JAVASCRIPT

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Introduction to JavaScript

JavaScript is used in millions of Web pages to improve the design, validate forms, detect browsers, create cookies, and much more.

JavaScript is the most popular scripting language on the Internet, and works in all major browsers, such as Internet Explorer, Mozilla Firefox, and Opera.

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

Java and JavaScript are two completely different languages in both concept and design!

Java (developed by Sun Microsystems) is a powerful and much more complex programming language - in the same category as C and C++.

What can a JavaScript Do ?

- **JavaScript gives HTML designers a programming tool -** HTML authors are normally not programmers, but JavaScript is a scripting language with a very simple syntax! Almost anyone can put small "snippets" of code into their HTML pages
- **JavaScript can put dynamic text into an HTML page -** A JavaScript statement like this: document.write("<h1>" + name + "</h1>") can write a variable text into an HTML page
- **JavaScript can react to events -** A JavaScript can be set to execute when something happens, like when a page has finished loading or when a user clicks on an HTML element
- **JavaScript can read and write HTML elements -** A JavaScript can read and change the content of an HTML element
- **JavaScript can be used to validate data -** A JavaScript can be used to validate form data before it is submitted to a server. This saves the server from extra processing
- **JavaScript can be used to detect the visitor's browser -** A JavaScript can be used to detect the visitor's browser, and - depending on the browser - load another page specifically designed for that browser

- **JavaScript can be used to create cookies** - A JavaScript can be used to store and retrieve information on the visitor's computer.

JavaScript Variables

Variables are "containers" for storing information.

JavaScript variables are used to hold values or expressions.

A variable can have a short name, like x, or a more descriptive name, like carname.

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

Note: Because JavaScript is case-sensitive, variable names are case-sensitive.

Example

A variable's value can change during the execution of a script. You can refer to a variable by its name to display or change its value.

```
<html>
<body>
<script type="text/javascript">
var firstname;
firstname="Welcome";
document.write(firstname);
document.write("<br />");
firstname="XYZ";
document.write(firstname);
</script>

<p>The script above declares a variable,
assigns a value to it, displays the value, change the value,
and displays the value again.</p>

</body>
</html>
```

Output :
Welcome
XYZ

The script above declares a variable, assigns a value to it, displays the value, change the value, and displays the value again.

Declaring (Creating) JavaScript Variables

Creating variables in JavaScript is most often referred to as "declaring" variables.

You can declare JavaScript variables with the **var statement**:

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

After the declaration shown above, the variables are empty (they have no values yet).

However, you can also assign values to the variables when you declare them:

```
var x=5;
var carname="Scorpio";
```

After the execution of the statements above, the variable **x** will hold the value **5**, and **carname** will hold the value **Scorpio**.

Note: When you assign a text value to a variable, use quotes around the value.

Assigning Values to Undeclared JavaScript Variables

If you assign values to variables that have not yet been declared, the variables will automatically be declared.

These statements:

```
x=5;
carname="Scorpio";
```

have the same effect as:

```
var x=5;
var carname="Scorpio";
```

Redeclaring JavaScript Variables

If you redeclare a JavaScript variable, it will not lose its original value.

```
var x=5;
var x;
```

DataTypes

- Numbers - are values that can be processed and calculated. You don't enclose them in quotation marks. The numbers can be either positive or negative.
- Strings - are a series of letters and numbers enclosed in quotation marks. JavaScript uses the string literally; it doesn't process it. You'll use strings for text you want displayed or values you want passed along.
- Boolean (**true**/**false**) - lets you evaluate whether a condition meets or does not meet specified criteria.
- Null - is an empty value. **null** is not the same as 0 -- 0 is a real, calculable number, whereas **null** is the **absence of any value**.

Data Types

TYPE	EXAMPLE
Numbers	Any number, such as 17, 21, or 54e7
Strings	"Greetings!" or "Fun"
Boolean	Either true or false
Null	A special keyword for exactly that – the null value (that is, nothing)

JavaScript Arithmetic

As with algebra, you can do arithmetic operations with JavaScript variables:

```
y=x-5;
z=y+5;
```

JavaScript Operators

The operator = is used to assign values.

The operator + is used to add values.

The assignment operator = is used to assign values to JavaScript variables.

The arithmetic operator + is used to add values together.

```
y=5;
z=2;
x=y+z;
```

within the **onLoad** Event Handler, other Event Handlers can test this flags to see if they can safely run, with the knowledge that the document is fully loaded and all objects are defined. For example:

```
<SCRIPT>

var loaded = false;

function doit() {
    // alert("Everything is \"loaded\" and loaded = " + loaded);
    alert('Everything is "loaded" and loaded = ' + loaded);
}

</SCRIPT>

<BODY onLoad="loaded = true;">
-- OR --
<BODY onLoad="window.loaded = true;">

<FORM>
    <INPUT TYPE="button" VALUE="Press Me"
      onClick="if (loaded == true) doit();">
-- OR --
    <INPUT TYPE="button" VALUE="Press Me"
      onClick="if (window.loaded == true) doit();">
-- OR --
    <INPUT TYPE="button" VALUE="Press Me"
      onClick="if (loaded) doit();">
</FORM>

</BODY>
```

The **onLoad** Event Handler is executed when the document or frameset is fully loaded, which means that all images have been downloaded and displayed, all subframes have loaded, any Java Applets and Plugins (Navigator) have started running, and so on. The **onUnLoad** Event Handler is executed just before the page is unloaded, which occurs when the browser is about to move on to a new page. Be aware that when you are working with multiple frames, there is no guarantee of the order in which the **onLoad** Event Handler is invoked for the various frames, except that the Event Handlers for the parent frame is invoked after the Event Handlers of all its children frames -- This will be discussed in detail in **Week 8**.

Setting the bgColor Property

The first example allows the user to change the color by clicking buttons, while the second example allows you to change colors by using drop down boxes.

Event Handlers