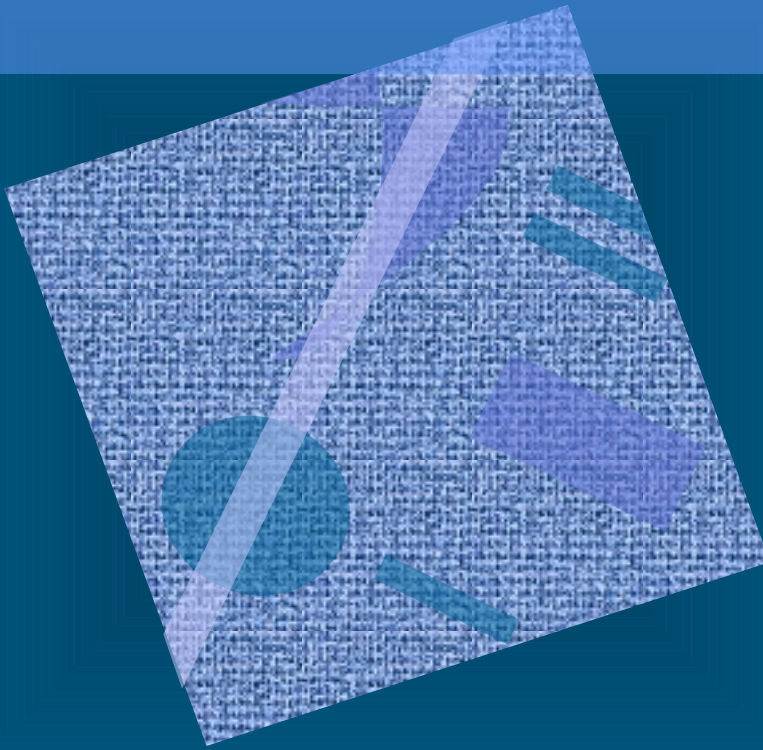


COMS 469: Interactive Media II



Agenda

- Review
- Data Types & Variables
- Decisions, Loops, and Functions

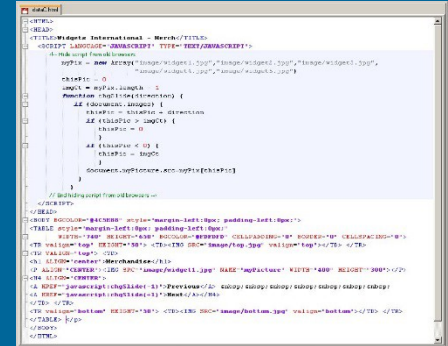
Review



gunkelweb.com/coms469

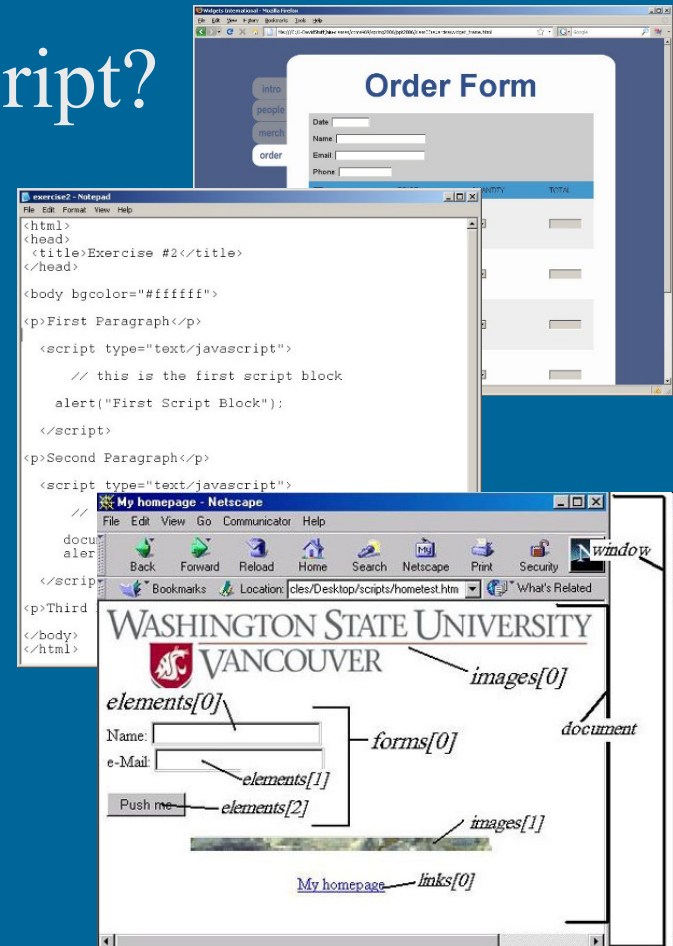
Review

- Basic Terminology
 - Computer Languages
 - Interpreted vs. Compiled
 - Client vs. Server side scripting
- JavaScript History
 - Netscape
 - Java vs. JavaScript
 - JavaScript vs. Jscript
 - Jscript = Microsoft's *dialect* of Javascript
 - Basically the same, but Jscript supports “conditional compilation,” not supported by other implementations of Javascript



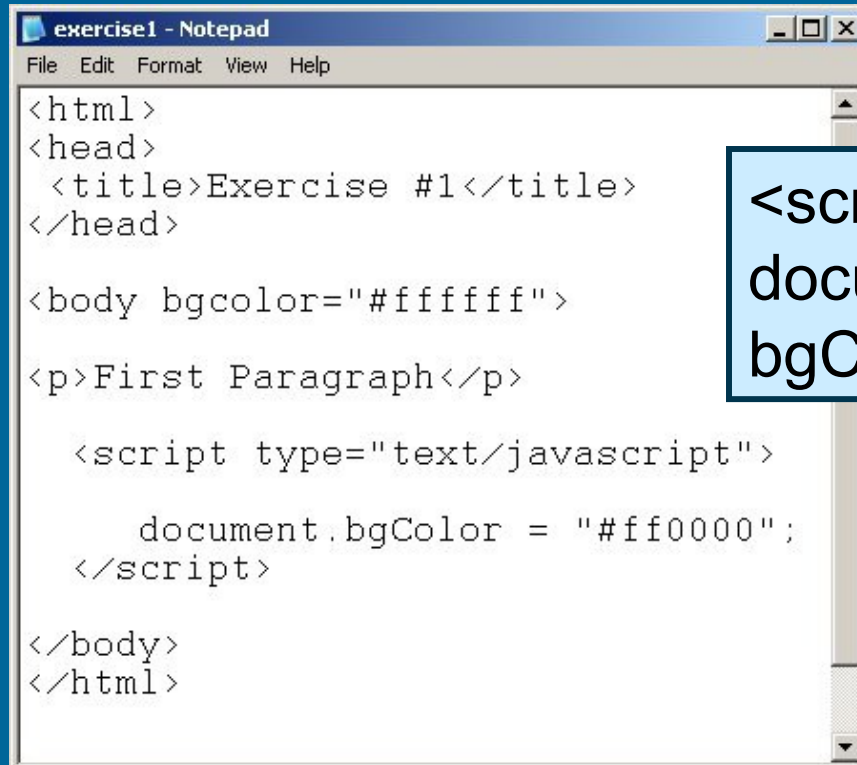
Review

- Rationale – Why JavaScript?
 - Compatibility
 - Easy to learn and use
 - Powerful/Practical
 - Lucrative
- JavaScript Terminology
 - Object
 - Property
 - Method



Review

- Writing JavaScript



```
<html>
<head>
  <title>Exercise #1</title>
</head>

<body bgcolor="#ffffff">

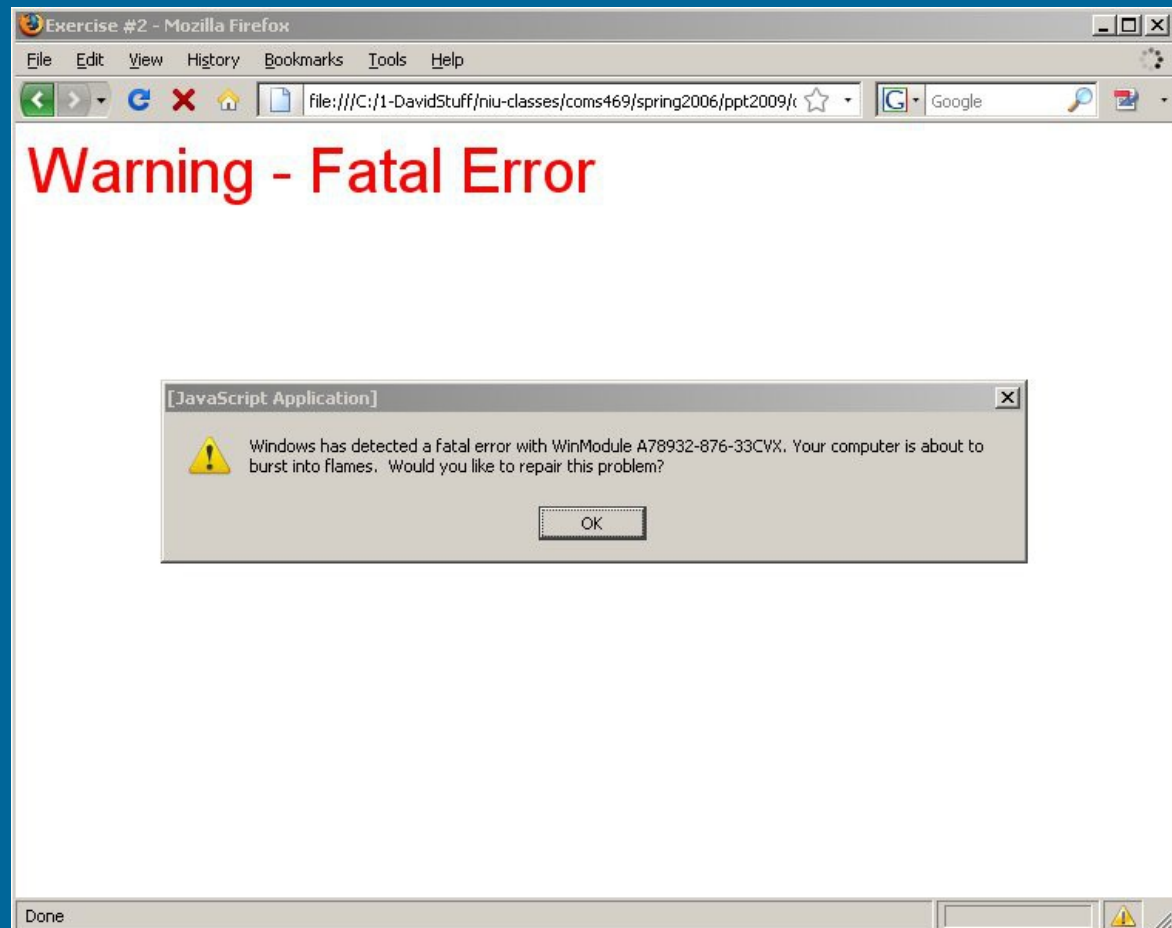
  <p>First Paragraph</p>

  <script type="text/javascript">
    document.bgColor = "#ff0000";
  </script>

</body>
</html>
```

<script> tag
document object
bgColor property

Review



```
practice1 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Exercise #2</title>
</head>

<body bgcolor="#ffffff">

<p style="font-size:40px; color:#ff0000">Warning - Fatal Error</p>

  <script type="text/javascript">

    alert("Windows has detected a fatal error with WinModule A78932-876-33CVX. Your computer is about
      to burst into flames. Would you like to repair this problem?");

  </script>

  <script type="text/javascript">

    alert("You have activated the Windows Disaster Recovery Wizard. Are you sure that you want to
      continue?");

  </script>

  <script type="text/javascript">

    alert("You have affirmed that you want to activate the Windows Disaster Recovery Wizard.
      Are you really sure that you want to do this?");

  </script>

  <script type="text/javascript">

    alert("End User License - This product is protected by international copyright and patent law.
      In running this program, you authorize Microsoft to deducted 30% from your annual income
      and to take your first born child. You also promise not to say anything bad about Microsoft,
      Bill Gates, or any affiliated Microsoft product or service. You also pledge your support
      for and allegiance to the Windows operating system and you affirm that you have never nor will
      you ever say anything about Vista that is or could be considered disparaging. You affirm
      that you have read this licensing agreement and that you agree to live by all its rules and
      stipulations.");

  </script>

  <script type="text/javascript">

    alert("Did you really read each and every line of the the End User License?");

  </script>

<p style="font-size:40px">Processing Windows Disaster Recovery</p>
<p><a href="practice1.html">click here</a> to continue.
</body>
</html>
```

```
practice1 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Exercise #2</title>
</head>

<body bgcolor="#ffffff">
<p style="font-size:40px">

  <script type="text/javascript">
    alert("Windows has detected a fatal error with WinModule A78932-876-33CVX. Your computer
    is about to burst into flames. Would you like to repair this problem?");

  </script>

  <script type="text/javascript">
    alert("You have activated the Windows Disaster Recovery Wizard.
    Are you sure that you want to continue?");

  </script>

  <script type="text/javascript">
    alert("You have affirmed that you want to activate the Windows Disaster Recovery Wizard.
    Are you really sure that you want to do this?");

  </script>

  <script type="text/javascript">
    alert("End User License - This product is protected by international copyright and patent law.
    In running this program, you authorize Microsoft to deducted 30% from your annual income
    and to take your first born child. You also promise not to say anything bad about Microsoft,
    Bill Gates, or any affiliated Microsoft product or service. You also pledge your support for
    and allegiance to the Windows operating system and you affirm that you have never nor will you
    ever say anything about Vista that is or could be considered disparaging. You affirm that
    you have read this licensing agreement and that you agree to live by all its rules and
    stipulations.");

    alert("Did you really read each and every line of the the End User License?");

  </script>

  <script type="text/javascript">
    alert("Did you really read each and every line of the the End User License?");

  </script>

  <script type="text/javascript">
    alert("Did you really read each and every line of the the End User License?");

  </script>

<p style="font-size:40px">Processing Windows Disaster Recovery</p>
<p><a href="practice1.html">click here</a> to continue.
</body>
</html>
```

```
practice1b - Notepad
File Edit Format View Help

<html>
<head>
  <title>Exercise #2</title>
</head>

<body bgcolor="#ffffff">
<p style="font-size:40px; color:#ff0000">Warning - Fatal Error</p>

  <script type="text/javascript">
    alert("Windows has detected a fatal error with WinModule A78932-876-33CVX. Your computer
    is about to burst into flames. Would you like to repair this problem?");

    alert("You have activated the Windows Disaster Recovery Wizard.
    Are you sure that you want to continue?");

    alert("You have affirmed that you want to activate the Windows Disaster Recovery Wizard.
    Are you really sure that you want to do this?");

    alert("End User License - This product is protected by international copyright and patent law.
    In running this program, you authorize Microsoft to deducted 30% from your annual income
    and to take your first born child. You also promise not to say anything bad about Microsoft,
    Bill Gates, or any affiliated Microsoft product or service. You also pledge your support for
    and allegiance to the Windows operating system and you affirm that you have never nor will you
    ever say anything about Vista that is or could be considered disparaging. You affirm that
    you have read this licensing agreement and that you agree to live by all its rules and
    stipulations.");

    alert("Did you really read each and every line of the the End User License?");

  </script>

  <p style="font-size:40px">Processing Windows Disaster Recovery</p>
  <p><a href="practice1.html">click here</a> to continue.
  </body>
  </html>
```

Data Types & Variables

- Overview/Topics
 - Types of Data in JavaScript
 - Variables
 - Error Checking
 - Using Data – Calculation & String Manipulation
 - Data Type Conversion
 - Arrays

Data Types & Variables

- Introduction
 - Computers process and display *data*
 - Processing = information modified, interpreted, or filtered
 - Display = results presented to the user in human readable form
 - Different *Data Types*
 - Numbers
 - Text
 - Boolean

Data Types & Variables

- Types of Data in JavaScript
 - Two kinds of computer languages
 - Strongly typed languages – must specify data type before data can be used; strict rules for data usage
 - Weakly typed languages – more forgiving about how you use different types of data; more flexible rules
 - JavaScript = Weakly Typed Language
 - JavaScript can often figure out data types for itself
 - Easier to write and use than strongly typed language

Data Types & Variables

- Numerical Data
 - Whole numbers or Integers (i.e. 145, 23, -8)
 - Negative or positive
 - Range -2^{53} to 2^{53}
 - Fractions or Floating-point (i.e. 1.45, 3.2, -4.5)
 - Negative or positive
 - Decimal point

Data Types & Variables

- Text Data or Strings
 - Anything contained by quotation marks
 - “This is text data”
 - ‘This is text data’
 - Quotation marks inside quotations marks
 - “This is ‘text’ data” – Not valid
 - “This is \'text\' data”
 - Valid
 - Escape Sequence Character

Data Types & Variables

- Boolean Data
 - True or False/Yes or No
 - Used for making decisions and writing conditional statements

Is this a hot dog?
If *yes*, eat it.
If *no*, do not eat it.

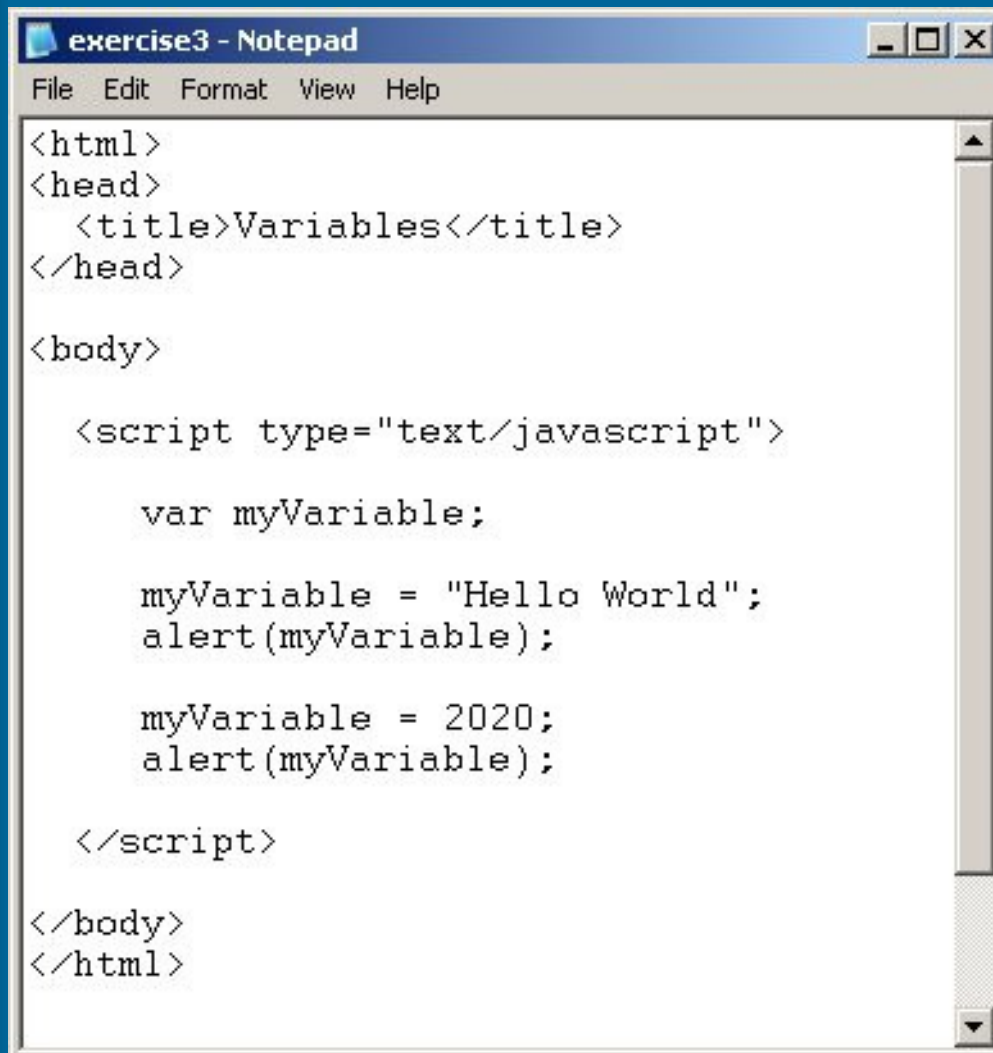
Data Types & Variables

- Variables – Storing Data in Memory
 - Variable
 - Something that can assume any value
 - Form of temporary data storage that can be altered
 - Variable Names in JavaScript
 - Arbitrary – x, filthyAnimal, larry, dog01
 - Case Sensitive – mystuff Mystuff myStuff MyStuff
 - Some Exclusions
 - *Reserved* words – words that JavaScript uses for itself (i.e. array, function, alert, etc.)
 - Symbols - %, &, \$, @

Data Types & Variables

- Variables – Storing Data in Memory
 - Declaring Variables
 - Before using a variable, you need to tell the computer that it exists
 - `var coldBeer`
 - Because JavaScript is weakly typed, you do not need to declare the data type
 - Assigning Value to a Variable
 - `coldBeer = "Pabst"`
 - *assignment operator* (assign the *string literal* "Pabst" to the variable coldBeer)

Data Types & Variables



```
<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var myVariable;

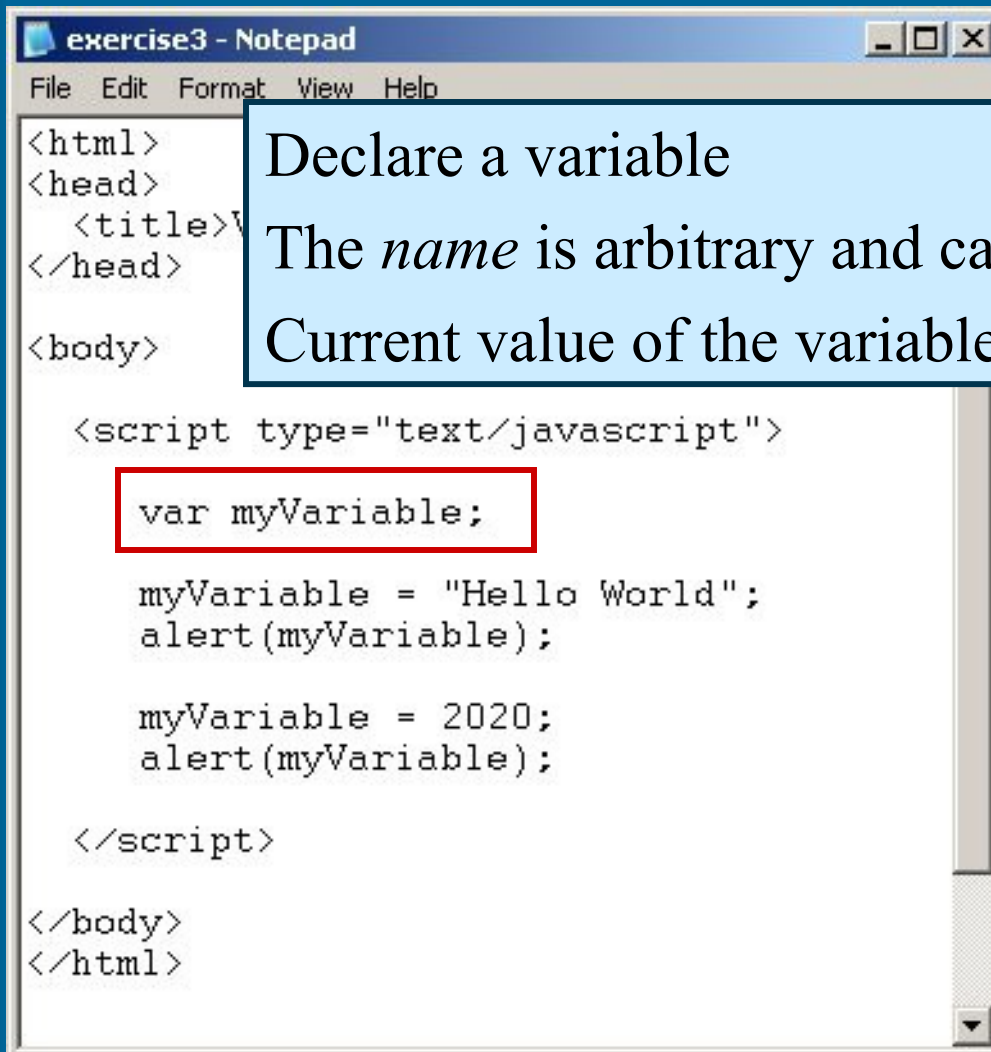
    myVariable = "Hello World";
    alert(myVariable);

    myVariable = 2020;
    alert(myVariable);

  </script>

</body>
</html>
```

Data Types & Variables



```
<html>
<head>
  <title>V
</head>

<body>

  <script type="text/javascript">
    var myVariable;

    myVariable = "Hello World";
    alert(myVariable);

    myVariable = 2020;
    alert(myVariable);

  </script>

</body>
</html>
```

Declare a variable

The *name* is arbitrary and case sensitive

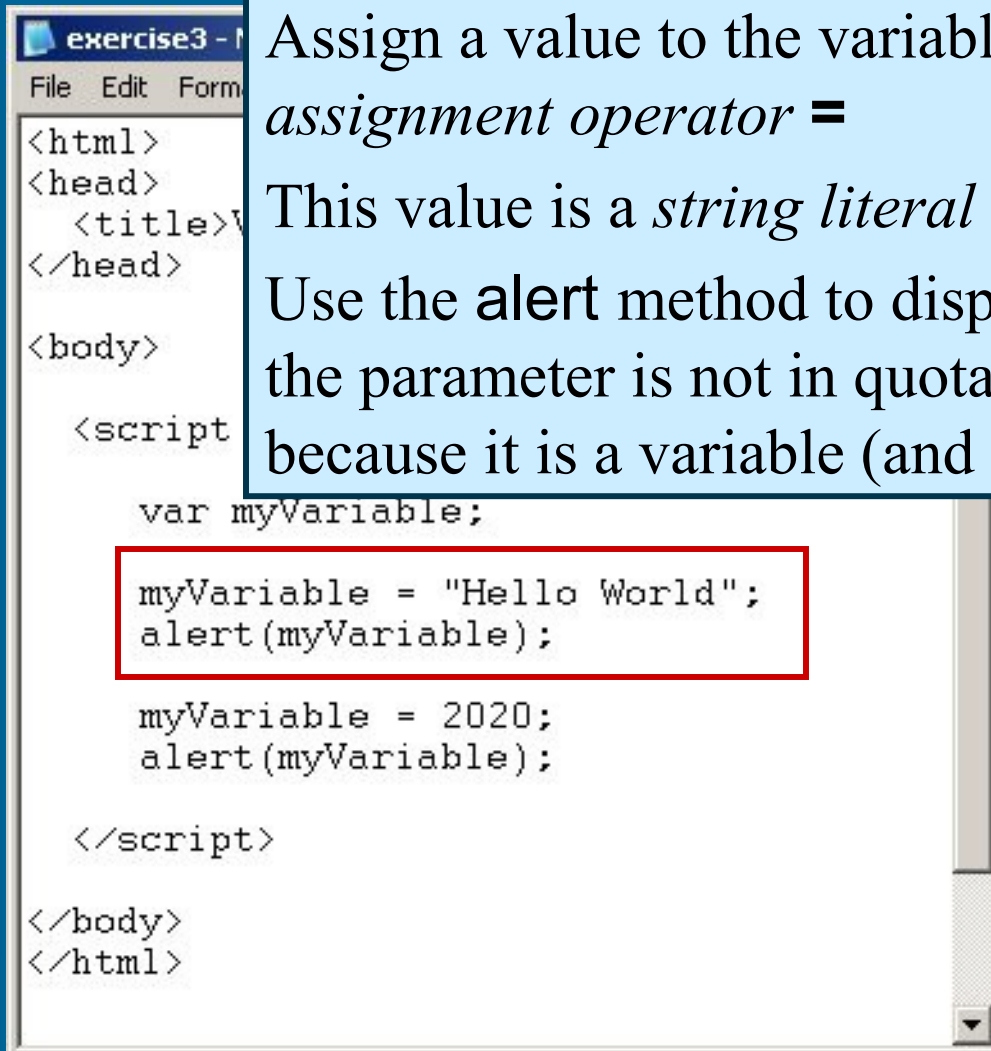
Current value of the variable is *undefined*

Data Types & Variables

Assign a value to the variable; use the *assignment operator* =

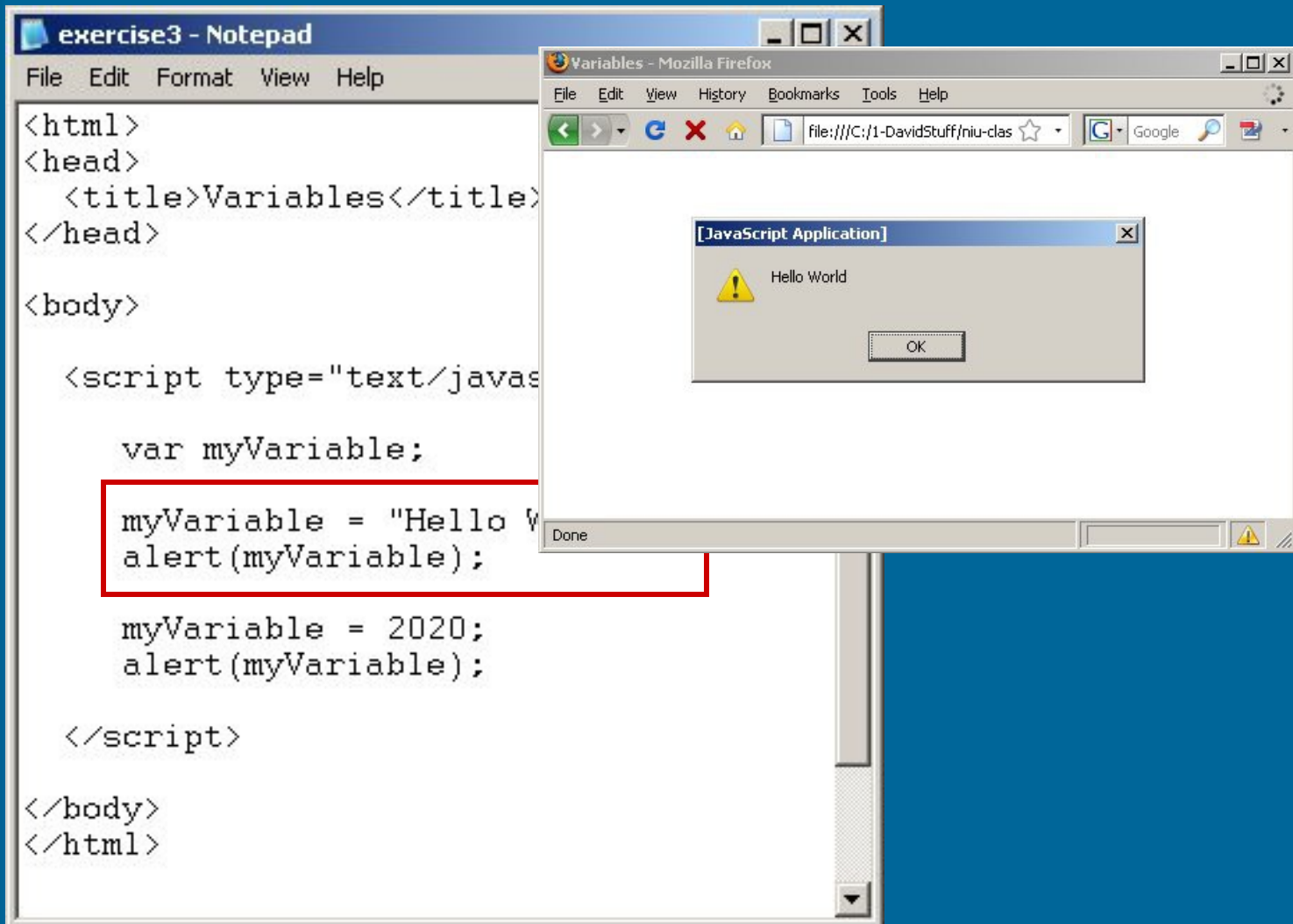
This value is a *string literal* – quotation marks

Use the **alert** method to display the results; the parameter is not in quotation marks because it is a variable (and not a string).

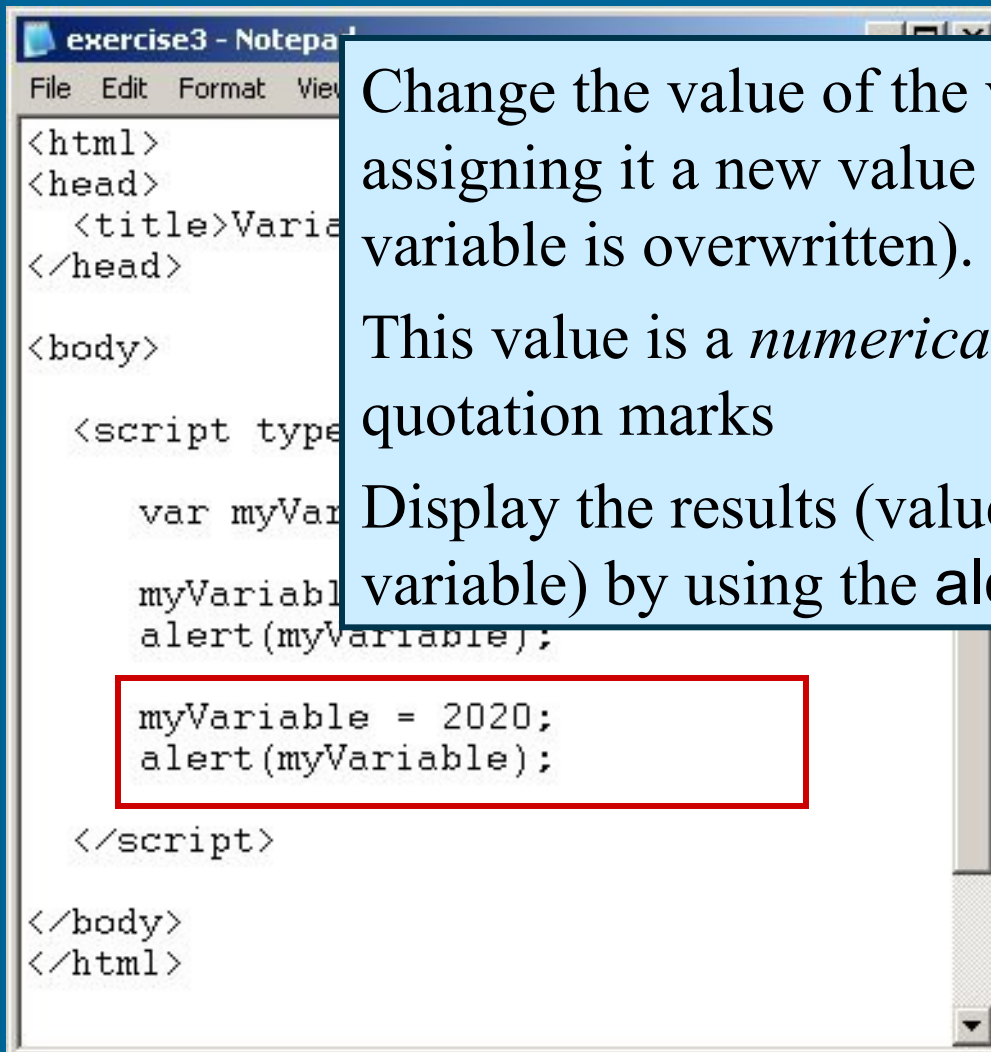


```
exercise3 - 1
File Edit Form
<html>
<head>
  <title>exercise3 - 1</title>
</head>
<body>
  <script>
    var myVariable;
    myVariable = "Hello World";
    alert(myVariable);
    myVariable = 2020;
    alert(myVariable);
  </script>
</body>
</html>
```

Data Types & Variables



Data Types & Variables



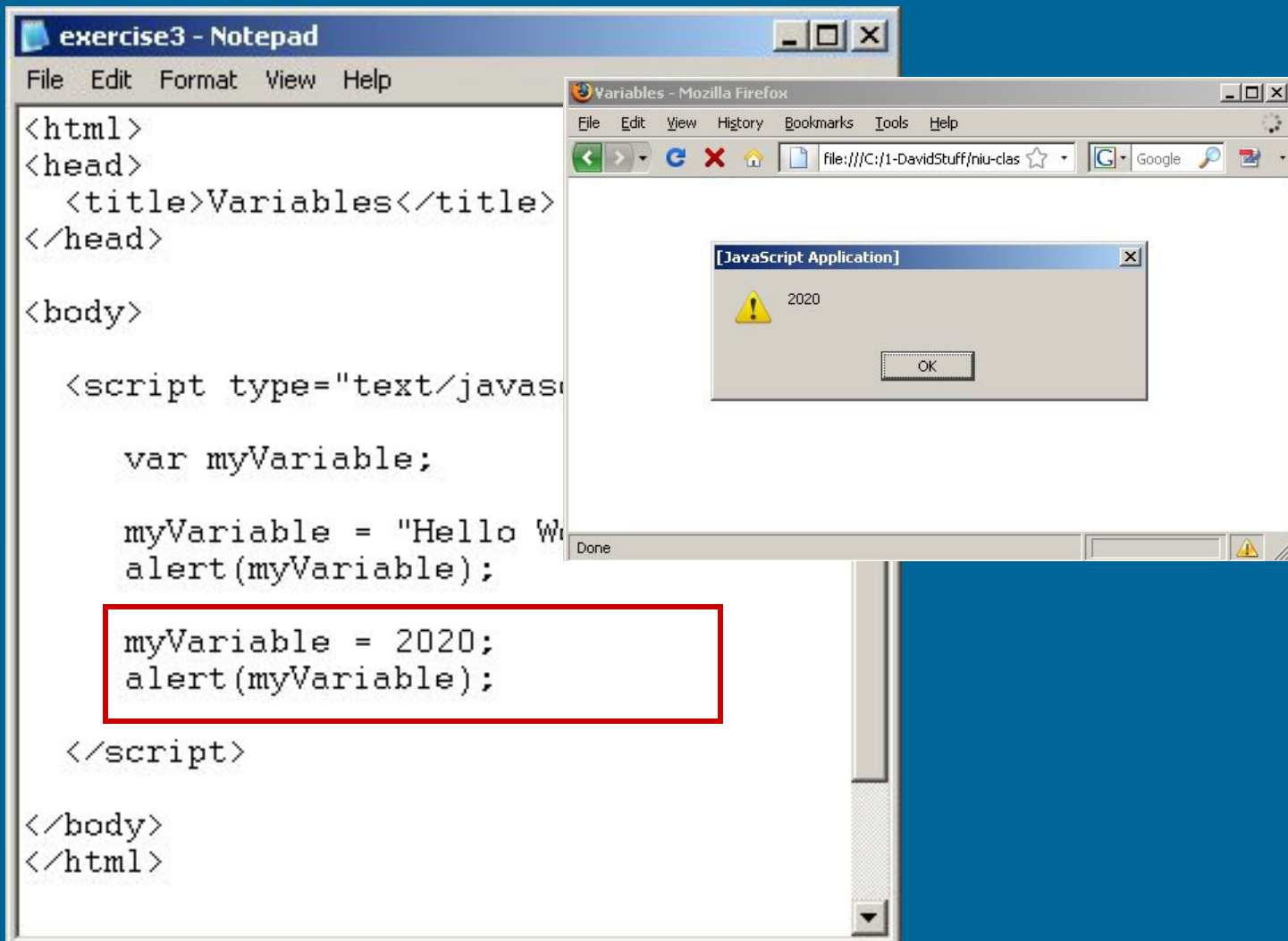
```
exercise3 - Notepad
File Edit Format View
<html>
<head>
  <title>Variables
</head>
<body>
  <script type="text/javascript">
    var myVariable = 1000;
    myVariable = 2020;
    alert(myVariable);
  </script>
</body>
</html>
```

Change the value of the variable by assigning it a new value (value of the variable is overwritten).

This value is a *numerical literal* – no quotation marks

Display the results (value of the variable) by using the **alert** method

Data Types & Variables



The image shows a Notepad window titled "exercise3 - Notepad" containing HTML code. The code defines a page titled "Variables" and includes a JavaScript script. The script declares a variable `myVariable`, assigns it the string "Hello World", and displays it in an alert box. A second line of code, `myVariable = 2020;`, is highlighted with a red rectangle. To the right, a Mozilla Firefox browser window is open to a local file. It displays a JavaScript alert box titled "[JavaScript Application]" with the message "2020" and an "OK" button.

```
<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var myVariable;

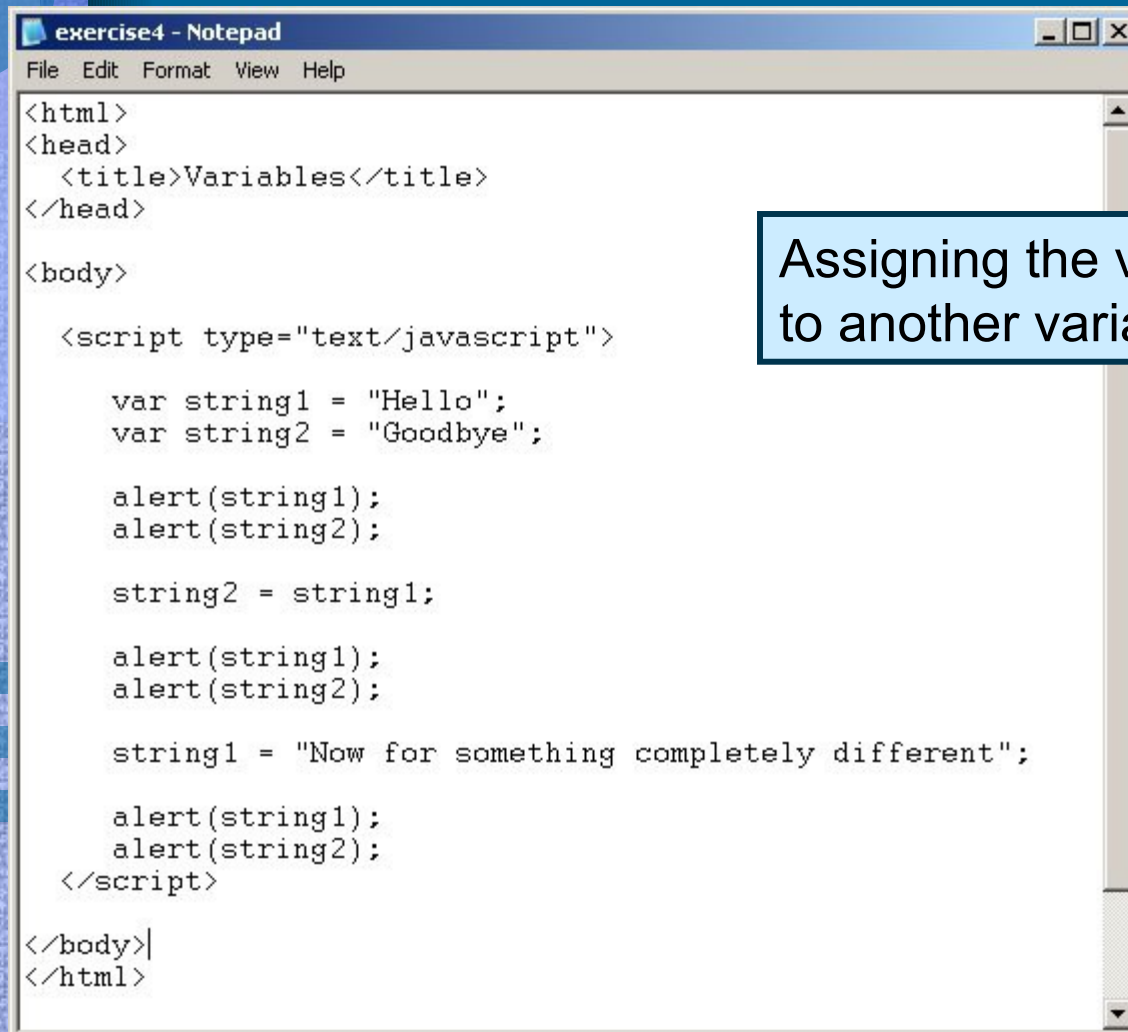
    myVariable = "Hello World";
    alert(myVariable);

    myVariable = 2020;
    alert(myVariable);

  </script>

</body>
</html>
```

Data Types & Variables



```
<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

    string2 = string1;

    alert(string1);
    alert(string2);

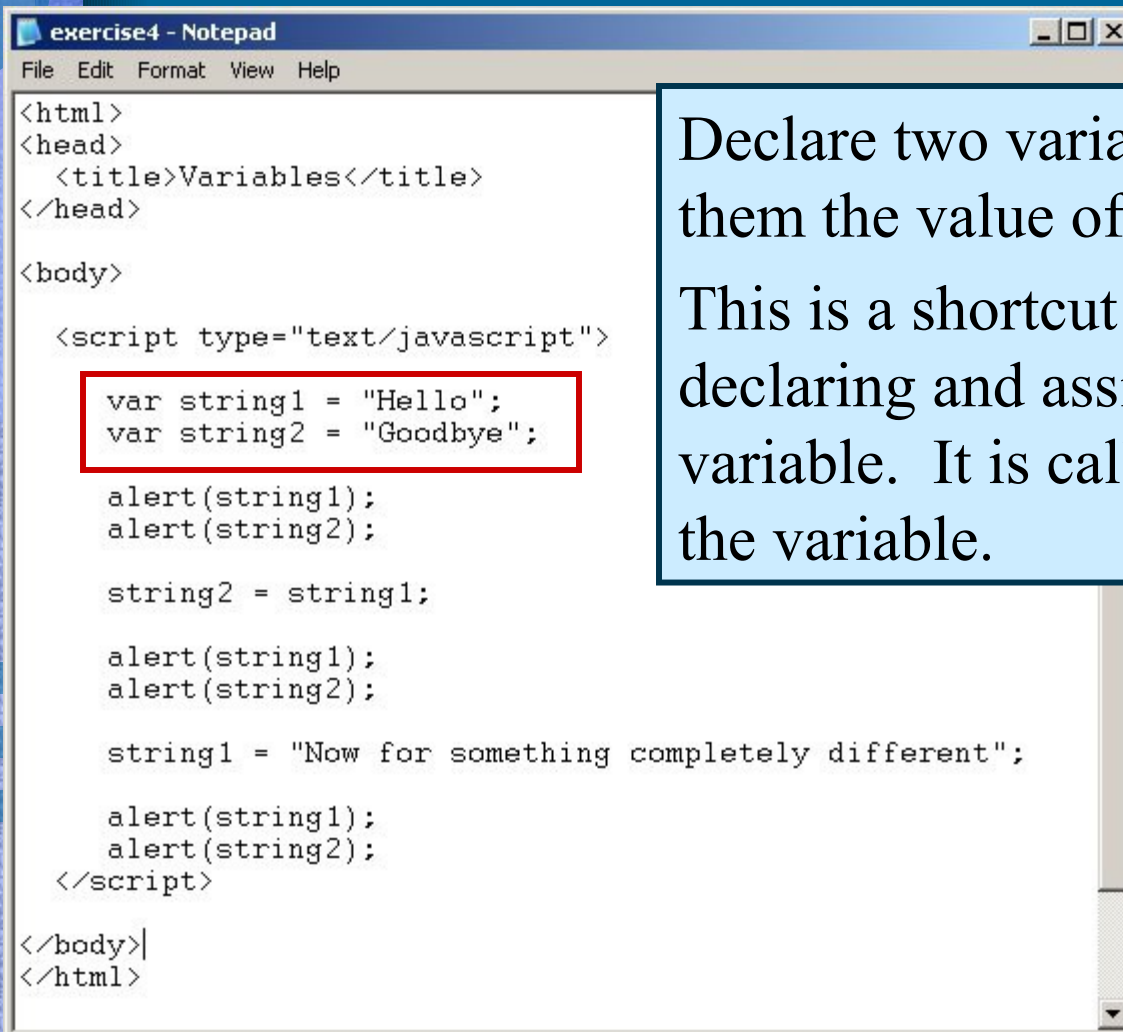
    string1 = "Now for something completely different";

    alert(string1);
    alert(string2);
  </script>

</body>
</html>
```

Assigning the value of a variable to another variable

Data Types & Variables



```
<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">
    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

    string2 = string1;

    alert(string1);
    alert(string2);

    string1 = "Now for something completely different";

    alert(string1);
    alert(string2);
  </script>

</body>
</html>
```

Declare two variables and assign them the value of a string literal.

This is a shortcut approach to declaring and assigning value to a variable. It is called *initializing* the variable.

Data Types & Variables

Use two **alert** functions to display the value of the two variables.

```
exercise4 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

    string2 = string1;

    alert(string1);
    alert(string2);

    string1 = "Now for something completely different";

    alert(string1);
    alert(string2);
  </script>

</body>
</html>
```

Data Types & Variables

```
exercise4 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

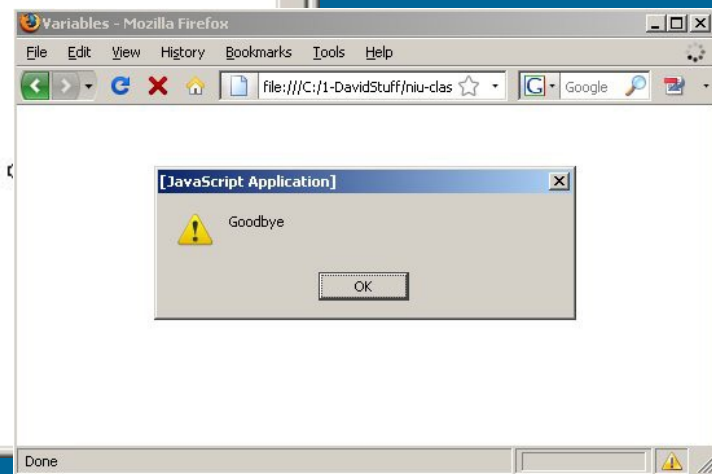
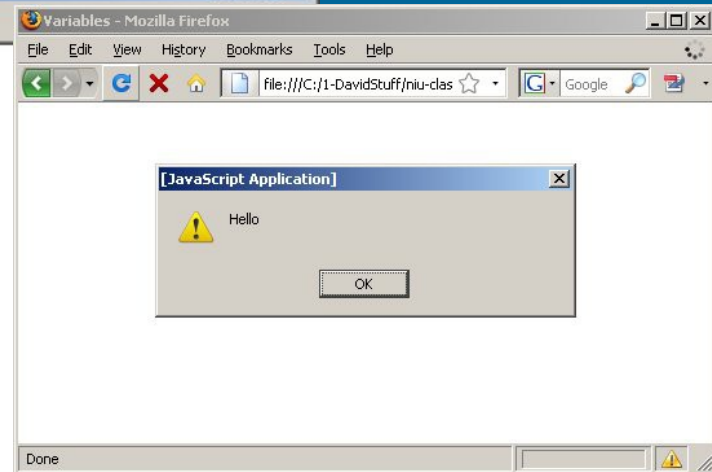
    string2 = string1;

    alert(string1);
    alert(string2);

    string1 = "Now for something completely different";

    alert(string1);
    alert(string2);
  </script>

</body>
</html>
```



Data Types & Variables

Assign the value of the second variable to the first variable.

```
exercise4 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

    string2 = string1;

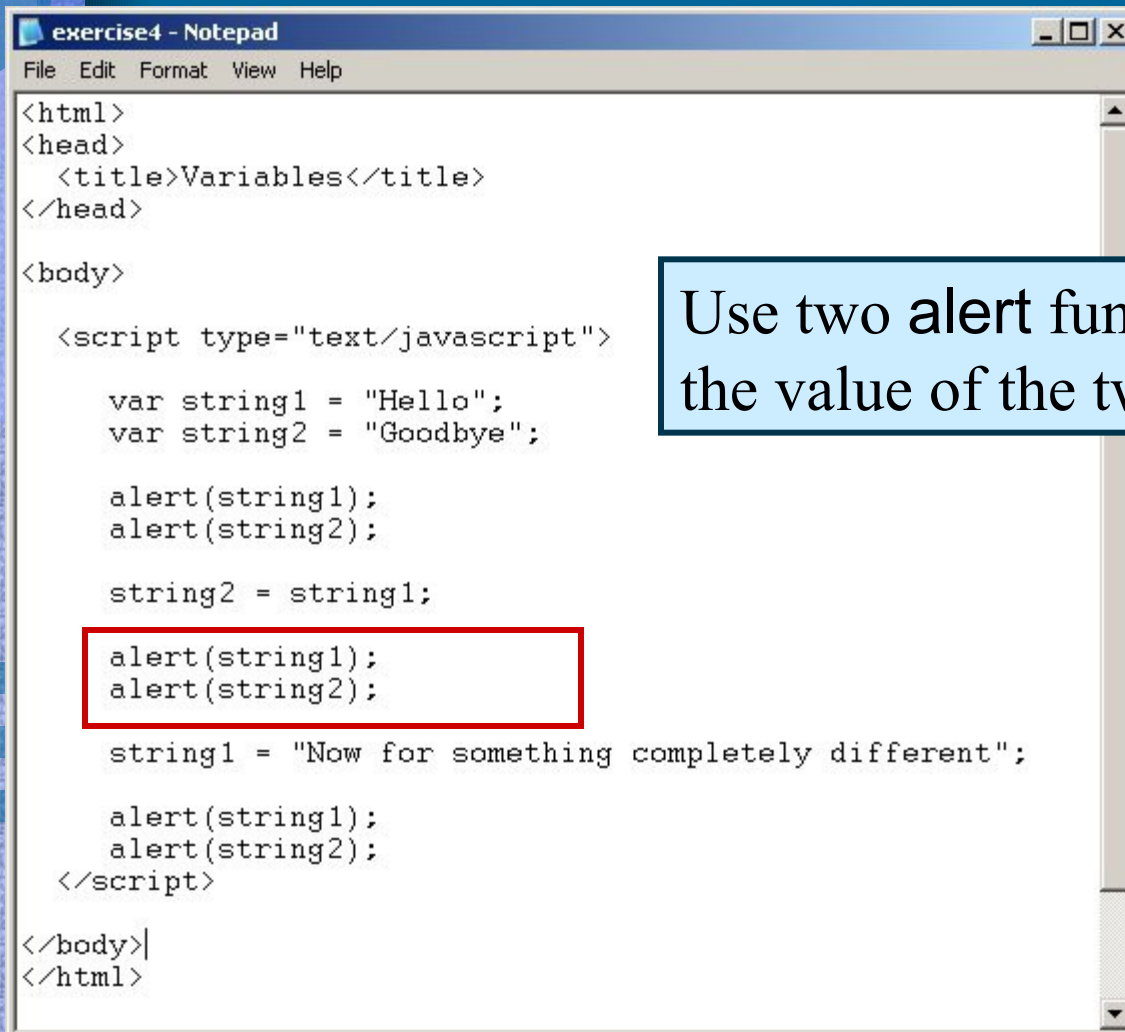
    alert(string1);
    alert(string2);

    string1 = "Now for something completely different";

    alert(string1);
    alert(string2);
  </script>

</body>
</html>
```

Data Types & Variables



```
<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

    string2 = string1;

    alert(string1);
    alert(string2);

  </script>

</body>
</html>
```

Use two alert functions to display the value of the two variables.

Data Types & Variables

```
exercise4 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

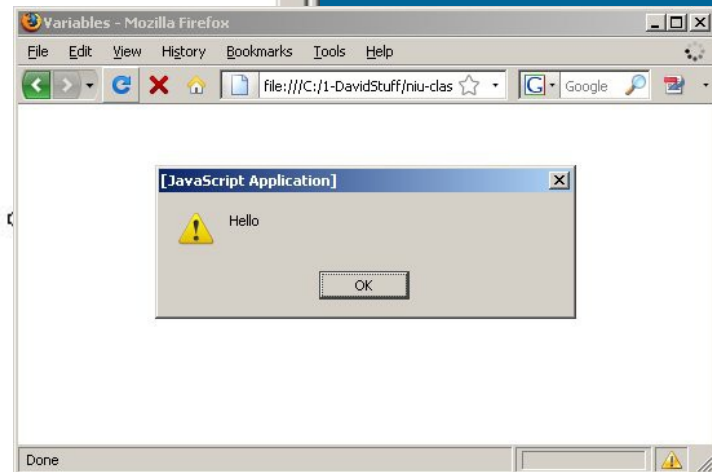
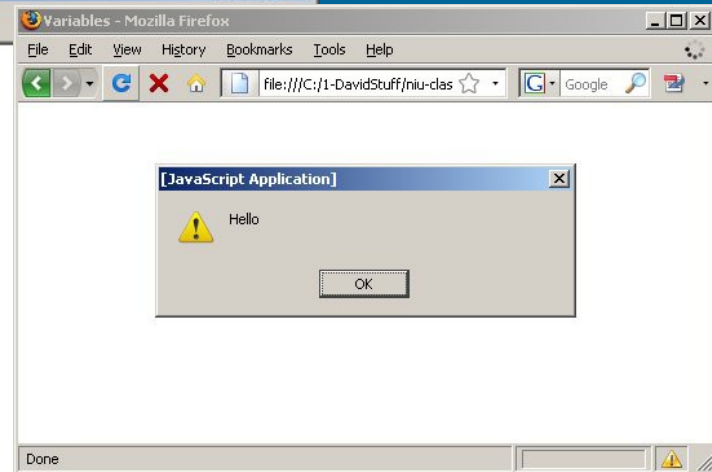
    string2 = string1;

    alert(string1);
    alert(string2);

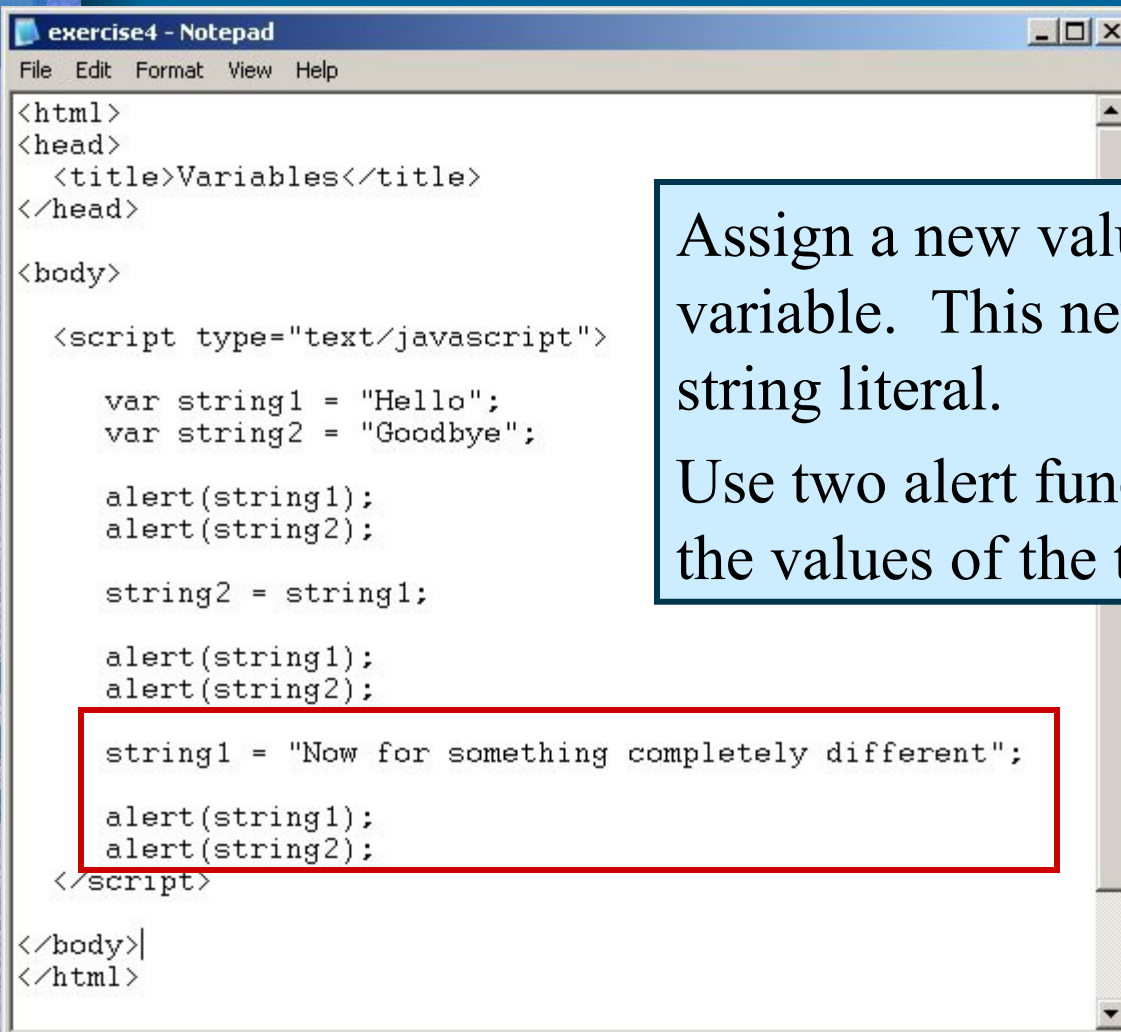
    string1 = "Now for something completely c

    alert(string1);
    alert(string2);
  </script>

</body>
</html>
```



Data Types & Variables



```
<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

    string2 = string1;

    alert(string1);
    alert(string2);

    string1 = "Now for something completely different";
    alert(string1);
    alert(string2);

  </script>

</body>
</html>
```

Assign a new value to the first variable. This new value is a string literal.

Use two alert functions to display the values of the two variables

Data Types & Variables

```
exercise4 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Variables</title>
</head>

<body>

  <script type="text/javascript">

    var string1 = "Hello";
    var string2 = "Goodbye";

    alert(string1);
    alert(string2);

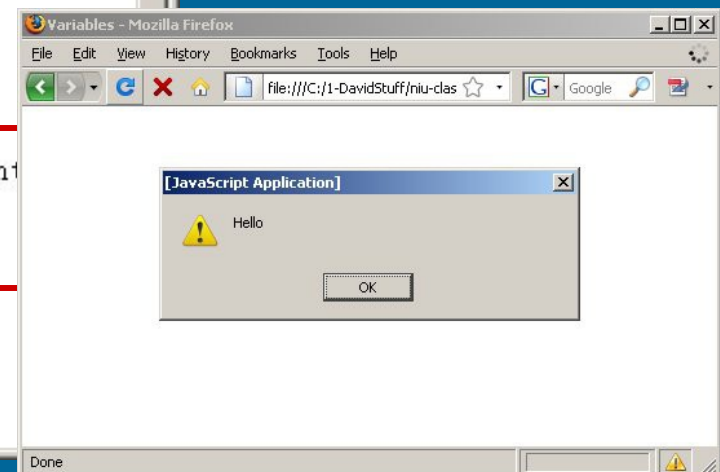
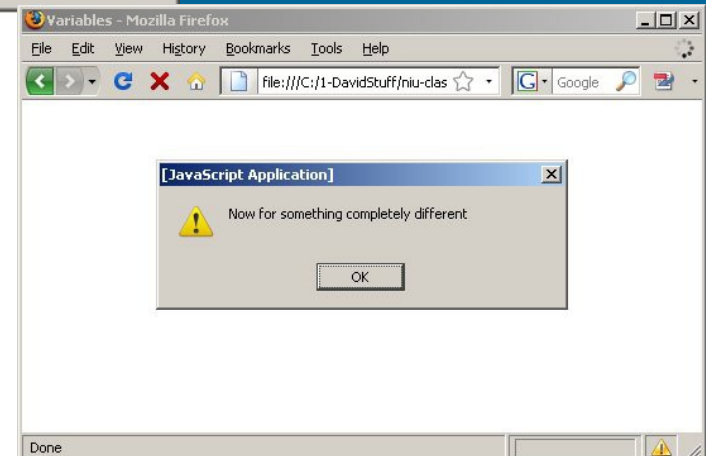
    string2 = string1;

    alert(string1);
    alert(string2);

    string1 = "Now for something completely different";
    alert(string1);
    alert(string2);

  </script>

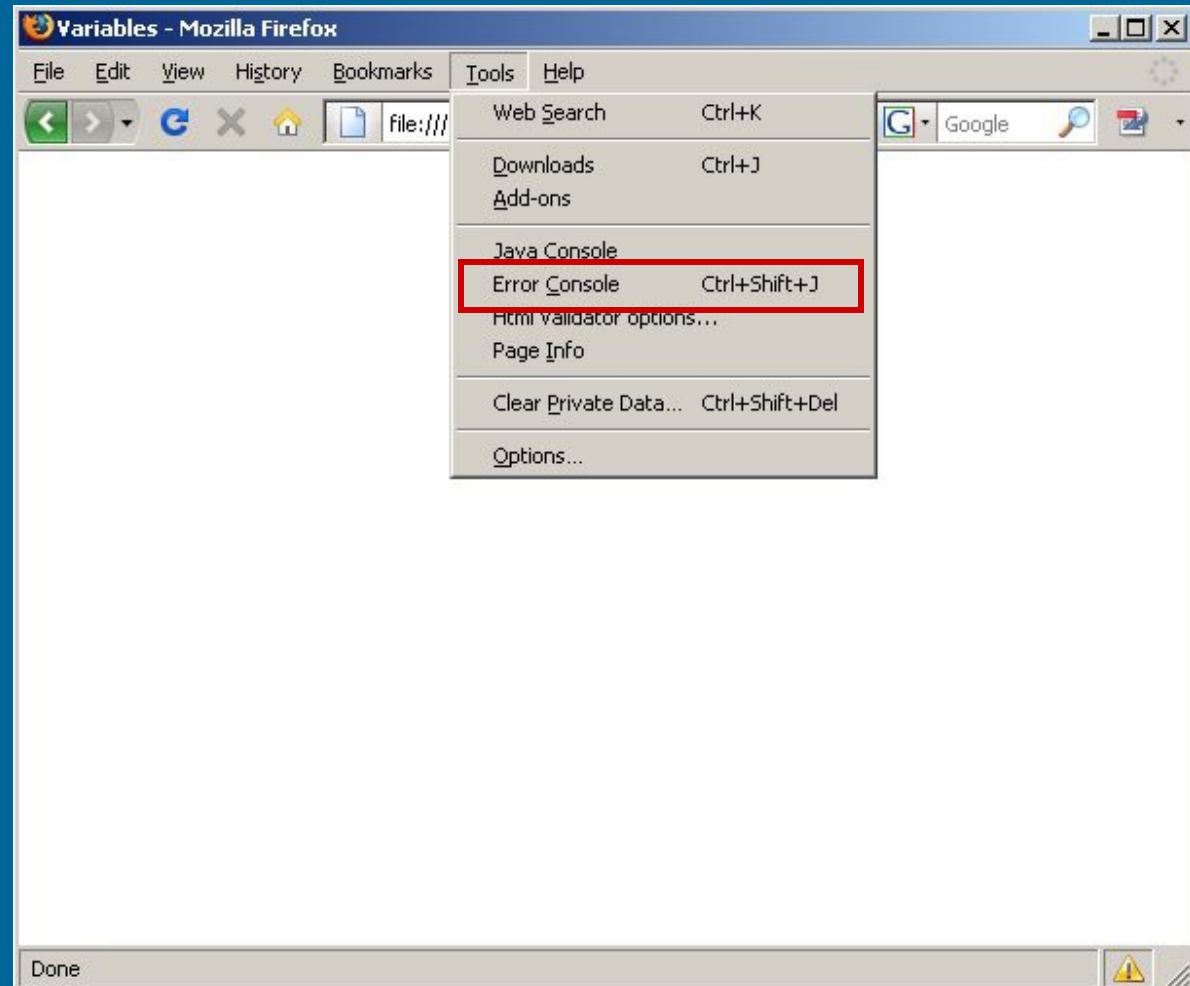
</body>
</html>
```



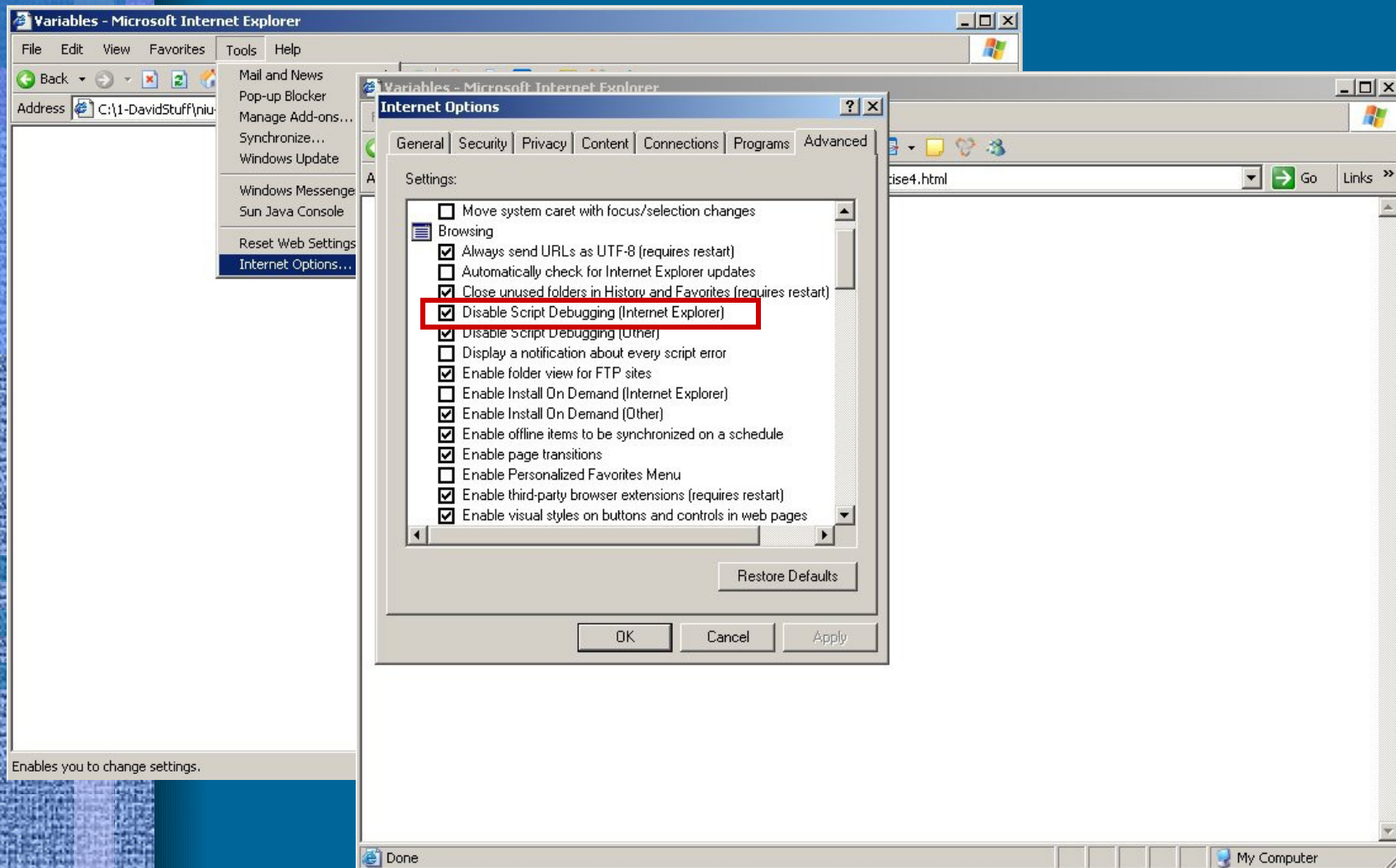
Error Checking

- Unlike HTML, JavaScript is far more sensitive to syntax errors
- Browsers have built in error checking
 - Firefox: Error Console
 - MS-IE: Script Debugging

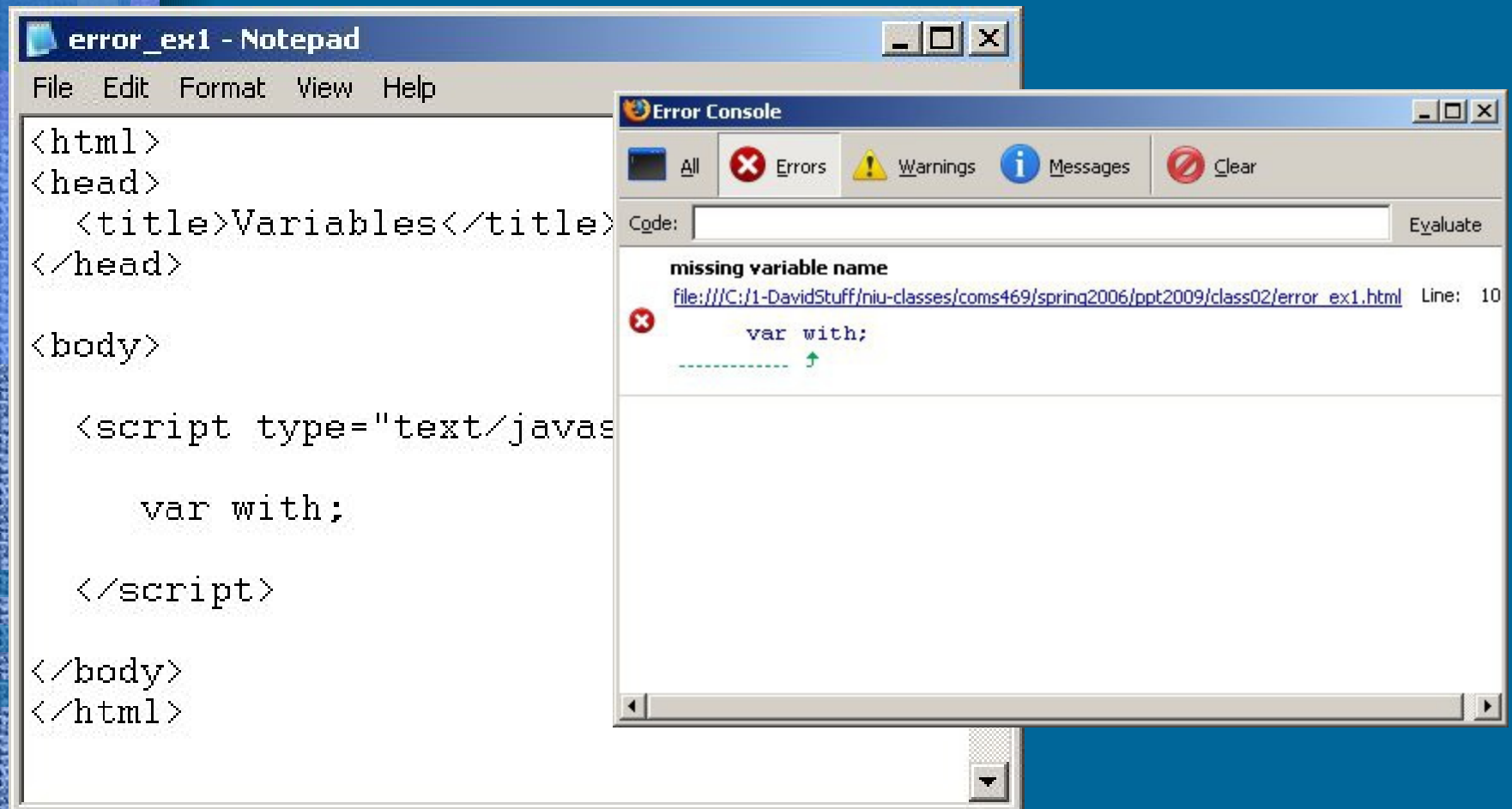
Error Checking



Error Checking



Error Checking



Using Data

- Numerical Calculations

Hot Dog	\$2
Fries	\$1
Beer	\$5
Total	\$8

```
var totalCost;  
totalCost = 2 + 1 + 5;  
alert(totalCost);
```

Declare a variable to hold the total cost
Use an *expression* to calculate the total cost and assign the result to the variable

Display the value assigned to the variable totalCost

Using Data

- Numerical Operators

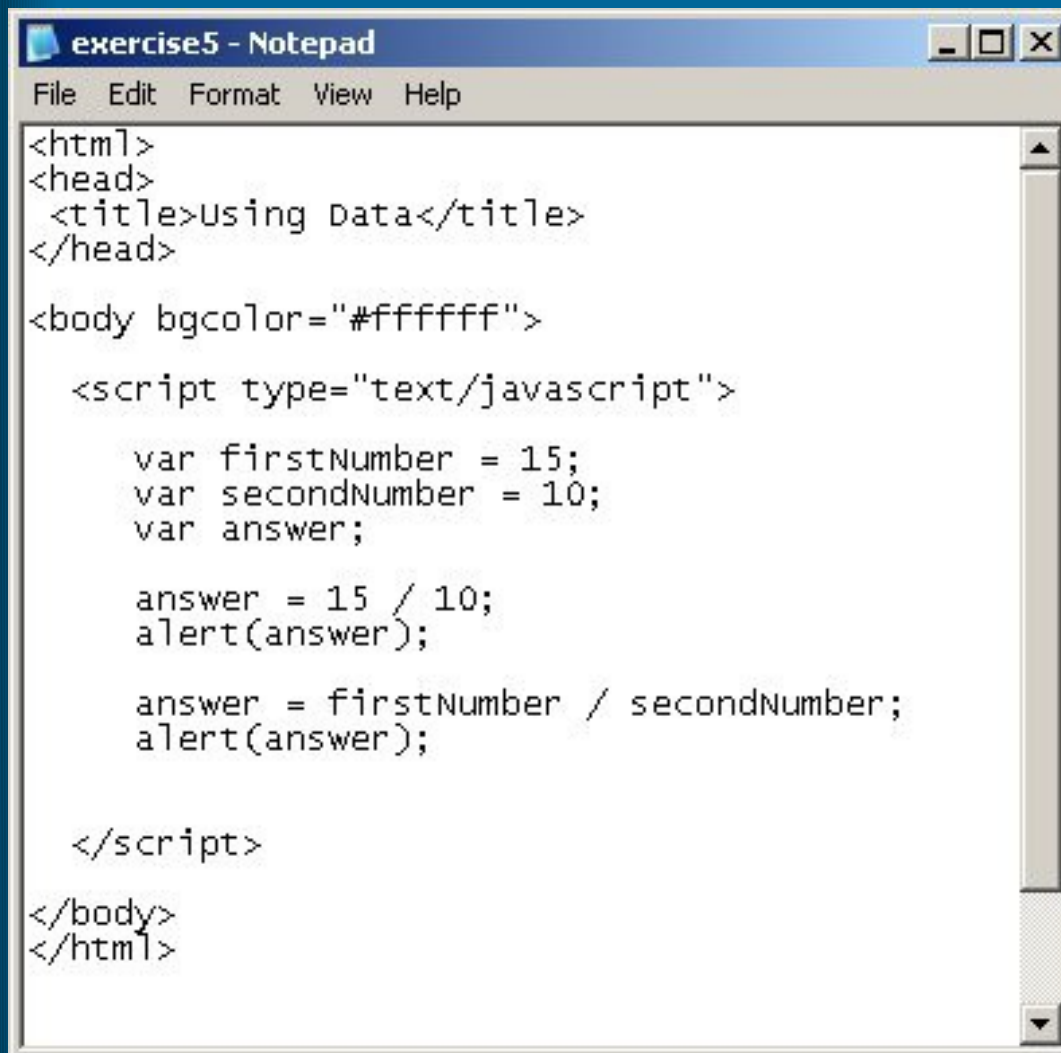
Addition	+
Subtraction	-
Multiplication	*
Division	/
Equals	==

- Increment and Decrement Operators

Increment (increase variable by one)	++
Decrement (decrease variable by one)	--

Increase by variable by set amount	+= α
Decrease by variable by set amount	-= α

Using Data



```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var firstNumber = 15;
    var secondNumber = 10;
    var answer;

    answer = 15 / 10;
    alert(answer);

    answer = firstNumber / secondNumber;
    alert(answer);

  </script>

</body>
</html>
```

Using Data

Declare three variables and assign the first two a numeric value.

exercise5 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var firstNumber = 15;
    var secondNumber = 10;
    var answer;

    answer = 15 / 10;
    alert(answer);

    answer = firstNumber / secondNumber;
    alert(answer);

  </script>

</body>
</html>
```

Using Data

```
exercise5 - Notepad
File Edit Format View Help

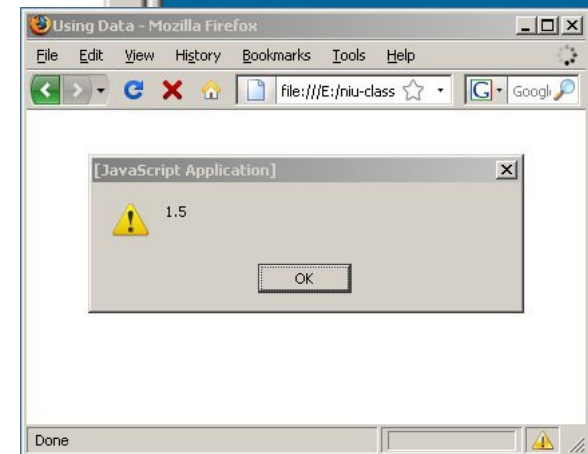
<html>
<head>
  <title>Using Data
</head>
<body bgcolor="white">
  <script type="text/javascript">
    var firstNumber = 15;
    var secondNumber = 10;
    var answer;

    answer = 15 / 10;
    alert(answer);

    answer = firstNumber / secondNumber;
    alert(answer);

  </script>
</body>
</html>
```

Set the answer variable to the result of the calculation of the expression $15 / 10$ (15 divided by 10). Display the result by using the alert function,



Using Data

Do the same calculation but use the variables `firstNumber` and `secondNumber`. Use the `alert` function to display the result.

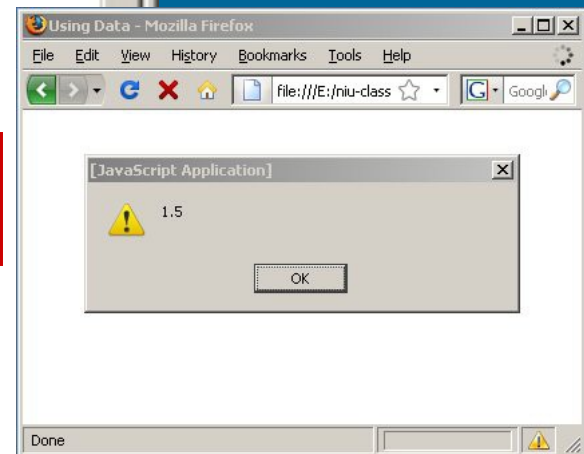
```
<html>
<head>
  <title>
</head>
<body b
  <script type= text/javascript >

    var firstNumber = 15;
    var secondNumber = 10;
    var answer;

    answer = 15 / 10;
    alert(answer);

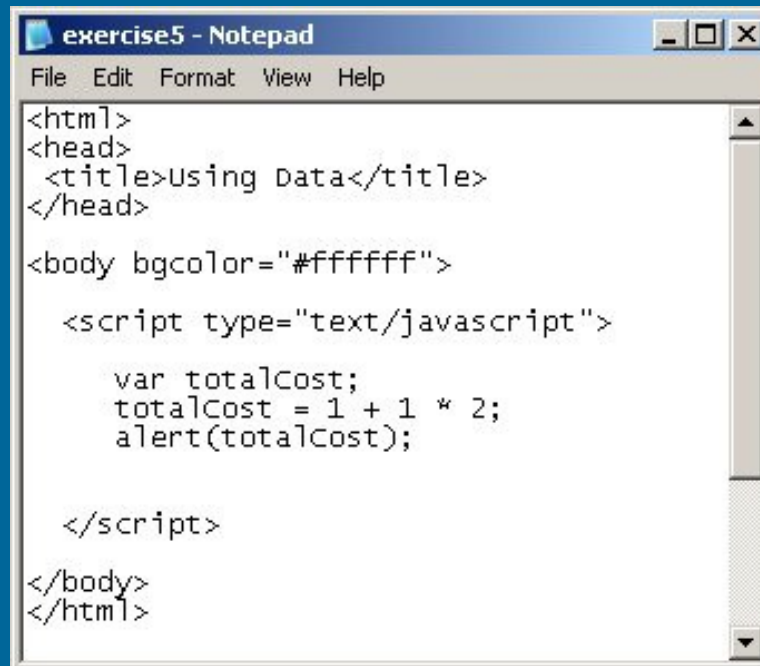
    answer = firstNumber / secondNumber;
    alert(answer);

  </script>
</body>
</html>
```



Using Data

- Operator Precedence
 - Some operations have a higher order of precedence—get dealt with sooner



```
exercise5 - Notepad
File Edit Format View Help
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var totalCost;
    totalCost = 1 + 1 * 2;
    alert(totalCost);

  </script>

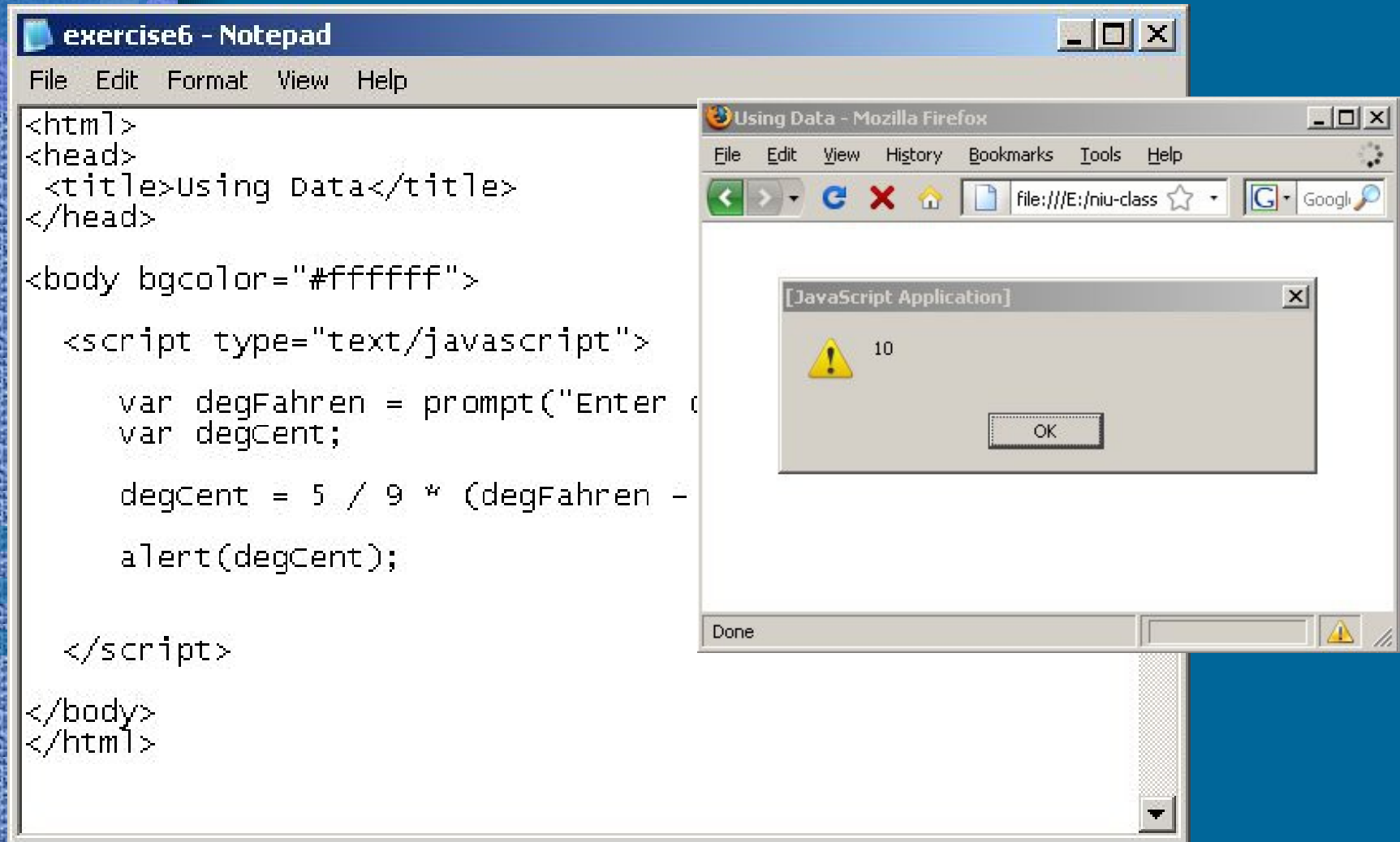
</body>
</html>
```

$$1 + 2 * 2 = 6$$

$$1 + 2 * 2 = 5$$

*Multiplication & division
take precedence over
addition & subtraction*

Variables & Data – Exercise



The image shows a desktop environment with two windows. The Notepad window, titled 'exercise6 - Notepad', contains the following HTML code:

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">
    var degFahren = prompt("Enter a degree Fahrenheit value:");
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);
    alert(degCent);

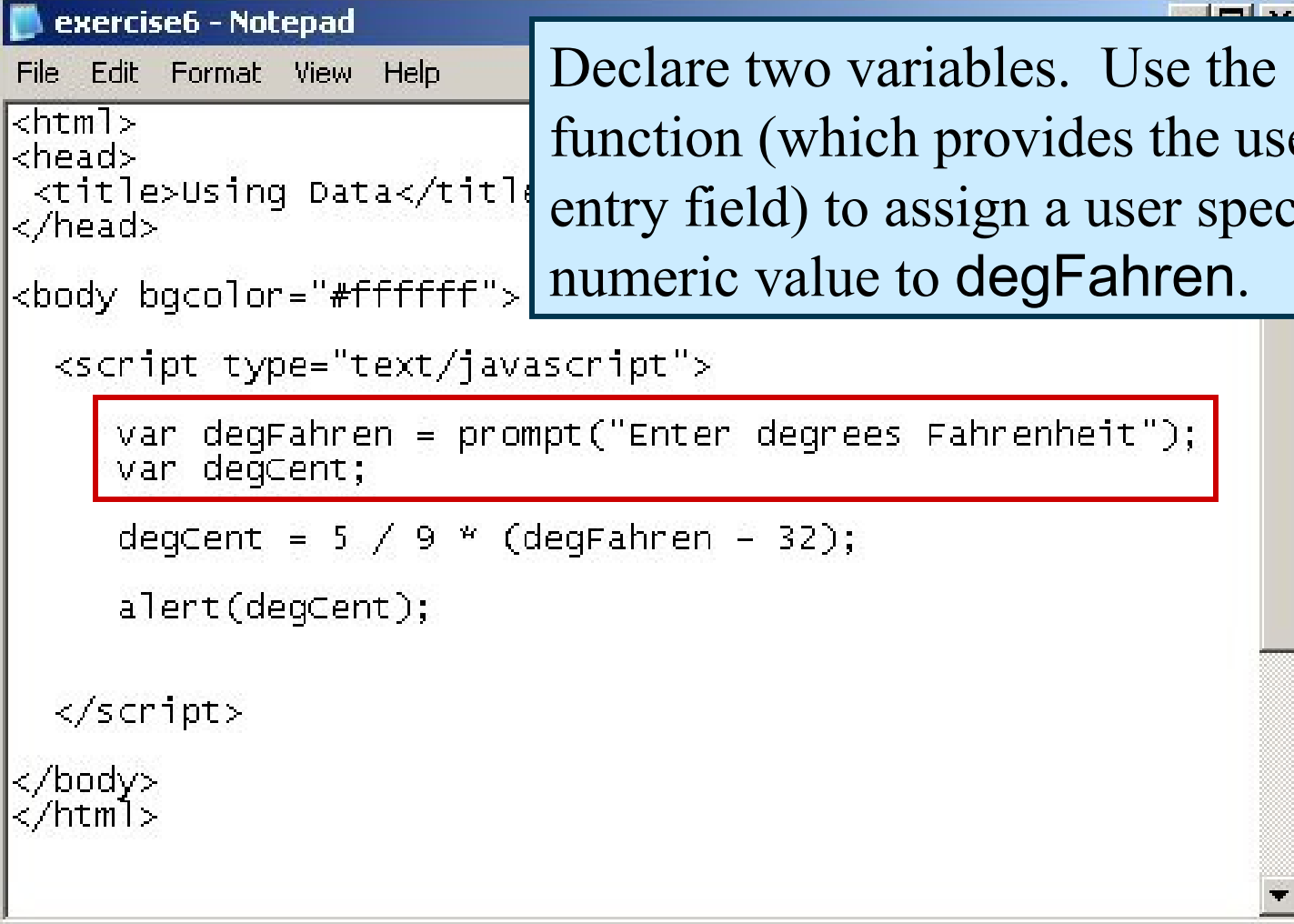
  </script>

</body>
</html>
```

The Mozilla Firefox browser window, titled 'Using Data - Mozilla Firefox', shows a file:///E:/niu-class. A JavaScript alert dialog box, titled '[JavaScript Application]', is displayed in the foreground, showing a yellow warning icon and the number '10'. The alert has an 'OK' button. The browser's status bar at the bottom shows 'Done' and a yellow warning icon.

Variables & Data – Exercise

Declare two variables. Use the prompt function (which provides the user with a text entry field) to assign a user specified numeric value to degFahren.



```
exercise6 - Notepad
File Edit Format View Help
<html>
<head>
  <title>Using Data</title>
</head>
<body bgcolor="#ffffff">

  <script type="text/javascript">
    var degFahren = prompt("Enter degrees Fahrenheit");
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    alert(degCent);

  </script>
</body>
</html>
```

Variables & Data – Exercise

exercise6 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>
```

```
<body bgcolor="#ffffff">
```

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

```
    var degFahren = prompt("Enter a temperature in degrees Fahrenheit");
    var degCent;
```

```
    degCent = 5 / 9 * (degFahren - 32);
```

```
    alert(degCent);
```

```
  </script>
```

```
</body>
</html>
```

Calculate the result and assign the value to the degCent variable.

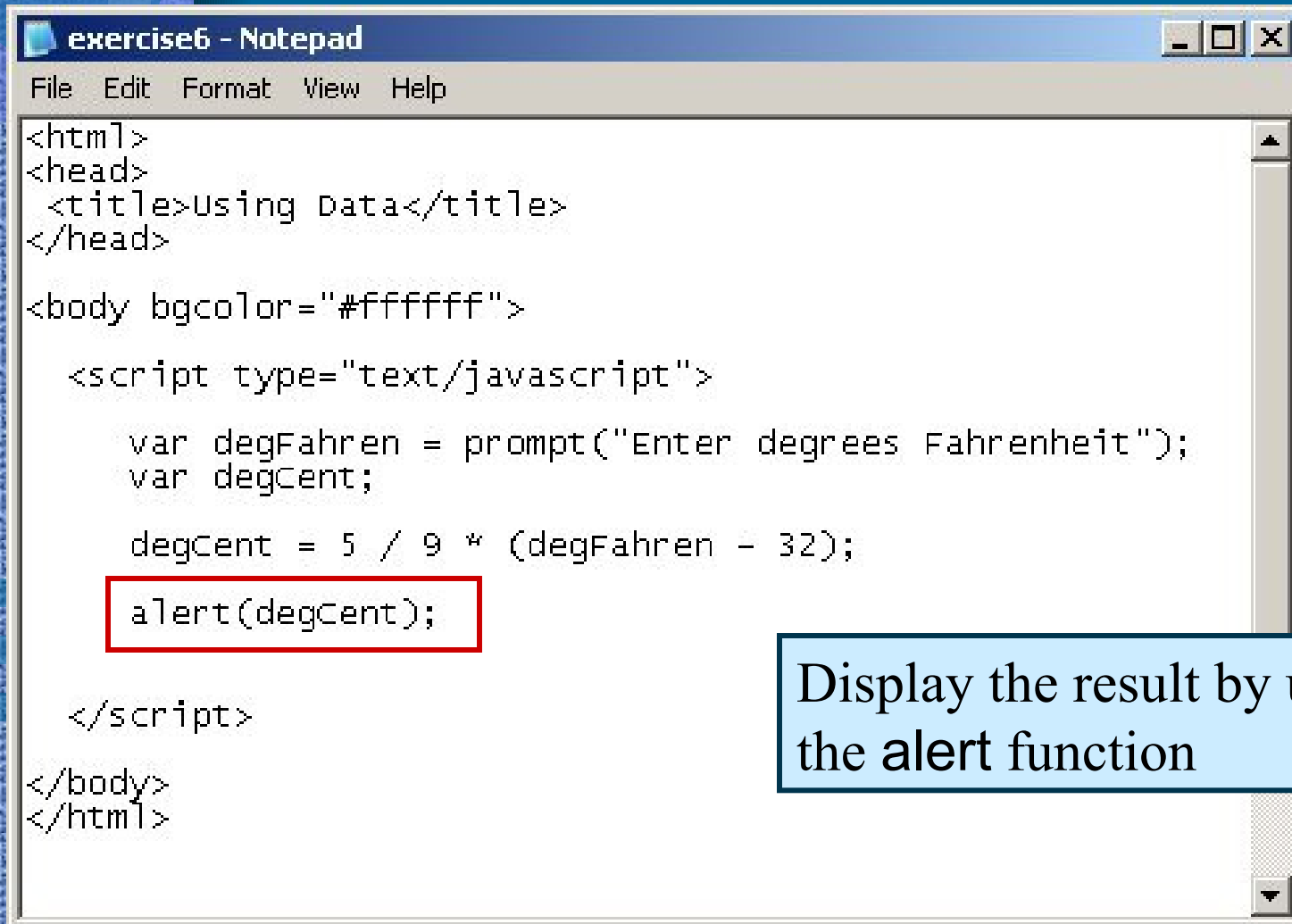
Precedence in performing the calculation

1) $5 / 9 = .5556$

2) $\text{degFahren} - 32 = 18$

3) $.5556 * 18 = 10$

Variables & Data – Exercise



```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = prompt("Enter degrees Fahrenheit");
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

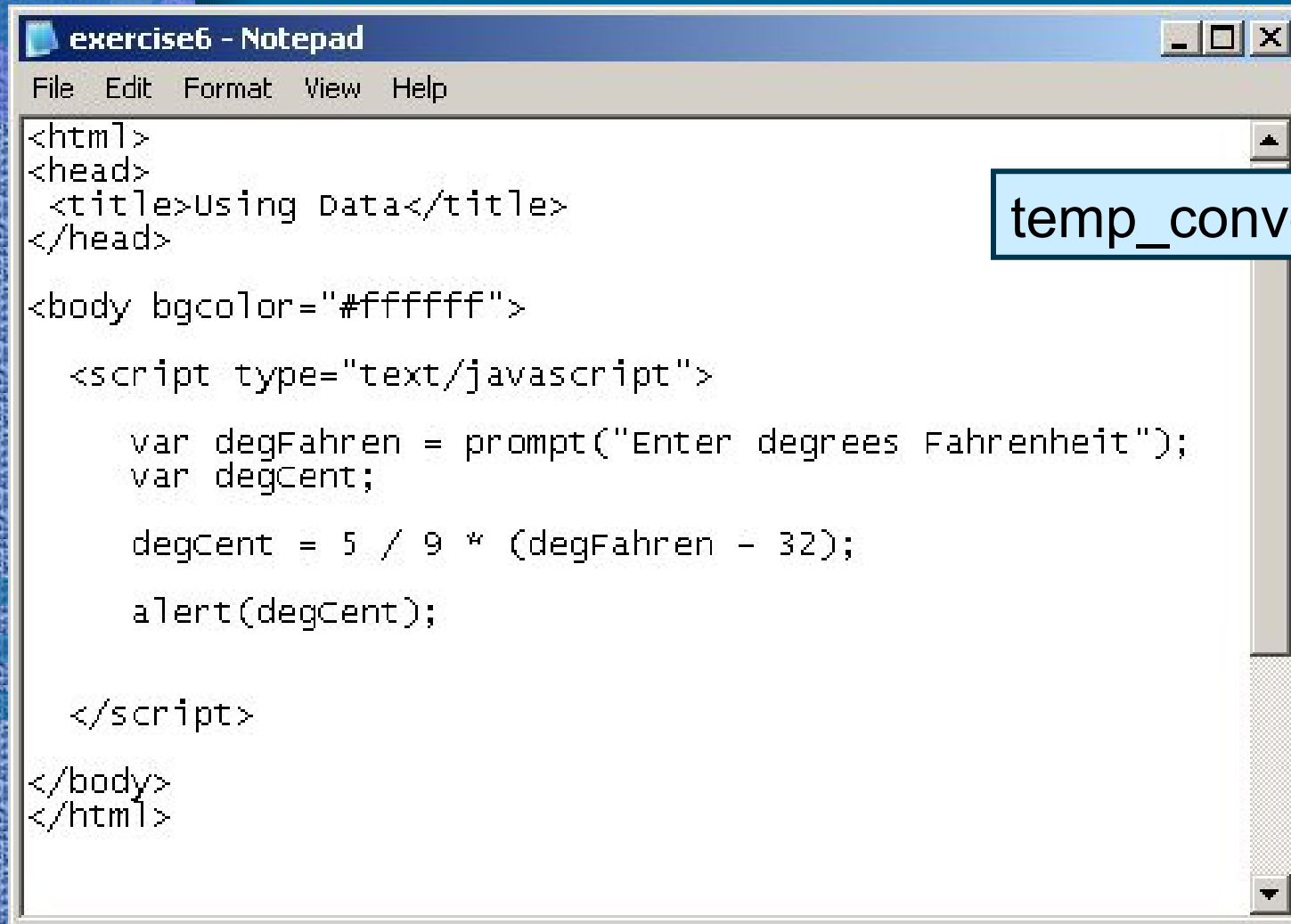
    alert(degCent);

  </script>

</body>
</html>
```

Display the result by using
the **alert** function

Variables & Data – Exercise



The image shows a Notepad window titled "exercise6 - Notepad" with a menu bar (File, Edit, Format, View, Help) and a text area containing the following code:

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = prompt("Enter degrees Fahrenheit");
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    alert(degCent);

  </script>

</body>
</html>
```

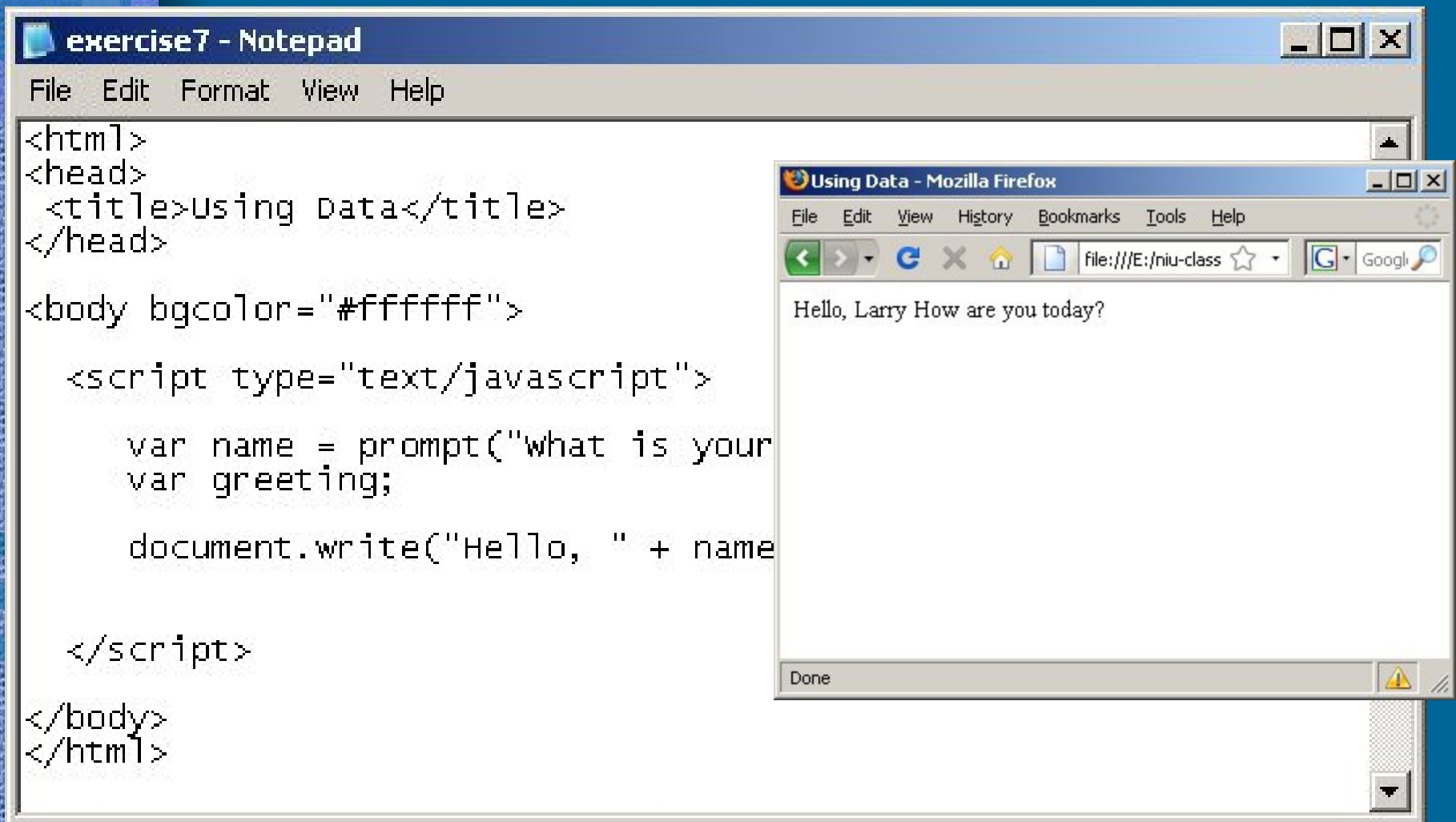
temp_converter1.html

Using Data

- Basic String Operations
 - Joining two or more string variables together:
Concatenation +

```
var greeting = "Hello" + "World";
```

Using Data



Using Data

exercise7 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>
<body bgcolor="#ffffff">

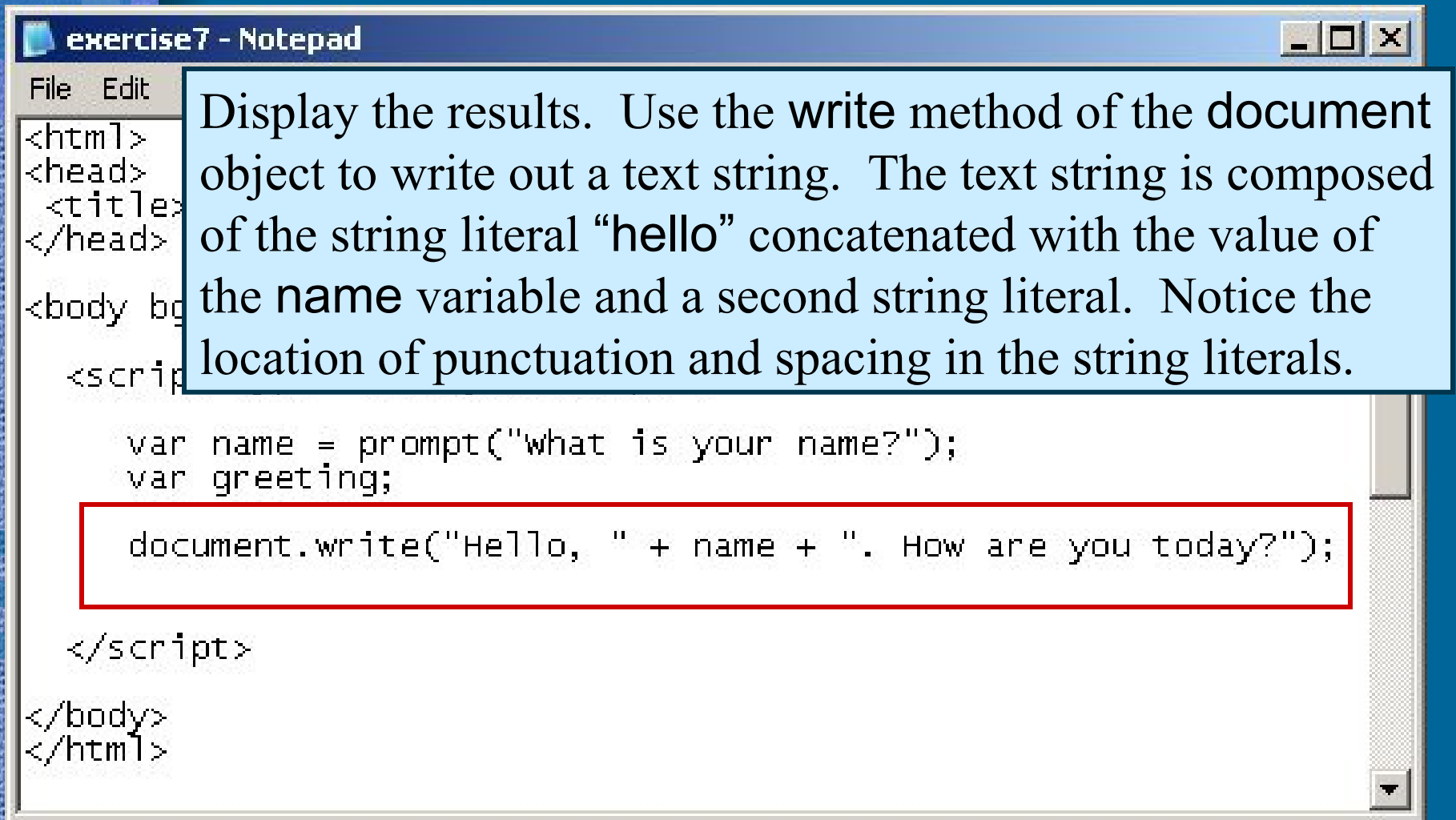
  <script type="text/javascript">
    var name = prompt("what is your name?");
    var greeting;

    document.write("Hello, " + name + ". How are you today?");

  </script>
</body>
</html>
```

Declare two variables. Use a prompt for the user to enter his/her name.

Using Data



exercise7 - Notepad

File Edit

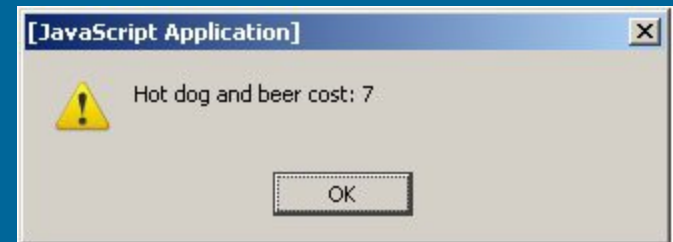
<html>
<head>
 <title>
</head>
<body>
 <script>

Display the results. Use the **write** method of the document object to write out a text string. The text string is composed of the string literal "hello" concatenated with the value of the **name** variable and a second string literal. Notice the location of punctuation and spacing in the string literals.

```
var name = prompt("what is your name?");  
var greeting;  
document.write("Hello, " + name + ". How are you today?");  
</script>  
</body>  
</html>
```

Using Data

- Mixing Numeric and String Data
 - Easy in JavaScript; use the + operator
 - JavaScript will figure out data type and act accordingly
 - Add numbers
 - Concatenate strings



```
alert("Hot dog and beer cost: " + (2 + 5));
```

Variables & Data – Exercise

exercise8 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = prompt("Enter degrees Fahrenheit");
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    alert(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

  </script>

</body>
</html>
```

Using Data - Mozilla Firefox

File Edit View History Bookmarks Tools Help

File:///L:/niu-classes/coms469/pc

Google

[JavaScript Application]

50° Fahrenheit is 10° Centigrade

OK

Done

Modify temp_converter1.html

Include string concatenation with numerical calculations

Variables & Data – Exercise

exercise8 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>
```

```
<body bgcolor="#ffffff">
```

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

```
    var degFahren = prompt("Enter degrees Fahrenheit");
    var degCent;
```

```
    degCent = 5 / 9 * (degFahren - 32);
```

```
    alert(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");
```

```
  </script>
```

```
</body>
```

```
</html>
```

Same as before. Declare two variables and set the value of the degCent variable to the results of the mathematical calculation.

Variables & Data – Exercise

exercise8 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = prompt(
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    alert(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

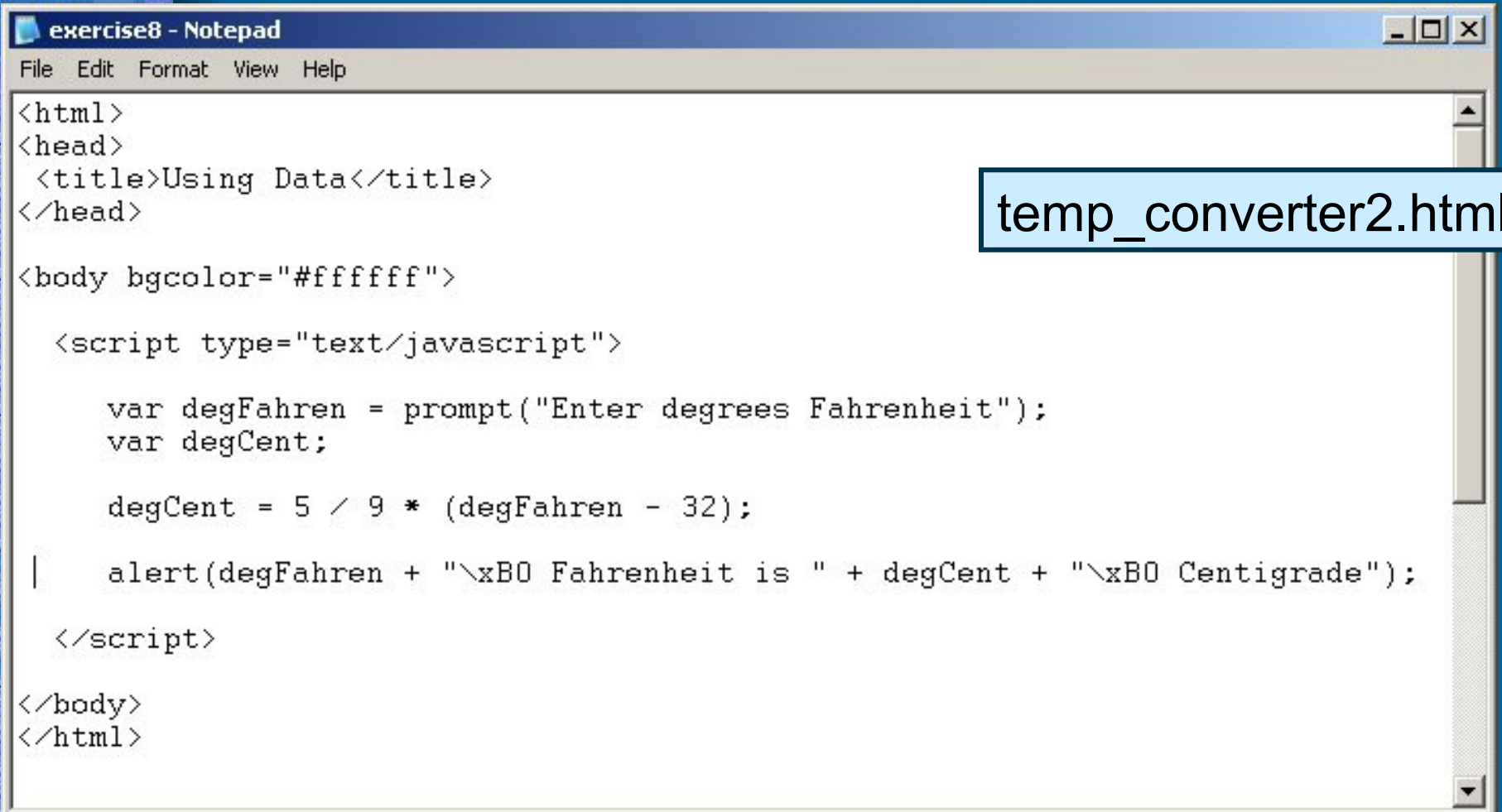
  </script>

</body>
</html>
```

Modify the parameter of the **alert**. Include variables concatenated with string literals. Use the escape sequence character `\xB0` to insert the ° (degrees symbol). Note the position of the quotation marks to include spaces in the string literals.

```
    alert(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");
```

Variables & Data – Exercise



```
exercise8 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = prompt("Enter degrees Fahrenheit");
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    alert(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

  </script>

</body>
</html>
```

temp_converter2.html

Data Type Conversion

- Automatic Data Conversion
 - JavaScript can usually figure out the right data type and make data conversions automatically
- Manual Data Conversion
 - Convert *string literal* to a *number*
Convert a *number* to a *string literal*
 - Necessary with HTML forms, which collect all data as string values

Data Type Conversion

Using Data - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Hot Dog:

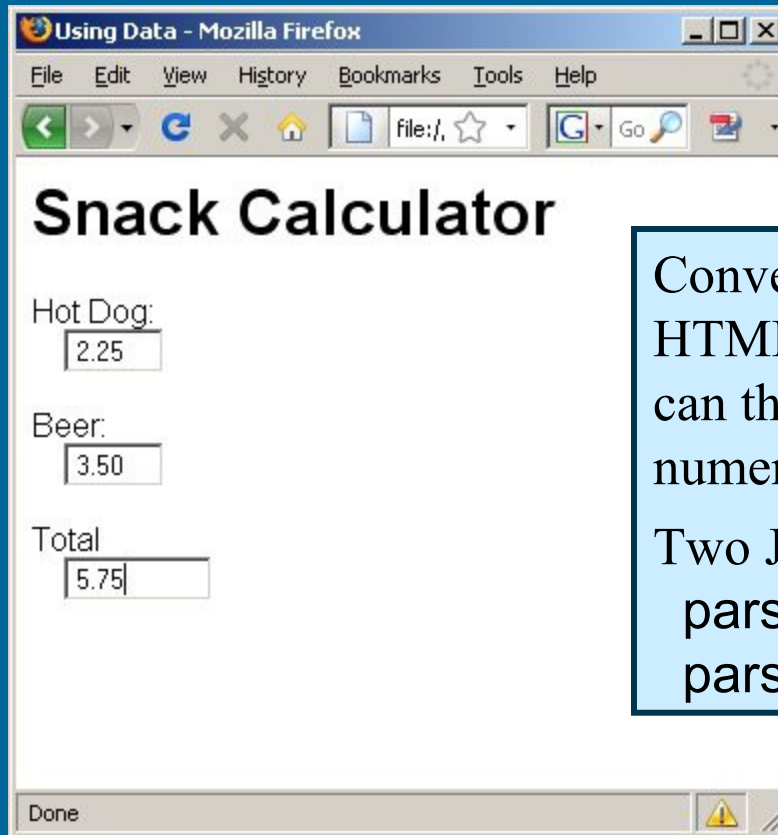
Beer:

Total

Done

Because data collected on an HTML form is stored as a string variable, JavaScript would not treat the values as numbers and add them together. It would concatenate them as string values.

Data Type Conversion



The screenshot shows a Mozilla Firefox browser window titled 'Using Data - Mozilla Firefox'. The address bar shows 'file:///.' and the search bar contains 'Go'. The main content area displays a form titled 'Snack Calculator'. The form has three input fields: 'Hot Dog:' with the value '2.25', 'Beer:' with the value '3.50', and 'Total' with the value '5.75'. The status bar at the bottom shows 'Done' and a warning icon.

Item	Value
Hot Dog:	2.25
Beer:	3.50
Total	5.75

Convert string values from an HTML form into numbers that can then be manipulated as numerical data.

Two JavaScript functions:
`parseInt`
`parseFloat`

Spend more time with these when we get to forms

Arrays

- *Array* = a variable that can store more than one value
 - *Variable* = bottle of beer
 - *Array* = case of beer
- Distinguish different piece of data in an array by using an *index number*



Element Name	Value
myArray[0]	10
myArray[1]	46

Square brackets
Numbering begins at 0

Arrays

- Creating an Array
 - Declare it like any other variable
 - Use the JavaScript keyword *new* to indicate that you are creating a new array

```
var myArray = new Array();
```

Arrays

- Populating an Array with Data

1) `var myArray = new Array("hot dog", "beer", 100);`

2) `var myArray = new Array();
myArray[0] = "hot dog";
myArray[1] = "beer";
myArray[2] = 100;`

```
exercise9 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

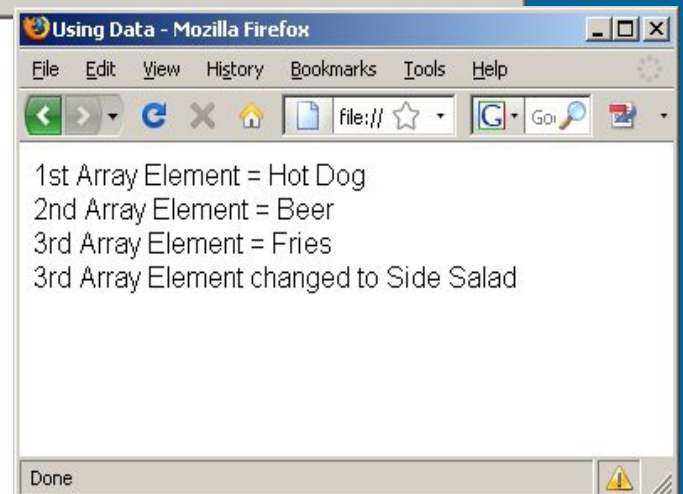
    var myArray = new Array();
    myArray[0] = "Hot Dog";
    myArray[1] = "Beer";
    myArray[2] = "Fries";

    document.write("1st Array Element = " + myArray[0] + "<br>");
    document.write("2nd Array Element = " + myArray[1] + "<br>");
    document.write("3rd Array Element = " + myArray[2] + "<br>");

    myArray[2] = "Side Salad";
    document.write("3rd Array Element changed to " + myArray[2] + "<br>");

  </script>

</body>
</html>
```



exercise9 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var myArray = new Array();
    myArray[0] = "Hot Dog";
    myArray[1] = "Beer";
    myArray[2] = "Fries";

    document.write("1st Array Element = " + myArray[0] + "<br>");
    document.write("2nd ");
    document.write("3rd ");

    myArray[2] = "Side";
    document.write("3rd ");

  </script>

</body>
</html>
```

Declare a variable and tell JavaScript that you want it to be a *new Array*.

Populate the Array with Data by assigning each element a value. In this case, we are populating the Array with *string* values.

exercise9 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var myArray = new Array();
    myArray[0] = "I";
    myArray[1] = "Beer";
    myArray[2] = "Fries";

    document.write("1st Array Element = " + myArray[0] + "<br>");
    document.write("2nd Array Element = " + myArray[1] + "<br>");
    document.write("3rd Array Element = " + myArray[2] + "<br>");

    myArray[2] = "Side Salad";
    document.write("3rd Array Element changed to " + myArray[2] + "<br>");

  </script>

</body>
</html>
```

Use a series of `document.write`s to display the values of the Array.

Notice that the *string literals* can contain HTML code, which are included for formatting.

exercise9 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Da
</head>

<body bgcolor="#

  <script type="

    var myArray = new Array();
    myArray[0] = "Hot Dog";
    myArray[1] = "Beer";
    myArray[2] = "Fries";

    document.write("1st Array Element = " + myArray[0] + "<br>");
    document.write("2nd Array Element = " + myArray[1] + "<br>");
    document.write("3rd Array Element = " + myArray[2] + "<br>");

    myArray[2] = "Side Salad";
    document.write("3rd Array Element changed to " + myArray[2] + "<br>");

  </script>

</body>
</html>
```

Change the value of the 3rd element in the Array.
Do this by using an assignment statement, which
assigns a new string literal to the 3rd element.

Arrays

- Multidimensional Arrays
 - An array with two or more indexes per element

Index	0	1	2
0	Name1	Name2	Name3
1	Age1	Age2	Age3
2	Address1	Address2	Address3

Arrays

```
exercise10 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var employee = new Array();

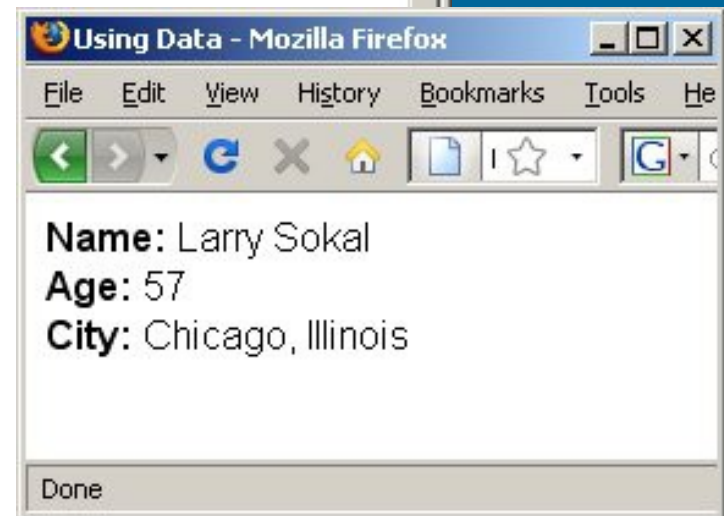
    employee[0] = new Array();
    employee[0][0] = "Margret Morris";
    employee[0][1] = 27;
    employee[0][2] = "Milwaukee, Wisconsin";

    employee[1] = new Array();
    employee[1][0] = "Larry Sokal";
    employee[1][1] = 57;
    employee[1][2] = "Chicago, Illinois";

    document.write("<b>Name:</b> " + employee[1][0] + "<br>");
    document.write("<b>Age:</b> " + employee[1][1] + "<br>");
    document.write("<b>City:</b> " + employee[1][2] + "<br>");

  </script>

</body>
</html>
```



Arrays

Declare a variable and indicate that you want it to be a *new Array*.

```
exercise10 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var employee = new Array();

    employee[0] = new Array();
    employee[0][0] = "Margret Morris";
    employee[0][1] = 27;
    employee[0][2] = "Milwaukee, Wisconsin";

    employee[1] = new Array();
    employee[1][0] = "Larry Sokal";
    employee[1][1] = 57;
    employee[1][2] = "Chicago, Illinois";

    document.write("<b>Name:</b> " + employee[1][0] + "<br>");
    document.write("<b>Age:</b> " + employee[1][1] + "<br>");
    document.write("<b>City:</b> " + employee[1][2] + "<br>");

  </script>

</body>
</html>
```

Arrays

Indicate that you want the [0] element of the employee array to be another new array.

In effect you're putting an array inside an array element.

exercise10 - Notepad

File Edit Format View

```
<html>
<head>
  <title>Using D
</head>
```

```
<body bgcolor="
```

```
<script type=
```

```
var employee = new Array();
```

```
employee[0] = new Array();
```

```
employee[0][0] = "Margret Morris";
```

```
employee[0][1] = 27;
```

```
employee[0][2] = "Milwaukee, Wisconsin";
```

```
employee[1] = new Array();
```

```
employee[1][0] = "Larry Sokal";
```

```
employee[1][1] = 57;
```

```
employee[1][2] = "Chicago, Illinois";
```

```
document.write("<b>Name:</b> " + employee[1][0] + "<br>");
```

```
document.write("<b>Age:</b> " + employee[1][1] + "<br>");
```

```
document.write("<b>City:</b> " + employee[1][2] + "<br>");
```

```
</script>
```

```
</body>
```

```
</html>
```

Arrays

Add data to the array. Use the assignment operator to assign both string and numeric values to the array elements.

`employee[0][1]` indicates the second element within the first element of the `employee` array.

exercise10 - No

File Edit Format

```
<html>
<head>
  <title>Using
</head>
```

```
<body bgcolor="white">
```

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

```
var employee = new Array();
```

```
employee[0] = new Array();
```

```
employee[0][0] = "Margret Morris";
```

```
employee[0][1] = 27;
```

```
employee[0][2] = "Milwaukee, Wisconsin";
```

```
employee[1] = new Array();
```

```
employee[1][0] = "Larry Sokal";
```

```
employee[1][1] = 57;
```

```
employee[1][2] = "Chicago, Illinois";
```

```
document.write("<b>Name:</b> " + employee[1][0] + "<br>");
```

```
document.write("<b>Age:</b> " + employee[1][1] + "<br>");
```

```
document.write("<b>City:</b> " + employee[1][2] + "<br>");
```

```
</script>
```

```
</body>
```

```
</html>
```

Arrays

Do the same for the second array element.
Use a series of document.write functions to display the values of the Array.

```
exercise10 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data
</head>

<body bgcolor="#fff" >

  <script type="text/javascript">

    var employee =

    employee[0] = new Array();
    employee[0][0] = "Margret Morris";
    employee[0][1] = 27;
    employee[0][2] = "Milwaukee, Wisconsin";

    employee[1] = new Array();
    employee[1][0] = "Larry Sokal";
    employee[1][1] = 57;
    employee[1][2] = "Chicago, Illinois";

    document.write("<b>Name:</b> " + employee[1][0] + "<br>");
    document.write("<b>Age:</b> " + employee[1][1] + "<br>");
    document.write("<b>City:</b> " + employee[1][2] + "<br>");

  </script>

</body>
</html>
```

Arrays – Exercise

Declare a variable `myArray` and indicate that you want it to be a new `Array()`.

Assign string values to the array elements by using the second assignment approach.

exercise9b - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff"

  <script type="text/javascript">

    var myArray = new Array();
    myArray[0] = "Hot Dog";
    myArray[1] = "Beer";
    myArray[2] = "Fries";

    document.write("<h2>Your Order:</h2> <hr width=200 align=left>" +
      "<b>Sandwich:</b> " + myArray[0] + "<br>" +
      "<b>Beverage</b> " + myArray[1] + "<br>" +
      "<b>Side Dish</b> " + myArray[2] + "<br>");

  </script>

</body>
</html>
```

Arrays – Exercise

exercise9b - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using
</head>
```

```
<body bgcolor=
```

```
<script typ
```

```
  var myArr
```

```
    myArray[0] = "Hot Dog";
```

```
    myArray[1] = "Beer";
```

```
    myArray[2] = "Fries";
```

```
    document.write("<h2>Your Order:</h2> <hr width=200 align=left>" +
      "<b>Sandwich:</b> " + myArray[0] + "<br>" +
      "<b>Beverage</b> " + myArray[1] + "<br>" +
      "<b>Side Dish</b> " + myArray[2] + "<br>");
```

```
</script>
```

```
</body>
```

```
</html>
```

Use a `document.write` to display the results. This is composed of *string literals* concatenated with the values returned by the *array* elements. These values are accessed by specifying the `myArray` variable followed by an index number in square brackets `[ ]`.

Arrays – Exercise

array_example.html

exercise9b - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var myArray = new Array();
    myArray[0] = "Hot Dog";
    myArray[1] = "Beer";
    myArray[2] = "Fries";

    document.write("<h2>Your Order:</h2> <hr width=200 align=left>" +
      "<b>Sandwich:</b> " + myArray[0] + "<br>" +
      "<b>Beverage</b> " + myArray[1] + "<br>" +
      "<b>Side Dish</b> " + myArray[2] + "<br>");

  </script>

</body>
</html>
```

Decisions, Loops & Functions

- Topics
 - Decision Making – if and switch statements
 - Looping – for and while statements
 - Functions - function { }

Decisions, Loops & Functions

- Decisions

- All computer languages include decision making capabilities
- Allow the computer to take a course of action based on whether a particular *condition* is met

Is this a hot dog?
If *yes*, eat it.
If *no*, do not eat it.

Decisions, Loops & Functions

- Comparison Operators

Operator Symbol	Purpose
==	Tests if LHS is equal to RHS
<	Tests if LHS is less than RHS
>	Tests if LHS is greater than RHS
<=	Tests if LHS is less than or equal to RHS
>=	Tests if LHS is greater than or equal to RHS
!=	Tests if LHS is not equal to RHS

Decisions, Loops & Functions

- Results and Assignment of Results
 - Results = *Boolean* data (true or false)

2 == 2	true
2 == 6	false

- Results of a comparison are often assigned to a variable, which stores the result for use later

```
var doughnuts = 10;  
var glutton = doughnuts > 5;
```

Decisions, Loops & Functions

- if statement

If this thing is a hot dog? Eat it.

```
if (thing = "hotdog")  
{  
    eat;  
}
```

Test condition

Code to execute when
the test condition is true
(curly braces mark off a
block of code)

exercise12 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>
```

```
<body bgcolor="#ffffff">
```

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

```
    var degFahren = Number(prompt("Enter degrees Fahrenheit"));
    var degCent;
```

```
        degCent = 5 / 9 * (degFahren -
```

```
document.write(degFahren + "\xB0 F
```

```
if (degCent < 0)
```

```
{
  document.write("<br>That's da
}
```

```
if (degCent > 35)
```

```
{
  document.write("<br>That's wa
}
```

```
</script>
```

```
</body>
```

```
</html>
```

Modify temp. conversion exercise
by adding two if statements

Using Data - Mozilla Firefox

File Edit View History Bookmarks Tools Help

file:///C:/1-DavidStuff/niu-c

12° Fahrenheit is -11.11111111111111° Centigrade
That's damn cold.

Done

```
exercise12 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = Number(prompt("Enter degrees Fahrenheit"));
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    document.write(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

    if (degCent < 0)
    {
      document.write("<
    }

    if (degCent > 35)
    {
      document.write("<
    }

  </script>

</body>
</html>
```

Same as previous example with one alteration.
Use the `Number( )` method to convert the
input data from a *string value* to a *number*.

exercise12 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = Number(prompt("Enter degrees Fahrenheit"));
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    document.write(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

    if (degCent < 0)
    {
      document.write("<br>Tha
    }

    if (degCent > 35)
    {
      document.write("<br>Tha
    }

  </script>

</body>
</html>
```

Replace the alert with document.write.
Make no change to the code between the
parenthesis.

exercise12 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = Number(prompt("Enter a temperature in Fahrenheit:"));
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    document.write(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

    if (degCent < 0)
    {
      document.write("<br>That's damn cold.");
    }

    if (degCent > 35)
    {
      document.write("<br>That's way too hot.");
    }

  </script>

</body>
</html>
```

Add two if statements. The first tests whether the number entered is less than 0 degrees. The second tests whether the number entered is greater than 35 degrees.

exercise12 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = Number(prompt("Enter degrees Fahrenheit"));
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    document.write(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

    if (degCent < 0)
    {
      document.write("<br>That's damn cold.");
    }

    if (degCent > 35)
    {
      document.write("<br>That's way too hot.");
    }

  </script>

</body>
</html>
```

Make these changes and save
as temp_converter3.html

Decisions, Loops & Functions

- Logical Operators

Operator	Symbol	Result
AND	&&	Returns true when both sides evaluate true
OR		Returns true when one side evaluates true
NOT	!	Negates whatever it precedes

beer AND cold

Pabst OR OldStyle

!BudLight

Decisions, Loops & Functions

- Logical Operators

```
if (degCent < 100)
{
    if (degCent > 0)
    {
        document.write("Temperature is between 0 and 100");
    }
}
```

```
if (degCent > 0 && degCent < 100)
{
    document.write("Temperature is between 0 and 100");
}
```

Decisions, Loops & Functions

- else and else if
 - Situations where you want some code to execute, when the test condition is true. And some other code to execute, when it is false.

```
if (degCent >0 && degCent < 100)
{
    document.write("Temperature is between 0 and 100");
}
else
{
    document.write("Temperature is not between 0 and 100");
}
```

Decisions, Loops & Functions

- else and else if

```
if (degCent >0 && degCent < 100)
{
    document.write("Temperature is between 0 and 100");
}
else if (degCent < 0)
{
    document.write("Temperature is below freezing");
}
else
{
    document.write("Temperature is above boiling");
}
```

```
exercise13 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var degFahren = Number(prompt("Enter degrees Fahrenheit"));
    var degCent;

    degCent = 5 / 9 * (degFahren - 32);

    document.write(degFahren + "\xB0 Fahrenheit is " + degCent + "\xB0 Centigrade");

    if (degCent > 0 && degCent < 100)
    {
      document.write("<br>Temperature is between 0 and 100");
    }
    else if (degCent < 0)
    {
      document.write("<br>Temperature is below freezing");
    }
    else
    {
      document.write("<br>Temperature is above boiling");
    }

  </script>

</body>
</html>
```

Decisions, Loops & Functions

- switch statement
 - More efficient way of writing conditionals (if/else) with lots of possibilities
 - *Switch* = “switch the code when the case matches”
 - Details
 - Multiple cases and one default
 - Each case ends with colon :
 - Enclosed by curly brackets { }

```
switch (beer)
{
    case "pabst":
        drink;
        break;

    case "oldstyle":
        drink;
        break;

    case "zywiec":
        drink;
        break;

    default:
        !drink;
        break;
}
```

exercise14 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>
```

```
<body bgcolor="#ffffff">
```

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

```
    var beer = prompt("What beer are you drinking?");
```

```
    switch (beer)
```

```
    {
```

```
      case "pabst":
```

```
        document.write("<br><b>Pabst</b> - That's the best choice.");
```

```
        break;
```

```
      case "Pabst":
```

```
        document.write("<br><b>Pabst</b> - That's the best choice.");
```

```
        break;
```

```
      case "miller":
```

```
        document.write("<br><b>Miller</b> - That's the worst choice.");
```

```
        break;
```

```
      case "Miller":
```

```
        document.write("<br><b>Miller</b> - That's the worst choice.");
```

```
        break;
```

```
      default:
```

```
        document.write("<br><b>" + beer + "</b> - That's a satisfactory choice.");
```

```
        break;
```

```
    }
```

```
  </script>
```

```
</body>
```

```
</html>
```

Declare a variable **beer** and assign to it the value the user enters into the prompt.

exercise14 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer
</head>
```

```
<body bgcolor="white">
```

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

```
  var beer = prompt("What beer are you drinking?");
```

```
  switch (beer)
```

```
  {
```

```
    case "pabst":
```

```
      document.write("<br><b>Pabst</b> - That's the best choice.");
```

```
      break;
```

```
    case "Pabst":
```

```
      document.write("<br><b>Pabst</b> - That's the best choice.");
```

```
      break;
```

```
    case "miller":
```

```
      document.write("<br><b>Miller</b> - That's the worst choice.");
```

```
      break;
```

```
    case "Miller":
```

```
      document.write("<br><b>Miller</b> - That's the worst choice.");
```

```
      break;
```

```
    default:
```

```
      document.write("<br><b>" + beer + "</b> - That's a satisfactory choice.");
```

```
      break;
```

```
  }
```

```
</script>
```

```
</body>
```

```
</html>
```

Use a switch statement to evaluate the user input. If one of the **cases** is matched, then the associated code is executed. If not, the process continues to the next **case**. This continues until we get to the **default** line, which is executed if none of the cases are matched.

Note: in the **cases**, we are testing for both “pabst” and “Pabst.” This is because we are evaluating a string value and JavaScript is case sensitive.

Decisions, Loops & Functions

- Looping – **for** and **while** statements
 - *Looping* = repeating a block of code as long as a condition is true

Initialize loop variable Test Loop Condition Increment loop variable

```
for (loopCounter = 0; loopCounter <= 10; loopCounter++)  
{  
    //code to execute  
}
```

Process

- 1) Execute initialization part of the **for** statement
- 2) Check the test condition. If *true*, continue; if not, exit the **for** statement
- 3) Execute code in the block after the **for** statement
- 4) Execute the increment part of the **for** statement
- 5) Repeat steps 2-4 until the test condition is *false*

Decisions, Loops & Functions

- Loops and Arrays
 - *Iterating* through the array



```
<html>
<head>
  <title>Beer Evaluator</title>
</head>

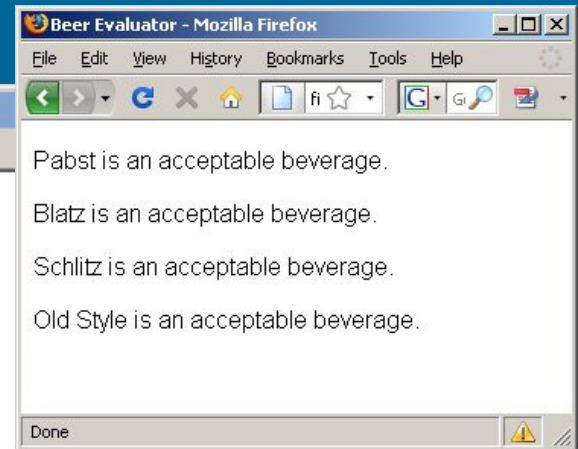
<body bgcolor="#ffffff">

  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Schlitz","Old Style");
    var loopCounter;

    for (loopCounter = 0; loopCounter <= 3; loopCounter++)
    {
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
    }
  </script>

</body>
</html>
```



Beer Evaluator - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Pabst is an acceptable beverage.

Blatz is an acceptable beverage.

Schlitz is an acceptable beverage.

Old Style is an acceptable beverage.

Done

Decisions, Loops & Functions

- Loops and Arrays
 - *Iterating* through the array

Create an array called `beer` and populate it with string values. Declare a variable `loopCounter`.

```
exercise15 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Beer Evaluator</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Schlitz","Old Style");
    var loopCounter;

    for (loopCounter = 0; loopCounter <= 3; loopCounter++)
    {
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
    }
  </script>

</body>
</html>
```

Decisions, Loops & Functions

- Loops and Arrays
 - *Iterating* through the array

Use a for statement to iterate through the array, extract each element and display a sentence.

Because the for creates a loop, `beer[loopCounter]` is incremented so that it eventually accesses each element in the array beginning with `beer[0]` and continuing through `beer[3]`.

exercise15 -

File Edit Form

```
<html>
```

```
<head>
```

```
  <title>Be
```

```
</head>
```

```
<body bgco
```

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

```
    var beer = new Array("Pabst","Blatz","Schlitz","Old Style");
```

```
    var loopCounter;
```

```
    for (loopCounter = 0; loopCounter <= 3; loopCounter++)
```

```
    {
```

```
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
```

```
    }
```

```
  </script>
```

```
</body>
```

```
</html>
```

Decisions, Loops & Functions

- while loop
 - for loops a specific number of times
 - while loops as long as the condition is true

```
while (beer != "miller")  
{  
    drink;  
}
```

Test condition – keep looping
while this condition is true

Code that is to be looped

while

exercise16 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Schlitz","Old Style");
    var loopCounter = 0;

    while (loopCounter < 4)
    {
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
      loopCounter++;
    }
  </script>

</body>
</html>
```

Beer Evaluator - Mozilla Firefox

File Edit View History Bookmarks Tools Help



Pabst is an acceptable beverage.

Blatz is an acceptable beverage.

Schlitz is an acceptable beverage.

Old Style is an acceptable beverage.

Done

while

Create an array called beer and populate it with string values. Declare a variable loopCounter.

exercise16 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Schlitz","Old Style");
    var loopCounter = 0;

    while (loopCounter < 4)
    {
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
      loopCounter++;
    }
  </script>

</body>
</html>
```

while

Use a **while** statement to loop through the array. As long as the value of **loopCounter** is less than 4, execute a **document.write** (which will display the name of the beer concatenated with a string value) and increment the **loopCounter** by one. As soon as the value of the **loopCounter** reaches 4, stop the loop.

exercise16 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>
```

```
<body bgcolor="#ffffff">
```

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

```
    var beer = new Array("Pabst",
    var loopCounter = 0;
```

```
    while (loopCounter < 4)
```

```
    {
```

```
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
      loopCounter++;
```

```
    }
```

```
  </script>
```

```
</body>
```

```
</html>
```

Decisions, Loops & Functions

- **break and continue statements**
 - **break** is used in **for** and **while** statements to end and exit the loop prematurely
 - **continue** also stops the execution of the loop statement but instead of leaving the loop, it starts execution at the next iteration

break

exercise17 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>

<body bgcolor="#ffffff">

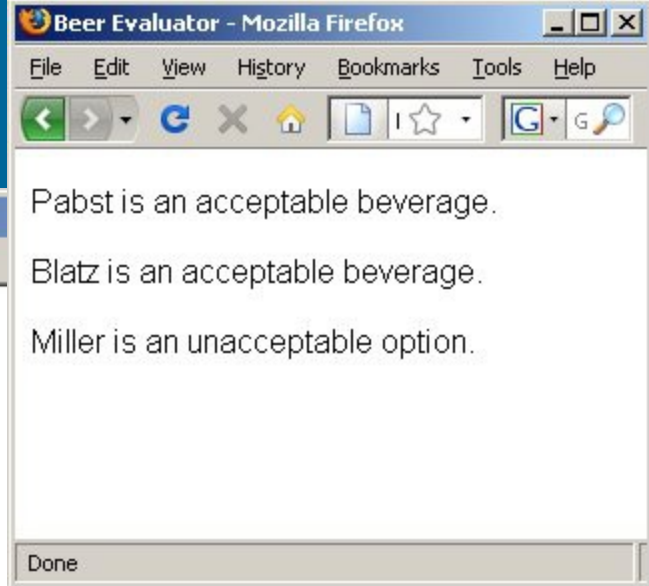
  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Miller","Schlitz","Old Style");
    var loopCounter = 0;

    while (loopCounter < 5)
    {
      if (beer[loopCounter] == "Miller")
      {
        document.write("<p>Miller is an unacceptable option.</p>");
        break;
      }
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
      loopCounter++;
    }

  </script>

</body>
</html>
```



break

The while statement loops through the array, displays a message (by using a document.write), and increments the loopCounter by one. It continues doing this until it encounters the value "Miller" at which time it writes out a different message, and breaks off from the loop.

```
while (loopCounter < 5)
{
    if (beer[loopCounter] == "Miller")
    {
        document.write("<p>Miller is an unacceptable option.</p>");
        break;
    }
    document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
    loopCounter++;
}
```

```
</script>
```

```
</body>
</html>
```

continue

exercise18 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>

<body bgcolor="#ffffff">

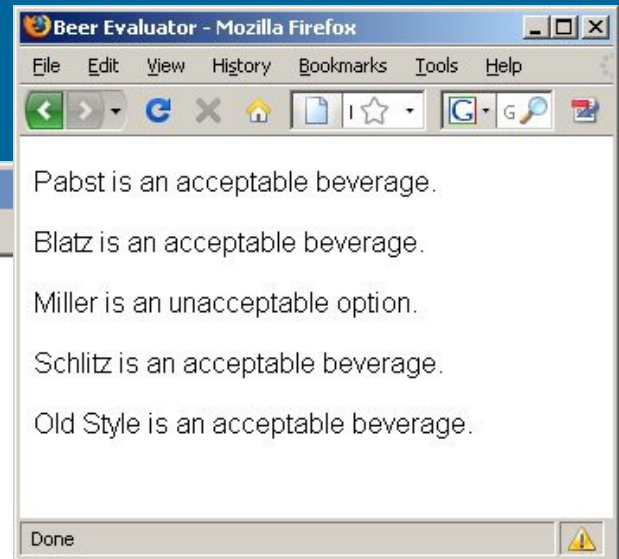
  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Miller","Schlitz","Old Style");
    var loopCounter = 0;

    while (loopCounter < 5)
    {
      if (beer[loopCounter] == "Miller")
      {
        document.write("<p>Miller is an unacceptable option.</p>");
        loopCounter++;
        continue;
      }
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
      loopCounter++;
    }

  </script>

</body>
</html>
```



continue

Works just like the previous example, but instead of breaking off the loop at the occurrence of "Miller," this script continues to go through the array and displays the remaining elements.

exercise18 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Beer Evaluator</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    var beer = new Array("Pabst","Blatz","Miller","Schlitz","Old Style");
    var loopCounter = 0;

    while (loopCounter < 5)
    {
      if (beer[loopCounter] == "Miller")
      {
        document.write("<p>Miller is an unacceptable option.</p>");
        loopCounter++;
        continue;
      }
      document.write("<p>" + beer[loopCounter] + " is an acceptable beverage.</p>");
      loopCounter++;
    }

  </script>

</body>
</html>
```

Decisions, Loops & Functions

- Function
 - A block of code that performs a certain task
 - Pre-made functions – `alert( )`
 - User-defined functions
 - Outcome
 - Return results – data
 - Perform an action
 - *Calling or Invoking*
 - Fire-up and execute the function

Decisions, Loops & Functions

- Function

```
function tempConvert(degFahren)
{
    var degCent;
    degCent = 5/9 * (degFahren - 32);

    return degCent;
}
```

- *function* keyword
- Name of the function
- Parameter associated with the function

Code that is to be executed when the function is called

Return statement – returns a value that can be used elsewhere in the script.

```
exercise20 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    function tempConvert(degFahren)
    {
      var degCent;
      degCent = 5 / 9 * (degFahren - 32);

      return degCent;
    }

    var degFahren = new Array(212,32,-459.15);
    var degCent = new Array( );
    var loopCounter;

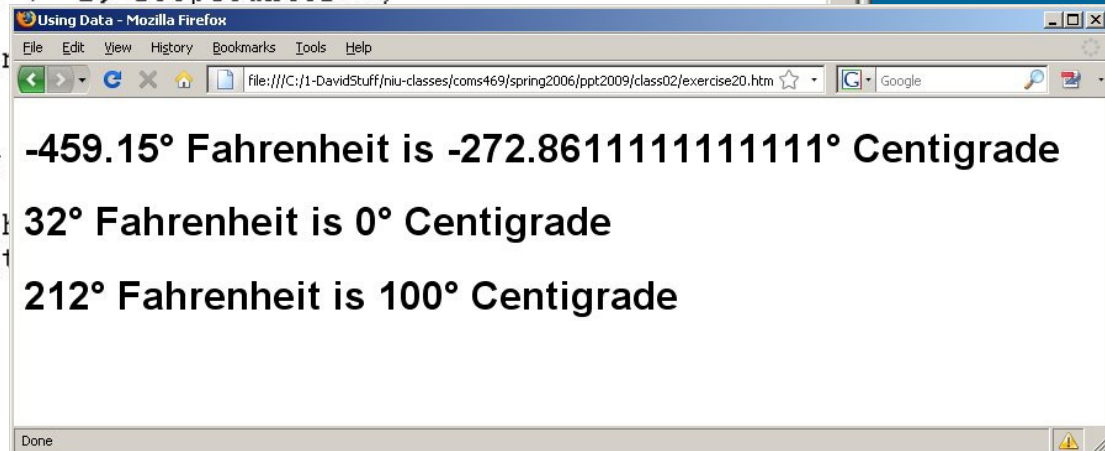
    for (loopCounter = 0; loopCounter <= 2; loopCounter++)
    {
      degCent[loopCounter] = tempConvert(degFahren[loopCounter]);
    }

    for (loopCounter = 0; loopCounter < 3; loopCounter++)
    {
      document.write("<h1>" + degFahren[loopCounter] + "° Fahrenheit is " + degCent[loopCounter] + "° Centigrade<br>");
    }

  </script>

</body>
</html>
```

Modify temp_converter3.html
Add a function, two arrays and
two for loops.



```
exercise20 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    function tempConvert(degFahren)
    {
      var degCent;
      degCent = 5 / 9 * (degFahren - 32);

      return degCent;
    }

    var degFahren = new Array(212, 32, -459, 15);
    var degCent = new Array( );
    var loopCounter;

    for (loopCounter = 0; loopCounter < degFahren.length; loopCounter++)
    {
      degCent[loopCounter] = tempConvert(degFahren[loopCounter]);
    }

    for (loopCounter = 0; loopCounter < degCent.length; loopCounter++)
    {
      document.write("<h1>" + degFahren[loopCounter] + " is " + degCent[loopCounter] + " degrees Celsius<br/>");
    }

  </script>

</body>
</html>
```

Create a conversion *function* called `tempConvert`, which will take the value of `degFahren` as its *parameter*.

The function performs the temperature conversion calculation using the code from the previous examples.

When the function has finished running, *return* the result which will be a value that is stored in the variable `degCent`

exercise20 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Us
</head>

<body bgcolor=

  <script

    funct
    {
      va
      de

      return degCent;
    }

    var degFahren = new Array(212,32,-459.15);
    var degCent = new Array( );
    var loopCounter;

    for (loopCounter = 0; loopCounter <= 2; loopCounter++)
    {
      degCent[loopCounter] = tempConvert(degFahren[loopCounter]);
    }

    for (loopCounter = 2; loopCounter >= 0; loopCounter--)
    {
      document.write("<h1>" + degFahren[loopCounter] + "\xB0 Fahrenheit is "
        + degCent[loopCounter] + "\xB0 Centigrade</h1>");
    }

  </script>

</body>
</html>
```

Declare three variables. The variable degFahren is assigned to a new Array, which will have three elements (numerical data). The variable degCent is also assigned to a new Array. The elements for this array are not specified; they will be created and filled in by the conversion function. And the variable loopCounter will be used in the two for statements that follow.

exercise20 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using
</head>

<body bgcolor=

  <script type=

    function
    {
      var de
      degCen

      return
    }

    var degFa
    var degCe
    var loopCounter;

    for (loopCounter = 0; loopCounter <= 2; loopCounter++)
    {
      degCent[loopCounter] = tempConvert(degFahren[loopCounter]);
    }

    for (loopCounter = 2; loopCounter >= 0; loopCounter--)
    {
      document.write("<h1>" + degFahren[loopCounter] + "\xB0 Fahrenheit is "
        + degCent[loopCounter] + "\xB0 Centigrade</h1>");
    }

  </script>

</body>
</html>
```

Call the tempConvert function three times by using a for statement. At each execution, pass the function one of the elements in the degFahren array, and assign the results of function's calculations to the degCent array. This will, in effect, populate the array with three elements (three numerical values which result from the conversion function).

Notice that the loopCounter variable is used in two ways: it keeps track of how many loops have been performed and it provides an index number for accessing the individual elements of the array.

exercise20 - Notepad

File Edit Format View Help

```
<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor=

  <script type=

    function
    {
      var de
      degCent

      return
    }

    var degFahren = new Array(212,32,-459.15);
    var degCent = new Array( );
    var loopCounter;

    for (loopCounter = 0; loopCounter <= 2; loopCounter++)
    {
      degCent[loopCounter] = tempConvert(degFahren[loopCounter]);
    }

    for (loopCounter = 2; loopCounter >= 0; loopCounter--)
    {
      document.write("<h1>" + degFahren[loopCounter] + "\xB0 Fahrenheit is "
                     + degCent[loopCounter] + "\xB0 Centigrade</h1>");
    }

  </script>

</body>
</html>
```

The second for loop writes the results contained in the degCent array to the document. In this case the value of the loopCounter is decremented. That is, it is initialized to 2 and the loop condition remains *true* until the loopCounter is less than 0. This means that the display of the result will move backwards through the array elements, starting with the last one and ending with the first.

```
exercise20 - Notepad
File Edit Format View Help

<html>
<head>
  <title>Using Data</title>
</head>

<body bgcolor="#ffffff">

  <script type="text/javascript">

    function tempConvert(degFahren)
    {
      var degCent;
      degCent = 5 / 9 * (degFahren - 32);

      return degCent;
    }

    var degFahren = new Array(212,32,-459.15);
    var degCent = new Array( );
    var loopCounter;

    for (loopCounter = 0; loopCounter <= 2; loopCounter++)
    {
      degCent[loopCounter] = tempConvert(degFahren[loopCounter]);
    }

    for (loopCounter = 2; loopCounter >= 0; loopCounter--)
    {
      document.write("<h1>" + degFahren[loopCounter] + "\xB0 Fahrenheit is "
                     + degCent[loopCounter] + "\xB0 Centigrade</h1>");
    }

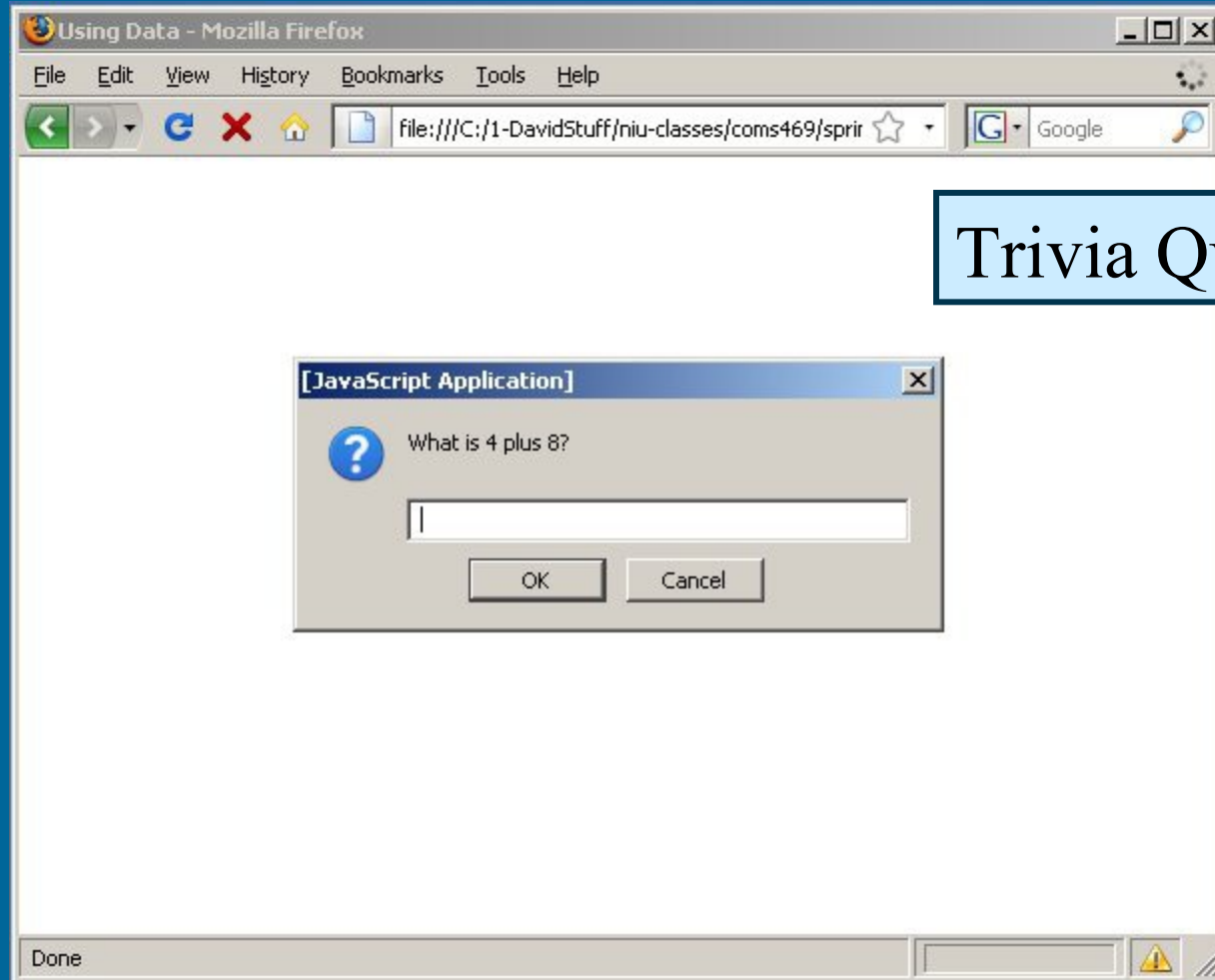
  </script>

</body>
</html>
```

Make these changes and save
as temp_converter4.html

Review Exercise

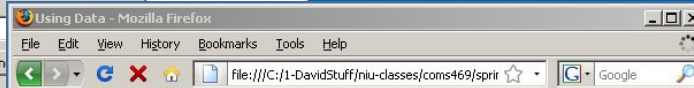
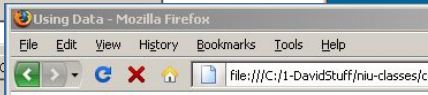
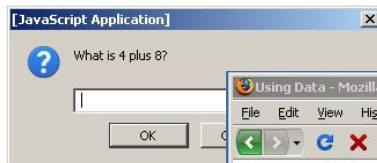
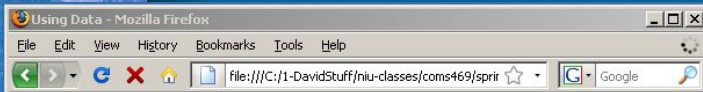
Trivia Quiz



Review Exercise

Three questions (2 ways to get this)

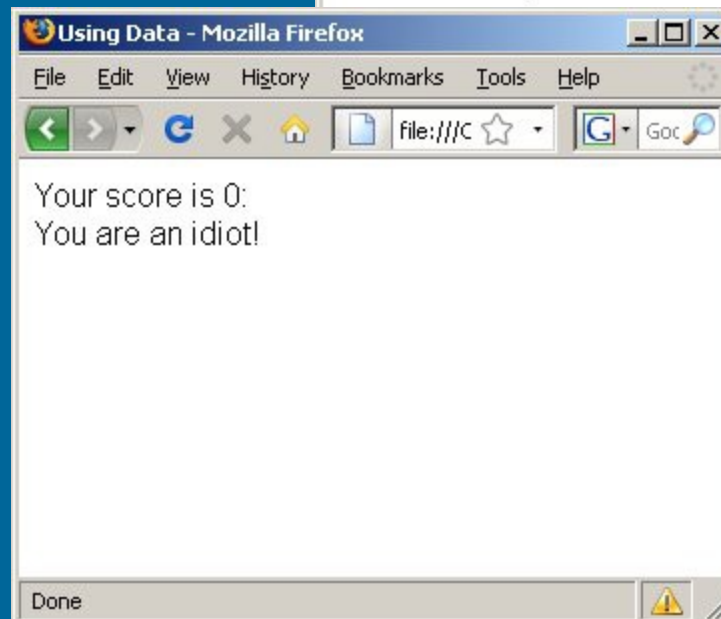
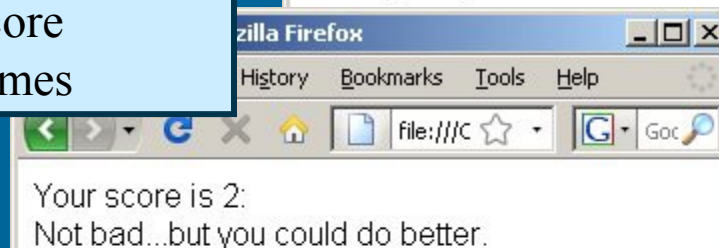
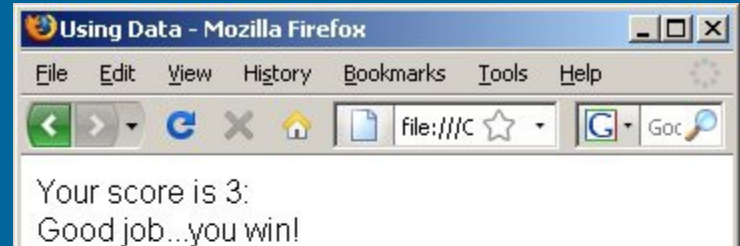
- Three separate prompt statements; evaluate each statement individually
- Store questions and answers in arrays and use a loop to generate the prompts and evaluate the results



Review Exercise

Display results

- Use a conditional statement to process the results and display the score
- Provide three different outcomes



Preview

- Topics/Chapters
 - Ch. 5: JavaScript—An Object-Based Language (pp. 133-188)
 - Ch. 6: Programming the Browser (pp. 189-218)