : HTML tags are keywords enclosed within angular brackets, that define how your web browser must format and display the content. Tags are not case sensitive. Every HTML page is enclosed within two tags <html> and </html>. This page is divided into two sections internally, head section and body section. Head section contains title of the document which is enclosed within <Title> and </Title> of <Head> and </Head>. The actual text of the document is written within <Body> and </Body>.

An attribute : An attribute defines a property for an element, consists of an attribute/value, and appears within the element's start tag. Sometime we need additional information with a tag.

```
<html>
   <head>
         <title> First Page </title>
   </head>
   <body bgcolor = green >
         attribute | value of attribute
          This is my first web page
   </body>
</html>
```

Classification of HTML Tags

HTML tags are categorized as :

1. Container tags 2. Empty tags

1. **Container Tags :** Container Tags are also called paired tags. Container Tags have a beginning tag and an end tag. The end tag is similar to the beginning tag but with a "/" in front of it. For Example <head> </head>, <body> </body>.
2. **Empty Tags :** Empty tags are standalone tags and do not have an end tag.
 is an example of singular tag/Empty tag.

Basic structure of HTML

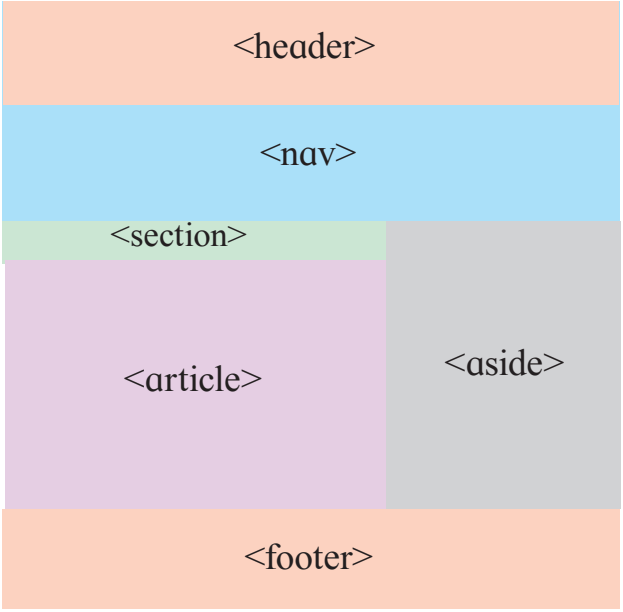
Purpose of tags :

- **<html> and </html> :** This tag indicates that the document is an html file.
- **<head> and </head> :** It includes <Title> within it, the text within <head> is not displayed on the webpage. This is used for search engine optimization.
- **<title> and </title> :** The content within this tag is displayed on the title bar.
- **<body> and </body> :** This tag includes all content which is to be developed in the web browser. Most of the tags are included in this tag.

Structure of web page using HTML5 :

The first line on the top, <!DOCTYPE html>, is **a document type declaration** and it lets the browser know the flavor of HTML.

```
<!DOCTYPE html>
<html>
 <head> <title>Your Website</title>
 </head>
 <body>
    <header>
      <nav>
      </nav>
    </header>
     <section>
       <article>
       </article>
     </section>
   <aside>
   </aside>
    <footer>
    </footer>
 </body>
</html>
```



This is representation of HTML5 Document structure

- **<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 apart from the content (like a sidebar).
- **<footer> -** Defines a footer for a document or a section.
- **<details> -** Defines additional details.

3.5 Text formatting element

Text formatting is used to make a document look attractive thereby enhancing it's appearance. The list of different text level formatting tags are as shown in Table no. 1 :

Tag Name	Description
<b>	Displays text within it in Bold like **Hello**.
<i>	Displays text within it in italicized manner like *Hello*.
<u>	Displays text with underline like Hello.
<small>	Displays text in small font size.
<sub>	Displays text in subscript form.
<sup>	Displays text in superscript form.
<ins>	Anything that appears within <ins>...</ins> element is displayed as inserted text.
<del>	Anything that appears within **~~...~~** element, is displayed as deleted text.
<mark>	The HTML <mark> element defines marked or **highlighted** text :

Table: 1 Text Formating Elements

Program 1 :

```
<!DOCTYPE html>
<html><head>
<title>Example of HTML5 text formatting tags</title>
</head><body>
 <b>This text is bold</b><br><br>
    <i>This text is italic</i><br><br>
    <mark>This text is marked</mark><br><br>
   This is <sub>subscript</sub> and <sup>superscript
</sup><br><br>
   <ins>This text is inserted to the document</ins><br><br>
 <del>This text is deleted from the document</del><br><br>
</body> </html>
```

Output 1 :

This text is bold

This text is italic

This text is marked

This is $_{\text{subscript}}$ and $^{\text{superscript}}$

This text is inserted to the document

~~This text is deleted from the document~~

Note :
 tag is used to specify a line break.

3.6 Heading levels

HTML provides six levels of heading tags. The range is from 1 to 6. These heading levels are represented as <H1> Text content </H1>. The <H1> tag displays text in bold and with largest heading level whereas <H6> tag displays text in the smallest heading level.

Program 2 :

```
<!DOCTYPE html>
<html>
<head>
<title>Heading levels</title>
</head>
<body bgcolor=skyblue>
  <H1>Heading level 1 Text is largest in size</H1>
  <H2>Heading level 2 </H2>
  <H3>Heading level 3</H3>
  <H4>Heading level 4</H4>
 <H5>Heading level 5</H5>
  <H6>Heading level 6 Text is smallest in size</H6>
</body>
</html>
```

Output 2 :

Note : *All the heading levels have attribute align with values left, right and center..*

For Example : <h1 align="center"> Largest heading size which is center aligned. </h1>

Do it yourself

- Create a simple web page using following features.
- Largest heading level 'Biodata' text in centre.
- Name in Bold.
- Address in Italics.
- Standard with underline.

Note : *Use any text editor to type the code and save it with 'filename. html' or 'filename. htm'. Use a browser to display the output.*

3.7 Inserting an image, a horizontal ruled line and a paragraph

◆ **<IMG> tag** is used to insert an image within a webpage. It uses following attributes :

- **src :** It is used to specify the path of an image file. The popular extensions of image file are png, jpg and gif.
- **height :** Specifies height of the image in pixels.
- **width :** Specifies width of the image in pixels.
- **alt :** It is referred as alternate text. It specifies the description of the image.

<IMG> is a empty tag. The syntax used in code is as :

<IMG src="Desert.jpg" height="400" width="400" alt="Desert image">

◆ **<HR> tag :** <Hr> tag is used to display **horizontal ruled line**. It is a singular tag. The attributes with <hr> tag

- **color :** Sets color for the **horizontal ruled line**.
- **width :** It specifies the length of the ruled line in % or pixels.
- **size :** It sets thickness of a ruled line.

◆ **<P> tag :** It is used to define paragraphs. It is a container tag.

3.8 Creating a table

A table is made up of rows and columns. A table in a webpage is created by using <table> tag, which is a container tag. The tags and attributes used to create a table are as follows :

<table> : It is used to indicate creation of a table.

<caption> : It is used to specify a table heading. It has align attribute which can have 'top' or 'bottom' as it's values. Top is the default value.

<tr> : This tag is used to create each row of the table.

<th> : It indicates table heading. <th> is generally used for first row column content of the table. It displays content in the bold format. It can be replaced with <td>.

<td> : It specifies data within the table (cell content).

The attributes of table are :

1. **border :** This attribute is required to display a border for the entire table. It has a numbered value. If border attribute is not specified, a table is created without the border for both table as well as columns.
2. **bordercolor :** It displays border in a specific color.
3. **align :** It aligns the table either to the left, right or center.
4. **bgcolor :** Sets the background color for the table.

The attributes of the <tr>, <th>, <td> :

1. **align :** It aligns the text horizontally. The values are aligned to the left, right or center.
2. **colspan :** This attribute is used within <td> or <th>. It creates a single column spanning across the table. It takes a numbered value, based on the number of columns to be spanned in a table.
3. **rowspan :** This attribute is used within <td> or <th>. It creates a single row spanning across the table. It takes a numbered value, based on the number of rows to be spanned in a table.

<tr>, <th>, <td> tags can have bgcolor attribute for specifying background color to a row or a column respectively.

Program 3 :

```
<!DOCTYPE html>
<html>
<head>
<title>Table with 4 rows and 3 columns
</title>
</head>
<body>
<table border="2">
<tr><th>Sr. No.</th>
<th>Input Device</th>
<th>Output Device</th> </tr>
 <tr> <td>1</td> <td>Keyboard</td>
<td>Monitor</td> </tr>
 <tr> <td>2</td> <td>Mouse</td>
<td>Printer</td> </tr>
 <tr> <td>3</td> <td>Joystick</td>
<td>Plotter</td> </tr>
</table>
</body>
 </html>
```

Output 3 :

Sr. No.	Input Device	Output Device
1	Keyboard	Monitor
2	Mouse	Printer
3	Joystick	Plotter

Do it yourself

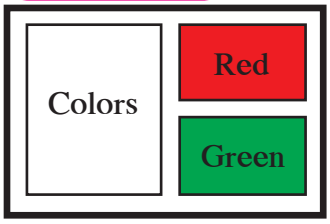
- To insert your photograph in a webpage the required tag is ……..
- Can the ruled line be coloured in blue ?
- To display table without borders the syntax can be as ……..
- Which attribute spans two or more columns of the table ?

Use of rowspan attribute in a table :

Program 4 :

```
<!DOCTYPE html>
<html>
<head><title> Table with rowspan attribute </title></head>
<body>
  <table border="3">
                <tr><td rowspan=2> Colors </td>
                 <td bgcolor=red>Red</td></tr>
                <tr>
                <td bgcolor=green>Green</td></tr>
   </table>
</body>
</html>
```

Output 4 :

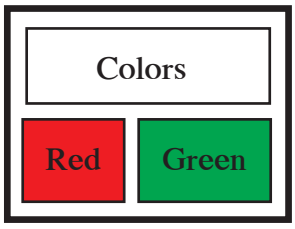


Use of colspan attribute in a table :

Program 5 :

```
<!DOCTYPE html>
<html>
<head><title> Table </title></head>
<body>
<table border ="3">
        <tr><td colspan="2" align="center"> Colors </td></tr>
        <tr><td bgcolor=red>Red</td>
        <td bgcolor=green>Green</td>
        </tr>
</table>
</body>
</html>
```

Output 5 :



3.9 Creating hyperlinks in a webpage

Hyperlinks are used to connect one document with another document.

In HTML, Links are created by using <a> tag.

Note : When you open any website and click on a text or an image it takes you to that page. It is known as hyperlink.

Syntax :

 Click here for my page

The href attribute in the above syntax is used to specify address of the file (URL) which needs to be opened on clicking.

HTML Link colours :

- A hyperlink by default appears blue in colour with an underline.
- It is not visited by any user.
- A visited link is underlined and purple.
- An active link is underlined and blue.

Image hyperlink :

Many websites have images as hyperlink. For example The previous arrow is an image which on clicking displays a previous webpage. The arrow is actually an image hyperlink.

Syntax :

<Img src = "arrow. gif" alt = "Click on arrow">

3.10 Forms in HTML

Forms in HTML is used to accept user input. The form in html is created by using <form> element as <form></form>.

Form controls

A form is a collection of different elements also called as controls like textbox, radio button, checkbox, submit button and many more.

Attributes used with form element and Input element.

<Form> tag can have following attributes

- **Name :** It specifies a name to a form.
- **Action :** The action attribute specifies the path where the form is to be submitted. When user clicks on submit button if the action attribute is committed, the action is set to the current page.
- **Method :** The method attribute specifies get or post method to be used when submitting the form data. Method of form are GET or POST.

i) **GET method :** The default method of submitting form data is GET. The data submitted by using GET is visible in the address bar. It is better for data which is not sensitive. The number of characters in GET method depends on browser.

ii) **POST Method :** The POST method of sending data does not display the form data in the address bar. So it is a secure method to submit sensitive or personal information. It does not have size limitations as in GET method.

The <Input> tag

The <Input> tag is used to specify the different types of controls by using type attribute. Syntax of using <Input> with type attribute is;

Type of control	Purpose
<Input type = "text">	Creates a one line textbox
<Input type = "radio">	Creates a radio button. The radio button allows one option selection against multiple choices.
<Input type = "checkbox">	Creates a checkbox. It allows more than one selection against multiple choices.
<Input type = "submit">	Displays a button for submitting the form data to a server.
<Input type = "password">	The password input type is used to create text contents in the form of '*' asterik or '•' disc.
<Input type = "reset">	The reset control clears the text content entered in the form.
<Input type = "button">	It displays push button which activates on events.

Table: 2 <Input> with values of type attribute

- **Attributes of <Input> :** Apart from type attribute, there are attributes which are specific to a particular type of controls. The following table specifies the description.

Attribute	Description
Type	It describes, the name of the control like text radio etc. eg type = "radio"
Name	Each input field must have a name. The name attribute is a user defined value. If the name attribute is not specified, the data of that input field will not get submitted.
Maxlength	This attribute is used with text and password type. It specifies the maximum number of characters which can be entered in a text or password box.
Size	The 'Size' attribute can be used with text and password type. It specifies the width of the text box.
Checked	The 'Checked' attribute specifies the default selection for options in a checkbox or radio button.
Value	The 'Value' attribute can be used with text, checkbox, radio, submit or reset. • When used with text type it specifies default value in a text box. • For checkbox and radio it defines value which is sent on submit.

Table: 3 Attributes of <Input>

<Textarea> tag :

The <textarea> is used to create a textbox with multiple lines. The number of lines and width of the textbox are specified by using rows and cols attribute respectively. The <textarea> can have following attributes.

- **name :** It is used to specify name for the textarea. For example name = "ta1".
- **rows :** It specifies the number of lines in a textarea. For example rows = "5"
- **cols :** It specifies the width of a text area.
- **maxlength :** It specifies the maximum number of characters allowed in the textarea.
- **placeholder :** It specifies a short hint that describes the expected value of a textarea. For example placeholder = "your address"
- **required :** It specifies that textarea must be filled out. i.e. It can not be blank.

Syntax :

<textarea name = "tal" rows = "5" cols = "30" placeholder = "your address" required> </textarea>

<Select> tag : <select> tag is used. to create drop-down list.

The attributes of <select> tag are :

1) **Name -** Assigns name to the control.
2) **Multiple -** It allows the user to select more than one value.

3) **Size -** The size attribute is used to specify the number of visible values.

The <option> tag inside the <select> tag defines the available options in the list.

The attributes of <option> tag are :

1) **selected :** To define preselected option, 'selected' attribute is added to the <option>

2) **value :** It assigns value to the option specified in the dropdown list.

Do it yourself

Identify following form elements.

- 
- 
- 
- 

Program 6 :

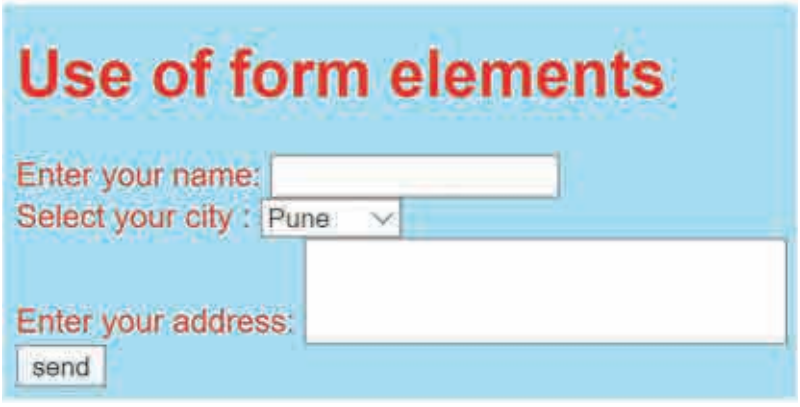
```
<!DOCTYPE html>
<html>
<head><title>Form with Input elements</title></head>
<body bgcolor="orange">
<h1>use of form</h1>
<form >
Enter your name  <input type="text" Name="n1"
maxlength="20"><Br>
Enter your standard : <input type ="radio" name="r1"
value="11">
11<sup>th</sup> <input type="radio" name="r1"
value="12">12<sup>th
</sup><br> Choose your optional subjects : <br>
<input type="checkbox" name="c1"
Value="Hindi">Hindi<br>
<input type="checkbox" name="c1"
Value="German">German<br>
<input type="checkbox" name="c1"
Value="Biology">Biology<br>
<input type="checkbox" name="c1" Value="IT">IT<br>
<input type="submit" value="Submit"><br>
</form></body></html>
```

Output 6 :

Program 7 :

```
<!DOCTYPE html>
<html>
<head><title> Form elements and textarea </title></head>
<body bgcolor = "cyan" text ="Red">
<h1> Use of form elements </h1>
<form method = "post" action = "data.php">
Enter your name: <input type = "text" name = "fn"> <br>
Select your city :
<select name="ct">
<option>Pune</option>
<option>Nagpur</option>
<option>Solapur</option>
</select><br>
Enter your address: <textarea name = "address" rows = "3" cols = "30"
placeholder = "your address" required> </textarea> <br>
<input type = "submit" value = "send">
</form></body> </html>
```

Output 7 :



Note : *PHP is server side scripting language.In the above program 'data.php' is the name of PHP file which stores the accepted data.*

Client Side Scripting

3.11 Introduction

There are a variety of scripting languages used to develop dynamic web pages. JavaScript was initially created to "make webpages alive". They don't need a special preparation or a compilation to run. Using HTML one can only design a web page but cannot implement any logic on web browsers like addition of two numbers, check any condition, looping statements (for, while), decision making statements (if-else) etc. This is possible by embedding JavaScript block into HTML.

3.12 Scripting language

A script is a list of commands that are executed by a scripting engine. Scripts are used to generate dynamic Web pages on the Web. Scripts can be opened and edited by using a text editor.

Insertion of JavaScript in HTML :

JavaScript can be use for client side or server side scripting language. JavaScript code can be inserted in HTML program between <script> and </script> tag. Language attribute is used to set scripting language. You can place any number of scripts in HTML. There are two methods to insert JavaScript in the HTML. Scripts can be placed in <body> or in <head> section of an HTML or in both.

Script Placed inside body section

```
<!DOCTYPE html>
<html>
<head><title>First</title>
</head>
<body>
<script language="javascript">
  // javascript statements
  </script>
</body>
</html>
```

Script Placed inside head section

```
<!DOCTYPE html>
<html>
<head><title> Second </title>
<script language="javascript">
  // javascript statements
  </script>
</head>
<body></body>
</html>
```

Note : *It's best practice to terminate JavaScript statements with semicolon(;). It's not required if you write each statement on a new line.*

3.13 Variables

The variable is a basic unit of storage in a JavaScript program.

Rules to declare variables :

Variable name may consist of alphabets, digits and underscore and dollar character with following rules :

1. They must start with an alphabet.
2. Uppercase and lowercase are distinct. This means that variable 'sum' is not same as 'SUM'.
3. It should not contain blank space or special symbol except underscore.
4. Standard keywords are not allowed as variable name. For Example document, while.
5. Variable name can be limited up to 255 characters.

Variable name in javascript is declared with keyword 'var'.

Syntax :

var variablename;

var variablename, variablename;

//To declare more than one variable, variablenames are separated by a comma.

Example :

var a //variable a has been declared.

var a,b,c // variables a, b and c have been declared.

var z=40,y=100// declaring variables with initialization

Do it yourself

- Define five correct and five incorrect variable names.
- List some scripting languages.

3.14 Data Types

Computer is mainly used to store information and to do complex calculations. When we store information it is in the form of alphabets, numbers or alphanumeric values. JavaScript provides data types to store and use different types of values that are :

1. **Number type :** Numerical value specially belongs to the 'number' data type. Number data type stores (holds) both whole number (integer) or decimal point numbers which stores fractional part of number (also called as floating point numbers). Number data type can hold positive as well as negative values.

```
Example :
var y=100000
var z= -67.99
```

2. **String Type :** Strings are used for storing text. Strings must be inside of either double or single quotes.

```
Example :
var x="Hello"
var str= 'Information Technology'
```

3. **Boolean Type :** It represents only two values 'true' and 'false'. All relational, conditional and logical operators produce Boolean values true/false or yes/no.
4. **Infinity :** Division by 0 gives you another special value.

```
Example : a=3/0
Result: Infinity
```

5. **null :** In JavaScript null is, just a value which means "nothing", "empty", "unknown". It is supposed to be something that doesn't exist.

6. **undefined :** JavaScript returns 'undefined' when variable which is declared but not assigned. Then java interpreter shows that it is undefined.

```
Example : var age; alert(age);
```

3.15 Operators

Operators are used to do arithmetic and logical operations. Operators that require one operand is called as unary operator and operators that require two operands are called as binary operator. Most of the operators can be divided into groups : Arithmetic, Relational and Logical operators.

3.15.1 Arithmetic operators :

Arithmetic operators are used in mathematical expressions in the same way that they are used in algebra. For following example consider:

var a = 40, b = 4.5;

Operator	Definition	Example	Result
+	Addition	a+b	44.5
-	Subtraction	a-b	35.5
*	Multiplication	a*b	180
/	Division	a/b	8.89
%	Modulus (It returns remainder after division)	a%b	4

Table: 4 Arithmetical Operators in JavaScript

Note : - *Type your Javascript program in editors and execute it in browser similar to HTML programs.*

Program 8 :

```
<!DOCTYPE html>
<html>
<head><title>multiplication</title> </head>
<body bgcolor="yellow">
<h1> Program to calculate multiplication of two numbers </h1>
<script language="javascript">
  var a,b,c;
  a=76;
  b=99.45;
  c=a*b;
  document.write("<br><h1>multiplication of two numbers : " +c+"</h1>");
</script></body></html>
```

Output 8 :

Program to calculate multiplication of two numbers

Multiplication of two numbers : 7558.2

Here, document. write() is used to display or write content on a web page.

3.15.2 '+' operator in JavaScript :

In JavaScript '+' operator has two meanings, arithmetic addition and string concatenation operator.

Example : var a=15+"Hello"
Result : 15Hello
Example : var a=15+7+"Hello"
Result : 22Hello

Do it yourself

- Find the result of....
  1. 20+'20'
  2. 10+20+"2"
  3. 10+'2'+'2'

3.15.3 Assignment Operators (=) :

It is important to know that assignment operator is not 'equal to' operator. Assignment operator is used to assign value of an expression to a variable. This means that value of an expression on the right hand side is assigned to the single variable on the left hand side. Value of variable may change during the next programming instruction.

Example :

```
var p=400; //assigns value to the variable p
var e=457.930;//assigns value to the variable e
var a=a+7;// evaluates expression a+7 and
          assigns value to a
var str="Hello"; // assigns string value to
                 variable str
var c=d; //assigns value of d to c
```

Expression : There is a difference between algebraic mathematical equations and computer programming statements. Following statements are valid expressions in algebraic mathematics, but they are invalid in programming languages.

```
a+b=10;          //error
a+b=c+d;         //error
c+d=p;           //error
10=x;            //error
X=10;            //valid
```

Note : *Remember that in a programming statement = operator just evaluates right side expression and assigns it to the left hand side variable so at the left hand side of = , operator always contains a single variable.*

Do it yourself

- Which of the following arithmetic expressions are valid in JavaScript.
  a) A=25/3%2
  b) X=12.67*-5.0
  c) 21%45-34+12=a+x
  d) (23/5)+4-7=c
  e) c+f=45*5/5%12

3.15.4 Relational Operators :

Relational operators are used to check conditions or comparison of operands. Result of relational operators is Boolean value 'true' or 'false'. They are used in looping and control structures. Following table shows JavaScript relational operators. For result consider the values as : a=10 and b=30…

Operator	Description	Example	Result
<	Less than	a<b	True
>	Greater than	a>b	False
<=	Less than equal to	a<=b	True
>=	Greater than equal to	a>=b	False
==	Equal to	a==b	False
!=	Not equal to	a!=b	True

Table: 5 Relational Operators in JavaScript

3.15.5 Logical Operators :

Logical operators are used to verify more than one condition at a time or to negate the condition. JavaScript has three logical operators.

Operator	Description	Example	Result

&& (and)	This operator evaluates to 'true' only when all its operands are 'true'.	var age=25;
		var salary=50000;
		if(age>55 && salary>25000)
			First condition evaluates to false and second condition evaluates to true, so that whole expression returns Boolean value as false.

|| (or)	This operator evaluates to 'true' when any one of the operand is 'true'.	var number =-1; if(number<0 || number>100)	First condition evaluates to true and second condition evaluates to false, so whole expression returns Boolean value true.
! (not)	This unary operator is used to invert the Boolean expression.	var z=0; if(!(z==0))	Expression returns Boolean value as false.

Table: 6 Logical Operators in JavaScript

Do it yourself

- Determine the Boolean value of each of the following logical expressions if a=10, b=-5 and c=20

1. a<b && c>b
2. a==b || c==d
3. c>-24 && a<50
4. a<b && b==c && a==b
5. c<0.0 || a>-20
6. b<c && a==67
7. a<b || a<c || b<c

3.15.6 Increment (++) and Decrement (--)Operators :

Increment (++) operator in JavaScript is used to increment value of variable by one and Decrement operator in JavaScript is used to decrement value of variable by one. They can be used in two ways :

++x	Pre- increment	Value of variable x is incremented before it is used in expression
x++	Post –increment	Value of variable x is incremented after it is used in expression
--x	Pre- decrement	Value of variable x is decremented before it is used in expression
x--	Post –decrement	Value of variable x is decremented after it is used in expression

Table: 7 Increment and Decrement Operators in JavaScript

Example :

```
var a=100;
b=++a
output : b=101 and a=101
```

```
var a=100;
b=a++;
output : b=100 and a=101
```

Comments in JavaScript

Comments are non-executable statements in program. Comments are used to provide information or explanation about your programming construct. Statements added in comments are ignored by JavaScript. It supports two types of comments.

1. Single line comment (//……..) : Single line comment begin with //. The JavaScript ignores everything from // to the end of the line.
2. Multiline comment : Multiline comments are used to comment on more than one line. It starts with /* and end with */

3.16 Commonly used Built-In Functions in JavaScript

Function is used to perform repetitive tasks whenever required. It is reusable code-block that will be executed when it is called.

Function	Description	Example	
parseInt()	This function is used to parse a string and convert it into a number	Example parseInt('MH100') parseInt('100') parseInt('100MH')	Output NaN 100 100
parseFloat()	This function is used to parse a string and convert it into floating point representation	Example parseFloat('MH100') parseFloat('100.00') parseFloat('100.2MH')	Output NaN 100 100.2
alert()	This function displays alert popup box with ok button. This is also called as a message box.	Example alert("welcome to javascript ") or window.alert("Hello")	
prompt()	This function is used when you want input value from user at the time of program execution. It displays ok and cancel buttons. Ok button returns input value, Cancel button returns null value.	Example: var n; n=prompt("Enter value for n")	
confirm()	This function displays confirmation message box with ok and cancel button. Ok button returns 'true' and cancel returns 'false'	Example: var ans; ans=confirm("Do you want to continue")	
toLowerCase()	This string function used to convert the given string into lower case alphabets	Example: var str="JavaSCRIPT" str=str.toLowerCase()	
toUpperCase()	This is string function is used to convert given string into uppercase alphabets	Example: var str= "JavaSCRIPT" str=str.toUpper Case()	
isNaN()	It returns true" if given value is not a number. It returns 'false'if given value is number	Example: isNaN(CP100) isNaN(100)	

Table: 8 Built-in functions in JavaScript

Note : *alert(), prompt() and confirm() are window functions we can use it without the window prefix.*

Note : *length is a property of string object used to calculate length of string.*

Program 9 :

```
<!DOCTYPE html>
<html>
<head><title>Area of circle</title>
</head>
<body bgcolor=yellow>
<h1> Program to calculate area of circle </h1>
<script language="javascript">
var r,area;
r=prompt("Enter the radius of circle");
area=3.14*r*r;
document.write("<h1>you entered radius value:</h1>" +r);
document.write("<h1>Area of circle is :</h1>" +area);
</script>
</body></html>
```

Output 9 :

```
Program to calculate area of circle you
entered radius value: 5.5
Area of circle is : 94.985
```

3.17 Decision Making Statements

1) if statement :

Syntax :

```
if(condition)
{
statement block;
}
```

If the conditional expression given in the parenthesis is true, then the statements within the block will be executed, followed by execution of the remaining program. If the conditional expression evaluates to false, then the statement block will not be executed. Note that if statement block constitutes a single statement, then drawing curly brackets is optional.

2) if else statement :

Syntax :

```
if(condition)
{
statement block;
}
else
{
statement block;
}
```

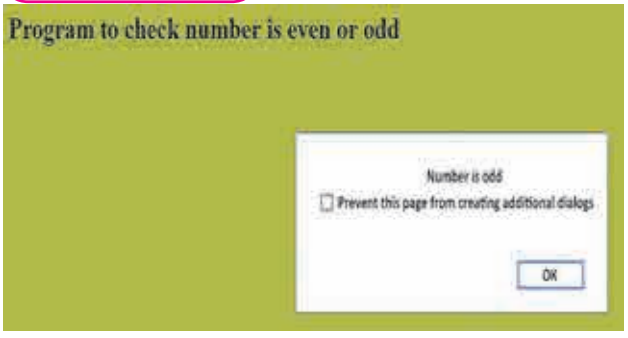
If the conditional expression evaluates to true, then true block statements will be executed otherwise false block that is the else part will be executed. At a time either true block or false block will be executed, not both.

Note : - *if.....else if ladder is used to check multiple conditions, at a time only one condition is true. if not, then else part is executed.*

Program 10 :

```
<!DOCTYPE html>
<html>
<head><title>Even Odd</title></head>
<body bgcolor="green">
<h1> Program to check number is even or odd </h1>
<script language="javascript">
  var a,b
  a=prompt("Enter your value:-");
 b=parseInt(a) ;
// input is converted into number data type
  if(b%2==0)
        alert("Number is even");
    else
        alert("Number is odd");
  </script>
  </body></html>
```

Output 10 :



3.18 User Defined Functions

A function in any scripting and programming languages is small part of program that we require again and again. It helps to make program smaller, A function is a subprogram designed to perform a particular task. Functions can be called either by an event or by giving call to that function.

Function definition :

Rules to declare function name is similar to variable

```
function functionname(argument1,argument2…)
    {
statement block;
    }
```

Values to be passed to the function for further processing

Program 11 :

```
<!DOCTYPE html>
<html>
<head><title>Function program</title>
<script language="javascript">
function show()
{
 alert("Welcome to function");
 }
</script></head>
<body bgcolor="green">
<h1> Use of Function in Javascript </h1>
<script language="javascript">
show();//calling of function
</script> </body></html>
```

Output 11:

3.18.1 Event Handling :

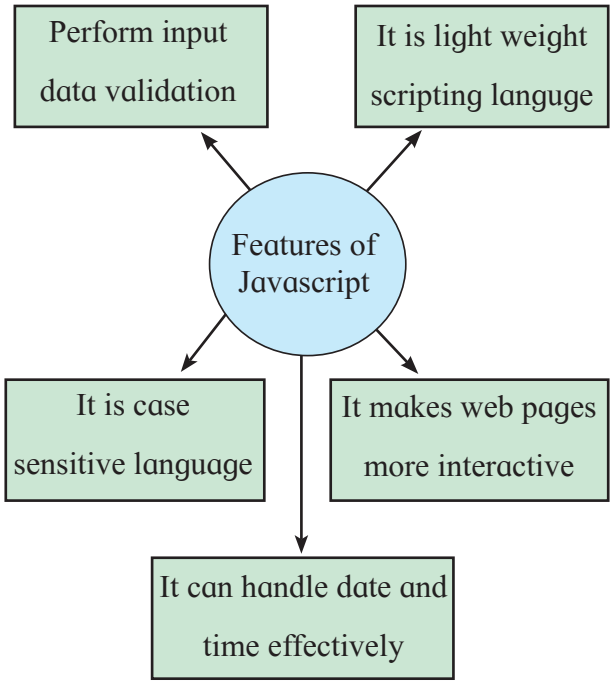
JavaScript is an event-driven language. Event is an action done by the user or an application. JavaScript's interaction with HTML is handled through events that occur when user or browser manipulates page. When the page loads, it is called an event, When the user clicks a button, that click is also an event. Other examples include events like pressing any key, closing a window, resizing a window, etc.

JavaScript lets you execute a code when events are detected. You can respond to any event using an **Event Handler**, which is just a function that's called when an event occurs. This event handler may cause button to close windows, messages to be displayed to users, data to be validated and virtually any other type of response. Some commonly used events are :

Event Handler	Description
Mouse Events	
onMouseOut	When user moves the mouse away from an element
onClick	When user clicks an element
onMouseOver	When user moves the mouse over an element
onMouseUp	When user releases a mouse button over an element
Keyboard Events	
onKeyDown	When user presses a key
onKeyUp	When user releases key.

Table: 9 Event Handler in JavaScript

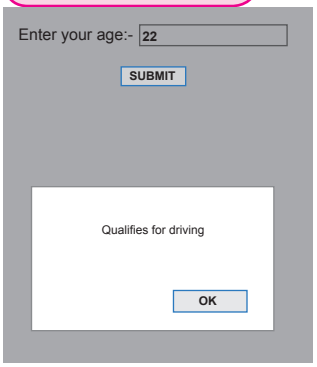
Features of Javascript

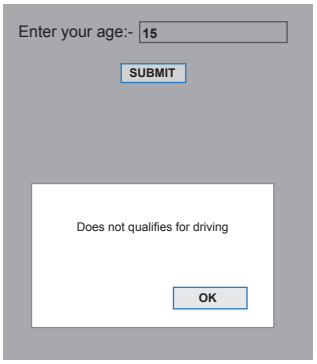


Program 12 :

```
<!DOCTYPE html>
<html><head><title>conditional statement</title>
<script language="javascript">
function check()
{
   var age;
   age=form1.t1.value;
   if(age>=18)
    alert("Qualifies for driving");
  else
    alert("Does not qualifies for driving");
 }
</script></head>
<body>
<form name="form1">
<center>
Enter your age:-
<input type="text" name="t1"><br><br>
 <input type="button" value="SUBMIT" onClick="check()">
 </form></body></html>
```

Output 12:

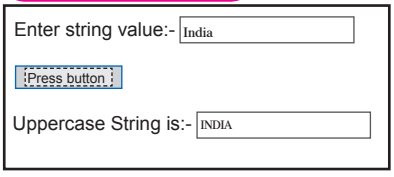




Program 13 :

```
<!DOCTYPE html>
<html><head><title>Uppercase function</title>
<script language="javascript">
function display()
{
   var a;
   a=form1.t1.value
  form1.t2.value=a.toUpperCase()
}
   </script></head>
<body><form name="form1">
Enter string value:-
<input type="text" name="t1"><br><br>
<input type="button" value="Press button"
 onKeyPress="display()">
 Uppercase String is:-
<input type="text" name="t2"></form></body></html>
```

Output 13:



Program 14 :

```
<!Doctype Html>
<html>
<head><title> Html 5 </title>
</head>
<body bgcolor=yellow>
<header>
<h1>HTML5 includes new semantics</h1>
<p >It includes semantic tags like header, footer, nav
</header>
<header>
<h1>Example of complete HTML5 Basics</h1>
<h2>The markup of the future under development.</h2>
</header>
<nav><h1><p>The nav element represents a section of navigation links. It is suitable for
either site navigation or a table of contents.</p></h1>
<a href="/">http://www.w3schools.com</a><br>
<a href="http://www.ebalbharati.in">Balbharti website</a><br>
</nav>
<aside>
<h1>Other education based websites of State</h1>
<a href="http://mahahsscboard.ac.in">State Board website</a><br>
<a href="http://examinfo.mh-hsc.ac.in">Online Exam website</a><br>
</aside>
<section>
<h1>Impressive Web Designing</h1>
<p>The aside element is for content that is tangentially related to the content around it, and
is typically useful for marking up sidebars.</p>
</section>
<section>
 <h1>Articles on:Article tag</h1>
</section>
 <article>
      <p>The article element represents an independent section of a document,
page or site. It is suitable for content like news or blog articles, forum posts or
individual comments.</p>
 </article>
<footer>© 2018 Balbharti.</footer>
</body></html>
```

Output 14:

HTML5 includes new semantics

It includes semantic tags like header,footer,nav

Example of complete HTML5 Basics

The markup of the future under development.

The nav element represents a section of navigation links. It is suitable for either site navigation or a table of contents.

http://www.w3schools.com

Balbharti website

Other education based websites of State

State Board website

Online Exam website

Impressive Web Designing

The aside element is for content that is tangentially related to the content around it, and is typically useful for marking up sidebars.

Articles on:Article tag

The article element represents an independent section of a document, page or site. It is suitable for content like news or blog articles, forum posts or individual comments.

Summary

- WWW stands for world wide web normally referred to as web.
- Webpage: A simple text file created using HTML.
- Website: A collection of web pages containing text images audios and videos. For Example Internet.
- Web Browser: A web browser is used to view web pages or websites on the internet For Example Internet Explorer, Google Chrome, Mozilla Firefox.
- Web Server: A Web server is an application or a computer that sends webpages over the internet using the HTTP protocol. The functionality of website is managed by web server. For Example IIS, Apache.
- URL(Uniform Resource Locator): It is an address of a webpage on the internet. The webpages are retrieved from the original location with the help of URL.
- HTTP: HTTP(Hyper Text Transfer Protocol) is a protocol used by WWW to Client server communication.
- Protocol : A protocol is a set of communication standards used for transferring information between computers in a network.
- <Html> and </Html>: This tag indicates that the document is an html file.
- <Head> and </Head>: It includes <Title> within it, the text within <head> is not displayed on the webpage.
- <title> and </title> : The content within this tag is displayed in a title bar.
- <body> and </body>: This tag includes all content which is to be developed in the web browser. Most of the tags are included in this tag.
- Text formatting element <b>,<I>,<u>,<small>,<sup>,<Sub>,<mark>,<del>, <ins>
- HTML provides six levels of heading tags. The range is from 1 to 6
- <IMG> this tag is used to insert an image within a webpage
- <Hr> this tag is used to display horizontal ruled line
- <table>: It is used to indicate creation of a table.
- <caption>: It is used to specify table heading. It has align attribute which can have top or bottom as it's values. Top is the default value.
- <tr> : This tag is used to create each row of the table.
- <th> : It is generally used for first row content of the table. It displays content in the bold format. It can be replaced with <td>.
- <td> : It specifies data within the table.(cell content)
- <Form> : It is used to accept users' entry . It has a collection of different elements or controls .

- <input> : It is used to create different controls .
- Type attribute of<input > can have values like text, password, radio, checkbox, submit, reset.
- <textarea> It is used to create text with multiple lines.
- JavaScript is scripting language which can be used to develop dynamic webpages. It is an event based scripting language; It is a platform independent language.
- Variables are the basic units of storage.
- JavaScript supports different types of operators such as arithmetic (+,-,*,/,%), relational (<,>,<=,>=,==), logical (&&,||,!) etc.
- if, if…else, are control statements in JavaScript.
- Javascript supports built-In functions like parseInt(), parseFloat(), prompt(), confirm(), alert() etc.
- Javascript supports user defined functions also that can be called either by an event or by giving call to that function.

Exercise

Q.1 Answer the Following :

1. The data entry operator wants to insert.

1. Photograph
2. Write remarks about the photograph
3. Underline the heading.

He will use :

1) <Image>

2) <Text>

3) <TextArea>

4) <Img>

5) <UL>

6) <U>

Select the correct tags from the above and arrange in the sequence

2. Identify the logical operators in the JavaScript.

1) OR

2) AND

3) | |

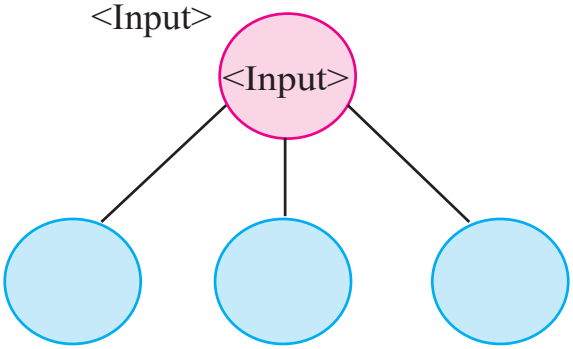
4) &

5) &&

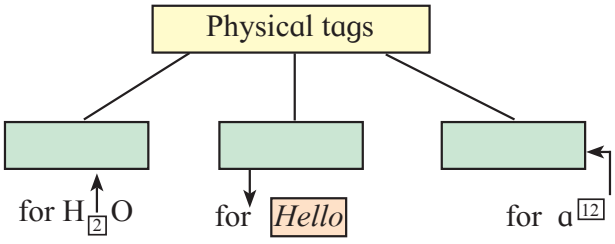
6) ++

Q.2 Complete the following Activity :

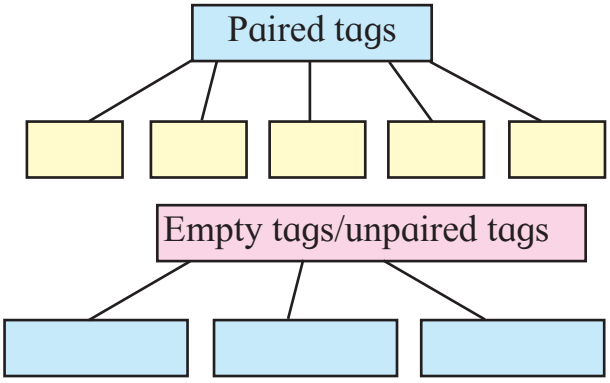
1. State atleast three attributes of <Input>



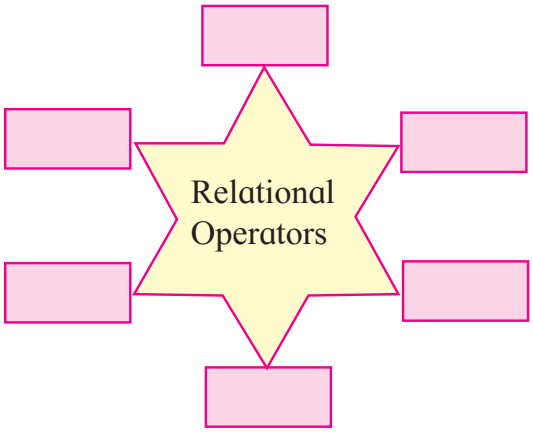
2.



3. Group the following.



4. Write operator names with symbol in boxes.



5. Complete following program to display multiplication of 6.40 and 300.

<!DOCTYPE html> <html>

<head><title> Series </title></head>

<body>

[ ]

var x= [ ] ;

var y= [ ] ;

document.write(x [ ] y);

[ ]

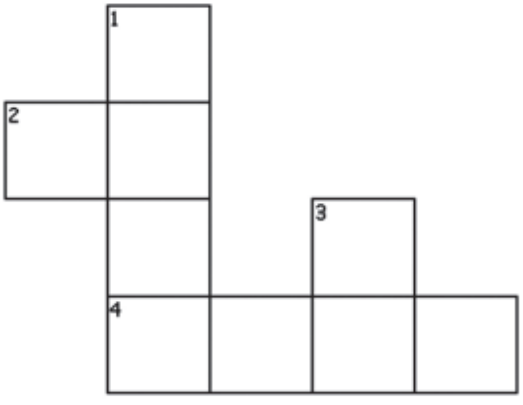
</body></html>

Q.3 Find out error if any in following javascript code.

```
var length ,breadth;
length=4.5;
breadth=6;
area=1/2*length*breadth;
document.write("Area of triangle is"area);
```

Q.4 Solve the following puzzles.

A) Fill the blocks



1) Across

2. The tag used to create table row.
4. Tag to create a form

2) Down

1. The attribute used to specify the path of a linked document.
3. The tag used to display horizontal ruled line.

B) Solve the puzzle by finding words with the help of hint given below.

p	z	c	b	e	p	e	s
r	l	o	m	v	d	l	l
s	k	n	s	a	r	s	t
y	e	f	a	l	s	e	d
w	q	i	s	n	a	n	g
v	a	r	o	s	d	y	z
i	l	m	e	n	c	x	i

1. Boolean value.

2. Keyword used in conditional if statement.

3. Built-In function in JavaScript

4. Function to check given value is number or not

5. Keyword used to declare variable

6. Function used to evaluate given expression

Q.5 Trace the output of following html code.

```
<!DOCTYPE html>
<html>
<head>
<title>Heading tags</title></head>
<body>
<h1 align=left>Information Technol-
ogy</h1>
<hr>
<h2 align=center>XI Standard</h2>
<h3 align=right>Division</h3>
</body>
</html>
```

Q.6 Discuss the following and Answer the questions.

1) A Jr. web designer wants to design a webpage to enter the employee name, address. He needs a button to clear the form content and submit the data.

- Write the different controls he will use to create the web page.
- State the tags to be used for the controls.

2) A teacher has asked a student to create a web page to accept number and check whether it is between 50 to 100.

- List the variable, operators to be used.
- Specify the built-in function used and structure used.

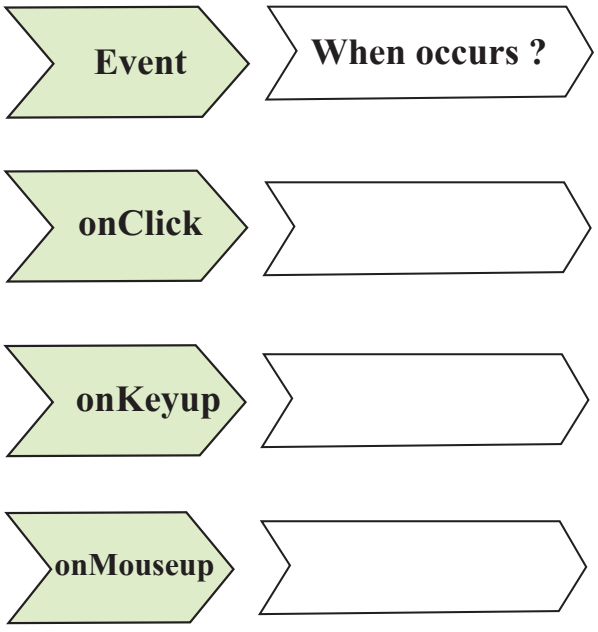
Q.7 Create webpages for the following.

1) Write a program using HTML to design your class Time Table.

2) Write a program using HTML to create a form and submit it with personal data like name, address and standard.

3) Write a javascript program to accept two numbers and perform addition of two numbers by using mouseover event

Q.8 Complete the following.



Q.9 Write HTML Code for the following table.

Place	State	Maximum Temperature in C
Wardha	Maharashtra	47.5
Akola		46.4
Khajuraho	Madhya Pradesh	46.4
Sagar		46.2