

Client-side Scripting

- HTML is a markup language that defines the structure of documents
- Style sheets allow us greater control over how document contents are to be displayed
- The resulting ‘page’ cannot change once it has been delivered and rendered
- What if we want to change it ... without downloading a different page?

- What if we want the page to change as the user looks at (or interacts with) it?
- What if the user wants to change the appearance of the page (such as change styles) themselves?
- This requires a *programming* solution; some instructions embedded in the page that can be activated and executed ‘executed’ by the browser (client)
- hence *client-side* scripts

—Scripting language needs

- an adequate set of programming structures
 - variables
 - data structures
 - assignment operators
 - iteratives (loops) and conditional
 - objects and methods
- a standardised way to access and control the basic structure of both the document and the browser

WHAT IS JAVASCRIPT?

- **JavaScript** is a *scripting* language which was designed to add interactivity to HTML pages
 - a *scripting* language is a lightweight programming language
 - everyone can use JavaScript without purchasing a license
 - JavaScript is an *interpreted* language
 - means that scripts execute without preliminary compilation

JAVASCRIPT IS NOT JAVA

JavaScript

- Created by **Netscape**
- JavaScript cannot stand alone. It must be embedded inside of a web page and must be displayed in a browser that understands the JavaScript language.
- Does not need to be compiled.

Java

- Created by **Sun** Microsystems
- A Java "applet" (so-called because it's a small application) may run on a Web page, but is actually a fully contained little program.
- It must be "compiled" into what's known as a "machine language/bytecode" before it can be run.

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- developed by Netscape
- confusingly, has nothing to do with Java!
- syntax is Java-like
- It is an object-oriented language
 - it has pre-defined objects with their associated methods and properties
 - you can define functions
 - you can create new objects

TYPES OF JAVASCRIPT



- External JavaScript
- Embedded JavaScript
- Inline JavaScript

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EXTERNAL JAVASCRIPT

- **External JavaScripts** are scripts that are written in a *separate document* (with *js* extension) and then attached to various Web documents.
 - The *js* file will be loaded at runtime
 - One example

Js File (myJsLib.js)

```
...  
<head>  
<script src="myJsLib.js"  
        language="javascript" >  
</script>  
</head>  
...
```

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INTERNAL JAVASCRIPT

- **Internal JavaScripts** are scripts embedded within a **<script>** tag within the head or body of the Web documents.
 - No separated file
 - Internal JavaScript can be in the ***body***

```
<HTML>
  <HEAD>
    <TITLE>JavaScript in the BODY Section</TITLE>
  </HEAD>
  <BODY>
    <SCRIPT LANGUAGE="JavaScript">
      //script statement(s)here

      ...
    </SCRIPT>
  </BODY>
</HTML>
```

INTERNAL JAVASCRIPT

- Internal JavaScript are scripts embedded within a **<script>** tag within the head or body of the Web documents.
 - No separated file
 - Internal JavaScript can be in the *head*

```
<HTML>
<HEAD>
  <TITLE>ExternalJavaScript in the HEAD Section</TITLE>
  <SCRIPT LANGUAGE="JavaScript">
    //script statement(s)here      ...
  </SCRIPT>
</HEAD>
<BODY>

  </BODY>
</HTML>
```

INTERNAL JAVASCRIPT

- Internal JavaScript are scripts embedded within a **<script>** tag within the head or body of the Web documents.
 - No separated file
 - Internal JavaScript can be in the *head* and the *body*

```
<HTML>
<HEAD>
  <TITLE>External JavaScript in the HEAD Section</TITLE>
  <SCRIPT LANGUAGE="JavaScript">
    //script statement(s)here    ...
  </SCRIPT>
</HEAD>
<BODY>
  <SCRIPT LANGUAGE="JavaScript">
    //script statement(s)here    ...
  </SCRIPT>
</BODY>
</HTML>
```

INLINE JAVASCRIPT

- **Inline JavaScript** are commands included within the values of attributes.
 - No HTML tags should be placed in between script statements
 - No JavaScript should be placed within a Web page unless between **<script>** tags or as an attribute value

```
<HTML>
<HEAD>
  <TITLE>Inline JavaScript</TITLE>
</HEAD>
<BODY>
  <A HREF="javascript:history.back()">back to previous page</a>
</BODY>
</HTML>
```

– Naming rules

- variable names must consist of only alphanumeric characters or the underscore (`_`) character.
- **variable names are case sensitive**

– Declaration and assignment

- use keyword `var` to declare a variable

```
var student_number = 25;
```

- “=” symbol assigns whatever is on the right of the symbol to whatever is on the left

```
price = 8.95;
```

- HTML events trigger actions in the browser
 - user clicking a button
 - web page loading
 - Moving the mouse over an image
- Most scripts are intended to deal with intercepting and handling events generated by the browser and/or the user.
- Normally, we attach JavaScript *event handlers* to various components of the document

— if statement

```
if (value > 10) {  
    . . .  
} else if (value > 5) {  
    . . .  
} else {  
    . . .  
}
```


- for loop

```
for (var i = 1; i < 10; i++) {  
    . . .  
}
```

- while loop

```
var i = 0;  
while (i < 10) {  
    . . .  
}
```

- How to escape from a loop

- **break** statement: skips the rest of the loop
- **continue** statement: skips the current loop only

- a set of one or more *functions*
 - do not declare a return type (int, boolean etc.)
 - can take 0 or more parameters

```
function add(a,b) {  
    return a+b;  
}
```

—comments for JavaScript code

- single-line comment starting with a double-slash //
- multi-line comments embedded within a /* and */ pair

DISPLAYING A LINE OF TEXT

```
1  <!-- Displaying a line of text. -->
2  <html>
3    <head>
4      <title>A First Program in JavaScript</title>
5      <script type = "text/javascript">
6        document.write("<h1>Welcome to JavaScript Programming!</h1>" );
7      </script>
8    </head>
9    <body>
10
11  </body>
12 </html>
13
```

DISPLAYING A LINE OF TEXT (CONTD)

```
2 <html>
3   <head>
4     <title>A First Program in JavaScript</title>
5     <script type = "text/javascript">
6       document.write("<h1 style='color:red;text-decoration:underline'>");
7       document.write("Welcome to JavaScript Programming!</h1>" );
8     </script>
9   </head>
10  <body>
11
12  </body>
13 </html>
14
```

FUNCTION - SUM OF TWO NUMBERS

```
<html>
<head>
  <title>Javascript</title>
<script>
  function add(a,b) {
    var result=a+b;
    alert('the result is: '+result);
  }
</script>
</head>
<body>
  <br><br>
  <input type='button' value='sum of 2 no.' onclick="add(5,8)">
  <br><br>
</body>
</html>
```

FUNCTION - SUM OF THREE NUMBERS

```
1 <html>
2 <head>
3   <title>Javascript</title>
4 </script>
5 function add(a,b,c){
6     var result=a+b+c;
7     alert('the result is: '+result);
8 }
9 </script>
10 </head>
11 <body>
12   <input type='button' value='sum of 3 no.' onclick="add(5,8,7)">
13 </body>
14 </html>
```

FUNCTION - READING FORM INPUT

```
1 <html>
2 <head>
3   <title>Javascript</title>
4 </script>
5 function compute() {
6     var x=document.addition.a.value;
7     var y=document.addition.b.value;
8     var z=parseInt(x)+parseInt(y);
9     document.addition.result.value=z;
10 }
11 </script>
12 </head>
13 <body>
14 <form name='addition'>
15     <input type='text' name='a' size='4'>
16     +
17     <input type='text' name='b' size='4'>
18     <input type='button'
19         value='='
20         onclick='compute()' >
21     <input type='text' name='result' size='6'>
22 </form>
23 </body>
24 </html>
```


EVENTS – ONFOCUS, ONCLICK

```
1 <html>
2 <head>
3   <title>Javascript</title>
4 </script>
5 function welcome() {
6   var a=document.info.username.value;
7   alert("you entered: "+a);
8 }
9
10 function clearName() {
11   document.info.username.value=" ";
12 }
13 </script>
14 </head>
15 <body>
16 <form name='info'>
17   <input type='text'
18     name='username'
19     value='enter your name'
20     onfocus='clearName()' >
21   <input type='button'
22     value='click me'
23     onclick='welcome()' >
24 </form>
25 </body>
```

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EVENT - ONCLICK

```
1  <html>
2  <head>
3    <title>Javascript</title>
4  </head>
5  <script>
6    function openWindow() {
7      window.open('http://www.google.com')
8    }
9  </script>
10 </body>
11
12 <input type='button'
13       value='open new browser window'
14       onclick="openWindow()">
15 </input>
16 </html>
```

EVENTS - ROLLOVER EFFECT

```
1 <html>
2 <head>
3   <title>Javascript</title>
4   <script>
5     function changeImage() {
6       document.bulb.src='bulbon.gif';
7     }
8
9     function revertImage() {
10      document.bulb.src='bulboff.gif';
11    }
12  </script>
13 </head>
14 <body>
15   <img src='bulboff.gif'
16       name='bulb'
17       onmouseover='changeImage()'
18       onmouseout='revertImage()'>
19 </body>
20 </html>
21
```

JAVASCRIPT + STYLES

```
1 <html>
2 <head>
3   <title>Javascript</title>
4 </head>
5 <body>
6
7   <p
8     style="height:20px;width:20px;background-color:red"
9     onmouseover="document.body.style.backgroundColor='red'"
10  >
11  </p>
12
13   <p
14     style="height:20px;width:20px;background-color:green"
15     onmouseover="document.body.style.backgroundColor='green'">
16  </p>
17
18   <p
19     style="height:20px;width:20px;background-color:blue"
20     onmouseover="document.body.style.backgroundColor='blue'"
21  >
22  </p>
23 </body>
24 </html>
25
```

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