# *Chapter 6*

## *Client Side Scripting Using Java Script*

### Java Script

Java script is a client side scripting language used to validate data.It is embedded in HTML document.The <SCRIPT> tag is used to include scripts in an HTML page.JavaScript was developed by Brendan Eich.It is ssupported by almost all web browsers. JavaScript was first known as **LiveScript.**

### <SCRIPT> Tag

The <SCRIPT> tag is used to include(embed) script in an HTML page.The Language attribute of <SCRIPT> tag specifies the type of scripting language used.

Example:

<SCRIPT Language=”JavaScript”>

</SCRIPT>

### The document.write ( ) function

The function **document.write** which writes a string into our HTML document.

First JavaScript Script

```
<html>

<body>

<script language="javascript" >

        document.write("Welcome to JavaScript") ;

</script>

</body>

</html>
```

Note:- We use Notepad for creating the above script and save the file with extension .HTML or .HTM. JavaScript ignores spaces, tabs, and newlines that appear in JavaScript programs.Java-

script is a case-sensitive language.

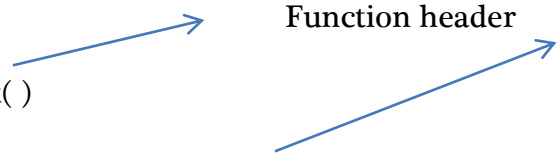
**Creating functions in JavaScript**

A function is a self-contained unit of a program that perform a specific task.It is an independent part of a program which is executed when it is called.A function is often referred to as a 'black box'.Normally functions are placed in the HEAD tag of HTML.

***Defining a function***

Functions must be declared before they are used.A function is defined using the function keyword.The function statements are emclosed in curley brace.Once a function is defined it can be called many times.A function has two parts function header and function body.

Example:- Function header Function body



```
function print( )
{
        document.write("Welcome to JavaScript Programming");
}
```

Note:-A function in JavaScript does not return type.

**Calling a function**

A function can be called using its name such as, print( ).

***Difference between function in JavaScript and C++***

A function is a named group of instructions.A function in JavaScript is defined using the keyword function.C++ does not use the keyword function to define a function.There is

no return type for a function in JavaScript,whereas a function in C++ by default eturns an integer value.

**Data types in JavaScript**

Data type specifies the type of data and the operations that can be performed on the data.data types in JavaScript is classiffied into two primitive data type and compositive data type.

**Primitive data types**

The three primitive data types in JavaScript are Number,String and Boolean.

**Number:-**They include integers and floating point numbers.

**Strings:-**A string is a combination of characters,numbers or symbols enclosed within double quotes.

**Boolean:-**A boolean data can be either True or False.

***Variables in JavaScript***

A variable is a data type whose value changes during program execution.Variables in JavaScript are declared using the var keyword.

Example: var a;

Declares a variable a.

Example: var msg="Hello";

***Note:-Javascript determines the typeof variable only when assigning a value.***

**Undefined data type**

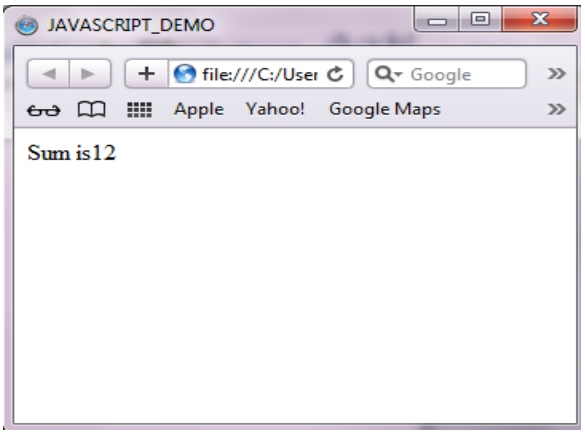
*The* Undefined data type *is used to represent a variable that has been named, but has had no data assigned to it.* The undefined data type is similar to null, in that it only has one possible value: undefined.

Example:-

*A web page to find the sum of two numbers*

```
<HTML>
<HEAD>
<TITLE>JAVASCRIPT_DEMO</TITLE>
<SCRIPT Language="JavaScript">
function sum()
{
   var a,b,c;
   a=10;
   b=2;
   c=a+b;
   document.write("Sum is");
   document.write(c);
}
</SCRIPT>
</HEAD>
<BODY>
<SCRIPT Language="JavaScript">
 sum( );
</SCRIPT>
</BODY>
</HTML>
```

Output:-




## Operators in JavaScript

An operator is a symbol used to perform a specific task.Operators in JavaScript are classified into  two,Arithmetic operator , Relational operator. and Logical operator.

## Arithmetic Operator

Arithmetic operator is used to perform arithmetic operations.

| Operator | Description |
|---|---|
| + | Addition |
| - | Subtraction |
| * | Multiplication |
| / | Division |
| % | Modulus |
| ++ | Increment |
| -- | Decrement |

## Relational Operator

Relational operator is used for comparison operations.

| Operator | Example | Same As |
|---|---|---|
| = | x = y | x = y |
| += | x += y | x = x + y |
| -= | x -= y | x = x - y |
| *= | x *= y | x = x * y |
| /= | x /= y | x = x / y |
| %= | x %= y | x = x % y |

## Assignment Operator

The assignment operator(=) operator is used to assign a value to a variable.

Example:- var a=10;

Assigns 10 to the variable a.

## Arithmetic Assignment Operator

The arithmetic assignment operators includes +=,- =,* =,/ =,% =.They are used to simplify the use of assignment operator.

Example:-

a+=10 is equal to a=a+10

a% =10 is equal to a=a%10

## Logical Operator

Logical operators are used for comparison.

Given that **x = 6** and **y = 3**, the table below explains the logical operators:

| Operator | Description | Example |
|---|---|---|
| && | and | (x < 10 && y > 1) is true |
| \|\| | or | (x == 5 \|\| y == 5) is false |
| ! | not | !(x == y) is true |

Arithmetic Operator Precedence

The following table lists JavaScript arithmetic operators, ordered from highest to lowest precedence:

| Operator | Precedence |
|---|---|
| ( ) | Expression grouping |
| ++ -- | Increment and decrement |
| * / % | Multiplication, division, and modulo division |
| + - | Addition and subtraction |

**String addition**

The + operator can be used to add(Join) two strings.

Example:-

```
var a,b,c
 a=”Hello”;
 b=”How are you”;
 c=a+b;
document.write(c);
```

Output:-

Hello How are you

**Number function in JavaScript**

The Number( ) function is used to convert a string data into a number.

Example:

Number(“42”); //returns 42

Number(“eggs”); //returns NaN  String that can’t be converted to number retyrns NaN.

Number(true);//returns 1

Number(false);//returns 0

***Note:-***

***NaN stands for Not a Number.***

**Control structures in JavaScript**

Control structures are used to alter the normal sequence of execution of a program.The important

Control structures in JavaScript are,

***1)if  statement***

The if statement executes a group of statements based on a condition.The syntax is

```
if(test_expression)
   {
        Statements;
   }
```

***2)Switch statement***

The Switch statement is a multi-branching statement,which executes statement based on value of the expression.The syntax is

```
switch(expression)
{
    case value1:statement1;break;
    case value2:ststement2;break;
    -   ----------------------
```

```
        Default:statement;
}
```

*3)for .....Loop*

The for loop executes a group of statements repeatedly.The syntax is

```
for(initialisation;expression;update_statement)
  {
        statements;
  }
```

*4)While ..... Loop*

The while loop executes a group of statements repeatedly based on a condition.The syntax is

```
while(expression)
   {
       statements;
   }
```

**Built-in Functions**

Built-in functions are also called methods.The following are the important methods in JavaScript.

*1)alert( ) function*

The alert( ) function is used to display a message on the screen.The syntax is

```
        alert("message");
```

*2)isNaN( ) function*

The isNaN( ) function is check if a value is a number or not.The function returns ***True*** if the value is a number.The syntax is

isNaN(test_value);

### *3)toUpperCase ( ) function*

This function converts a string into uppercase.

Example:-

```
var a,b;

a=”abcd”;

b=a.toUpperCase( );

document.write(b);
```

Output:ABCD

### *4)toLowerCase( ) function*

This function converts a string to lowercase.

### *5)charAt( ) function*

The **charAt**() **method** returns the character at the specified index in a string. The index of the first character is 0, the second character is 1, and so on.

Example:-

```
var str = "HELLO WORLD";
var res = str.charAt(0);
```

returns H

length Property

The length property returns the length of a string(number of characters).

Example:-

```
var a=”Welcome”;

var len=a.length;

document.write(len);
```

Output:-

7

### *Difference between function and property*

A function has paremeters within parenthesis after the function name,but property doesnot have paremeters within parenthesis.

### *Events in JavaScript*

JavaScript programs use event driven programming model.In an event driven programming model code remains idle until called upon by an event.An event is an action triggered(initiated) by an use such as mouseclick,keypress etc.The important events in JavaScript are

| *Event* | *Description* |
|---|---|
| *onClick* | *Occurs when the user clicks on an object* |
| *onMouseEnter* | *Occurs when the mouse pointer is moved out of an object.* |
| *onMouseLeave* | *Occurs when the mouse pointer is moved out of an object.* |
| *onKeyDown* | *Occurs when the user press a key on the keyboard.* |
| *onKeyUp* | *Occurs when the user releases a key on the keyboard.* |

### Accessing values in a textbox using JavaScript

Names are provided to textboxes to access them.

The following HTML code is used to specify name to textbox.

<INPUT Type=”Text” Name=”txtnum”;

The above textbox can be accessed as

var n= document.txtnum.value;

The above statement assigns the value in txtnum.

### *Different ways to add Scripts to a web page*

JavaScript code can be placed in the Head or Body section of a web page.It can also be placed as an external file with '***.js'*** extension.Placing JavaScript code as external file helps to use it in multiple web pages.It also helps to load the page faster.The external script can be linked to HTML file by the Src attribute of **<Script>** tag.

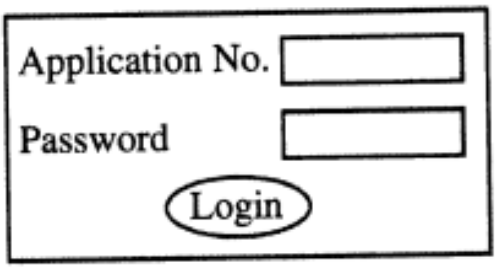
Placing JavaScript in head section allows to execute the script faster as the head section is loaded before the body section.Placing the script in Body section allows to execute the script when the page is loaded.

***Conclusion:-***

- JavaScript is a client side scripting language.
- JavaScript was developed by ***Brendan Eich*** for Netscape web browser.It was early knows as ***Mocha***.
- The <SCRIPT> tag is used to include script in HTML page.
- The JavaScript code is interpreted at runtime by JavaScript engine.JavaScript engine is a virtual machine for executing JavScript code.
- The Keyword ***Var*** is used to declare a variable in JavaScript.
- The Keyword ***function*** is used to declare a function in JavaScript.
- The addition operator(+) is used to add two strings together.
- The document in document.write function refers to the body section of the web page(HTML document).
- By default the content of text box is treated as string type.
- The Number( ) function is used to convert a string data into number.
- The value property of a textbox is used to access data in a textbox.

# *Previous Questions*

1.Develop a webpage to display the following login screen.

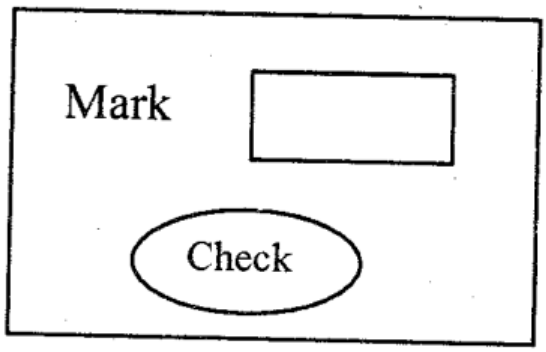



Write JavaScript to do the following validation :

(a)The application number should be in the range 10000 to 99999.

(b)The password should contain atleast 8 characters. **March 2016**

2.Design the following web page to enter the mark of a student:




(a) Write the HTML code for the website.

(b) Provide validation for the text box using Java Script.The mark should be in the range 0 to 100 and should be a number.The text box should not be empty.

June 2016

## ***JavaScript Practice Programs***

1)Develop a web page to display the following screen.User can enter a number in the first text box.On clicking the show button ,product of all numbers from 1 to the entered limit should be displayed in the second text box.

```
<html>
 <head>
  <Script Language="JavaScript">
        function Product()
    {
          var p=1,i;
          var n=document.frmProduct.txtNum.value;

      for(i=1;i<=n;i++)
      {
          p=p*i;
      }
document.frmProduct.txtResult.value=p;
    }
  </Script>
 </head>
<body>
<center>
<form name="frmProduct">
Enter the limit  <input type="text" name="txtNum">
<br><br><br>
```

Product upto the limit  <input type="text" name="txtResult">

<br><br><br>

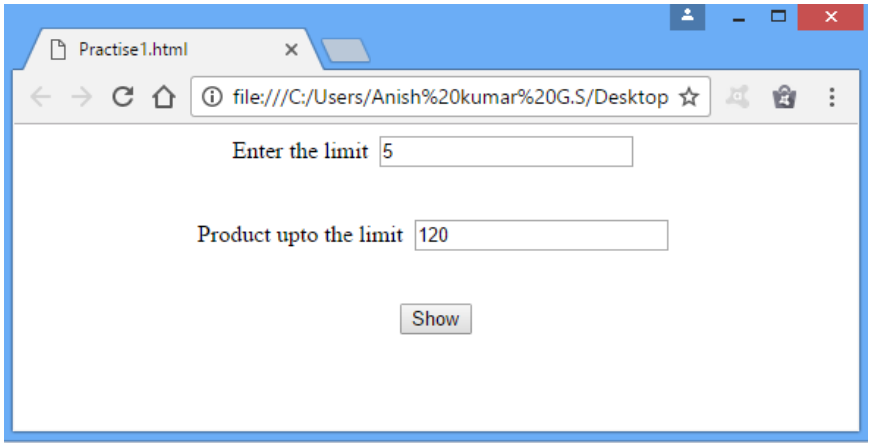
<input type="button"  value="Show" onClick="Product()">

</form>

</body>

</html>

**Output:-**




2)Develop a web page to display the following screen.User anter a number in the first text box.On clicking the show button,Even or Odd should be displayed in the second text box depending whether the number is even or odd.

<html>

<head>

<Script Language="JavaScript">

function Check()

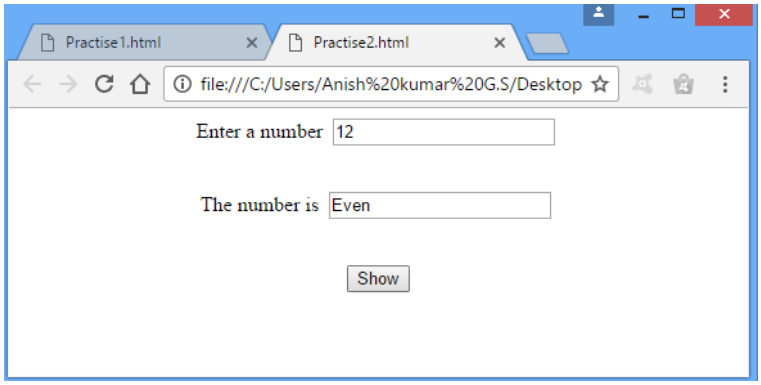
{

var n=document.frmCheck.txtNum.value;

```
            if(n%2==0)
          document.frmCheck.txtResult.value="Even";
              else
          document.frmCheck.txtResult.value="Odd";


          }
    </Script>
  </head>
 <body>
<center>
<form name="frmCheck">
Enter a number  <input type="text" name="txtNum">
<br><br><br>
The number is  <input type="text" name="txtResult">
<br><br><br>
<input type="button"  value="Show" onClick="Check()">
</form>
 </body>
</center>
</html>
```

Output:-



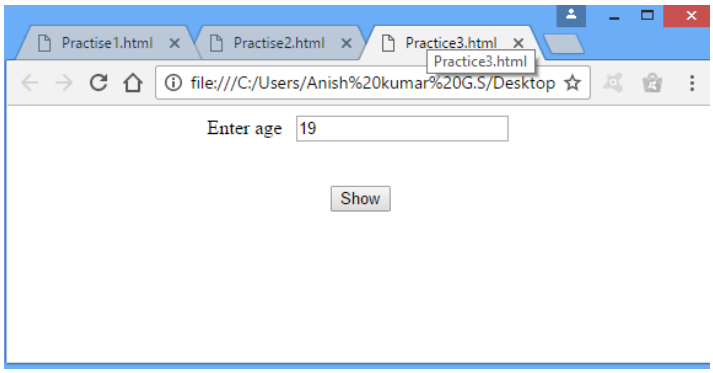

3)Develop a web page to display the following screen.The user can enter an age in the text box.if the user enter an alphabet,instead of a number in the text box,on clicking the show button,it should display a message “Invalid Age” to the user.Other wise it should display a message “Correct Data”.

```
<html>
 <head>
  <Script Language="JavaScript">
        function Check()
      {

            var age=document.frmCheck.txtNum.value;
            var flag;
            flag=isNaN(age);
            if(flag==true)
            alert("Invalid Age");
             else
            alert("Correct Data");
```

```
        }
   </Script>
 </head>
 <body>
<center>
<form name="frmCheck">
Enter age   <input type="text" name="txtNum">
<br><br><br>
<input type="button"  value="Show" onClick="Check()">
</form>
 </body>
</center>
</html>
```

**Output:-**




4) Develop a web page to display the following screen.The user can enter a number in the text.If the user entered a Number ,on clicking the check button,it should display “Number” other wise it should display “Not a Number”.

```
<HTML>
 <HEAD>
        <TITLE>Calculator</TITLE>
  <SCRIPT Language="JavaScript">
 function Check( )
{
 var num;
 var Flag;
 num=document.frmCheck.txtNum.value;
 Flag=isNaN(num);
 if(Flag==true)
document.frmCheck.txtResult.value="Not a Number";

  else
document.frmCheck.txtResult.value="Number";
}

</SCRIPT>
</HEAD>
<FORM name=frmCheck>
<CENTER>
Enter a Number:
<INPUT Type="text" name="txtNum">
```

<BR><BR>

Result:

<INPUT Type="text" name="txtResult">

<INPUT Type="button" value="Check" onClick="Check()">

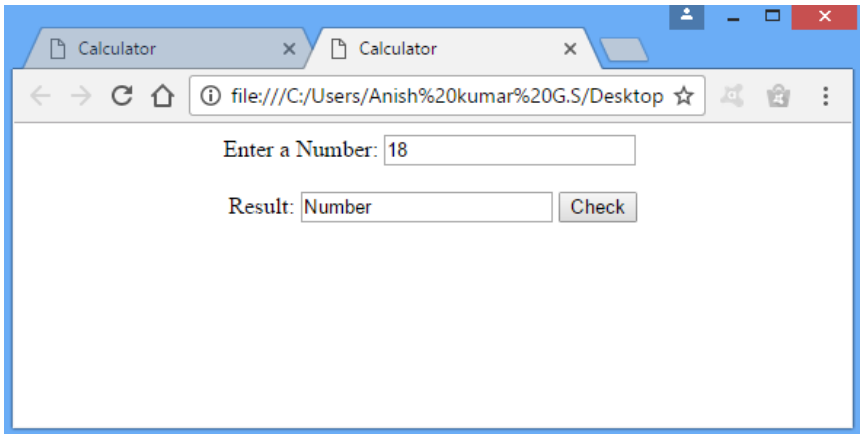
</CENTER>

</FORM>

</BODY>

</HTML>

**Output:-**




5) A web page should contain one text box for entering a text. There should be two buttons labelled "To Upper Case" and "To Lower Case".On clicking each button, the content in the text box should be converted to upper case or lower case accordingly. Write the required

JavaScript for these operations. <HTML>

<HEAD>

<TITLE>String_Convertion</TITLE>

<SCRIPT Language="JavaScript">

function upper( )

```
{



document.frmconvert.txtconvert.value=document.frmconvert.txtstring.value.toUpperCa
se();

}

function lower( )

{


document.frmconvert.txtconvert.value=document.frmconvert.txtstring.value.toLowerCa
se();

  }

</SCRIPT>

  </HEAD>

<BODY>

 <FORM Name="frmconvert">

    <CENTER>

   Enter the String:

    <INPUT Type="text" Name="txtstring">

 <BR><BR>

<INPUT Type="text" Name="txtconvert">

<BR><BR>

<INPUT Type="button" value="“To Upper Case" onClick="upper( )">

<INPUT Type="button" value="To Lower Case”" onClick="lower( )">
```

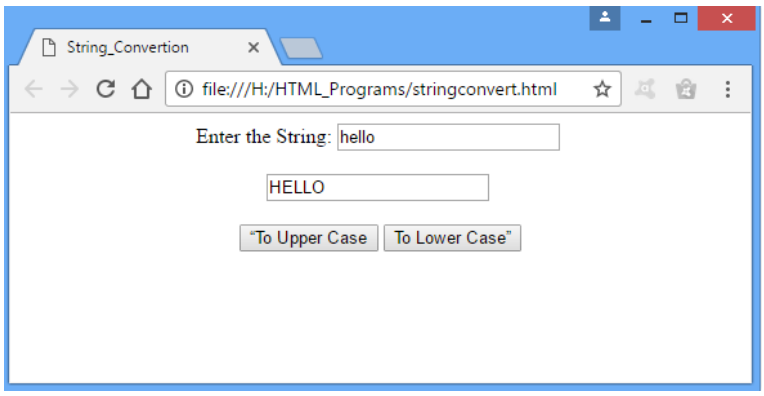
</CENTER>

</FORM>

</BODY>

</HTML>

**Output:-**



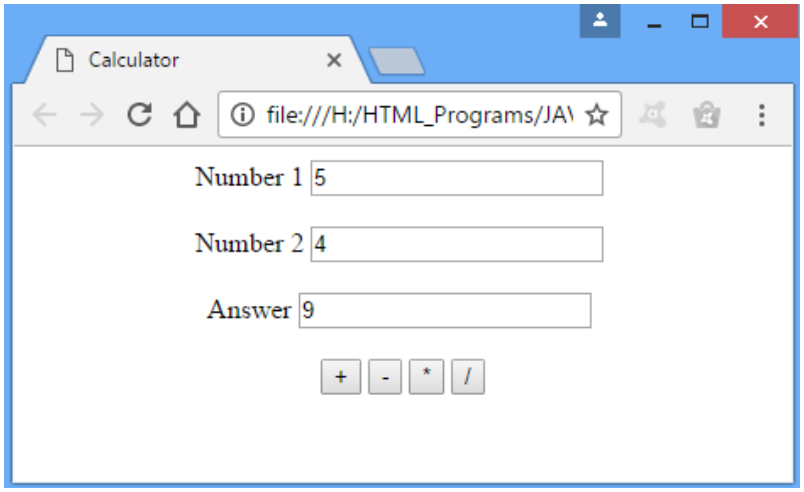

6) Develop a simple calculator using JavaScript. The web page should contain two text boxes of entering two numbers and another text box for displaying the answer. There should be four buttons to perform addition, subtraction, multiplication and division. On clicking a button, the corresponding result should be displayed in the answer box. Write the required JavaScript.

```
<HTML>
<HEAD>
<TITLE>Calculator</TITLE>
<SCRIPT Language="JavaScript">
function plus( )
{
var num1,num2,result;
num1=document.frmcalc.txtNum1.value;
num2=document.frmcalc.txtNum2.value;
result=Number(num1)+Number(num2);
document.frmcalc.txtResult.value=result;
}
function minus( )
```

```
{
var num1,num2,result;
num1=document.frmcalc.txtNum1.value;
num2=document.frmcalc.txtNum2.value;
result=Number(num1)-Number(num2);
document.frmcalc.txtResult.value=result;
}
function div( )
{
var num1,num2,result;
num1=document.frmcalc.txtNum1.value;
num2=document.frmcalc.txtNum2.value;
result=Number(num1)/Number(num2);
document.frmcalc.txtResult.value=result;
}
function mul( )
{
var num1,num2,result;
num1=document.frmcalc.txtNum1.value;
num2=document.frmcalc.txtNum2.value;
result=Number(num1)*Number(num2);
document.frmcalc.txtResult.value=result;
}
</SCRIPT>
</HEAD>
<FORM name=frmcalc>
<CENTER>
Number 1
<INPUT Type="text" name="txtNum1">
<BR><BR>
Number 2
<INPUT Type="text" name="txtNum2">
<BR><BR>
Answer
```

```
<INPUT Type="text" name="txtResult">
<BR><BR>
<INPUT Type="button" value="+" onClick="plus()">
<INPUT Type="button" value="-" onClick="minus()">
<INPUT Type="button" value="*" onClick="mul()">
<INPUT Type="button" value="/" onClick="div()">
</CENTER>
</FORM>
</BODY>
</HTML>
```

**Output:-**

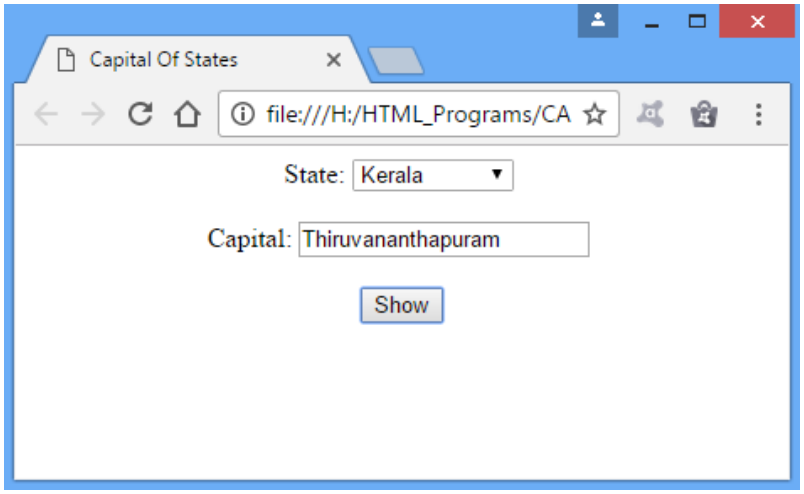



7) Develop a web page to find the capital of Indian States. The page should contain a dropdown list from which the user can select a state.On clicking the show button, the web page should display the capital of the state in another text box. Write the required JavaScript.

```
<HTML>
<HEAD>
<TITLE>Capital Of States</TITLE>
<SCRIPT Language="JavaScript">
function Capital( )
{
var n,answer;
n=document.frmCapital.cboState.selectedIndex;
```

```
switch (n)
{
case 0: answer="Thiruvananthapuram";break;
case 1:answer="Bengaluru";break;
case 2:answer="Chennai";break;
case 3:answer="Mumbai";break;
}
document.frmCapital.txtCapital.value=answer;
}
</SCRIPT>
</HEAD>
<FORM Name="frmCapital">
<CENTER>State:
<SELECT Size=1 Name="cboState">
<OPTION>Kerala</OPTION>
<OPTION>Karnataka</OPTION>
<OPTION>Tamilnadu</OPTION>
<OPTION>Maharashtra</OPTION>
</SELECT>
<BR><BR>
Capital:
<INPUT Type="Text" Name="txtCapital">
<BR><BR>
<INPUT Type="Button" value="Show" onClick="Capital ( )">
</CENTER>
</FORM>
</BODY>
</HTML>
```

**Output:-**




8)Develop a web page to accept a Register Number of a student.Provide validation for this textbox.The validation are 1)It should not be empty 2)It should be a number 3)It should be greater than 8 characters.

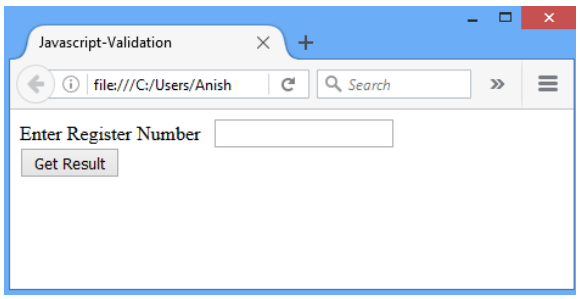
```
<html>
        <head>
        <title>Javascript-Validation</title>
<Script Language="Javascript">
 function checkData()
{
        var rno=document.frmvalid.txtRegno.value;
        if(rno==" ")
        {
          alert("Please enter Register Number");
        }

        if(isNaN(rno))
        {
          alert("Invalid Register Number");
```

```
        }
        if(rno.length<8)
        {
          alert("The register No must have 8 Characters");
        }

}
</Script>
</head>
<body>
<form name="frmvalid">
Enter Register Number&amp;nbsp;&amp;nbsp;
<input type="text" name="txtRegno">
<br>
<input type="submit" value="Get Result" onClick="checkData()">
</form>
</body>
</html>
```

Output:-



9)Develop a webpage to find the factorial of a given number .User can enter a number in a text box.On clicking the Show button factorial should be displayed on second text box.

```
<html>
<head>
<Script Language="JavaScript">
function factorial()
{
  var f=1,i;
  var n=document.frmfact.txtNum.value;
 for(i=1;i<=n;i++)
 {
  f=f*i;
 }
 document.frmfact.txtResult.value=f;
}
 </Script>
</Head>
<body>
<center>
<form name="frmfact">
Enter the Number:&amp;nbsp;&amp;nbsp;
<input type="text" name="txtNum" >
 <br> <br> <br>
```

```
Factorial: 

<input type="text" name="txtResult">

<br>

<input type ="button" value="show" onClick="factorial()">

</form>

</body>

</center>

</html>
```

**Output:-**