

# Web Development



## Java Script

By

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### Reference Books:

1. [www.w3school.com](http://www.w3school.com)
2. *HTML dog* by Partick Griffiths.
3. *Professional CSS Cascad Style Sheet for Web Design*, by Christopher Schmitt.
4. *Javascript, Sixth Edition*, by Danny Goodman.
5. *PHP6, Apache,MySql Web Development*, by Timothy Boronczyk.





# Topics

- What is JavaScript?
- Why JavaScript?
- Including JavaScript in HTML
- Hello World Example Script
- JavaScript Comments
- If Clause, While, Function statements.



# What is JavaScript?

- A client-side scripting language
  - Client-side refers to the fact that it is executed in the client (software).
  - Execution is done by using web browsers.
  - A server-side language is one that runs on the Web server. Examples: PHP, ASP, Python.
- Interpreter is used to run JavaScript at the client.
  - Each line is processed as it loads in the browser.



# JavaScript is not Java

- Completely different types of languages that just happen to be similarly named
  - JavaScript - programs are **interpreted** in the browser
  - Java - programs are **compiled** and can be run as stand alone applications



# Why Java Script

## Commercial applications

- Need for more interactive and appealing.
- Java Script allows you to make interactive Web pages.

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# Including JavaScript in HTML

- Two ways to add JavaScript to Web pages
  - Use the `<script type="text/JavaScript">...</script>` tag inside either head or body.
  - Include the script in an external file -- file.js
  - Call : `<script src="file.js"> </script>`
- External JavaScript Advantages
  - 1-It separates HTML and code.
  - 2-It makes HTML and JavaScript easier to read and maintain.
  - 3-Cached JavaScript files can speed up page loads.



# JavaScript Basics

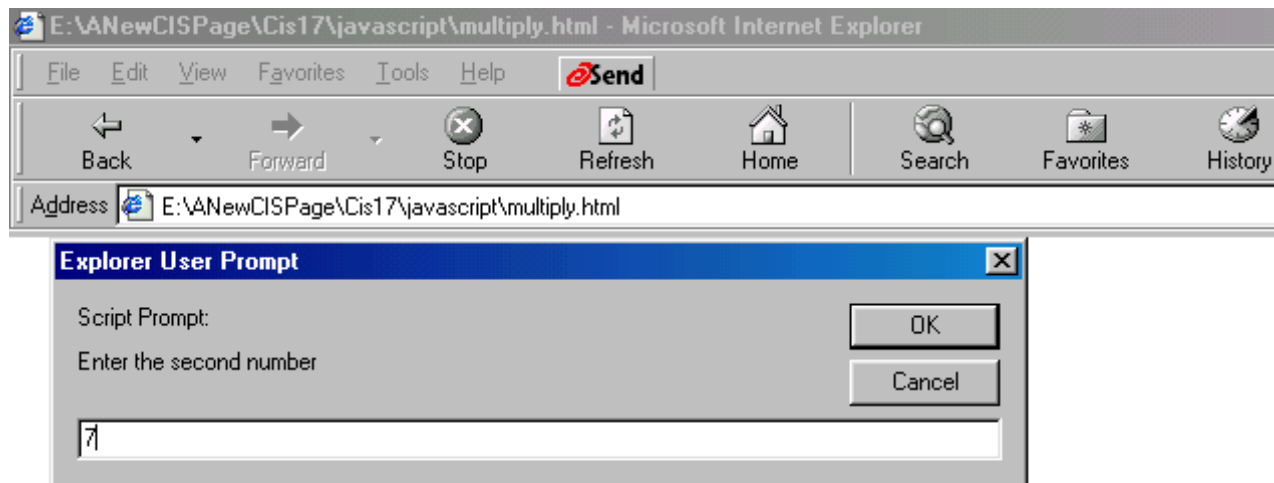
## Input (prompt and form)

Prompt ()

```
firstnum = prompt("Enter the second  
number");
```

```
parseInt=(firstnum);    3
```

```
parseFloat=(firstnum);    3.444
```



# JavaScript Basics

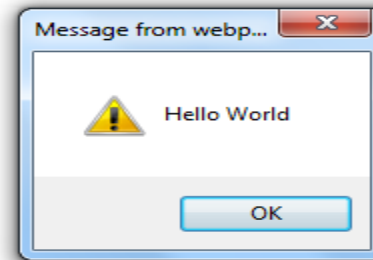
## Output



- `document.write()` – method used to write text to the Web page



- `alert()` – method used to display messages in a dialog box



- `document.getElementById(" id").innerHTML = x;`





# document.write()

Ends in a semicolon

```
document.write("<h1>Hello, world!</h1>");
```

Enclosed in quotes -- denotes a "string"



# Hello World in JavaScript

Example: Internal JS inside body Tag:

```
<!DOCTYPE html>
<html>
  <head>
    <title>Hello World Example</title>
  </head>
  <body>
    <script type="text/javascript">
      <!--
        document.write("<h1>Hello, world!</h1>");
      //-->
    </script>
  </body>
</html>
```

What about if you put the red code inside head?.



# The `<script>...</script>` tag

- The code for the script is contained in the `<script>...</script>` tag

```
<script type="text/javascript">
```

```
•  
•  
•
```

```
</script>
```



# Comments in JavaScript

- Two types of comments
  - Single line
    - Uses two forward slashes (i.e. `//`)
  - Multiple line
    - Uses `/*` and `*/`

# Single Line Comment Example



```
<script type="text/javascript">  
  <!--  
    // This is my JavaScript comment  
    document.write("<h1>Hello!</h1>");  
  //-->  
</script>
```



# Multiple Line Comment Example

```
<script type="text/javascript">  
  <!--  
    /* This is a multiple line comment.  
     * The star at the beginning of this line is optional.  
     * So is the star at the beginning of this line.  
     */  
    document.write("<h1>Hello!</h1>");  
  //-->  
</script>
```

# Find the Bug!

```
<script type="text/javascript">  
  <!--  
    /* This is my JavaScript comment  
     * that spans more than 1 line.  
     *  
    document.write("<h1>Hello!</h1>");  
  //-->  
</script>
```





# JavaScript Basics

## JavaScript Value (Data) Types

| Type     | Example | Description  |
|----------|---------|--|
| String   | "Howdy" | A series of characters inside quote marks  |
| Number   | 4.5     | Any number not inside quote marks  |
| Boolean  | true    | A logical true or false  |
| Null     | null    | Devoid of any content but a value just the same  |
| Object   |         | A software thing that is defined by its properties and methods (arrays are also objects) |
| Function |         | A function definition  |

| Syntax | Name                      | Type   |
|--------|---------------------------|--------|
| +      | Addition (plus)           | Binary |
| -      | Subtraction (minus)       | Binary |
| *      | Multiplication (multiply) | Binary |
| /      | Division (divide)         | Binary |
| %      | Modulus (modulo)          | Binary |
| ++     | Increment                 | Unary  |
| --     | Decrement                 | Unary  |



# JavaScript Basics



## JavaScript Comparison Operators

| Symbol | Description                 |
|--------|-----------------------------|
| ==     | Equals                      |
| !=     | Does not equal              |
| >      | Is greater than             |
| >=     | Is greater than or equal to |
| <      | Is less than                |
| <=     | Is less than or equal to    |

### *Bitwise operators in JavaScript*

| Syntax | Name                       | Type   |
|--------|----------------------------|--------|
| &      | Bitwise AND                | binary |
|        | Bitwise OR                 | binary |
| ^      | Bitwise XOR (exclusive OR) | binary |
| ~      | Bitwise NOT                | unary  |
| <<     | Left shift                 | binary |
| >>     | Right shift                | binary |



## Example: Multiply two numbers using Java Script

```
<html>
<script type="text/JavaScript">
var ans = 0;
var firstnum = 0;
var secondnum = 0;
firstnum = prompt("Enter the first number",0);
secondnum = prompt("Enter the second number",0);
ans = firstnum * secondnum;
document.write(ans);
</script>
</html>
```

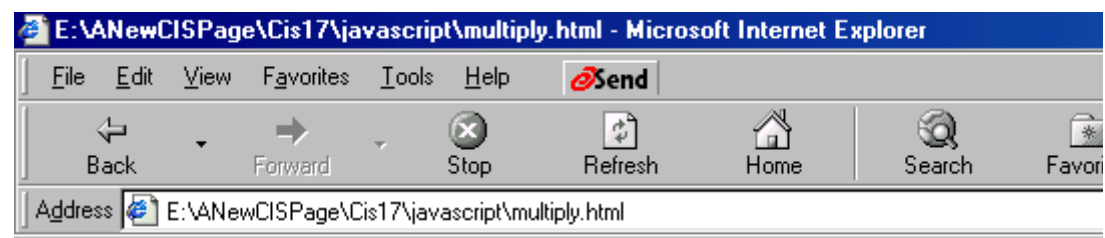
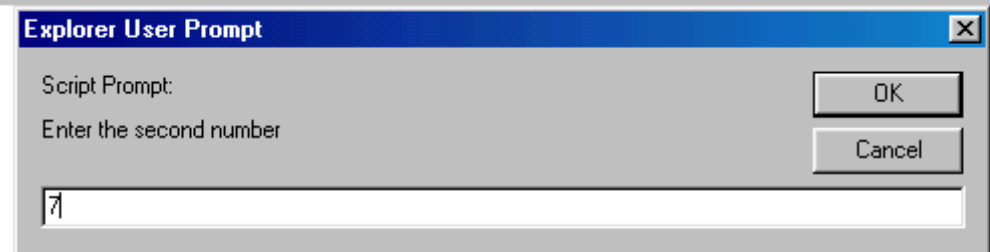
```
ans = firstnum * secondnum;
```

This takes the two numbers stored in firstnum and secondnum and multiplies them together. The results are stored in ans.

The prompt can be used to take in data. The message in quotes is used to ask the user for input and the 0 indicates it is numeric input. Note that the data that was keyed in with the first prompt was assigned to firstnum and the data that was keyed in with the second prompt was assigned to secondnum.

```
document.write(ans);
```

I am now using the write method to put ans to the screen.



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**Example: Add two numbers using Java Script, the output number should be red color and size 20 pt.**

```
<!DOCTYPE html>
```

```
<html>
```

```
<head><title> sum</title></head>
```

```
<style>
```

```
p{ color : red; font-size:20pt;}
```

```
</style>
```

```
<body>
```

```
<h1> The result of Times</h1>
```

```
<p id="sm"></p>
```

```
<script>
```

```
var a = 3;
```

```
var b = 6;
```

```
var x = b + a;
```

```
document.getElementById("sm").innerHTML =  
x;
```

```
</script>
```

```
</body>
```

```
</html>
```



# Conditionals

```
if( Condition)
{
    Result: java script statement;
}
else {
    Result: java script statement;
}
```



# J.S. Loop:

1- **for** with only iteration condition.

2- **while** conditional loop.

```
For (initial value i=0; i<= length; counter i++ )
```

```
{
```

Here, the code will be iterated many time, which are equal to **length**.

```
}
```

```
while (condition)
```

```
{
```

the JavaScript code to be executed while the condition is True

```
}
```

the JavaScript code to be executed when the loop is finished



# Functions

- Way to write several lines of script and use them repeatedly as needed.

```
function Greetings()  
{  
    alert("Hello, this is a friendly message.");  
}
```

```
messageStr = "This is a customized message."  
function Greetings(messageStr) {  
    alert(messageStr);  
}
```



Question: Write a JavaScript program to subtract two numbers by using HTML form.

```
<html><style>
div{background-color:lightblue; border: 6px solid red; width:320px;}
</style><body><div>
<center><h1>Calculator</h1></center>
<form name="form1" >
  Number1: <input type="text" name="Number1" value="44" ><br>
  Number2: <input type="text" name="Number2" value="22" ><br>
  Result: <input type="text" name="Result" value="" min="2"
  maxlength="40" size="40"><br><br>
</form>
<button onclick="add()">+</button>
<script>
num1=document.form1.Number1; num2=document.form1.Number2;
result=document.form1.Result;
function add() {
num11=parseInt(num1.value);
num22=parseInt(num2.value);
var rsl=num11+num22;
result.value=rsl; }
</script></div></body></html>
```





Question: Write a java script program to record how many button has been clicked?

```
<!DOCTYPE html>
<html>
<style> </style>
<body><form name="form1">
<input type="button" name="button1" onclick="click_count()" value="0"/>
</form>
<script>
var count=0;
function click_count()
{
count++;
document.form1.button1.value="button clicked" + count +"times";
}
</script></body></html>
```

# Question: design width and height image control as in the figure below:

```

<!DOCTYPE html>
<html> <style></style> <body> <p> Toolbar </p>
<form name="form1">
<input type="button" name="button1" onclick="height_incr()" value="+"/>Height
<input type="button" name="button2" onclick="height_decr()" value="-"/> </br>
<input type="button" name="button3" onclick="width_incr()" value="+"/> Width
<input type="button" name="button4" onclick="width_decr()" value="-"/>
</form>

<script>
function height_incr()
{document.images["img1"].height++;}
function height_decr()
{document.images["img1"].height--;}
function width_incr()
{document.images["img1"].width++;}
function width_decr()
{document.images["img1"].width--;}
</script></body></html>

```





## Questions:

1- Write JavaScript program that inputs two numbers and outputs the result of the following operations: Addition, Subtraction, Times, Division, Sin & Cos, Round, Factorial and Power.

2- Write a JavaScript program doing form validation as following checking:

A- If input form field empty, a snapshot message will be alerted.

B- If Entering number instead of letters or vice versa, a snapshot message will be alerted.

3- Write a JavaScript program that calculates money exchange rate for the following currencies: USD, IQD, Euro, Pound, RM (Ringgit Malaysian). Hint: take the value from Internet