

1. JavaScript Basics

Why Use JavaScript?

- A platform independent scripting language developed for creating browser independent client-side active user interface on Web pages
- It allows Web page writers to create dynamic, interactive HTML documents

Integrating JavaScript and HTML

- Provide active user interfaces through Web browsers
- Validate user input information (checking FORM data) without using complex server-side scripts
- Display output alert and input prompt boxes
- Display custom messages
- Support object controls: forms, buttons, and check boxes
- Generate clocks, calendars, and timestamp documents
- Support Event handling (keyboard, mouse input, etc)
- Open new windows and redirection
- Interact with a Java applet on a Web page
- Check types of browsers

Object-Oriented JavaScript

- Object-Oriented Language
 - Methods (actions: subroutines, procedures, functions)
 - Properties (attributes: variables)
- Have states, behavior, and identity
- Instances of classes (creating working object variables)
- Examples of real-world objects:
 - Windows, File, Person, Car

Roles of an object

- Actor (active object), or
- Server (never operates upon other object), or
- Agent (both actor and server)

Features of JavaScript Language

- Case sensitive: statements, functions and variables
- Semicolons termination (optional)
- Comments
 - `/* This is a comment. */` -- C programming language style
 - `// This is a comment.` – C++ programming language style
- Keywords (lower case)
- Identifiers: variables, functions and label names
- Variables: declared and optionally initialized, with the "var" element
- Function names must be typed with a consistent capitalization
- Data types (Object types):
 - Numbers
 - Booleans
 - Strings
 - Objects
 - Arrays
 - Functions and methods

- Null and undefined
- Operators (C/C++/Java style): math, assignment, relational operators
- Statements: a sequence of statements for forming a script or program
 - Declaration: var, function
 - Expression statements: formed by combining literal values and variables, for examples,
 - $10+2$
 - $(n1 + n2)/2$
 - `Name = "Hello World"`
 - `x = Math.sqrt(10);`
 - `y++` or `y = y + 1`
 - Compound statements
 - Empty statements
 - Label statements
 - Other statements
 - `break`
 - Decision making (if/else)
 - Control structure (break, continue, for, for/in, with, while, do/while, switch, case, default)
 - `function`, `return`
 - `import`, `export`
- Regular expressions support (similar to matching and searching techniques used in LINUX/UNIX environments)

Basic Language Rules

<script> and </script> tags

Attributes:

LANGUAGE

Specifies the scripting language "JavaScript", "Jscript", "PerlScript", "VBScript", etc

SRC

Gives the full URL of an external script to be loaded and executed with the **js** as the name of the file extension for a Javascript code.

ARCHIVE

Specifies the URL of a JAR file (zipped) that contains the script specified by the SRC attributes

Where to place JavaScript Codes

You will normally insert scripts into any HTML document with a combination of the following three different approaches:

- Place <script> </script> tags and code within <body> and </body> tags
- Define JavaScript functions and variables within <head> </head> tags for local reuse in a HTML page and invoke functions through event handlers such as mouse activities (movement, clicking, focusing, etc) and keyboard activities (key down, up, etc)
- Include external JavaScript code for global reuse (multiple sites and pages)

1. Place `<script>` `</script>` tags and code within `<body>` and `</body>` tags

```
<html>
<!-- firstjavascript.htm -->
<head>
    <title> First JavaScript </title>
</head>
<body BGCOLOR=WHITE>
<h1>
    <script LANGUAGE="JAVASCRIPT" TYPE="TEXT/JAVASCRIPT">

        document.write("Hello, JavaScript")

    </script>
</h1>

</body>
</html>
```

Example 1-1: Say "Hello, World" using JavaScript code. The example page is saved as [Js_helloworld.html](#).

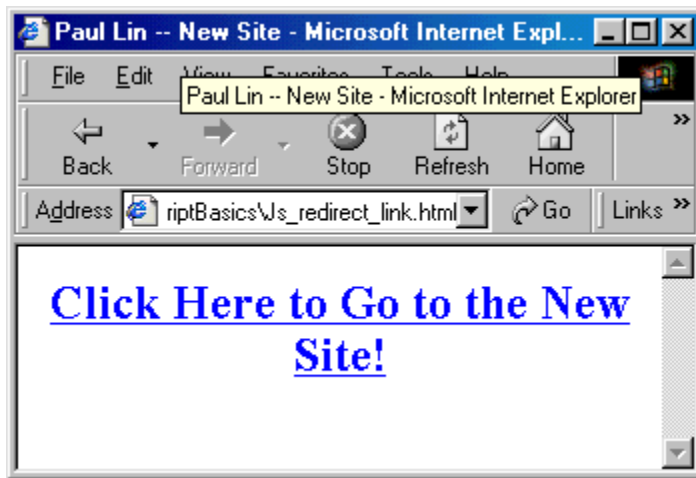
```
<html>
<!-- Js_helloworld.html -->
<head>
    <title>Hello World</title>
</head>
<body bgcolor="white">
<h1>
    <script language="javascript" type="text/javascript">

        document.write("Hello, World!")
        // C++ style comment
        /* C style comment */
        // Display a pop up window to alert the user
        alert("Hello, World!")
    </script>
</h1>
</body>
</html>
```



Example 1-2: Embed JavaScript in <A HREF> link. This example is saved as [Js_redirect_link.html](#).

```
<html>
<!-- Js_redirect_link.html
  Embed JavaScript in the HREF link tag
  1. If the browser does not support JavaScript it loads
  hello.html, otherwise, it loads helloworld.html which
  use alert() function to display a pop up window.
  2. if the browser support Javascript, the pop up window displays,
  then close click "OK" to close the alert window, finally
  it loads the hello.html.
-->
<head>
  <title>Paul Lin -- New Site </title>
</head>
<body bgcolor="white">
<h2 align="center"> <a href="Js_helloworld.html"
  onClick="window.location='Js_helloworld.html';
  return false" > Click Here to Go to the New Site!</a></h2>
</body>
</html>
```



Example 1-3; Redirect the user to another site using JavaScript `window.location()` function. This Web page is saved as [redirect.html](#).

```
<html>
<!-- redirect.html -->
<head>
<title>Redirection Using Javascript</title>
<script language="javascript" type="text/javascript">
  window.location = "http://www.etcs.pfw.edu/~lin"
</script>
</head>
<body bgcolor="white">
<h2>Upgrade to require your Web Browser to have the latest version of
JavaScript!</h2>
</body>
</html>
```



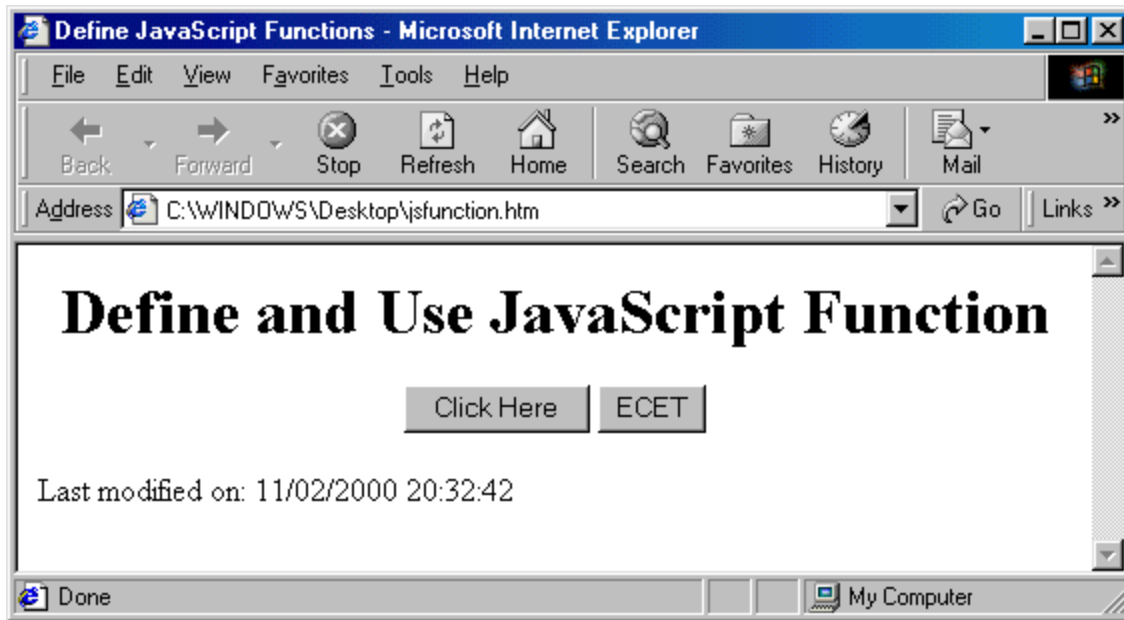
2. Define JavaScript Functions and Variables within <head> </head> tags and invoke functions through event handler.

Functions

- Defining a function
- Calling a function

Example 1-4: Create and use JavaScript functions. This Web page is saved as [jsfunctions.html](#).

```
<html>
<!--jsfunctions.html    -->
<head>
<title> Define JavaScript Functions </title>
<script language = "JavaScript">
    function Greeting() {alert("Hello World!");}
    function Say(message) {alert(message) }:
</script>
</head>
<h1 align="center"> Define and Use JavaScript Function </h1>
<div align="center">
<form>
    <input type="button" value="Click Here" onClick="Greeting()">
    <input type="button" value="ECET" onClick="Say('Electrical and
Computer Engineering Technology')">
</form>
</div>
<script>
    document.write("Last modified on: " + document.lastModified);
</script>
</body>
</html>
```

3. Include external JavaScript code for global reuse

```
<html>
<script language = "javascript" SRC =
"http://www.etcs.ipfw.edu/~lin/src.js">
</script>
```

```
<head>
    <script> </script>
</head>
```

// Non-script Option:

```
<body>
    <script>
        Statements
    </script>

    <NOSCRIPT>
        [JavaScript is not supported]
</body>
```