JavaScript, Sixth Edition

Chapter 3 Solutions

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.

1. How do you create a new empty array?

var *arrayName* = [];

or

var *arrayName* = new Array(*number of elements*);

1. How do you access an individual element in an array?

*array\_name*[*index*]

1. What property do you use to determine the number of elements in an array?

length

1. 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.

1. 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.

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

for

1. 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.

* 1. 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.

* 1. 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.

* 1. 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.

* 1. 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.

# Review Questions

1. What is the correct syntax for creating an empty array named taxRules?
   1. var taxRules = {};
   2. var taxRules;
   3. var taxRules = [];
   4. var taxRules[5];
2. Which of the following statements adds the value “oak” as the third element of the trees array?
   1. trees += "oak";
   2. trees += "","","oak";
   3. trees[2] = "oak";
   4. trees[3] = "oak";
3. Which of the following properties returns the number of elements in an array?
   1. length
   2. size
   3. elements
   4. indexes
4. Which characters are used to create a command block?
   1. ( )
   2. [ ]
   3. { }
   4. <>
5. You track the progress of a loop with a(n) \_\_\_\_\_\_\_\_\_.
   1. counter
   2. iteration
   3. increment
   4. decrement
6. The statements in a(n) \_\_\_\_\_\_\_ statement always execute at least once.
   1. for
   2. do/while
   3. switch
   4. if
7. If you do not include code that changes the counter value in a loop statement, your program will be caught in a(n) \_\_\_\_\_\_\_\_\_\_.
   1. iteration
   2. condition
   3. fallthrough
   4. infinite loop
8. When is a for statement initialization expression executed?
   1. When the for statement begins executing
   2. With each repetition of the for statement
   3. When the counter variable is incremented
   4. When the for statement ends
9. The parentheses at the start of a(n) \_\_\_\_\_\_ statement can include code that initializes a counter and changes its value with each iteration.
   1. while
   2. do
   3. do/while
   4. for
10. The \_\_\_ statement halts a looping statement and restarts the loop with a new iteration.
    1. restart
    2. continue
    3. break
    4. halt
11. An if statement can include multiple statements provided that they \_\_\_.
    1. execute after the if statement’s closing semicolon
    2. are not contained within a command block
    3. do not include other if statements
    4. are contained within a command block
12. A simple if/else statement enables you to specify code for \_\_\_\_ alternatives.
    1. 2
    2. 3
    3. 4
    4. unlimited
13. The \_\_\_\_\_\_\_ statement is equivalent to the conditional operator (?:).
    1. if
    2. if/else
    3. nested if
    4. switch
14. A switch statement compares the value of an expression to a value contained in a(n) \_\_\_\_\_\_\_.
    1. default label
    2. case label
    3. fallthrough
    4. break statement
15. When the value returned by a switch statement expression does not match a case label, then the statements within the \_\_\_ label execute.
    1. error
    2. else
    3. exception
    4. default
16. What is the difference between an array and a standard variable?

A standard variable stores just one value, but an array can store multiple values.

1. Provide the code to access the value of the fourth element in the projectTeam array, and explain how you determined the index value.

projectTeam[3]

The numbering of array index values starts at 0, so the index value of the first element would be 0, the second would be 1, the third would be 2, and the fourth would be 3.

1. Explain what causes an infinite loop, and what you can to do ensure that your programs do not contain infinite loops.

In an infinite loop, a loop statement never ends because its conditional expression is never falsy. To ensure that a while statement will eventually end, you must include code within the command block that changes the value used by the conditional expression.

1. What does an else if statement replace? What are the advantages of using an else if statement?

In an else if construction, you combine an else statement with its nested if statement. The resulting statement requires fewer characters to create and is easier to read.

1. Explain what “fallthrough” means and how to prevent it.

Execution of a switch statement does not automatically stop after the statements for a particular case label are executed. Instead, by default the switch statement continues evaluating the rest of the case labels in the list, an event known as fallthrough. 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;.

# Case Projects

## Individual Case Project

Plan and add a feature to one of the web pages in your personal site that incorporates content or functionality created by a series of if , if/else, and/or else if statements, or by a switch statement. If your page requires an event listener, create one that’s backward-compatible with older versions of Internet Explorer. View and test your page in one or more browsers as appropriate to ensure it works as you expect.

Students should submit a web page from their individual site that they’ve enhanced with conditional logic. The page should incorporate either a switch statement or a series of if , if/else, and/or else if statements. Any event listener should be backward-compatible with IE8, using the following form:

if (*element*.addEventListener) {

*element*.addEventListener("*event*", *function*, false);

} else if (*element*.attachEvent) {

*element*.attachEvent("on*event*", *function*);

}

## Team Case Project

Choose one of the web pages from your team web site to enhance with code that uses an array and a loop. Arrays are often used to store a set of related data, either provided by the developer or added by a user. Loops are often used in combination with arrays to perform a common action on each element in an array. Plan the structure of the code as a team, then divide into two groups. One group should create the code for the array, and the other the code for the loop. After each group has completed its work, come back together as a full group and incorporate the code in the group web page. Test the code to verify the page works as planned, doing any troubleshooting and making any edits to the functions as a full team.

Teams should submit a web page from their team site that they’ve enhanced with code that uses an array and a loop.