Chapter 1

Short Quiz 1

1. What method of accessing documents did Tim Berners-Lee create? What was noteworthy about his system?
   Hypertext linking. It was a way to easily access cross-referenced documents stored on a computer network.

2. What does W3C stand for? What does the organization do?

3. What are the codes in an HTML document called? What function do they serve?
   An HTML document is a text document that contains codes, called tags, which specify how the data in the document is treated by a web browser.
Short Quiz 2

1. In client/server architecture, what is a client? What is a server?

   The server is usually some sort of database from which a client requests information. A server fulfills a request for information by managing the request or serving the requested information to the client—hence the term, client/server. One of the primary roles of the client, or front end, in a two-tier system is the presentation of an interface to the user. The user interface gathers information from the user, submits it to a server, or back end, then receives, formats, and presents the results.

2. What does the middle tier do in a three-tier architecture?

   The middle tier handles the interaction between the web browser client and the data storage tier. Essentially, the client tier makes a request of a database on a web server. The processing tier performs any necessary processing or calculations based on the request from the client tier, and then reads information from or writes information to the data storage tier. The processing tier also handles the return of any information to the client tier.

3. What is ECMAScript? Why was it created?

   ECMAScript is an international, standardized version of JavaScript. It was created to ensure that all browsers implemented a common scripting language rather than using customized, incompatible variations.

Short Quiz 3

1. JavaScript code in an HTML document goes within which HTML element?

   script

2. Why should you end every JavaScript statement with a semicolon?

   The semicolon serves to identify the end of each statement, making it easier for a programmer to read his or her own code (and for other programmers to read the code later on). In addition, a JavaScript parser must perform additional work on a script without semicolons to determine where each statement ends, which can slow down a web page and detract from the user experience.

3. How do you create a single-line comment in JavaScript? How do you create a multiline comment in JavaScript?

   // a single-line comment starts with two slashes
   /* a multiline comment starts with a slash followed by an asterisk
      and ends with an asterisk followed by a slash */
Short Quiz 4

1. What is an identifier? What limits does JavaScript place on an identifier?
   The name you assign to a variable is called an identifier. You must observe the following rules and conventions when naming a variable in JavaScript:
   › Identifiers must begin with an uppercase or lowercase ASCII letter, dollar sign ($), or underscore (_).
   › You can use numbers in an identifier but not as the first character.
   › You cannot include spaces in an identifier.
   › You cannot use reserved words for identifiers.

2. What is the difference between declaring and initializing a variable?
   Using the `var` keyword to create a variable is called declaring the variable. When you declare a variable, you can also assign a specific value to, or initialize, the variable by adding an equal sign (=) after the variable name, followed by the value you're assigning to the variable.

3. How do you change the value of a variable?
   You can change a variable’s value at any point in a script by using a statement that includes the variable's name, followed by an equal sign, followed by the value you want to assign to the variable.

4. What is an event handler for?
   When an event occurs, your script executes any code that responds to that specific event on that specific element. This code is known as the event handler.

Short Quiz 5

1. Why should you place scripts at the end of an HTML document’s body section?
   The elements in an HTML document are rendered in the order in which they occur in the document, and each script is processed when the HTML element that contains it is parsed by a browser. When processing a script in the head section or in the middle of HTML content, most browsers do not continue rendering the web page until the script is loaded and executed. If a script is very large or complex, this could cause the page to be displayed with only some of its content and formatting until the script finishes loading. If you instead place your `script` elements just before the end of the body section, you allow browsers to render all the simple HTML content immediately on the user’s screen, and then load and process any JavaScript that works with...
Chapter 2

Short Quiz 1

1. What is the difference between a named function and an anonymous function?
   A named function is a set of related statements that is assigned a name. You can use this name to reference, or call, this set of statements in other parts of your code. An anonymous function, on the other hand, is a set of related statements with no name assigned to it. The statements in an anonymous function work only in a single context—the place in the code where they are located.

2. Why does a named function not execute automatically? How do you execute it?
   Creating a named function definition only names the function, specifies its parameters, and organizes the statements it will execute. To execute a named function, you must invoke, or call, it from elsewhere in your program. The code that calls a named function is referred to as a function call and consists of the function name followed by parentheses, which contain any variables or values to be assigned to the function parameters.

3. What alternatives exist to specifying an event handler using an HTML attribute?
   One alternative is to specify the function as a property value for the object representing the HTML element. Each element has an `on` event property for each event it supports. The other alternative is the `addEventListener()` method, which is available for every web page element.

4. How do you view any error messages that a browser might generate when processing your code?
   Browsers display error messages in a pane known as a browser console. You use either a keyboard shortcut or a menu command to make the browser console visible.
5. Why is it poor programming practice to declare a global variable inside of a function by not using the `var` keyword?

   It makes it harder to identify the global variables in your scripts. Using the `var` keyword forces you to explicitly declare your global variables outside of any functions and local variables within functions.

**Short Quiz 2**

1. What is the difference between an integer and a floating-point number?
   An integer is a positive or negative number with no decimal places. A floating-point number is a number that contains decimal places or that is written in exponential notation.

2. Which possible values can a Boolean variable have?
   `true` or `false`

3. What is an empty string?
   A zero-length string assigned as the value of a string variable.

4. Why do you sometimes need to insert an extra space in a string when using the concatenation operator?
   When values are concatenated, the last character of the first value is directly followed by the first character of the second value. If a space is needed between the two values, you need to add it.

**Short Quiz 3**

1. What is the difference between a binary operator and a unary operator?
   A binary operator requires an operand before and after the operator. A unary operator requires just a single operand either before or after the operator.

2. How does JavaScript deal with code that performs arithmetic operations on string values?
   When performing arithmetic operations on string values, a JavaScript interpreter attempts to convert the string values to numbers. However, JavaScript interpreters do not convert strings to numbers when you use the addition operator. When you use the addition operator with strings, the strings are combined instead of being added together.
3. **What is a comparison operator? What kind of value does it return?**

A comparison operator, or relational operator, is used to compare two operands and determine if one value is greater than another. A Boolean value of \textit{true} or \textit{false} is returned after two operands are compared.

4. **What is a falsy value? What are the six falsy values in JavaScript?**

A falsy value is a value that is treated in comparison operations as the Boolean value \textit{false}. The six falsy values in JavaScript are ",", -0, 0, NaN, null, and undefined.

**Short Quiz 4**

1. **When performing operations with operators in the same precedence group, how is the order of precedence determined?**

   The order of precedence is determined by the operator’s associativity, which is the order in which operators of equal precedence execute. Associativity is evaluated from left-to-right or right-to-left, depending on the operators involved.

2. **How is the expression 5 + 2 * 8 evaluated? Explain your answer.**

   The numbers 2 and 8 are multiplied first for a total of 16, then the number 5 is added, resulting in a total of 21. This is because the * operator has higher precedence than the + operator.

**Chapter 3**

**Short Quiz 1**

1. **How is an array different from a standard variable?**

   An array contains a set of data represented by a single variable name. An array is like a collection of variables contained within a single variable.

2. **How do you create a new empty array?**

   ```javascript
   var arrayName = [];
   ```

   or

   ```javascript
   var arrayName = new Array(number of elements);
   ```

3. **How do you access an individual element in an array?**

   ```javascript
   array_name[index]
   ```
4. What property do you use to determine the number of elements in an array?
   
   *length*

5. How do you use a browser to check the value of a specific array element?

   Open the browser console, and then at the command line enter the array name followed by the index number for the array element in brackets.

### Short Quiz 2

1. What is the role of a counter in a repetition statement?

   To ensure that a *while* statement ends after the desired tasks have been performed, you must include code that tracks the progress of the loop and changes the value produced by the conditional expression. You can track the progress of a *while* statement, or any other loop, with a counter. A counter is a variable that is incremented (increased) or decremented (decreased) with each iteration of a loop statement.

2. What are the differences between a *while* and *do/while* statement?

   Unlike the simpler *while* statement, the statements in a *do/while* statement always execute at least once, before the conditional expression is evaluated the first time.

3. Which repetition statement allows you to initialize a counter variable as part of its syntax?

   *for*

4. How do you force a new iteration of a loop even when its condition evaluates to a falsy value?

   You use a *continue* statement.

### Short Quiz 3

1. What does an *if* statement do when its condition evaluates to a falsy value?

   If the condition evaluates to a falsy value, the *if* statement command block is skipped, and the program continues on to execute any statements after the command block.

2. What can you do with an *if/else* statement that you can't do with an *if* statement?

   You can execute one set of statements when a condition evaluates to a truthy value and another set of statements when the condition evaluates to a falsy value.
3. Why would you nest decision-making statements?

You use nested if and if/else statements to perform conditional evaluations that must be executed after the original conditional evaluation.

4. How do you specify possible values for the expression in a switch statement?

The switch statement compares the value of an expression to a value contained within a special statement called a case label. A case label in a switch statement represents a specific value.

5. What statement should you include at the end of the code for each case label in a switch statement? Why is it important to include this statement?

To ensure that your switch statements perform as expected and that fallthrough does not occur, the last statement for each case label should be break;. A break statement is a special kind of statement that is used to end the execution of a switch statement. To end a switch statement once it performs its required task, include a break statement at the end of the statements associated with each case label.

Chapter 4

Short Quiz 1

1. Explain the difference between syntax errors, run-time errors, and logic errors. Provide an example of each.

Syntax errors occur when the interpreter fails to recognize code. For example, if a programmer attempts to use a method that does not exist or omits a method’s closing parenthesis, the scripting engine generates a syntax error.

A run-time error occurs when the JavaScript interpreter encounters a problem while a program is executing. Run-time errors differ from syntax errors in that they do not necessarily represent JavaScript language errors. Instead, run-time errors occur when the interpreter encounters code that it cannot execute. For example, consider the statement createRecommendation();, which calls a custom JavaScript function. This statement does not generate a syntax error, because it is legal (and usually necessary) to create and then call custom functions in a JavaScript program. However, if your program includes the call statement but does not include code that creates the function in the first place, your program generates a run-time error. The error occurs when the interpreter attempts to call the function and is unable to find it.
A logic error is a flaw in a program’s design that prevents the program from running as you anticipate. One example of a logic error is the creation of an infinite loop, in which a loop statement never ends because its conditional expression is never updated or is never false.

2. Where can you find error messages in a browser?
In the browser’s console.

3. Suppose your browser console lists a single error, which you find and fix. Why is it important to save your work and reload the page in the browser?
Generally when a browser encounters a syntax error, the browser is unable to process any JavaScript code that follows the error. Because there are a number of possible reasons for—and ways of fixing—any given error, the processor can no longer reliably parse the code that comes after the error. Therefore, saving and reloading a page after fixing an error may uncover additional errors.

Short Quiz 2

1. What are the two different statements you can add to your code to provide you with additional information while you’re debugging?
   window.alert()
   console.log()

2. What statement would you use to log the text “itemTotal: ” plus the value of the itemTotal variable to the console?
   console.log("itemTotal: " + itemTotal);

3. When is commenting out code useful in debugging?
   Commenting out code is useful when you have narrowed down an error to a specific part of the code but don’t know exactly which line or lines contain the error.

Short Quiz 3

1. What is a breakpoint? How do you set a breakpoint?
   A breakpoint is a designation added to a specific statement in a program that causes program execution to pause when it reaches that statement. To set a breakpoint, you click the line number for the line where program execution should stop.
2. Explain the differences between stepping in (or into), stepping over, and stepping out.

Stepping in or stepping into, executes an individual line of code and then pauses until you instruct the debugger to continue. This feature gives you an opportunity to evaluate program flow and structure as code is being executed.

As you use the Step Into button to move through code, the debuggers stop at each line within every function of the JavaScript program. However, when stepping through a program to trace a logical error, it is convenient to be able to skip functions that you know are functioning correctly. The second option, known as stepping over, allows you to skip function calls. The program still executes each function that you step over, but it appears in each debugger as if a single statement executes.

The final option, stepping out, executes all remaining code in the current function. If the current function was called from another function, all remaining code in the current function executes and the debugger stops at the next statement in the calling function.

3. What is the call stack? How do you use it in debugging?

The call stack is the ordered list maintained by a JavaScript processor containing all the procedures, such as functions, methods, or event handlers, that have been called but have not yet finished processing. Each time a program calls a procedure, the procedure is added to the top of the call stack and then removed after it finishes executing. The ability to view a list showing the contents of the call stack is very useful when tracing logic errors in large programs with multiple functions. Viewing the call stack, along with using tracing commands, makes it easier to locate the specific function causing the problem.

Short Quiz 4

1. When is it necessary to include exception handling in your code? Give an example.

You use exception handling to test any type of input or functionality that is external to a program. The main reason for using exception handling in JavaScript is to evaluate user input.

2. What statement in the code to handle an exception do you use to specify an error message?

throw
3. **How do you reference a previously generated error message in a `catch()` statement?**

   Whatever argument name you specify when creating the `catch` statement is the variable name you use within `statements` to refer to the text of the thrown exception.

### Short Quiz 5

1. **How can code editors designed for web development help you in identifying errors in your HTML?**

   These editors automatically highlight syntax errors in HTML, CSS, and JavaScript code as you type. This means that rather than needing to scrutinize each line of code, you can count on the editor to visually draw your attention to any errors it identifies—often even before you test your code.

2. **What code would you enter on the command line to declare a variable named `cost` with a value of 75, and then log to the console the result of multiplying the `cost` variable by 1.2?**

   ```javascript
   var cost = 75; cost*1.2;
   ```

3. **Explain how coding in strict mode can help you write better code.**

   For debugging purposes, it can be useful to develop and test all your code using strict mode. This not only helps you notice issues in your code that may be causing problems, but it also helps you strengthen your coding techniques to use current best practices, rather than relying on some parts of the language that are still technically part of the specification but whose use is not generally recommended.

### Chapter 5

### Short Quiz 1

1. **What is the `Window` object?**

   The `Window` object represents a web browser window. The `Window` object is called the global object because all other objects in the browser object model are contained within it.

2. **What is the DOM?**

   The `Document` object branch of the browser object model is represented by its own object model called the Document Object Model, or DOM. Unlike the BOM, which is a loose standard, the DOM is a formal specification of the World Wide Web Consortium (W3C), like HTML and CSS.
3. What is the difference between the Window object and the Document object? What is the relationship between the two?

JavaScript specifies the objects, properties, and methods of the browser and the relationship between them through a specification called the browser object model (BOM). One part of the BOM, the Document object, represents the contents of a document within the browser. Because the Document object is where many of the changes happen in a dynamic web page, this object has its own object model, known as the document object model (DOM).

Short Quiz 2

1. What statement would you use to create a variable named logo and assign as its value a reference to the element with the id value logoImage?

   var logo = getElementById("logo");

2. What statement would you use to create a variable named firstPriority and assign as its value a reference to the first li element in the document?

   var firstPriority = getElementsByTagName("li")[0];

3. What statement would you use to create a variable named language and assign as its value the value of the lang attribute of the html element?

   var language = document.getElementsByTagName("html")[0].lang;

4. What statement would you use to change the value of the lang attribute of the html element to the value of the language variable?

   document.getElementsByTagName("html")[0].lang = language;

Short Quiz 3

1. What statement creates a new footer element?

   document.createElement("footer");

2. Name two methods you can use to add a node to the DOM tree, and explain the difference between them.

   appendChild()

   insertBefore()

   A node added with appendChild() is always appended after any existing child nodes. The insertBefore() method allows you to specify the order of the inserted node among its sibling nodes.
3. How would the results of the following two statements differ?

```javascript
drive.cloneNode(true);
drive.cloneNode(false);
```

The `true` argument indicates that the cloned node should include any child nodes of the specified node, while the `false` argument indicates that only the specified parent node should be cloned.

**Short Quiz 4**

1. What statement do you use to create a new, blank window?

```javascript
window.open();
```

2. What happens if your apps include JavaScript code that opens a new window or tab without a request from the user?

   The pop-up blocker feature built into the current versions of all major browsers will prevent the window or tab from opening.

3. What extra step do you need to take in code to create a new window if you want to be able to control the new window from the window that created it?

   If you want to control the new window by using JavaScript code located within the web browser in which it was created, then you must assign the new `Window` object created with the `window.open()` method to a variable.

**Short Quiz 5**

1. Provide two statements that display the previous page in the browser history.

```javascript
history.back();
history.go(-1);
```

2. What is the effect of the statement `location.reload(true);`?

   This statement forces the current web page to reload from the server where it is located, even if no changes have been made to it.

3. What types of information can you access using the `Screen` object?

   The `Screen` object is used to obtain information about the display screen's size, resolution, and color depth.
Chapter 6

Short Quiz 1

1. Describe two common uses of JavaScript with forms.

JavaScript is commonly used with forms for two reasons: to add functionality that makes forms easier for users to fill out, and to validate or process the data that a user enters before that data is submitted to a server-side script.

2. Name two advantages of identifying form elements using the `getElementById()` method rather than by specifying their index numbers within the form.

One advantage of referencing form objects using methods such as `getElementById()` rather than the `forms` collection is that you don't need to switch between using one syntax for referencing form objects, and another syntax for non-form objects. In addition, using Document object methods makes your code more flexible when you need the same code to be able to refer to both form and nonform elements. Finally, use of the `name` attribute is not allowed in the strict DTD for XHTML, so if you’re writing JavaScript to work with XHTML documents, you cannot use the forms array or other browser arrays.

Short Quiz 2

1. If you were designing a form with a question that asked users if they owned a bicycle, would you expect more accurate input using a text input box or a check box? Why?

A check box would provide more accurate input. It would allow users to respond only yes (checked) or no (unchecked). If users had to respond by typing in a text input box, they might misspell their input, or enter text that’s not easily interpretable as yes or no.

2. What property do you use to change the selected option element in a selection list? What value do you use to specify that no option element is selected?

`selectedIndex`

-1
Short Quiz 3

1. List two attributes that specify parameters for browser-based validation in child elements of a form, and describe what each does.
   See Table 6-12

2. List a value for the type attribute of the input element that triggers browser-based validation, and describe what content browsers check for.
   See Table 6-13

3. What is the constraint validation API?
   A set of properties and methods that enable you to customize many aspects of the way browsers present browser-based validation feedback.

4. What is one drawback of using browser-based validation?
   No aspect of bubble appearance aside from text is customizable, meaning that the color, shape, and size varies among browsers.
   Browser-based validation doesn’t allow you to set multiple validation messages.

Short Quiz 4

1. Which event fires when a form is submitted?
   submit

2. What method do you use to disable the default behavior associated with an event?
   preventDefault()  

3. What property do you check to determine if a text input box contains user input?
   value

4. What built-in JavaScript function do you use to test whether a value is not a number?
   isNaN()
Chapter 7

Short Quiz 1

1. What is object-oriented programming? What is an object?
   Object-oriented programming (OOP) refers to the creation of reusable software objects that can be easily incorporated into multiple programs. The term “object” specifically refers to programming code and data that can be treated as an individual unit.

2. Name at least two built-in JavaScript classes.
   Arguments, Array, Boolean, Date, Error, Function, Global, JSON, Math, Number, Object, RegExp, String

Short Quiz 2

1. What code creates a dateToday variable and assigns the current date and time as its value?
   ```javascript
   var dateToday = new Date();
   ```

2. Which method of the Number class do you use to convert a number to a string that is formatted with local numeric formatting style?
   ```javascript
   toLocaleString()
   ```

3. What is the result of applying the floor() method of the Math class to a numeric value?
   The value is rounded to the next lowest integer.

Short Quiz 3

1. What statement would you use to create a new empty object with the name manifest using an object literal?
   ```javascript
   var manifest = {};
   ```

2. What statement would you use to add a property named itemNum to the manifest object, and assign the property a numeric value of 1501?
   ```javascript
   manifest.itemNum = 1501;
   ```

3. What single statement would you use to create a new empty object with the name manifest that includes a property named itemNum with a value of 1501?
   ```javascript
   var manifest = {
       itemNum: 1501
   };
   ```
Chapter 8

Short Quiz 1

1. What string property returns the number of characters in a string?

   length

2. Explain which values you provide for the two arguments of the substring() and slice() methods.

   In both cases, you pass to the method the starting index and ending index of the characters you want to extract.

3. In the expression var result = sourceString.localeCompare(compareString), what are the possible return values and what does each mean?

   The possible return values are a negative value (usually -1), 0, and a positive value (usually 1). A return value of 0 means that sourceString and compareString are equivalent. A return value of -1 means that compareString sorts after sourceString. A return value of 1 means that compareString sorts before sourceString.

Short Quiz 2

1. How do you use the test() method of the RegExp object to check a string against a regular expression?

   The test() method returns a value of true if a string contains text that matches a regular expression or false if it doesn't. The syntax for the test() method is

   var pattern = test(string);

2. What is an anchor in a regular expression? What two characters are used as anchors?

   A pattern that matches the beginning or end of a line is called an anchor. The ^ metacharacter matches characters at the beginning of a string, and the $ metacharacter matches characters at the end of a string.

3. What characters surround a subexpression?

   ()

4. What characters surround a character class?

   []
Short Quiz 3

1. When you use the `slice()` method, you provide two values as arguments. Explain what these two values signify.

   The first argument indicates the start position within the array to begin extracting elements. The second argument is an integer value that indicates the number of elements to return from the array, starting with the element indicated by the first argument.

2. What is the difference between the `shift()` and `unshift()` methods?

   The `shift()` method removes and returns the first element from the beginning of an array, whereas the `unshift()` method adds one or more elements to the beginning of an array.

3. How do the `pop()` and `push()` methods work?

   The `pop()` method removes the last element from the end of an array, whereas the `push()` method adds one or more elements to the end of an array. You append the `pop()` method to the name of the array whose last element you want to remove. You append the `push()` method to the name of an array and pass to the method a comma-separated list of values for the elements you want to add.

Short Quiz 4

1. Which method do you use to convert a string to an array? Which object is this a method of?

   `split()`

   String

2. What is the difference between the `toString()` and `toLocaleString()` methods of the `String` object?

   You can use the `toString()` and `toLocaleString()` methods to convert an array to a string. The `toString()` method automatically separates converted array elements with commas. The `toLocaleString()` method formats the returned string according to the conventions of the user's language or country and also automatically separates each converted array element with that locale's separator character.

3. What is JSON? What is it used for?

   JavaScript Object Notation (JSON) is a data format that represents a JavaScript object as a string. JSON is commonly used to send data from an application to a server, or from a server to an application.
Chapter 9

Short Quiz 1

1. How do you reference a passed query string in your code?
   
   The `search` property of the `Location` object contains a URL's query or search parameters.

2. How is data in a query string separated from a URL? How are individual name-value pairs distinguished within a query string?
   
   A query string is separated from a URL with the `?` character.
   
   Individual name-value pairs are separated within a query string by the `&` character.

3. How is a hidden form field different from other form fields?
   
   A hidden form field is not displayed by web browsers and, therefore, allows developers to hide information from users. Hidden form fields temporarily store data that needs to be sent to a server along with the rest of a form, but that a user does not need to see.

Short Quiz 2

1. What are the two main types of cookies? What is the difference between them?
   
   Cookies can be temporary or persistent. Temporary cookies remain available only for the current browser session. Persistent cookies remain available beyond the current browser session and are stored in a text file on a client computer.

2. How do you delete a cookie in your code?
   
   To delete a cookie, you must set its expiration to a date in the past.

3. What are some advantages of using Web Storage rather than cookies? Why might a developer choose to continue using cookies?
   
   Creating, reading, and removing cookies requires complex code that's not always straightforward. In addition, all cookies are sent to the server with each HTTP request. Storing and reading data with Web Storage is much more straightforward than using cookies.
   
   Because Web Storage is not supported by a number of older browser versions, cookies are still the standard for storing information on the client about a user's interactions with a web server.
1. **What is a code injection attack?**

   JavaScript code on a web page that is not written securely is vulnerable to a code injection attack, in which a program or user enters JavaScript code that changes the function of the web page. For instance, a malicious program could open a web page containing a form and enter JavaScript code in one of the form fields designed to retrieve sensitive information from the server. Such a program could then relay this information to a person other than the owner.

2. **What is the same origin policy?**

   Under the same origin policy, windows and tabs can view and modify the elements and properties of documents displayed in other windows and tabs only if they share the same protocol (such as HTTP) and exist on the same web server.

3. **What is a third-party script? How do you include one in a web document?**

   A third-party script is a script from another domain that you want to run on your web pages.

   To enable a third-party script in a web document, you simply include a `script` element with a `src` value pointing to the third-party content. The same origin policy limits scripts to those referenced by HTML documents from the original web server; this enables web pages to use third-party scripts.

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**Chapter 10**

**Short Quiz 1**

1. **What is a touch cascade?**

   Mobile operating systems consider elements such as links and form elements to be clickable. On these elements, mobile browsers respond to a touch by initiating a touch cascade. In a touch cascade, a browser checks a touched element for an event handler for multiple events, including some mouse events.

2. **What is the difference between touch events and pointer events?**

   Touch events, as the name implies, focus on responding to a user’s finger touches on a touchscreen. Pointer events aim to handle input from a mouse, finger, or stylus with each event.
3. Why do touch events not support `clientX` and `clientY` properties? What do they use instead of these properties?

Touch events are built to support multitouch devices, which allow for multiple touches on the screen at the same time. Therefore, touch events don't include `clientX` or `clientY` properties as direct children. Instead, each touch event has the properties `touches`, `targetTouches`, and `changedTouches`, each of which contains an array of coordinates.

**Short Quiz 2**

1. What is the parent object of the `geolocation` property?

   `Navigator`

2. Why is it useful to add a second timeout to supplement the timeout in the `getCurrentPosition()` method?

   In most browsers, the `getCurrentPosition()` timeout takes effect only after a user has granted permission for your app to access location data. If a user ignores or doesn't notice the request, this timeout never starts counting. In addition, some browsers offer users the option of saying “Not now” to the permission request, instead of “Never,” and these browsers treat a “Not now” answer the same as they would treat a lack of response to the request. Therefore, your code must include one additional layer to deal with this scenario.

3. Why do you need to use an additional API, such as the Google Maps API, to display a map based on geolocation information?

   You have to integrate the geolocation information with databases and JavaScript functionality that can identify the location specified by your geographic coordinates and illustrate that location on a map.

**Short Quiz 3**

1. Why is it useful to test mobile web apps on services that run on a desktop computer?

   Developers don't all have the resources to build and maintain a collection of mobile devices for testing. A number of services are available online that enable users to interact with virtual versions of many mobile devices.

2. Why is it important to minimize the download size of your mobile web app?

   First, although mobile devices can connect to the Internet via a home network with a fast connection, many mobile users access the web when connected to the mobile...
networks of their wireless providers (such as AT&T or Verizon). While mobile speeds are increasing on a regular basis, most are still significantly slower than the fastest home broadband connections. Therefore, to ensure that users can view and use your web app on a mobile network soon after they request it, your app should require users to download as little data as possible.

The other reason it’s important to limit the amount of data that mobile users must download is that many mobile broadband plans include data caps that limit the amount of data a user can download each month. Many users purchase monthly plans that provide a set amount of data transfer every month for activities like viewing web pages and checking email, and these users want to avoid being charged extra by their providers or having their access cut off if they hit the limit. Your app can support its users in this goal by downloading only the minimum amount of data necessary for the current task.

3. What does it mean to minify a file?

In a large web app, it’s important for developers to remove every unneeded character to reduce the download size as much as possible. One commonly used method is minifying files, which removes comments, indents, and line breaks, and tweaks code in other ways to make it smaller.

Chapter 11

Short Quiz 1

1. Name two data formats that can be used with Ajax.

   JSON and XML.

2. What does the XMLHttpRequest object do?

   The XMLHttpRequest object—commonly referred to as the XHR object—uses HTTP to exchange data between a client computer and a web server. Unlike standard HTTP requests, which usually replace the entire page in a web browser, the XMLHttpRequest object can be used to request and receive data without reloading a web page.

3. Explain the relationship between a proxy and JavaScript’s same-origin policy when creating an Ajax request.

   The same-origin policy restricts how JavaScript code in one tab (or window or frame) accesses a web page in another tab on a client computer. For tabs to view and modify the elements and properties of documents displayed in other tabs, they must use the same protocol (such as HTTP) and exist on the same web server. Historically, an Ajax app that used JavaScript could not use the XMLHttpRequest object to directly access
content on another domain’s server; the data requested with the XMLHttpRequest object had to be located on the web server where the JavaScript program was running. In other words, you could not directly bypass your own web server and grab data off someone else’s web server. The same-origin policy applies only to JavaScript, and not to other programs running on a web server. This means that you can use a server-side script as a proxy to access data from another domain. In computer terms, a proxy refers to a server that acts for or performs requests for other clients and servers. The server-side proxy script can return the data to the client computer as it is requested with the XMLHttpRequest object. Using a proxy remains a common technique for working around the same-origin policy to access third-party content.

**Short Quiz 2**

1. How many lines does an HTTP message have, and what is the content of each line?
   
   4 lines.
   
   › Start line (request method or status returned)
   › Header lines (zero or more)
   › Blank line
   › Message body (optional)

2. What is the function of the Cache-Control header, and what value should you generally specify for this header when requesting data with Ajax?

   The Cache-Control header specifies how a web browser should cache any server content it receives. Caching refers to the temporary storage of data for faster access. Most web browsers try to reduce the amount of data that needs to be retrieved from a server by caching retrieved data on a local computer. If caching is enabled in a web browser, the browser will attempt to locate any necessary data in its cache before making a request from a web server. While this technique improves web browser performance, it goes against the reason for using Ajax, which is to dynamically update portions of a web page with the most recent data from a server. For this reason, you should always include the Cache-Control header when creating an Ajax connection, and you should assign it a value of no-cache.

3. Explain the meaning of the HTTP status codes 304 and 404.

   304: Not Modified. The client already has the current version of the requested content.

   404: Not Found. The requested URL was not found.
Short Quiz 3

1. What is the purpose of keeping an HTTP connection open and reusing it, rather than closing it?

Opening and closing HTTP connections represent a significant bottleneck in loading a web page, increasing the amount of time it takes for a document to load. To improve performance between client requests and server responses, HTTP/1.1 automatically keeps the client-server connection open until the client or server explicitly closes it by assigning a value of close to the Connection header. This means that you can make your Ajax programs faster by reusing an instantiated XMLHttpRequest object instead of re-creating it each time you send a server request.

2. What method should you call before beginning a new HTTP request using an existing XMLHttpRequest object, and why?

When you reuse an existing XMLHttpRequest object, it may already be in the process of sending a request to the server. To improve performance, you should call the abort() method of the XMLHttpRequest object to cancel any existing HTTP requests before beginning a new one.

3. What XMLHttpRequest property references the non-XML results of an HTTP request?

responseText

Short Quiz 4

1. What is the first step in working with the contents of a JSON string returned as the value of the responseText property?

To work with the contents of a JSON string, you first use the parse() method of the JavaScript JSON object to convert the string to an object.

2. What is the difference between a synchronous and an asynchronous request?

A synchronous request stops processing the JavaScript code until a response is returned from the server. An asynchronous request allows JavaScript to continue processing while it waits for a server response.

3. To ensure that your script continues running if a server problem occurs, should you use a synchronous or asynchronous request? Why?

To ensure that your script continues running if a server problem occurs, you should use asynchronous requests with the send() method.
Although synchronous responses are easier to handle than asynchronous responses, one major drawback is that a script will not continue processing until a synchronous response is received. Therefore, if the server doesn’t respond for some reason (perhaps because it is running slowly due to high traffic or maintenance requirements), your web page will appear to be unresponsive. Users can stop the script by clicking the browser’s Stop button. However, a synchronous request with the `send()` method does not contain any mechanism for specifying the length of time allowed for receiving a response.

**Short Quiz 5**

1. **What is JSON-P? What is CORS?**

   JSON with padding, or JSON-P, requests JSON content using a `script` element rather than an `XMLHttpRequest` object. With Cross-Origin Resource Sharing, or CORS, the server for a web service sends a special HTTP response header that indicates that the response data may be used on other domains.

2. **List at least one advantage and one disadvantage of using XHR with a proxy, JSON-P, and CORS.**

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>XHR with proxy</td>
<td>Enables use of XHR object for any request.</td>
<td>Requires web server configuration.</td>
</tr>
<tr>
<td></td>
<td>Can be used with XML, JSON, or other text data.</td>
<td>Requires knowledge of PHP.</td>
</tr>
<tr>
<td></td>
<td>Supported by almost all browsers in use.</td>
<td></td>
</tr>
<tr>
<td>JSON-P</td>
<td>Allows direct request without a proxy.</td>
<td>Response data must be JSON.</td>
</tr>
<tr>
<td></td>
<td>Supported by almost all browsers in use.</td>
<td>Any password or API key is exposed to the end user.</td>
</tr>
<tr>
<td>CORS</td>
<td>Allows direct request without a proxy.</td>
<td>Not yet widely supported by web services.</td>
</tr>
<tr>
<td></td>
<td>Can be used with XML, JSON, or other text data.</td>
<td>Not supported by IE8 or IE9.</td>
</tr>
<tr>
<td></td>
<td>Purpose-built, not a workaround.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supported by current versions of all modern browsers.</td>
<td></td>
</tr>
</tbody>
</table>

3. **Describe the potential security implications of using JSON-P.**

   It’s important to recognize that incorporating content from another domain using JSON-P opens a potential security hole in your website. If the site from which you’re
requesting data is compromised by malicious code, the content you receive from that site is a potential route to attack your site as well. For this reason, it’s important to use JSON-P only with a web service that you trust.

In addition, a JSON-P request that requires authentication, such as a password or API key, exposes these sensitive credentials to end users. For this reason, you should generally use JSON-P that requires authentication only with trusted users, such as in an app that is used only by your organization’s employees.

Chapter 12

Short Quiz 1

1. **What is the first step in using jQuery in a project?**
   
The first step in using jQuery is to link the .js file that contains the library to your HTML document.

2. **How does every jQuery statement start?**
   
Every jQuery statement begins with $. The $ symbol specifies that any code that follows should be interpreted using the jQuery library.

3. **How do you select elements in jQuery?**
   
To select elements in jQuery, you specify a CSS selector, contained in quotes.

Short Quiz 2

1. **What argument do all jQuery animation methods take?**
   
All jQuery animation methods take a value in milliseconds as an argument, allowing you to specify the time frame over which the animation should occur.

2. **What is the difference between using the jQuery addClass() method and the show() method to display an element with the display property value set to none?**
   
Using the addClass() method requires that you define a class in your style sheet that sets the display property value to none. When you use the show() method, jQuery changes the property value automatically, without requiring any additional code in your style sheet.