Introduction JavaScript

Script means small piece of code. Scripting languages are two kinds one is client-side other one is servers-side scripting. In general client-side scripting is used for verifying simple validation at client side, server-side scripting is used for database verifications. VBScript, java script and J script are examples for client-side scripting and ASP, JSP, Servlets,PHP etc. are examples of server-side scripting.

JavaScript (originally known as "LiveScript") is a scripting language that runs inside the browser to manipulate and enhance the contents of Web pages. Java Script is designed to add interactivity to HTML pages. W eb pages are two types

5. Static web page
6. Dynamic webpage

- ❖ Static web page where there is no specific interaction with the client
- ❖ Dynamic web page which is having interactions with client and as well as validations can be added.

Simple HTML script is called static web page, if you add script to HTML page it is called dynamic page. Netscape navigator developed java script. Microsoft's version of JavaScript is Jscript.

- ❖ Java script code as written between <script>-----</script>tags
- ❖ All java script statements end with a semicolon
- ❖ Java script ignores white space
- ❖ Java script is case sensitive language
- ❖ Script program can save as either. Js or.html

Benefits of JavaScript

- ❖ It is widely supported by web browsers;
- ❖ It gives easy access to the document objects and can manipulate most of them.
- ❖ Java Script gives interesting animations with long download times associated with many multimedia data types;
- ❖ Web surfers don't need a special plug-in to use your scripts
- ❖ Java Script relatively secure - you can't get a virus infection directly from Java Script.
- ❖ JavaScript code resembles the code of C Language; the syntax of both the language is very close to each other. The set of tokens and constructs are same in both the language.

Problems with JavaScript

- ❖ Most scripts relay upon manipulating the elements of DOM;
- ❖ Your script does not work then your page is useless
- ❖ Because of the problems of broken scripts many web surfers disable java script support in their browsers
- ❖ Script can run slowly and complex scripts can take long time to start up

Similarities between java script and java:

1. Both java script and java having same kind of operators
2. Java script uses similar control structures of java
3. Nowadays both are used as languages for use on internet.
4. Labeled break and labeled continue both are similar
5. Both are case-sensitive languages
6.

Difference between java script and java:

Java Script	Java
Java Script is scripting language	Java is a programming language
Java Script is object-based programming language.	Java is object –oriented programming language
Java script code is not compiled, only interpreted.	Java is compiled as well as interpreted language
Java Script is Weekly-typed language	Java is Strongly-typed language
JavaScript code is run on abrowser only.	**Java** creates applications that run in a virtual machine or browser

The syntax of the script tag isas follows:

```
        <script language=""scripting language name"">
    ----------------------------------------
        </script>
```

The language attribute specifies the scripting language used in the script. Both Microsoft internet explorer and Netscape navigator use java script as the default scripting language. The script tag may be placed in either the head or the body or the body of an HTML document.

```
          Ex: <script language=""javascript"">
                        -------------
                        -------------
                        -------------
          </script>
```

Comments in JavaScript:

Single line comment- //
Multi-line comment- <!-- comment -->

Operators in JavaScript:

- Arithmetic operators(+,-,*,/,%)
- Relational operators(<,>,!=,<=,>=)
- Logical operators(&&,||,!)
- Assignment operator(=)
- Increment decrement operators(++,--)
- Conditional/Ternary operator(?:)
- Bitwise operators(&,|,!)

Control structures:

- If statement
- Switch
- While
- Do-while
- For
- Break
- Continue

Control structures syntax and working as same as java language.

Variables

Variables are like storage units/place holders to hold values. A variable is a memory location to hold certain different types of data. In Javascript, A variable can store all kinds of data. It is important to know the proper syntax to which variables must conform:

- They must start with a letter or underscore ("_")
- Subsequent characters can also be digits (0-9) or letters (A-Z and/or a-z). Remember, JavaScript is case-sensitive. (That means that MyVar and myVar are two different names to JavaScript, because they have different capitalization.)
- You cannot use reserved words as variable names.
- You cannot use spaces in names.
- Names are case-sensitive.

Syntax:

var v_name = value;

Examples of legal variable names are fname, temp99, and _name.

When you declare a variable by assignment outside of a function, it is called global variable, because it is available everywhere in the document. When you declare a variable within a function, it is called local variable, because it is available only within the function. To assign a value to a variable, you use the following notation:

```
var num = 8; var
real= 4.5;
var myString = "Web Technologies";
```

Values of Variables(Data types)

JavaScript recognizes the following types of values:

- Numbers, such as 42 or 3.14159
- Boolean values, either true or false
- Strings, such as "Howdy!"
- NULL, a special keyword which refers to nothing.

Functions

Functions are one of the fundamental building blocks in JavaScript. A function is a JavaScript procedure -a set of statements that performs a specific task when called. A function definition has these basic parts:

- The *function* keyword
- A function name
- A comma-separated list of arguments to the function in parentheses
- The statements in the function in curly braces: { }

Defining a Function

Defining the function means, name the function and specifies what to do when the function is called. You define a function within the <SCRIPT>...</SCRIPT> tags within the <HEAD> ... </HEAD> tags. While defining a function, you can also declare the variables which you will be calling in that function. Here's an example of *defining* a function:

```
function msg()
{
     window.alert("This is an alert box.");
}
```

Here's an example of a function that takes a parameter:

```
function welcome(string)
{
        window.alert("Hi"+string);
 }
```

When you call this function, you need to pass a parameter (such as the word that the user clicked on) into thefunction.

Calling a Function

Calling the function actually performs the specified actions. When you call a function, this is usually within the BODY of the HTML page, and you usually pass a parameter into the function on which the function will act.

Here's an example of calling the same function:

msg();

For the other example, this is how you may call it:

<inupt type="button" name="welcome" onClick="*msg1("Vijay")*"/>

OBJECTS IN JAVASCRIPT

When you load a document in your Web browser, it creates a number of JavaScript objects with properties and capabilities based on the HTML in the document and other information. These objects exist in a hierarchy that reflects the structure of the HTML page itself. The pre-defined objects that are most commonly used are the window and document objects. Some of the useful Objects are:

1. Document
2. Window
3. Browser
4. Form
5. Math
6. Date

The DocumentObject

A document is a web page that is being either displayed or created. The document has a number of properties that can be accessed by JavaScript programs and used to manipulate the content of the page.

write or writeln

Html pages can be created on the fly using JavaScript. This is done by using the write or writeln methods of the documentobject.

Syntax:

```
document.write ("String"); document.writeln
("String");
```

In this document is object name and write () or writeln () are methods. Symbol period is used as connector between object name and method name. The difference between these two methods is carriage form feed character that is new line character automatically added into thedocument.

Exmaple: document.write("<body>");
document.write("<h1> Hello</h1>");

bgcolor and fgcolor

These are used to set background and foreground(text) color to webpage. The methods accept either hexadecimal values or common names for colors.

Syntax:

```
document.bgcolor="#1f9de1";
document.fgcolor="silver";
```

anchors

The anchors property is an array of anchor names in the order in which they appear in the HTML Document. Anchors can be accessed like this:

Syntax:

```
document.anchors[0];
      :
document.anchors[n-1];
```

Links

Another array holding all links in the order in which they were appeared on the Webpage

Forms

Another array, this one contains all of the HTML forms. By combining this array with the individual form objects each form item can be accessed.

The Window Object

The window object is used to create a new window and to control the properties of window.
Methods:

1. *open("URL","name") :* This method opens a new window which contains the document specified by URL and the new window is identified by its name.
2. *close():* this shutdowns thecurrent window.

Properties:

toolbar = [1|0] location= [1|0] menubar = [1|0] scrollbars = [1|0] status = [1|0] resizable = [1|0]
where as 1 means *on* and 0 means *off*

height=pixels, width=pixels : These properties can be used to set the window size.
The following code shows how to open a new window

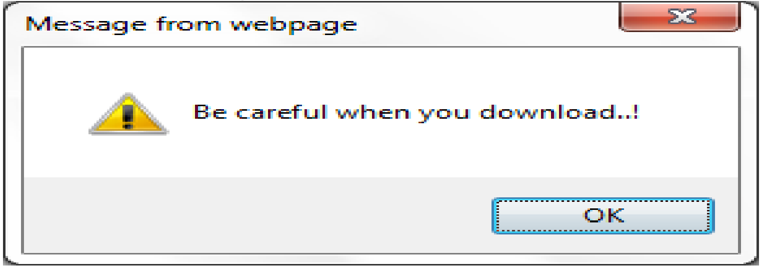
newWin = open("first.html","newWin","status=0,toolbar=0,width=100,height=100");

Window object supports three types of message boxes.

1. Alert box
2. Confirm box
3. Prompt box

Alert box is used to display warning/error messages to user. It displays a text string with *OK* button.

Syntax: window. Alert("Message");



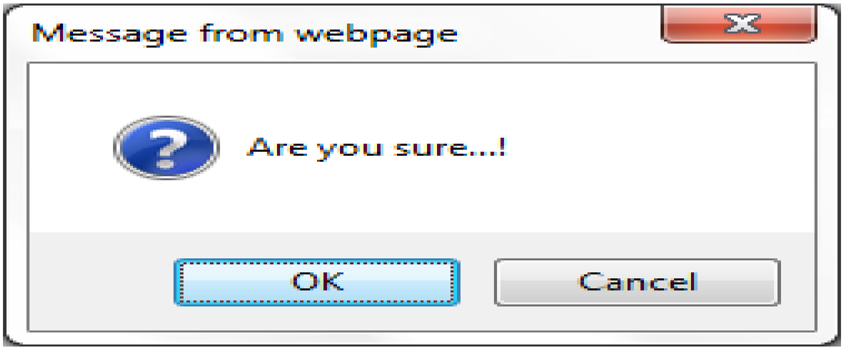
Message from webpage

Be careful when you download..!

Confirm Box is useful when submitting form data. This displays a window containing message with two buttons: *OK* and *Cancel.* Selecting *Cancel* will abort the any pending action, while *OK* will let the action proceed.

Syntax

window.confirm("String");

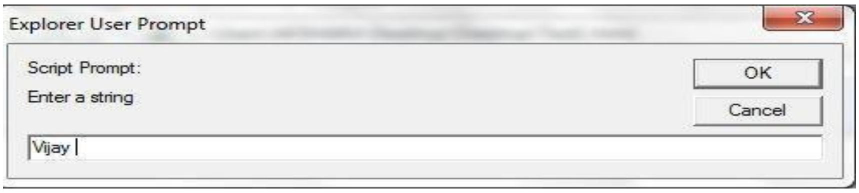


Message from webpage

Are you sure...!

Prompt box used for accepting data from user through keyboard. This displays simple window that contains a prompt and a text field in which user can enter data. This method has two parameters: a text string to be used as a prompt and a string to use as the default value. If you don"t want to display a default then simply use an empty string. Syntax

Variable=window.prompt("string","default value");



Explorer User Prompt

Script Prompt:
Enter a string

Vijay

The Form Object

Two aspects of the form can be manipulated through JavaScript. First, most commonly and probably most usefully, the data that is entered onto your form can be checked at submission. Second you can actually build forms through JavaScript.

Form object supports three events to validate the form

onClick = "method()"

This can be applied to all form elements. This event is triggered when the user clicks on the element.

onSubmit = "method()"

This event can only be triggered by form itself and occurs when a form is submitted.

onReset = "method()"

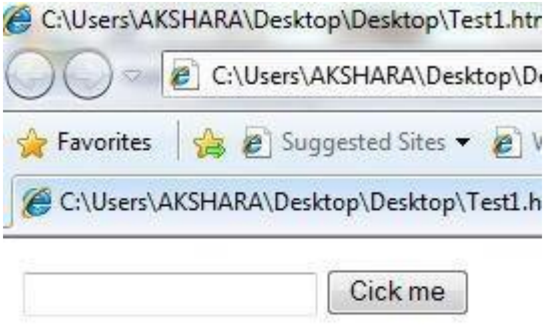
This event can only be triggered by form itself and occurs when a form is reset.

Example: HTML program that applies a random background color when you click on button

```
<html>
```

```
<head>
<script language = "javascript">
        function change()
        {

      }
</script>
</head>
<body>
var clr = document.bgColor=parseInt(Math.random()*999999); document.f1.color.value=clr;<form
name="f1">
        <input type="text" name="color"/>
        <input type="button" value="Cick me" onclick="change()"/>
</form> </body></html>
```


C:\Users\AKSHARA\Desktop\Desktop\Test1.htr
C:\Users\AKSHARA\Desktop\D
Favorites
Suggested Sites
C:\Users\AKSHARA\Desktop\Desktop\Test1.h
Cick me

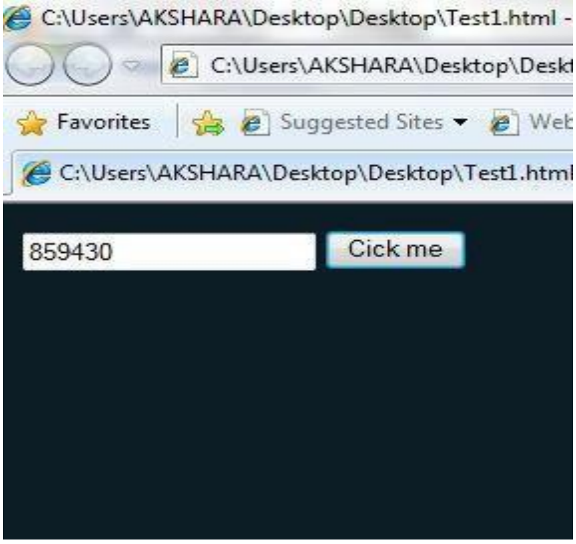

C:\Users\AKSHARA\Desktop\Desktop\Test1.html -
C:\Users\AKSHARA\Desktop\Deskt
Favorites
Suggested Sites
Web
C:\Users\AKSHARA\Desktop\Desktop\Test1.html
859430
Cick me

Fig.1: On first run background is white

Fig.2: After clicking on button"Clickme": background changed to "black"The browser Object

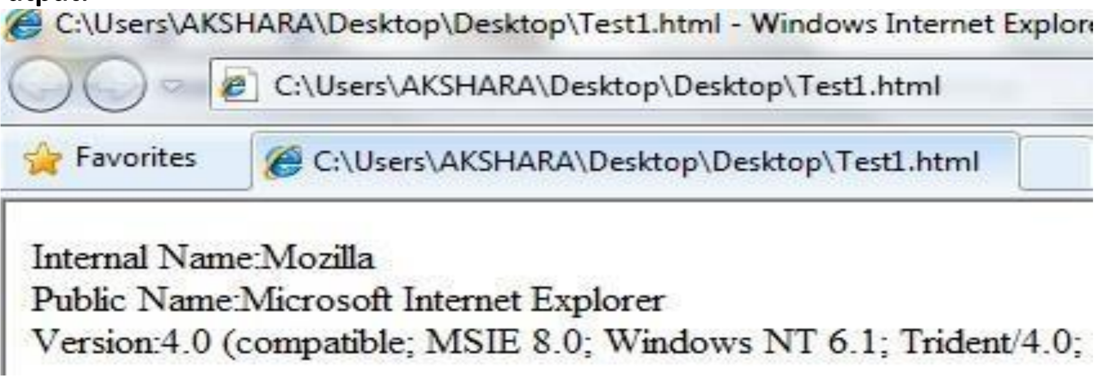
The browser is JavaScript object that can be used to know the details of browser. Some of the properties of the browser object is as follows:

Property	Description
navigator.appCodeName	It returns the internal name for the browser. For major browsers it is *Mozilla*
navigator.appName	It returns the public name of the browser – navigator or Internet Explorer
navigator.appVersion	It returns the version number, platform on which the browser is running.
navigator.userAgent	The strings appCodeName and appVersion concatenated together
navigator.plugins	An array containing details of all installed plug-ins
Navigator.mimeTypes	An array of all supported MIME Types

Example: Write javascript to display internal details of a browser (***Test.html***)

```
<script language = "javascript">
<!--
   document.writeln("Internal      Name:"+navigator.appCodeName);
   document.writeln("<br/>Public Name:"+navigator.appName);
   document.writeln("<br/>Version:"+navigator.appVersion);
-->
</script>
```

Output:


C:\Users\AKSHARA\Desktop\Desktop\Test1.html - Windows Internet Explor
C:\Users\AKSHARA\Desktop\Desktop\Test1.html
Favorites
C:\Users\AKSHARA\Desktop\Desktop\Test1.html

```
Internal Name:Mozilla
Public Name:Microsoft Internet Explorer
Version:4.0 (compatible; MSIE 8.0; Windows NT 6.1; Trident/4.0;
```

The Math Object

The *Math* object holds all mathematical functions and values. All the functions and attributes used in complex mathematics must be accessed via this object.

Syntax:

Math.methodname();
Math.value;

Method	Description	Example
Math.abs(x)	Returns the absolute value	Math.abs(-20) is 20
Math.ceil(x)	Returns the ceil value	Math.ceil(5.8) is 6 Math.ceil(2.2) is 3
Math.floor(x)	Returns the floor value	Math.floor(5.8) is 5 Math.floor(2.2) is 2
Math.round(x)	Returns the round value, nearest integer value	Math.round(5.8) is 6 Math.round(2.2) is 2
Math.trunc(x)	Removes the decimal places it returns only integer value	Math.trunc(5.8) is 5 Math.trunc(2.2) is 2
Math.max(x,y)	Returns the maximum value	Math.max(2,3) is 3 Math.max(5,2) is 5
Math.min(x,y)	Returns the minimum value	Math.min(2,3) is 2 Math.min(5,2) is 2
Math.sqrt(x)	Returns the square root of x	Math.sqrt(4) is 2
Math.pow(a,b)	This method will compute the a^b	Math.pow(2,4) is 16
Math.sin(x)	Returns the sine value of x	Math.sin(0.0) is 0.0
Math.cos(x)	Returns cosine value of x	Math.cos(0.0) is 1.0
Math.tan(x)	Returns tangent value of x	Math.tan(0.0) is 0
Math.exp(x)	Returns exponential value i.e e^x	Math.exp(0) is 1

Math.random(x)	Generates a random number in between 0 and 1	Math.random()
Math.log(x)	Display logarithmic value	Math.log(2.7) is 1

Math.PI	Returns a ∏ value	a = Math.PI;
		a = 3.141592653589793

The Date Object

This object is used for obtaining the date and time. In JavaScript, dates and times represent in milliseconds since 1st January 1970 UTC. JavaScript supports two time zones: UTC and local. UTC is Universal Time, also known as Greenwich Mean Time(GMT), which is standard time throughout the world. Local time is the time on your System. A JavaScript *Date* represents date from -1,000,000,000 to -1,000,000,000 days relative to 01/01/1970.

Date Object Constructors:

new Date(); Constructs an empty date object.

new Date("String"); Creates a Date object based upon the contents of a text string.

new Date(year, month, day[,hour, minute, second]); Creates a Date object based upon the numerical values for the year, month and day.

```
var dt=new Date();
document.write(dt);          //TueDec 23 11:23:45 UTC+0530 2015
```

Methods in Date object:

Java script date object provides several methods, they can be classified is string form, get methods and set methods. All these methods are provided in the following table.

Method	Description
getDate()	Returns day of the month i.e. 1 to 31
getDay()	Returns an integer representing day of the week(0 - 6), Sunday to Saturday respectively.
getMonth()	Returns month of the year from 0 to 11, January to December respectively.
getFullYear()	Returns four-digit year number
getHours()	Returns hour field of the Date Object in 24 hours time format (0 to 23)
getMinitues()	Returns minute field of the Date Object from 0 to 59
getseconds()	Returns seconds field of the Date Object 0 to 59
setDate(v)	To set the date, day, month and full year
setDay(v)	
setMonth(v)	
setFullYear(y,m,d)	
setHours(v)	To set the hours, minutes, seconds of time
setMinutes(v)	
setSeconds(v)	
toString()	Returns the Date as a string

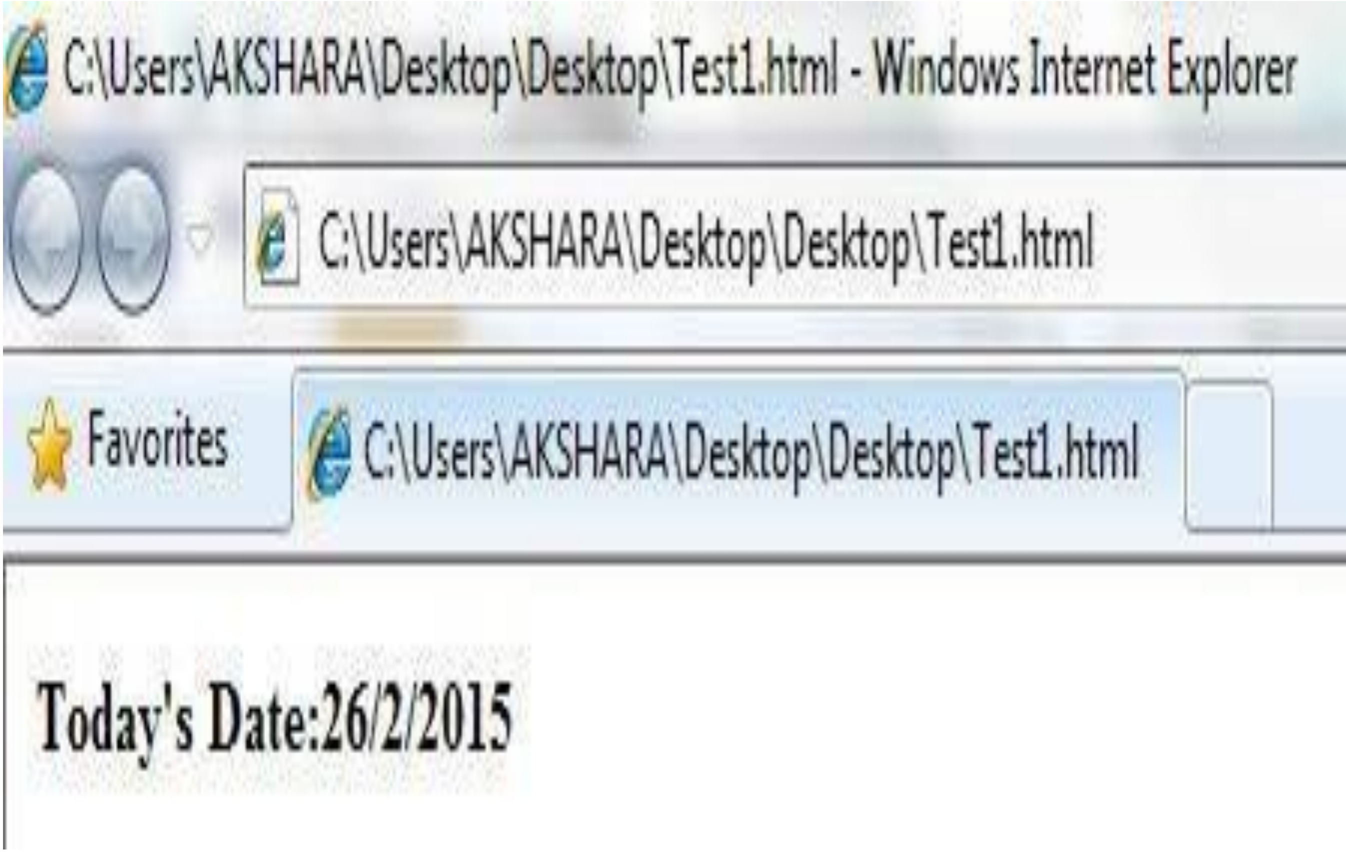
Example: Write javascript to display internal details of a browser (***Test.html***)

```
<script language = "javascript">
<!--
```

```
-->

        var dt = new Date(); var day = dt.getDate();
      var month = dt.getMonth()+1; var year = dt.getFullYear();
      document.writeln("<h4>Today's        Date:"+day+"/"+month+"/"+year);-
```

Output:



C:\Users\AKSHARA\Desktop\Desktop\Test1.html - Windows Internet Explorer
C:\Users\AKSHARA\Desktop\Desktop\Test1.html
Favorites
C:\Users\AKSHARA\Desktop\Desktop\Test1.html

Today's Date:26/2/2015

1.16 DYNAMIC HTML

DHTML is combination of HTML, CSS and JavaScript. It gives pleasant appearance to web page.

Difference between HTML and DHTML

HTML	DHTML
HTML is used to create static web pages.	DHTML is used to create dynamic web pages.
HTML is consists of simple html tags.	DHTML is made up of HTML tags+cascading style sheets+javascript.
Creation of html web pages is simplest but less interactive.	Creation of DHTML is complex but more interactive.