

## JavaScript



- JavaScript is *the* scripting language of the Web.
- JavaScript is used in millions of Web pages to add functionality, validate forms, detect browsers, and much more.

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## What is JavaScript?



- JavaScript was designed to add interactivity to HTML pages
- JavaScript is a scripting language
- A scripting language is a lightweight programming language
- JavaScript is usually embedded directly into HTML pages
- JavaScript is an interpreted language (means that scripts execute without preliminary compilation)
- Everyone can use JavaScript without purchasing a license

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## Example



```
<html>
<body>

<script type="text/javascript">
    document.write("This is my first JavaScript!");
</script>

</body>
</html>
```

This is my first JavaScript!

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## How to Handle Simple Browsers



- Browsers that do not support JavaScript, will display JavaScript as page content.
- The HTML comment tag should be used to "hide" the JavaScript.
- Just add an HTML comment tag `<!--` before the first JavaScript statement, and a `-->` (end of comment) after the last JavaScript statement.

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## Example



```
<html>
<body>
<script type="text/javascript">
<!--
document.write("Hello World!");
//-->
</script>
</body>
</html>
```

The two forward slashes at the end of comment line (//) is the JavaScript comment symbol. This prevents JavaScript from executing the --> tag.

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## What can a JavaScript do?



- JavaScript gives HTML designers a programming tool
- JavaScript can put dynamic text into an HTML page  
JavaScript can react to events
- JavaScript can read and write HTML elements
- JavaScript can be used to validate data
- JavaScript can be used to detect the visitor's browser
- JavaScript can be used to create cookies

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## How To Use?



- `<script>` tag is used to insert a JavaScript into an HTML page.
- Between `<body>` tag
- Between `<head>` tag

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## How To Use (Cont.)?



- JavaScripts in the **body** section will be executed WHILE the page loads.
- JavaScripts in the **head** section will be executed when CALLED.

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## JavaScript Statements



- JavaScript is case sensitive.
- Use of semicolon(;) in the end of statement is ***optional***.

`document.write("Hello");`

`document.write("Hello")`

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## JavaScript Comments



- Single line comments start with `//`.

```
<script type="text/javascript">
// Write a heading
document.write("<hl>This is a heading</hl>");
// Write two paragraphs:
document.write("<p>This is a paragraph.</p>");
document.write("<p>This is another paragraph.</p>");
</script>
```

- Multi line comments start with `/*` and end with `*/`.

```
<script type="text/javascript">
/*
The code below will write
one heading and two paragraphs
*/
document.write("<hl>This is a heading</hl>");
document.write("<p>This is a paragraph.</p>");
document.write("<p>This is another paragraph.</p>");
</script>
```

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## JavaScript Variables



- JavaScript variables are used to hold values or expressions.

`x=5, y=6, z=x+y`

Rules for JavaScript variable names:

- Variable names are case sensitive (y and Y are two different variables)
- Variable names must begin with a letter or the underscore character

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## JavaScript Variables



- Declaration

```
var x;  
var carname;
```

- Assign Values

```
x=5;  
carname="Toyota";
```

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## JavaScript Arithmetic Operators



- Y=5

Operator	Description	Example	Result
+	Addition	$x = y + 2$	$x = 7$
-	Subtraction	$x = y - 2$	$x = 3$
*	Multiplication	$x = y * 2$	$x = 10$
/	Division	$x = y / 2$	$x = 2.5$
%	Modulus (division remainder)	$x = y \% 2$	$x = 1$
++	Increment	$x = ++y$	$x = 6$
--	Decrement	$x = --y$	$x = 4$

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## JavaScript Assignment Operators



- $x = 5$  and  $y = 10$

Operator	Example	Same As	Result
=	$x = y$		$x = 5$
+=	$x += y$	$x = x + y$	$x = 15$
-=	$x -= y$	$x = x - y$	$x = 5$
*=	$x *= y$	$x = x * y$	$x = 50$
/=	$x /= y$	$x = x / y$	$x = 2$
%=	$x \% = y$	$x = x \% y$	$x = 0$

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## + Operator and Strings



- To add two or more string variables together, use the + operator.

```
<script type="text/javascript">
txt1="What a very";
txt2="nice day";
txt3=txt1+" "+txt2;
document.write(txt3);
</script>
```

What a very nice day

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## Comparison Operators



Given that **x=5**, the table below explains the comparison operators:

Operator	Description	Example
==	is equal to	x==8 is false
===	is exactly equal to (value and type)	x===5 is true x==="5" is false
!=	is not equal	x!=8 is true
>	is greater than	x>8 is false
<	is less than	x<8 is true
>=	is greater than or equal to	x>=8 is false
<=	is less than or equal to	x<=8 is true

```
if (age<18) document.write("Too young");
```

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## Logical Operators



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

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## If...Else Statements



- used to perform different actions based on different conditions.
- **if statement** - use this statement to execute some code only if a specified condition is true
- **if...else statement** - use this statement to execute some code if the condition is true and another code if the condition is false
- **if...else if....else statement** - use this statement to select one of many blocks of code to be executed
- **switch statement** - use this statement to select one of many blocks of code to be executed

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## Example (If)



```
if (condition)
{
  code to be executed if condition is true
}
```

Note that if is written in lowercase letters. Using uppercase letters (IF) will generate a JavaScript error!

### Example

```
<script type="text/javascript">
//Write a "Good morning" greeting if
//the time is less than 10

var d=new Date();
var time=d.getHours();

if (time<10)
{
  document.write("<b>Good morning</b>");
}
</script>
```

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## Example (If...else)



```
if (condition)
{
  code to be executed if condition is true
}
else
{
  code to be executed if condition is not true
}
```

### Example

```
<script type="text/javascript">
//If the time is less than 10, you will get a "Good morning" greeting.
//Otherwise you will get a "Good day" greeting.

var d = new Date();
var time = d.getHours();

if (time < 10)
{
  document.write("Good morning!");
}
else
{
  document.write("Good day!");
}
</script>
```

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## Example(if...else if...else)

```
if (condition1)
{
    code to be executed if condition1 is true
}
else if (condition2)
{
    code to be executed if condition2 is true
}
else
{
    code to be executed if condition1 and condition2 are not true
}
```

### Example

```
<script type="text/javascript">
var d = new Date()
var time = d.getHours()
if (time<10)
{
    document.write("<b>Good morning</b>");
}
else if (time>10 && time<16)
{
    document.write("<b>Good day</b>");
}
else
{
    document.write("<b>Hello World!</b>");
}
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</script>
```

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## Switch Statement

- used to perform different actions based on different conditions.

```
switch(n)
{
    case 1:
        execute code block 1
        break;
    case 2:
        execute code block 2
        break;
    default:
        code to be executed if n is different from case 1 and 2
}
```

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## Example (Switch)

```
<script type="text/javascript">
//You will receive a different greeting based
//on what day it is. Note that Sunday=0,
//Monday=1, Tuesday=2, etc.

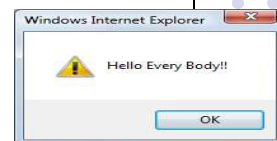
var d=new Date();
theDay=d.getDay();
switch (theDay)
{
case 5:
    document.write("Finally Friday");
    break;
case 6:
    document.write("Super Saturday");
    break;
case 0:
    document.write("Sleepy Sunday");
    break;
default:
    document.write("I'm looking forward to this weekend!");
}
</script>
```

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## Popup Boxes

- **Alert Box**  
`alert("Hello Every Body");`
- **Confirm Box**  
`confirm("Press a button");`
- **Prompt Box**  
`prompt("Your name","")`



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## Functions



- A function will be executed by an event or by a call to the function.

```
function functionname(var1,var2,...,varX)
{
  some code
}

function displaymessage()
{
  alert("Hello World!");
}
```

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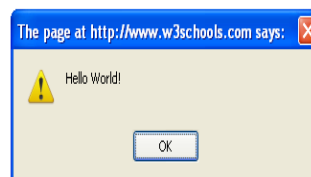
## Example (Function)



```
<html>
<head>
<script type="text/javascript">
function displaymessage()
{
  alert("Hello World!");
}
</script>
</head>

<body>
<form>
<input type="button" value="Click me!" onclick="displaymessage()" />
</form>
</body>
</html>
```

By pressing the button above, a function will be called. The function will alert a message.



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## JavaScript Loops



You want the same block of code to run over and over again in a row. Instead of adding several almost equal lines in a script we can use loops to perform a task like this.

In JavaScript, there are two different kind of loops:

- **for** - loops through a block of code a specified number of times
- **while** - loops through a block of code while a specified condition is true

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## The for Loop



```
for (var=startvalue;var<=endvalue;var=var+increment)
{
  code to be executed
}
```

```
<script type="text/javascript">
var i=0;
for (i=0;i<=5;i++)
{
  document.write("The number is " + i);
  document.write("<br />");
}
```

The number is 0  
 The number is 1  
 The number is 2  
 The number is 3  
 The number is 4  
 The number is 5

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## While Loop



```
while (var<=endvalue)
{
    code to be executed
}
```

```
<script type="text/javascript">
var i=0;
while (i<=5)
{
    document.write("The number is " + i);
    document.write("<br />");
    i++;
}
```

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## The break Statement



- The break statement will break the loop and continue executing the code that follows after the loop (if any).

```
<script type="text/javascript">
var i=0;
for (i=0;i<=10;i++)
{
    if (i==3)
    {
        break;
    }
    document.write("The number is " + i);
    document.write("<br />");
}
</script>
```

The number is 0

The number is 1

The number is 2

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## The continue Statement

- The continue statement will break the current loop and continue with the next value.

```
<script type="text/javascript">
var i=0
for (i=0;i<=10;i++)
{
  if (i==3)
  {
    continue;
  }
  document.write("The number is " + i);
  document.write("<br />");
}
</script>
```

The number is 0  
 The number is 1  
 The number is 2  
 The number is 4  
 The number is 5  
 The number is 6  
 The number is 7  
 The number is 8  
 The number is 9  
 The number is 10

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## JavaScript Events

- Events are actions that can be detected by JavaScript.
- Examples of events:
  - A mouse click
  - A web page or an image loading
  - Mousing over a hot spot on the web page
  - Selecting an input field in an HTML form
  - Submitting an HTML form
  - A keystroke

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## Events



- **onLoad and onUnload**
- **onFocus, onBlur and onChange**
- **onSubmit**
- **onMouseOver and onMouseOut**

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## JavaScript Objects



- JavaScript is an Object Oriented Programming (OOP) language.
- An OOP language allows you to define your own objects and make your own variable types.
- We will start by looking at the built-in JavaScript objects.

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## JavaScript Objects and Properties



- Properties are the values associated with an object.

```
<script type="text/javascript">  
var txt="Hello World!";  
document.write(txt.length);  
</script>
```

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## JavaScript String Object



- The String object is used to manipulate a stored piece of text.
- Some String Methods

[search\(\)](#)

[toLowerCase\(\)](#)

[toUpperCase\(\)](#)

## JavaScript Date Object



- The Date object is used to work with dates and times.

```
new Date() // current date and time
new Date(milliseconds) //milliseconds since 1970/01/01
new Date(dateString)
new Date(year, month, day, hours, minutes, seconds, milliseconds)
```

```
today = new Date()
d1 = new Date("October 13, 1975 11:13:00")
d2 = new Date(79,5,24)
d3 = new Date(79,5,24,11,33,0)
```

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## Date Comparison



?

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## JavaScript Array Object



- The Array object is used to store multiple values in a single variable.
- An array can be defined in three ways.

1:

```
var myCars=new Array(); // regular array (add an optional integer
myCars[0]="Saab";        // argument to control array's size)
myCars[1]="Volvo";
myCars[2]="BMW";
```

2:

```
var myCars=new Array("Saab","Volvo","BMW"); // condensed array
```

3:

```
var myCars=["Saab","Volvo","BMW"]; // literal array
```

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## JavaScript Math Object



- The Math object allows you to perform mathematical tasks.

Math.PI

Math.E

Math.sqrt(number)

Math.round(4.7)

## JavaScript Navigator Object



- The Navigator object allows you to check/validate your Browser.
- Navigator.appName;
- Navigator.appVersion