THE EXPERT'S VOICE® IN WEB DEVELOPMENT

jQuery 2 Recipes

A Problem-Solution Approach

CREATE LIGHTWEIGHT, EXTENSIBLE JAVASCRIPT CODE QUICKLY AND EASILY WITH THE JQUERY 2 LIBRARY

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Contents at a Glance

CHAPTER 1

Introduction

1-1. About jQuery 2.0

jQuery is a multi-browser, lightweight, and extensible open source JavaScript library that can be used to simplify client-side and client-to-server communication scripting. It simplifies coding by replacing many lines of JavaScript code with fewer lines by using jQuery built-in methods. Some of the main features of jQuery include:

- Dynamic HTML creation and manipulation
- HTML events handling
- Effects and animations
- Client to server communication

In addition to core jQuery, this book also covers jQuery UI and jQueryMobile, which are built on the core.

As of writing of this book, the latest version of jQuery is 2.1.0. This version has the same API as the previous version 1.x, but it isn't supported on older browsers like Internet Explorer 8 and older. The main reason for this release is to eliminate the code required to support older browsers. This has made smaller jQuery files possible and hence produced an improvement in performance. If your user base is still using Internet Explorer 8 or older, you should use the latest version of the jQuery 1.x series.

jQuery can be downloaded from `http://jquery.com/download/`.

jQuery 2 is compatible with jQuery 1.9. All features of jQuery 1.9 have been included in jQuery 2.

1-2. Migration Plan

If you are using a version older than jQuery 1.9, upgrade it to jQuery 1.9+ first by using the jQuery migration plug-in. As of the writing of this book, the latest version of the jQuery 1 series is 1.10.2 and latest version of the jQuery 2 series is 2.1.0.

You can use migration plug-in by replacing your current reference to jQuery library by the following:

```
<script src="http://code.jquery.com/jquery-1.10.2.js"></script>
<script src="http://code.jquery.com/jquery-migrate-1.2.1.js"></script>
```

If you want to use a local copy of the jQuery and the jQuery migration plug-in, download it from the following locations:

jQuery 1.10.2 (Development version): `http://code.jquery.com/jquery-1.10.2.js`

jQuery Migrate 1.2.1: `http://code.jquery.com/jquery-migrate-1.2.1.js`

Use the following path to use them (assuming you have saved the downloaded files under the `scripts` folder under your website's root folder).

```
<script src="scripts/jquery-1.10.2.js"></script>
<script src="scripts/jquery-migrate-1.2.1.js"></script>
```

This migration tool will help you identify features/APIs that are deprecated in older versions of jQuery and removed in jQuery 1.9+. The development version of the migration plug-in will display a warning in the broswer's console. Be sure to use browsers that support console interface. The browser console is an interface where developers and users can view information like network requests, JavaScript code, CSS, warnings, errors, and messages logged by JavaScript. Newer versions of Internet Explorer, Firefox, Chrome, Safari, and Opera have built-in consoles. Refer to Appendix B to learn about how to open the web console in different browsers.

1-3. Objects–Basic Concept

Objects are the key to understanding object-oriented technology. Each object has a state (attributes or properties) and a behavior (methods). In object-oriented terms, objects don't have to be seen or touched. Some examples of objects are cars, bank accounts, and rectangles. A car has attributes (or properties), such as the manufacturer, model, category, color, and so on, and it has methods, such as start the car, stop the car, put it in park, apply the hand brake, and so on. A bank account has attributes, such as account holder's name, account number, account type, current balance. It has methods such as withdraw money, deposit money, transfer money, and so on. A rectangle has attributes such as length and width and has methods such as determine its area, parameter, and so on.

A *class* is a general specification from which individual objects are created (instantiated).

Table 1-1 displays examples of classes and objects.

***Table 1-1.** Examples of classes and objects*

Class	Object	
Class Name: Car	Object Name: `myCar`	
Attributes	**Attributes**	**Value**
Manufacturer	Manufacturer	Lexus
Model	Model	ES 350
Category	Category	Sedan
Color	Color	White
	Object Name: `rentalCar`	
	Attributes	**Value**
	Manufacturer	Chverlot
	Model	Impala
	Category	Sedan
	Color	Blue
Class Name: Account	Object Name: `customer1Account`	
Attributes	**Attributes**	**Value**
AccountHolderName	AccountHolderName	John Smith
AccountNumber	AccountNumber	7823712924
AccountType	AccountType	Checking
CurrentBalance	CurrentBalance	$1,560.78
	Object Name: `customer2Account`	
	Attributes	**Value**
	AccountHolderName	Jane Smith
	AccountNumber	89127312
	AccountType	Saving
	CurrentBalance	$14,590.80

1-4. Introduction to JavaScript

JavaScript is an object-oriented scripting language that is commonly used to create interactive effects and to dynamically create web page content. JavaScript language is case sensitive. JavaScript code is executed within the web browser, on the client side. It is used to retrieve and manipulate web page data objects (DOM) for interactivity and dynamic creation of presentation.

JavaScript code can be included on the same page as the HTML code or in a separate file, which is then included in the HTML file.

The following is the syntax for the internal JavaScript code:

```
<script>
// JavaScript Code
</script>
```

The following is the syntax for including external JavaScript code:

```
<script src="myJavaScript.js"></script>
```

Note: In `myJavaScript.js`, the `<script>` and `</script>` tags are not needed.

1-4-1. Data Types

JavaScript has dynamic types. The `DataType` of the variable is based on its value. Same variables can be used as different types. If no value is assigned to the variable, the default value of `null` is assigned.

- **Strings** – Used to hold texts and are declared as follows:

  Syntax: `var <variableName> = "<value>";`

  Example: `var firstName = "John";`

- **Numbers** – Used to hold numbers (integers and decimals):

  Syntax: `var <variableName> = "<value>";`

  Example: `var monthlySalary = 5450;`

- **Booleans** – Used to hold two values—true or false. Booleans are used to check for certain conditions:

  Syntax: `var <variableName> = "<value>";`

  Example: `var isContractor = true;`

- **Arrays** – Used to hold one or more than one value. They can be of the same data type of different types:

  Syntax: `var <variableName> = new Array();`

  Example: Arrays can be declared and set using any of the following three methods:

  ```
  var departments = new Array();
       departments[0]= "Sales";
       departments[1]= "Marketing";
       departments[2]= "Technology";

       var departments = new Array("Sales", "Marketing", "Technology");
       var departments = ["Sales", "Marketing", "Technology"];
  ```

It is not necessary that all the elements of an array are of the same data type.
The following is the syntax to access elements in an array –

```
arrayName[indexNumber];
```

where, *indexNumber* is the element number in the array and it is 0 based.
For example, `document.write(departments[2])` displays "Technology".

- **Objects** – A variable can be defined as a built-in object (like `Date`, `Image`, `Array`, and `String`) or as a custom (user-defined) object.

  Syntax: `var <variableName> = new ObjectName();`

  Examples:

  - `var syst emDate = new Date(); // for current date`
  - `// parameters- yr_num, mo_num, day_num`

    `// optional - hr_num, min_num, sec_num, ms_num`

    `var dateOfBirth - new Date(1972, 11, 30);`
  - `// parameter - dateString`

    `var joiningDate = new Date("10/10/2004");`
  - `var logoImage = new Image("images/logo.jpg");`
  - `var firstName = new String("John");`
  - `var employee = {firstName: "John", lastName: "Smith", monthlySalary: 5450};`

An example of an array of objects:

```
var employees = new Array(
        {firstName:"John", lastName:"Smith", monthlySalary:5000},
        {firstName:"Jane", lastName:"Smith", monthlySalary:5450});
```

To access the *firstName* of the *employee* object, you can use `employee.firstName`.

1-4-2. Commonly Used JavaScript Objects and Events

When a DOM element is created using a tag in HTML code, a JavaScript object is created. This object's attributes can be accessed (get) and set using JavaScript code. Alternatively, JavaScript can be used to create DOM elements. Listing 1-1 demonstrates an example of creating DOM elements.

Listing 1-1. DOM elements creation

```
<!DOCTYPE html>
<html lang=en>
<head>
   <title>HTML5 Anchor</title>
   <meta charset=utf-8>
</head>
<body>
   <a id="newsLink" href="http://msnbc.com">News</a>
</body>
</html>
```

When the code in the listing 1-1 is executed in a browser and the user clicks on the News link, a page will be displayed from `msnbc.com`. Due to the line `<a id="newsLink" href="http://msnbc.com">MSNBCNews</a>`, a JavaScript object called `Anchor` is created that can be referenced and manipulated using the JavaScript code. Listing 1-2 demonstrates an example to access and set a DOM element.

Listing 1-2. Access and manipulate a DOM element

```
<!DOCTYPE html>
<html lang=en>
<head>
<title>HTML5 Anchor</title>
<meta charset=utf-8>
<script>
      function changeNewsLink() {
         var objAnchor = document.getElementById("newsLink");
                    alert(objAnchor.href);
                    objAnchor.href = "http://cnn.com";
      }
</script>
</head>
<body onload="changeNewsLink();">
    <a id="newsLink" href="http://msnbc.com">News</a>
</body>
</html>
```

Here's a detailed explanation of this code:

- `onload="changeNewsLink();"`

  calls the JavaScript function `changeNewsLink` when all the elements in the body of the HTML page are loaded (i.e., the DOM elements are created). It is advisable to call functions that access DOM elements using this method.

- `var objAnchor = document.getElementById("newsLink");`

  looks for an element with the ID as `newsLink` and then reference that element by using the JavaScript variable `objAnchor`.

- `alert(objAnchor.href);`

  displays the current `href` value of the `Anchor` object.

- `objAnchor.href = "http://cnn.com";`

  changes the `href` attribute of the `Anchor` object to `http://cnn.com`. Now, when the user clicks the News link on the web page, a page from `cnn.com` will be displayed instead.

The following is the list of commonly used JavaScript statements:

- `for`. This is used to create a loop to iterate through a list of elements or perform repetitive operations for a range of values.

  Syntax:

  ```
  for (var i=initialValue; condition while true; incrementOrDecrementTheCount)
  ```

Listing 1-3 demonstrates an example to use *for* statement to display multiplication table of number 4.

Listing 1-3. Using for statement to display multiplication table

```
<!DOCTYPE html>
<html lang=en>
<head>
<title>Multiplication Table</title>
<meta charset=utf-8>
<script>
    for (var i=1; i <= 10; i++) {
      document.write(4 + " x " + i + " = " + (4*i) +"<br>");
    }
</script>
</head>
<body>
</body>
</html>
```

Listing 1-4 demonstrates an example to use for statement to iterate through an array to objects and display FirstName.

Listing 1-4. Using for statement to iterate through an array

```
<!DOCTYPE html>
<html lang=en>
<head>
<title>Iterate Through Objects</title>
<meta charset=utf-8>
<script>
var employees = new Array(
   {"FirstName":"John", "LastName":"Smith", "MonthlySalary": 5000},
   {"FirstName":"Jane", "LastName":"Smith", "MonthlySalary":5450});

   for (var i=0; i < employees.length; i++) {
      document.write(employees[i].FirstName +"<br>");
   }
</script>
</head>
<body>
</body>
</html>
```

In the above code, the short form of this line

```
for (var i=0; i < employees.length; i++)
```

can be written as

```
for (var i in employees)
```

- if ... else ... This is used to execute lines of code (logic) when certain conditions are true and execute different logic when conditions are not true.

Syntax:

```
      if (condition is true) {
      // JavaScript Code
      } else {
      // JavaScript Code
}
```

Listing 1-5 demonstrates an example to display the names and bonuses for employees by using a 5% bonus for employees with a salary of $5,000 or less and a 3% bonus for others.

Listing 1-5. Using if else statement

```
<!DOCTYPE html>
<html lang=en>
<head>
   <title>Iterate Through Objects</title>
   <meta charset=utf-8>
   <script>
      var employees = new Array(
{"FirstName":"John", "LastName":"Smith", "MonthlySalary": 5000},
{"FirstName":"Jane", "LastName":"Smith", "MonthlySalary":5450});

   for (var i in employees) {
      var bonusPercentage;
      if (employees[i].MonthlySalary <= 5000) {
         bonusPercentage = 0.05;
      } else {
         bonusPercentage = 0.03;
      }
      document.write(employees[i].FirstName + " " +
          (employees[i].MonthlySalary*bonusPercentage) + "<br>");
   }
   </script>
</head>

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

- *continue* statement is used to go to the next iteration of the loop without performing subsequent statements in the loop block.
- *break* statement is used to break the loop to exit out of the loop.

The following is a list of commonly used JavaScript objects:

- `Anchor`
- `Array`
- `Boolean`
- `Button`

- Checkbox
- Date
- Document
- Form
- Image
- String
- Window
- Location

The table 1-2 lists the commonly used DOM events that occur when users perform an action. For example, when a user clicks a button on a web page, the `onclick()` event is triggered. If there is any function associated with the `onclick` event for the button, that function is executed as well.

Table 1-2. *Commonly used DOM events*

Event Type	Event Name	Description
Mouse Event	onclick	When the user clicks on an element.
Mouse Event	ondblclick	When the user clicks on an element.
Form Event	onblur	When the user clicks some other form element or tab on the form element.
Form Event	onchange	When a value of a form element is changed.
Form Event	onfocus	When a form element gets focus.
Form Event	onsubmit	When a form is submitted, that is, when a submit button is clicked in the form.
Body Event	onload	After a page is loaded and all DOM elements are created.

Developers can specify which JavaScript statement or function to call when an event occurs. Listing 1-6 demonstrates an example to display a message when user clicks the button.

Listing 1-6. Event handling

```
<!DOCTYPE html>
<html lang=en>
<head>
<title>Events</title>
<meta charset=utf-8>
<script>
    function displayName() {
      alert(frmRegister.txtName.value);
    }
</script>
</head>
<body>
<form id="frmRegister">
```

```
Name: <input type="text" name="txtName"><br>
   <input type="button" value="Register" onclick="displayName();"><br>
</form>
</body>
</html>
```

When the user clicks the Register button, the `onclick` event occurs, which calls the `displayName()` JavaScript function. The `displayName` function gets the value entered in the textbox, which is `txtName`, and displays it as a popup message.

1-5. About XML

XML (eXtensible Markup Language) is designed to carry and store data. It is a representation of data in a structured and pre-defined format.

```
Syntax: <xmlTag attributeName="attributeValue">
           elementValue
        </xmlTag>
```

`elementValue` can be a literal value or another XML node.

An XML tag name doesn't have any space in it. It can have zero or more attribute names and `attributeValue` pairs. It can have only one value. It can be nested. The start and end of a data element are represented by `openingTag` and `closingTag`, respectively. Refer to Listing 1-7 for XML representation of employee information.

Listing 1-7. XML representation of employee information

```
<Employees>
    <Employee>
        <Name>John Doe</Name>
        <Department>Sales</Department>
        <DateOfJoining>09/12/2001</DateOfJoining>
        <Salary>75000</Salary>
    </Employe>
    <Employee>
        <Name>Jane Doe</Name>
        <Department>Technology</Department>
        <DateOfJoining>09/12/1998</DateOfJoining>
        <Salary>85000</Salary>
    </Employe>
</Employees>
```

Data elements enclosed in `<>` are called tags. Each tag `<tagName>` has a closing tag, which is specified as `</tagName>`. For example, the `<Employee>`'s closing tag is `</Employee>`.

1-6. About JSON

JSON (JavaScript Object Notation) is a lightweight data-interchange format. A JSON object is represented as `{"objectName":objectValue}`. An array is represented as `[object,object,...]`.

For example, `Employees` information can be represented as `{"Employees":[]}` where `Employee` is an object and `Employees` is an array of `Employee` objects. This example has two object types: `Employees` and `Employee`.

In JavaScript, the JSON string can be converted to a JavaScript object and each element can be accessed using the code segment specified in Listing 1-8.

Listing 1-8. JSON representation of employee information

```
<script>
   var jsonString = '{"Employees":[{"Name":"John", "Department":"Sales"},
      {"Name":"Jane", "Department":"Technology"}]}';
   var jsonObj = jQuery.parseJSON(jsonString);
   var employeesObj = jsonObj.Employees;
   for (var i=0; i<employeesObj.length; i++) {
      var employeeObj = employeesObj[i];
      var employeeName = employeeObj.Name;
      alert(i + ": " + employeeName);
   }
</script>
```

1-7. Introduction to Web Services

Web services are application components that can be used by other applications over HTTP or HTTPS. In a typical application (desktop and web applications), their functional components are defined in the same source code or in the same package or externally packaged software (like DLL and JAR) located on the same machine. In the case of web services, the functions provider and consumer are usually on separate servers. The web service provider and consumers don't have to be written using same language and be running on the same type of operating system. This is one of the main advantages of using web services—it operates under heterogeneous environments.

Here's an example of a web service specification:

Web Service – WeatherService

Function / Operation – `getCurrentTemperature()`

Input: Zip Code

Result: Temperature in Celsius

Figure 1-1 dispays web service request and response between the consumer and the provider.

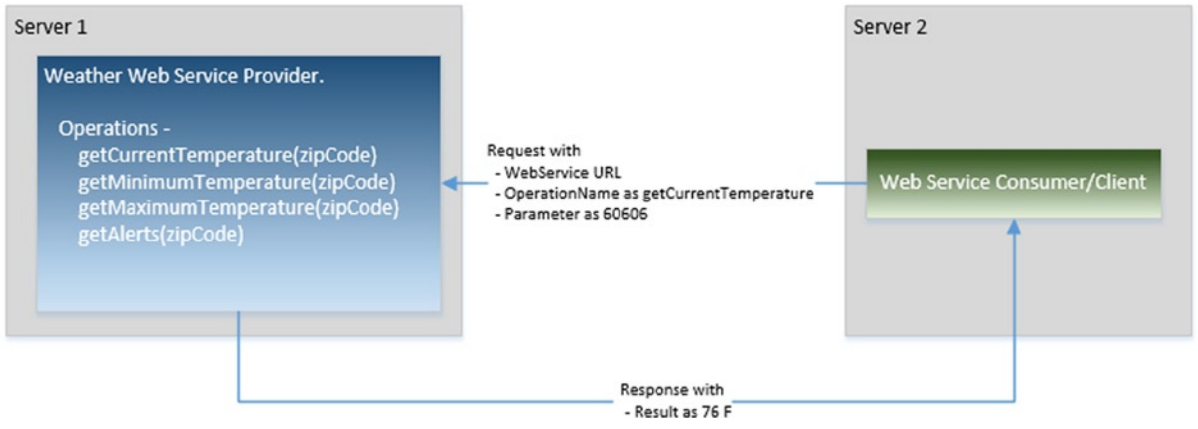

Server 1
Weather Web Service Provider.
Operations -
getCurrentTemperature(zipCode)
getMinimumTemperature(zipCode)
getMaximumTemperature(zipCode)
getAlerts(zipCode)
Request with
- WebService URL
- OperationName as getCurrentTemperature
- Parameter as 60606
Server 2
Web Service Consumer/Client
Response with
- Result as 76 F

Figure 1-1. *Web Service request and response*

1-7-1. SOAP Web Services

The acronym SOAP stands for Simple Object Access Protocol. It is an XML-based protocol used to consume web services. A protocol is a contract between the provider and consumer for the specification of the format of requests and responses between them. Details of services (the operations) provided by the web services are defined (by the provider) and accessed (by the users) using the Web Services Description Language (WSDL), which is in XML format. WSDL has following four main sections—`message`, `portType`, `binding`, and `service`.

Developers don't need to code each element of the SOAP message. There are many libraries, utilities, and plug-ins available that can take an object and build the SOAP message request. Upon receiving the response, they can parse the SOAP message and build the object, which can then be used in the program. Listing 1-9 shows an example of a SOAP message request.

Listing 1-9. SOAP message request

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope">
<soap:Header>
</soap:Header>
<soap:Body>
    <m:GetCurrentTemperatureRequest xmlns:m="http://www.myWeather.org/weather">
      <m:ZipCode>60606</m:ZipCode>
    </m: GetCurrentTemperatureRequest>
</soap:Body>
</soap:Envelope>
```

Listing 1-10 shows an example of a SOAP message response.

Listing 1-10. SOAP message response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope">
<soap:Header>
</soap:Header>
<soap:Body>
    <m:GetCurrentTemperatureResponse xmlns:m="http://www.myWeather.org/weather">
      <m:ZipCode>60606</m:ZipCode>
      <m:CurrentTemperature>76 F</m:CurrentTemperature>
    </m: GetCurrentTemperatureResponse>
</soap:Body>
</soap:Envelope>
```

1-7-2. RESTful Web Services

The acronym REST stands for Representational State Transfer. It is a simpler alternative to SOAP and is gaining widespread acceptance for creating web services. It transfers XML, JSON, or both (refer to Sections 1-5 and 1-6 for XML and JSON formats). REST establishes a one-to-one mapping between four basic operations—`Create`, `Retrieve`, `Update`, and `Delete` (called CRUD) operations and HTTP methods—`POST`, `GET`, `PUT` and `DELETE`. A client can access the REST resource using the unique URI and a representation of the resource is returned by the REST web service. Unlike SOAP, REST doesn't contain a messaging layer. SOAP uses the Web Services Description Language (WSDL) to define the web services interface, whereas REST uses the Web Application Description Language (WADL) to define the web services interface.

Consider the same example from SOAP to invoke a REST service:

```
http://www.myWeather.com/weather/CurrentTemperature/60606
```

This is not the request body—it's just the URL. This URL is sent to the server using a simpler GET request, and the HTTP reply is the raw result data in XML or JSON. Unlike with SOAP, the response is not embedded inside anything.

Here's an example of a response in JSON format:

```
{"ZipCode":"60606", "Temerature":"76 F"}
```

1-8. About jQuery UI

jQuery UI is collection of commonly used user interface widgets that responds to user initiated events and provides prebuilt themes and easily maintainable custom themes. It is built on top of the jQuery JavaScript library.

jQueryUI can be downloaded from http://jqueryui.com/download/. Refer to the listing 1-11 to see how to use the widgets available in the jQuery UI library.

Listing 1-11. Using the jQuery UI datepicker widget

```
<!DOCTYPE html>
<html>
<head>
    <link rel="stylesheet" href="http://code.jquery.com/ui/1.11.1/themes/start/jquery-ui.min.css"/>
    <script src="http://code.jquery.com/jquery-2.1.0.min.js"></script>
    <script src="http://code.jquery.com/ui/1.11.1/jquery-ui.min.js"></script>
    <script>
         $(document).ready(function(){
            $("#datepicker").datepicker();
          });
    </script>
</head>
<body>
    Date: <input type="text" id="datepicker" />
</body>
</html>
```

Figure 1-2 displays jQuery UI datepicker widget which is created by the above code.

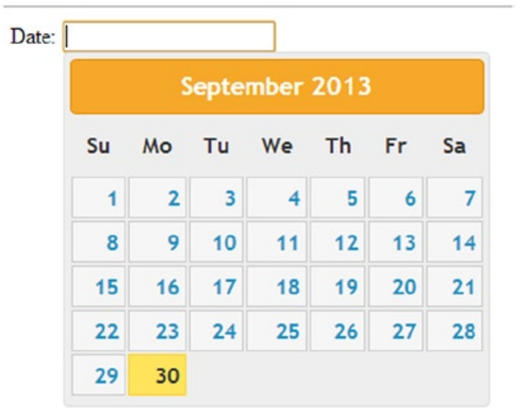
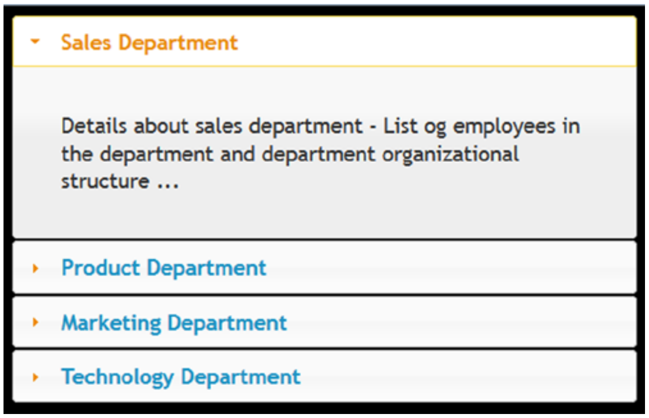
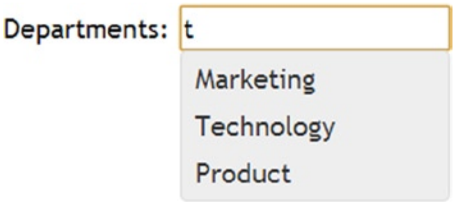


Figure 1-2. *Datepicker widget*

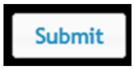
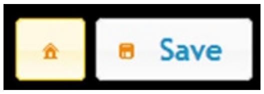
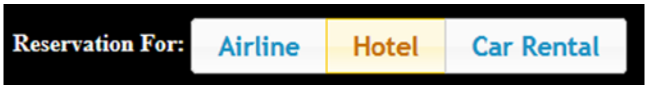
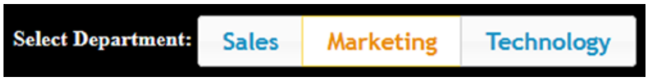
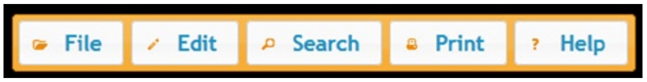
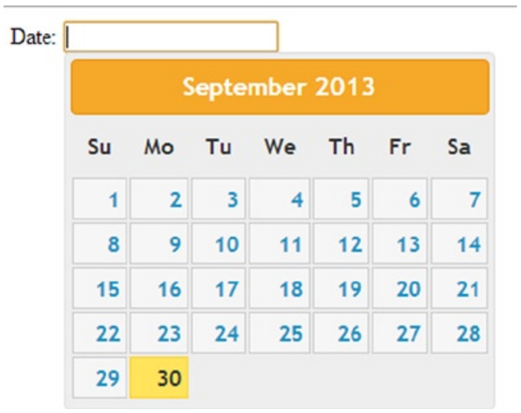
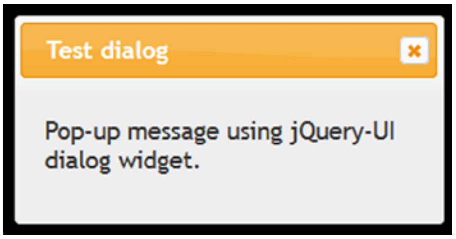
The jQuery UI is built on the jQuery JavaScript library. In order to use it, you need to download jQuery in addition to jQuery UI and include the jQuery JavaScript file before including the jQuery UI JavaScript file. Table 1-3 lists commonly used jQuery UI Widgets.

Table 1-3. *Commonly used jQuery UI Widgets*

UI Widget	Display As
Accordion	 Sales Department Details about sales department - List og employees in the department and department organizational structure ... Product Department Marketing Department Technology Department
Autocomplete	 Departments: t Marketing Technology Product

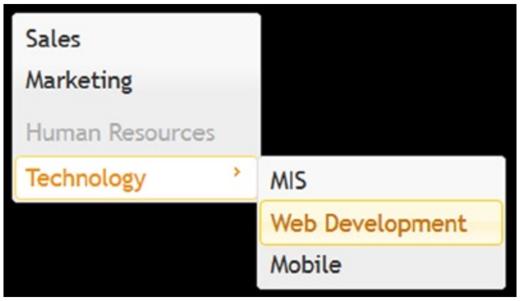
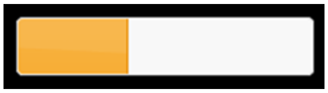
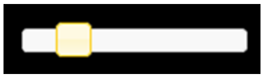
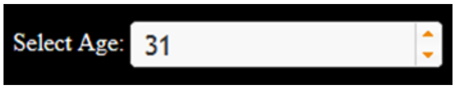
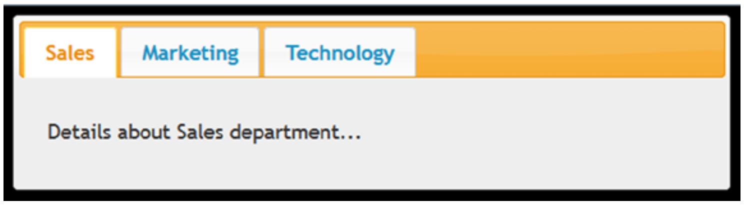
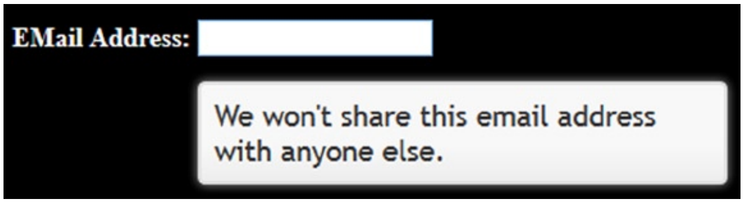
(*continued*)

Table 1-3. (*continued*)

UI Widget	Display As
Button	Simple button:  Icons:  Checkboxes:  Radio buttons:  Toolbar: 
Datepicker	 Date: September 2013 Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Dialog	 Test dialog Pop-up message using jQuery-UI dialog widget.

(*continued*)

Table 1-3. (*continued*)

UI Widget	Display As
Menu	 Sales Marketing Human Resources Technology MIS Web Development Mobile
Progress bar	
Slider	
Spinner	
Tabs	 Sales Marketing Technology Details about Sales department...
Tooltip	 EMail Address: We won't share this email address with anyone else.

The `ui-lightness` theme is in for the previous examples. You'll learn more about jQuery UI in Chapter 10.

1-9. About jQueryMobile

jQueryMobile is a JavaScript user interface library for mobile devices. It is built on the jQuery and jQuery UI JavaScript libraries. It supports responsive design, which means the user interface is adjusted depending on target platform (such as desktop browsers, smartphones, and tablets).

jQueryMobile is built on HTML5, CSS3, and the jQuery JavaScript library. In order to use it, you need to download jQuery in addition to jQueryMobile and include the jQuery .js file before including the jQueryMobile .js file.

The jQueryMobile JavaScript library can be downloaded from `http://jquerymobile.com/download/`. You'll learn more about jQueryMobile in Chapter 11.

1-10. Introduction to jqWidgets

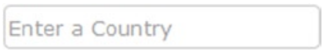
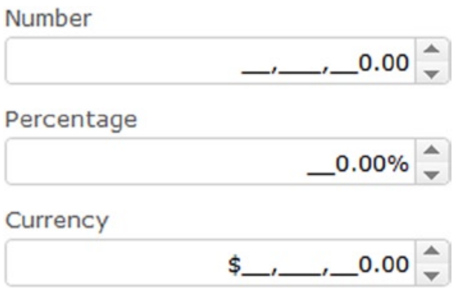
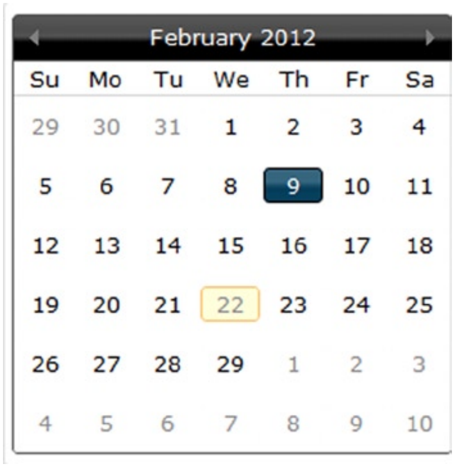
`jqWidgets` is a JavaScript user interface library for developing websites and applications on mobile devices. It is built on HTML5, CSS3, JavaScript, and the jQuery libraries. jQuery UI provides basic widgets, whereas `jqWidgets` provides advanced user interface components such as `jqxGrid`, `jqxChart`, `jqxTree`, and so on.

jQueryMobile is built on HTML5, CSS3, and the jQuery JavaScript library. In order to use it, you need to download jQuery in addition to jQueryMobile and include the jQuery .js file before including the jQueryMobile js file.

The `jqWidgets` library can be downloaded from `http://www.jqwidgets.com/download/`.

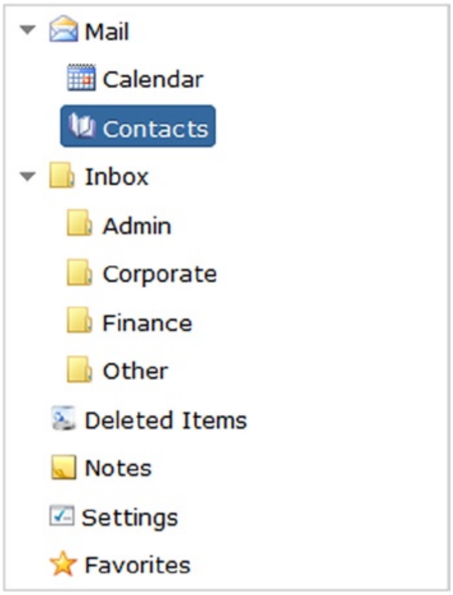
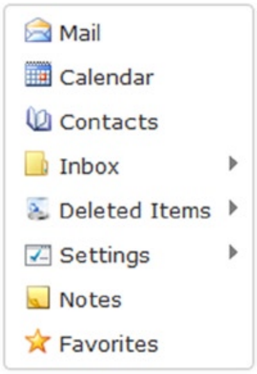
In order to use `jqWidgets`, include jQuery JavaScript and the respective `jqwidgets` JavaScript file in the HTML file. The table 1-4 lists commonly used `widgets`.

Table 1-4. *Commonly used jqWidgets*

Widget	Display As
`jqxInput`	 Enter a Country
`jqxNumberInput`	 Number: __,___,__0.00 Percentage: __0.00% Currency: \$__,___,__0.00
`jqxCalendar`	 February 2012 Su Mo Tu We Th Fr Sa 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 1 2 3 4 5 6 7 8 9 10

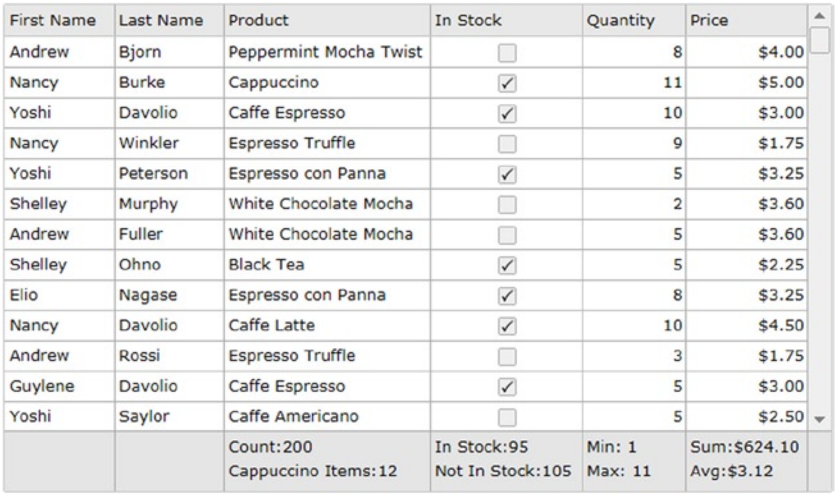
(*continued*)

Table 1-4. (*continued*)

Widget	Display As
`jqxTree`	 Mail Calendar Contacts Inbox Admin Corporate Finance Other Deleted Items Notes Settings Favorites
`jqxMenu`	 Mail Calendar Contacts Inbox Deleted Items Settings Notes Favorites

(*continued*)

Table 1-4. (*continued*)

Widget	Display As
`jqxGrid`	

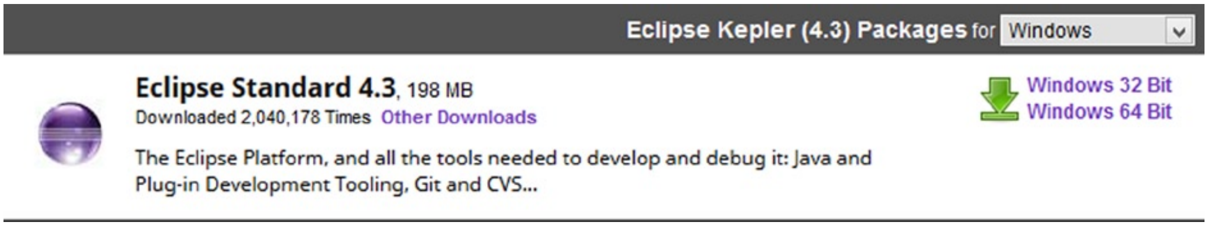
First Name	Last Name	Product	In Stock	Quantity	Price
Andrew	Bjorn	Peppermint Mocha Twist	☐	8	$4.00
Nancy	Burke	Cappuccino	✓	11	$5.00
Yoshi	Davolio	Caffe Espresso	✓	10	$3.00
Nancy	Winkler	Espresso Truffle	☐	9	$1.75
Yoshi	Peterson	Espresso con Panna	✓	5	$3.25
Shelley	Murphy	White Chocolate Mocha	☐	2	$3.60
Andrew	Fuller	White Chocolate Mocha	☐	5	$3.60
Shelley	Ohno	Black Tea	✓	5	$2.25
Elio	Nagase	Espresso con Panna	✓	8	$3.25
Nancy	Davolio	Caffe Latte	✓	10	$4.50
Andrew	Rossi	Espresso Truffle	☐	3	$1.75
Guylene	Davolio	Caffe Espresso	✓	5	$3.00
Yoshi	Saylor	Caffe Americano	☐	5	$2.50
		Count:200 Cappuccino Items:12	In Stock:95 Not In Stock:105	Min: 1 Max: 11	Sum:$624.10 Avg:$3.12

More details about `jqWidget`'s widgets are specified in Chapter 12.

1-12. About Eclipse IDE

Eclipse is an open source integrated development environment (IDE) that provides features like folder structure creation, suggestions, auto-complete, and the ability to check code in and out from commonly used source control repositories like Subversion. Eclipse installation is optional. In place of Eclipse, you can use any text editor or other IDE tools like Microsoft Visual Studio.

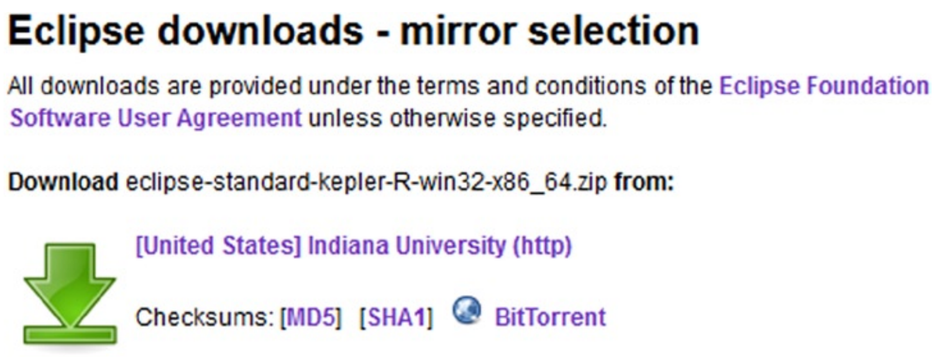
To download Eclipse, go to `http://www.eclipse.org/downloads/`. Figure 1-3 displays the latest version of eclipse available at the time of writing of this book.


Eclipse Kepler (4.3) Packages for Windows
Eclipse Standard 4.3, 198 MB
Downloaded 2,040,178 Times Other Downloads
Windows 32 Bit
Windows 64 Bit

The Eclipse Platform, and all the tools needed to develop and debug it: Java and Plug-in Development Tooling, Git and CVS...

Figure 1-3. *Eclipse version*

Check the appropriate Windows 32-Bit or Windows 64-Bit link, depending on your Windows operating system. Figure 1-4 displays the page when "Windows 64 Bit" link is clicked.


Eclipse downloads - mirror selection

All downloads are provided under the terms and conditions of the Eclipse Foundation Software User Agreement unless otherwise specified.

Download eclipse-standard-kepler-R-win32-x86_64.zip from:

[United States] Indiana University (http)

Checksums: [MD5] [SHA1] BitTorrent

Figure 1-4. *Eclipse 64 Bit downloadable file*

Click on the down arrow to download and save the file. Extract the folders and files from the downloaded file called `eclipse-standard-kepler-R-win32-x86_64.zip` using Winzip or any other compression/decompression utility. Save the extracted files and folders under `c:\eclipse` or any other folder you prefer. You can run eclipse by double clicking eclipse.exe.

Summary

This chapter was a high-level overview of technologies used to develop static and dynamic web and mobile applications. It introduced JavaScript, jQuery, jQueryUI, `jqWidgets`, and jQueryMobile, which are used to create a rich user interface. It also covered web services (SOAP and RESTful), XML, and JSON, which are used to transfer information between tiers within the same infrastructure or within infrastructures spread across the globe. The following chapters will use these technologies to understand how different sub-components of an application are designed, built, and implemented.

CHAPTER 2

jQuery Fundamentals

This chapter covers the fundamentals of the jQuery library, including the following topics:

- How to access jQuery library functionalities
- Using conditional statements
- Looping
- The structure of the Document Object Model (DOM)
- Commonly used objects in the jQuery library
- jQuery functions
- Method chaining

2-1. Setting Up jQuery

As with any other JavaScript library, if you want to access functionalities of the jQuery library, you need to include the jQuery JavaScript file. There are two ways to include the jQuery JavaScript library in an HTML file:

- **Using a local file**—The jQuery library can be downloaded from `http://jquery.com/download/`. At the time of this writing, the latest version of jQuery was 2.1.0. Download the compressed (production) version of the library if you don't intend to modify or debug the jQuery JavaScript code. Otherwise, you can download the uncompressed (development) version.

  If your user base is still using Internet Explorer 8 or older, download the latest version of jQuery 1.x. You should download the latest version of jQuery 2.x if your user base is using Internet Explorer 9 (or newer) or any other new version of browsers such as Firefox, Google Chrome, and Apple Safari.

- **Using the Content Delivery Network (CDN)**—CDN is a distributed network of servers that hosts open source libraries like jQuery. When a request is made in a browser to access the jQuery library, CDN identifies the closest server and provides the jQuery JavaScript file to the browser.

The advantages of using CDN include:

- If another application has already used the CDN to locate the jQuery JavaScript file, the chances are the file is in the browser's cache. If it is in the cache, that copy of the library will be used; otherwise it will be downloaded from the closest server.
- Has a faster download since the closest server is used to deliver the file.

The only problem with using CDN is that if an Internet connection is not available, the web page won't work. This is an issue for developers who sometimes want to develop and test their sites offline.

Setting Up the Development Environment

Before you start a new project, you need to set up the development environment folder structure so that files with a similar purpose are in the same folder and are easy to find. For example, all JavaScript library files should be in the `scripts` folder, all images should be in the `images` folder, and all CSS files and image files used in the CSS should be in the `styles` folder. To set up your development environment, create a new folder (called for example, `jQueryLearn`) where you want to keep all your HTML (.htm and .html) files and folders that contain JavaScript (.js) files, CSS (.css) files, and image (.jpg, .png, .bmp, and so on) files.

The structure of your development environment should follow this:

- jQueryLearn/
    - Images/*.png, *.gif, *.jpg, etc.
    - Scripts/*.js
    - Styles/*.css
    - Styles/images/*.png, *.gif, *.jpg, etc.
    - *.htm

Copy the downloaded jQuery compressed file called `jquery-2.1.0.min.js` in the `scripts/` folder.

Create a template HTML file in the `jQueryLearn` folder. You can use this `template.htm` file to create other HTML files. Listing 2-1 displays the content of the `template.htm` file.

Listing 2-1. Including jQuery library in the HTML page (the template.htm file)

```
<!doctype html>
<html lang="en">
   <head>
      <meta charset="utf-8">
      <script src="scripts/jquery-2.1.0.min.js"></script>
   </head>
   <body>
   </body>
</html>
```

Replace `jquery-2.1.0.min.js` with the jQuery library version you have downloaded and are planning to use. If you are planning to step through the jQuery library code during debugging, you should use an uncompressed development version of jQuery library.

If instead of using a local downloaded jQuery file, you want to use the CDN, include one of the following lines in your code:

```
<script src="http://ajax.googleapis.com/ajax/libs/jquery/2.1.0/jquery.min.js">
</script>
<script src="http://code.jquery.com/jquery-2.1.0.min.js">
</script>
```

2-2. Using Conditional Statements

There are two types of conditional statements—`if...else` and `switch`. The `if...else` statement is used if the value of the variable is checked only a few times. If the value of the same variable is checked many times and a different set of statements is executed, a `switch` statement is used. These conditional statements are not specific to the jQuery library, they are native to the JavaScript.

if...else Statements

Conditional statements tests whether a certain condition is true. If the condition is true, all the statements between the curly braces immediately after the `if` statement are executed. If the condition is false, all the statements between the curly braces immediately after the `else` statement are executed. If there is only one statement you want to execute when the condition is true or false, you don't need to specify the braces but it is preferable to use braces all the time.

In JavaScript and jQuery, the basic syntax for conditional statements is as follows:

```
if (condition) {
   // code segment if condition is true
 } else {
    // code segment if condition is false
  }
```

Listing 2-2 demonstrates the use of the `if...else` statement.

Listing 2-2. Using the if...else statement

```
<!DOCTYPE html>
<html lang="en">
   <head>
      <meta charset="utf-8">
      <script>
         function submitForm() {
          var firstName = document.getElementById("txtFirstName");

            if (firstName.value == "") {
               alert("Please enter First Name before submitting");
               return false;
            } else {
               // Perform some action
               alert("Form is successfully submitted");
               return true;
            }
         }
     </script>
   </head>
   <body>
      <form>
         First Name: <input id="txtFirstName" type="text"><br><br>
         <input type="button" value="Submit" onClick="submitForm()">
      </form>
   </body>
</html>
```

Figure 2-1 displays the page created by Listing 2-2 when viewed in a browser.

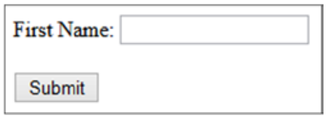


***Figure 2-1.** Using a conditional statement*

This code is binding the `submitForm()` function to the button's click event. When a user clicks the button, `submitForm()` function is executed. In the `submitForm()` function, you are first getting the input element with the ID `txtFirstName` using the `getElementById()` method and then checking its `value` property. If `value` is blank, `"Please enter First Name before submitting"` is displayed; otherwise `"Form is successfully submitted"` is displayed. Figures 2-2 and 2-3 show the pop-up messages that are displayed depending on the value entered for First Name.

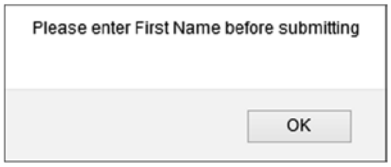

Please enter First Name before submitting

***Figure 2-2.** The message displayed when First Name is left blank*

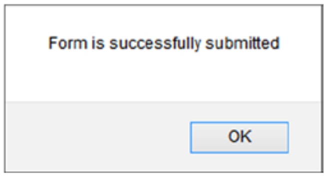

Form is successfully submitted

***Figure 2-3.** The message displayed when value is entered for First Name*

if ... if else ... else Statements

If the logic is more complex and you have to check multiple conditions, you can use the following syntax:

```
if (condition1) {
    // code segment if condition1 is true
} else if (condition2) {
    // code segment if condition2 is true
} else {
   // code segment if condition1 is not true and
   // condition2 is not true
}
```

Listing 2-3 demonstrates the use of an `if...else if...else` statement.

Listing 2-3. Using multiple conditional statements

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="utf-8">

   <script>
      function getDepartmentName() {
         var departmentID = document.getElementById("departmentID").value;
       var departmentName = "";

      if (departmentID == "") {
                 alert("Please enter Department ID");
      } else if (departmentID == "S")  {
                 departmentName = "Sales";
      } else if (departmentID == "M")  {
                 departmentName = "Marketing";
      } else if (departmentID == "T")  {
                 departmentName = "Technology";
      } else if (departmentID == "C")  {
                 departmentName = "Customer Support";
      } else {
                 departmentName = "Unknown";
      }
      document.getElementById("departmentName").innerHTML = departmentName;
     }
    </script>
</head>
<body>
      Department ID [S, M, T, C]:<input id="departmentID" type="text">
      <label id="departmentName"></label>
      <br>
      <input type="button" value="Get Department Name" onClick="getDepartmentName();">
</body>
</html>
```

Figure 2-4 displays the page when viewed in a browser.

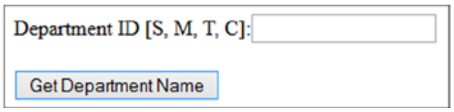


Figure 2-4. *Using multiple conditional statements*

This code binds the `getDepartmentName()` function to the button's click event. When a user clicks the button, the `getDepartmentName()` function is executed. In the `getDepartmentName()` function, you first get the input element with the ID `departmentID` using the `getElementById()` method and then check its `value` property. If `value` is blank, `"Please enter Department ID"` is displayed; otherwise, based on the value entered for the Department ID, `departmentName` is set. Its value is then used to set the `innerHTML` property of the label tag with an ID of `departmentName`. Figures 2-5 and 2-6 show the pop-up messages depending on the value entered for the Department ID.

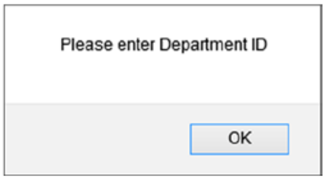

Please enter Department ID

Figure 2-5. *The message displayed when the Department ID is left blank*

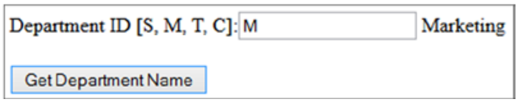

Department ID [S, M, T, C]: M Marketing

Figure 2-6. *The Department Name is displayed when a valid value is entered for the Department ID*

switch Statements

In place of multiple `if...else` statements, you can use the `switch` statement. In the case of the `switch` statement, the value of the expression is compared with the value of each `case` statement and if it matches, the following block of statements is executed until a `break` statement is encountered. If none of the `case` statements is true, the block of statements in the `default` statement will be executed. The `switch` statement is used in place of an `if...else` statement to make the code more organized and readable.

The syntax for a `switch` statement is:

```
switch(n) {
  case 1:
    // code segment if n == 1
    break;
  case 2:
    // code segment if n == 2
    break;
  default:
    // code segment if none of the above case statements is true
}
```

Listing 2-4 demonstrates the use of a `switch` statement.

Listing 2-4. Using the switch statement

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="utf-8">
   <script>
      function getDepartmentName() {
         var departmentID = document.getElementById("departmentID").value;
         var departmentName = "";

        switch (departmentID) {
                        case "": alert("Please enter Department ID");
                                     break;
                        case "S": departmentName = "Sales";
                                       break;
                        case "M": departmentName = "Marketing";
                                        break;
                        case "T": departmentName = "Technology";
                                       break;
                        case "C": departmentName = "Customer Support";
                                       break;
                        default:  departmentName = "Unknown";
                    }
       document.getElementById("departmentName").innerHTML = departmentName;
     }
    </script>
</head>
<body>
      Department ID [S, M, T, C]:<input id="departmentID" type="text">
      <label id="departmentName"></label>
      <br>
      <input type="button" value="Get Department Name" onClick="getDepartmentName();">
</body>
</html>
```

2-3. Looping

Loops are used when the same statements need to be executed for a range of values (each time with a different value from the range) or for each element in an array or in the collection of objects. A loop statement is also used when the same statements are executed until a condition becomes true. The two commonly used looping statements are `for` and `while`. These looping statements are not specific to the jQuery library; they are native to JavaScript.

for Loops

The `for` loop executes the same code segment for each element from a collection or for a number of times until a condition becomes true.