

# JavaScript

## by Example

Second Edition

### EXAMPLE

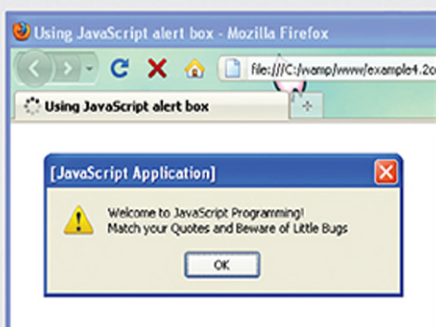
using the alert() method

```
<html>
<head>
<title>Using JavaScript alert box</title>
1 <script type="text/javascript">
2   var message1="Match your Quotes and ";
3   var message2="Beware of Little Bugs ";
4   alert("Welcome to JavaScript Programming!\n" +
        message1 + message2);
</script>
</head>
</html>
```

### EXPLANATION

- 1 The JavaScript program starts here with the `<script>` tag.
- 2 Two variables, `message1` and `message2` are assigned text strings.
- 3 The `alert()` method contains a string of text. Buried in the string is a backslash sequence, `\n`. There are a number of these sequences available in JavaScript (see Table 3.1 on page 32). The `\n` causes a line break in a string. The reason for using the `\n` escape sequence is
- 4 The `alert()` method concatenates the two variables. The `+` sign concatenates the variables together and variables together in the alert box as shown in the screenshot, the program will

### RESULT



Ellie Quigley

# *JavaScript by Example*

*Second Edition*

# JavaScript by Example

## Table of Contents

Cover

Half Title

Title Page

Copyright Page

Contents

Preface

1 Introduction to JavaScript

1.1 What JavaScript Is

1.2 What JavaScript Is Not

1.3 What JavaScript Is Used For

1.4 JavaScript and Its Place in a Web Page

1.4.1 Analysis of the Diagram

1.5 What Is Ajax?

1.6 What JavaScript Looks Like

1.7 JavaScript and Its Role in Web Development

1.7.1 The Three Layers

1.8 JavaScript and Events

1.9 Standardizing JavaScript and the W3C

1.9.1 JavaScript Objects

1.9.2 The Document Object Model

1.10 What Browser?

1.10.1 Versions of JavaScript

1.10.2 Does Your Browser Follow the Standard?

# **Table of Contents**

1.10.3 Is JavaScript Enabled on Your Browser?

## **1.11 Where to Put JavaScript**

1.11.1 JavaScript from External Files

## **1.12 Validating Your Markup**

1.12.1 The W3C Validation Tool

1.12.2 The Validome Validation Tool

## **1.13 What You Should Know**

# **2 Script Setup**

## **2.1 The HTML Document and JavaScript**

2.1.1 Script Execution

## **2.2 Syntactical Details**

2.2.1 Case Sensitivity

2.2.2 Free Form and Reserved Words

2.2.3 Statements and Semicolons

2.2.4 Comments

2.2.5 The <script> Tag

## **2.3 Generating HTML and Printing Output**

2.3.1 Strings and String Concatenation

2.3.2 The write() and writeln() Methods

## **2.4 About Debugging**

2.4.1 Types of Errors

## **2.5 Debugging Tools**

2.5.1 Firefox

2.5.2 Debugging in Internet Explorer 8

2.5.3 The JavaScript: URL Protocol

## **2.6 JavaScript and Old or Disabled Browsers**

2.6.1 Hiding JavaScript from Old Browsers

## **2.7 What You Should Know**

# **Table of Contents**

## **3 The Building Blocks: Data Types, Literals, and Variables**

### **3.1 Data Types**

#### **3.1.1 Primitive Data Types**

#### **3.1.2 Composite Data Types**

### **3.2 Variables**

#### **3.2.1 Valid Names**

#### **3.2.2 Declaring and Initializing Variables**

#### **3.2.3 Dynamically or Loosely Typed Language**

#### **3.2.4 Scope of Variables**

#### **3.2.5 Concatenation and Variables**

### **3.3 Constants**

### **3.4 Bugs to Watch For**

### **3.5 What You Should Know**

## **4 Dialog Boxes**

### **4.1 Interacting with the User**

#### **4.1.1 The alert() Method**

#### **4.1.2 The prompt() Method**

#### **4.1.3 The confirm() Method**

### **4.2 What You Should Know**

## **5 Operators**

### **5.1 About JavaScript Operators and Expressions**

#### **5.1.1 Assignment**

#### **5.1.2 Precedence and Associativity**

### **5.2 Types of Operators**

#### **5.2.1 Arithmetic Operators**

#### **5.2.2 Shortcut Assignment Operators**

#### **5.2.3 Autoincrement and Autodecrement Operators**

#### **5.2.4 Concatenation Operator**

# **Table of Contents**

5.2.5 Comparison Operators

5.2.6 Logical Operators

5.2.7 The Conditional Operator

5.2.8 Bitwise Operators

## **5.3 Number, String, or Boolean? Data Type Conversion**

5.3.1 The parseInt() Function

5.3.2 The parseFloat() Function

5.3.3 The eval() Function

## **5.4 Special Operators**

## **5.5 What You Should Know**

# **6 Under Certain Conditions**

## **6.1 Control Structures, Blocks, and Compound Statements**

## **6.2 Conditionals**

6.2.1 if/else

6.2.2 if/else if

6.2.3 switch

## **6.3 Loops**

6.3.1 The while Loop

6.3.2 The do/while Loop

6.3.3 The for Loop

6.3.4 The for/in Loop

6.3.5 Loop Control with break and continue

6.3.6 Nested Loops and Labels

## **6.4 What You Should Know**

# **7 Functions**

## **7.1 What Is a Function?**

7.1.1 Function Declaration and Invocation

7.1.2 Return Values

# **Table of Contents**

7.1.3 Anonymous Functions as Variables

7.1.4 Closures

7.1.5 Recursion

7.1.6 Functions Are Objects

## **7.2 Debugging Techniques**

7.2.1 Function Syntax

7.2.2 Exception Handling with try/catch and throw

## **7.3 What You Should Know**

# **8 Objects**

## **8.1 What Are Objects?**

8.1.1 Objects and the Dot Syntax

8.1.2 Creating an Object with a Constructor

8.1.3 Properties of the Object

8.1.4 Methods of the Object

## **8.2 Classes and User-Defined Functions**

8.2.1 What Is a Class?

8.2.2 What Is this?

8.2.3 Inline Functions as Methods

## **8.3 Object Literals**

## **8.4 Manipulating Objects**

8.4.1 The with Keyword

8.4.2 The for/in Loop

## **8.5 Extending Objects with Prototypes**

8.5.1 Adding Properties with the Prototype Property

8.5.2 The Prototype Lookup Chain

8.5.3 Adding Methods with Prototype

8.5.4 Properties and Methods of All Objects

8.5.5 Creating Subclasses and Inheritance

## **8.6 What You Should Know**

# **Table of Contents**

## **9 JavaScript Core Objects**

### **9.1 What Are Core Objects?**

### **9.2 Array Objects**

#### **9.2.1 Declaring and Populating Arrays**

#### **9.2.2 Array Object Properties**

#### **9.2.3 Associative Arrays**

#### **9.2.4 Nested Arrays**

### **9.3 Array Methods**

### **9.4 The Date Object**

#### **9.4.1 Using the Date Object Methods**

#### **9.4.2 Manipulating the Date and Time**

#### **9.4.3 Customizing the Date Object with the prototype Property**

### **9.5 The Math Object**

#### **9.5.1 Rounding Up and Rounding Down**

#### **9.5.2 Generating Random Numbers**

#### **9.5.3 Wrapper Objects (String, Number, Function, Boolean)**

#### **9.5.4 The String Object**

#### **9.5.5 The Number Object**

#### **9.5.6 The Boolean Object**

#### **9.5.7 The Function Object**

#### **9.5.8 The with Keyword Revisited**

### **9.6 What You Should Know**

## **10 Its the BOM! Browser Objects**

### **10.1 JavaScript and the Browser Object Model**

#### **10.1.1 Working with the navigator Object**

#### **10.1.2 Working with the window Object**

#### **10.1.3 Creating Timed Events**

#### **10.1.4 Working with Frames**

#### **10.1.5 The location Object**



# **Table of Contents**

10.1.6 The history Object

10.1.7 The screen Object

10.2 What You Should Know

## **11 Working with Forms and Input Devices**

11.1 The Document Object Model and the Legacy DOM 0

11.2 The JavaScript Hierarchy

11.2.1 The Document Itself

11.3 About HTML Forms

11.3.1 Attributes of the <form> Tag

11.4 JavaScript and the form Object

11.4.1 Naming Forms and Input Types (Controls) for Forms

11.4.2 The Legacy DOM with Forms

11.4.3 Naming Forms and Buttons

11.4.4 Submitting Fillout Forms

11.4.5 The this Keyword

11.4.6 The submit() and reset() Methods

11.5 Programming Input Devices (Controls)

11.5.1 Simple Form Validation

11.6 What You Should Know

## **12 Working with Images (and Links)**

12.1 Introduction to Images

12.1.1 HTML Review of Images

12.1.2 The JavaScript image Object

12.2 Reviewing Links

12.2.1 The JavaScript links Object

12.3 Working with Imagemaps

12.3.1 Replacing Images Dynamically with the src Property

12.3.2 Preloading Images and the Image() Constructor

# **Table of Contents**

12.3.3 Randomly Displaying Images and the onClick Event

12.3.4 Links with an Image Map and JavaScript

## **12.4 Resizing an Image to Fit the Window**

## **12.5 Introduction to Slideshows**

12.5.1 A Simple Slideshow with Controls

12.5.2 A Clickable Image Slideshow

## **12.6 Animation and Timers**

12.6.1 Changing Image Position

12.6.2 Changing Image Height and Width Properties

## **12.7 What You Should Know**

# **13 Handling Events**

## **13.1 Introduction to Event Handlers**

## **13.2 The Inline Model for Handling Events**

13.2.1 HTML and the Event Handler

13.2.2 Setting Up an Event Handler

13.2.3 Return Values

13.2.4 JavaScript Object Methods and Events

## **13.3 Handling a Window or Frame Event**

13.3.1 The onLoad and onUnload Events

13.3.2 The onFocus and onBlur Event Handlers

13.3.3 The onResize Event Handler

## **13.4 Handling Mouse Events**

13.4.1 How to Use Mouse Events

13.4.2 Mouse Events and ImagesRollovers

13.4.3 Creating a Slideshow with Mouse Events

## **13.5 Handling Link Events**

13.5.1 JavaScript URLs

## **13.6 Handling a Form Event**

# **Table of Contents**

13.6.1 Buttons

13.6.2 this for Forms and this for Buttons

13.6.3 Forms and the onClick Event Handler

13.6.4 Forms and the onFocus and onBlur Event Handlers

13.6.5 Forms and the onChange Event Handler

13.6.6 Forms and the onSubmit Event Handler

13.6.7 HTML Event Handlers and JavaScript Event Methods

13.6.8 The onError Event

## **13.7 The event Object**

13.7.1 Capturing and Bubbling (Trickle Down and Bubble Up)

13.7.2 Event Object Properties

13.7.3 Using Event Object Properties

13.7.4 Passing Events to a JavaScript Function

13.7.5 Mouse Positions

13.7.6 Key Events

## **13.8 The Scripting Model for Handling Events**

13.8.1 Getting a Reference to the Object

## **13.9 What You Should Know**

# **14 Introduction to CSS (Cascading Style Sheets) with JavaScript**

## **14.1 What Is CSS?**

## **14.2 What Is a Style Sheet?**

14.2.1 What Is a CSS-Enhanced Browser?

14.2.2 How Does a Style Sheet Work?

## **14.3 CSS Program Structure**

14.3.1 Comments

14.3.2 Grouping

## **14.4 Common Style Sheet Properties**

14.4.1 Units of Measurement

# **Table of Contents**

- 14.4.2 Working with Colors
- 14.4.3 Working with Fonts
- 14.4.4 Working with Text
- 14.4.5 Working with Backgrounds and Images
- 14.4.6 Working with Margins and Borders
- 14.5 Types of Style Sheets
  - 14.5.1 The Embedded Style Sheet and the <style> Tag
  - 14.5.2 The Inline Style and the <style> Attribute
- 14.6 The External Type with a Link
  - 14.6.1 The <link> Tag
  - 14.6.2 Importing with @import
- 14.7 Creating a Style Class
  - 14.7.1 Styling a Simple Table with Class
  - 14.7.2 Using a Specific Class Selector
- 14.8 The ID Selector and the ID Attribute
- 14.9 Overriding or Adding a Style with the <span> Tag
  - 14.9.1 The <span> Tag and the style Attribute
  - 14.9.2 The <span> Tag and the class Attribute
  - 14.9.3 Inheritance and Contextual Selectors
- 14.10 Positioning Elements and Layers
  - 14.10.1 Absolute Positioning
  - 14.10.2 The <div> Container
  - 14.10.3 Absolute Positioning
  - 14.10.4 Relative Positioning
  - 14.10.5 The z-index and Three Dimensions
- 14.11 Where Does JavaScript Fit In?
  - 14.11.1 What Is DHTML?
  - 14.11.2 How JavaScript Views Style Sheets
  - 14.11.3 The style Object

# **Table of Contents**

14.11.4 The className Property

14.11.5 Drop-Down Menus and Tooltips

14.12 What You Should Know

## **15 The W3C DOM and JavaScript**

15.1 The W3C DOM

15.2 How the DOM Works with Nodes

15.3 Nodes

15.3.1 Parents and Children

15.3.2 Siblings

15.3.3 The nodeName and nodeType Properties

15.3.4 The Whitespace Bug

15.4 Walking with the DOM

15.5 DOM Inspectors

15.6 Methods to Shorten the DOM Walk

15.6.1 The document.getElementById() Method

15.6.2 The document.getElementsByTagName() Method

15.6.3 JavaScript Properties to Represent HTML Attributes

15.7 Modifying the DOM (Appending, Copying, and Removing Nodes)

15.7.1 The innerHTML Property and the Elements Content

15.7.2 Modifying the Content of an Element

15.7.3 Creating New Elements with the DOM

15.7.4 Inserting Before a Node

15.7.5 Creating Attributes for Nodes

15.7.6 DOM Review: Creating a Blog

15.7.7 Creating a Table with the DOM

15.7.8 Cloning Nodes

15.7.9 Removing a Node

15.7.10 Scrolling with the Nodes

# **Table of Contents**

## **15.8 Event Handling and the DOM**

15.8.1 The HTML Inline Way

15.8.2 The Scripting Way

15.8.3 The DOM Way

15.8.4 Bubbling and Capturing

## **15.9 Event Listeners with the W3C Model**

15.9.1 Adding an Event

15.9.2 Registering More Than One Event

15.9.3 Removing an EventListener

15.9.4 Event Listeners with Microsoft Internet Explorer

15.9.5 Event Properties Revisited

## **15.10 Unobtrusive JavaScript**

15.10.1 JavaScript Libraries

## **15.11 What You Should Know**

# **16 Cookies**

## **16.1 What Are Cookies?**

16.1.1 Cookie Ingredients

16.1.2 The Attributes of a Cookie

## **16.2 Creating a Cookie with JavaScript**

16.2.1 The Cookie Object

16.2.2 Assigning Cookie Attributes

16.2.3 Lets Make Cookies!

16.2.4 Retrieving Cookies from a Server

16.2.5 Deleting a Cookie

16.2.6 Using the Browser to Remove Cookies

## **16.3 What You Should Know**

# **17 Regular Expressions and Pattern Matching**

## **17.1 What Is a Regular Expression?**

# **Table of Contents**

## **17.2 Creating a Regular Expression**

- 17.2.1 The Literal Way
- 17.2.2 The Constructor Method
- 17.2.3 Testing the Expression
- 17.2.4 Properties of the RegExp Object

## **17.3 String Methods Using Regular Expressions**

- 17.3.1 The match() Method
- 17.3.2 The search() Method
- 17.3.3 The replace() Method
- 17.3.4 The split() Method

## **17.4 Getting ControlThe Metacharacters**

- 17.4.1 The Dot Metacharacter
- 17.4.2 The Character Class
- 17.4.3 Metasymbols
- 17.4.4 Metacharacters to Repeat Pattern Matches
- 17.4.5 Anchoring Metacharacters
- 17.4.6 Alternation

## **17.5 Form Validation with Regular Expressions**

- 17.5.1 Checking for Empty Fields
- 17.5.2 Checking for Numeric Zip Codes
- 17.5.3 Checking for Alphabetic Data
- 17.5.4 Removing Extraneous Characters
- 17.5.5 Checking for Valid Social Security Numbers
- 17.5.6 Checking for Valid Phone Numbers
- 17.5.7 Checking for Valid E-Mail Addresses
- 17.5.8 Credit Card Validation
- 17.5.9 Putting It All Together

## **17.6 What You Should Know**

## **18 An Introduction to Ajax (with JSON)**

# **Table of Contents**

## **18.1 Why Ajax?**

## **18.2 Why Is Ajax Covered Last?**

## **18.3 The Steps for Creating Ajax Communication**

### **18.3.1 Step 1: Create the XMLHttpRequest Object**

### **18.3.2 Step 2: Initializing the Object**

### **18.3.3 Sending the Request to the Server**

### **18.3.4 Step 3: Monitoring the State of the Server Response**

### **18.3.5 Handling the Response with a Callback Function**

### **18.3.6 The Browser Cache Issue**

## **18.4 Putting It All Together**

### **18.4.1 Using Ajax to Retrieve Text from a File**

### **18.4.2 Using Ajax to Retrieve XML from a File**

### **18.4.3 Ajax and Forms**

## **18.5 Ajax and JSON**

### **18.5.1 JSON Data Structures**

### **18.5.2 Steps to Use JSON**

### **18.5.3 Putting It All Together with JSON**

### **18.5.4 Solving the eval() Security Problem**

## **18.6 Debugging Ajax with Firebug**

### **18.6.1 Basic Instructions for Using Firefox**

### **18.6.2 What You Should Know**

## **Index**