Solution and Answer Guide

Carey, JavaScript Web Warriors 7e, 9780357638002, Chapter 1: Introduction to JavaScript

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# Quick Check Answers

Quick Check 1

1. How does a scripting language like JavaScript differ from a programming language like C#?

JavaScript does not require a compiler, but instead needs a JavaScript interpreter which reads and runs the code as it is loaded.

**Feedback**: Scripting languages like JavaScript differ from programming languages like Java and C#, which need to be compiled (written for machine code) before they can be run.

1. What are the three core foundations upon which JavaScript is built?

ECMAScript, the Document Object Model (DOM), the Browser Object Model (BOM)

**Feedback**: ECMAScript is a scripting language that is used by language other than JavaScript. One of things that makes JavaScript unique is that combines ECMAScript with the Document Object Model (DOM) that specifies how to interact with the contents of the web page and the Browser Object Model (BOM) that specifies how to interact with the browser.

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.

**Feedback**: In understanding how JavaScript interacts with the user’s computer and the computer hosting the website, it’s important to distinguish between the client (the user’s computer) and the server in which the website resides.

Quick Check 2

1. What HTML element is used to embed JavaScript code within an HTML file?

The script element

**Feedback**: The <script> tag encloses all JavaScript statements that are embedded within the HTML file. It is also used to reference external JavaScript files by including the src attribute within the tag. However, it cannot do both at the same time.

1. What JavaScript command do you use to write the HTML content <h1>Plant Types</h1> to the web page document?

document.write("<h1>Plant Types</h1>")

**Feedback**: The document.write() method is used to write content into the web page at the location in the HTML file where the script element has been placed.

1. Provide the code to write the text, “Major Page Heading” as JavaScript block comment.

/\*
 Major Page Heading
\*/

**Feedback**: Block comments must start with the /\* characters and end with the \*/ characters. All text between those two characters is treated as comment text.

1. Provide the code to write the text, “Major Page Heading” as a JavaScript line comment.

// Major Page Heading

**Feedback**: Line comment are single line comments that begin with the // characters. They can only extend through a single line. If one needs a multi-line comment, one should use a block comment.

Quick Check 3

1. What are the three JavaScript keywords for declaring a variable?

let, var, and const

**Feedback**: The let keyword represents the standard introduced in ES6 (in 2016.) The var keyword is the old standard and is still typically used in JavaScript code. The const keyword was also introduced in ES6 and should only be used for constants (unchanging values.) The main difference between var and let is in the scope of the variable (a topic introduced in Chapter 2.)

1. What is the difference between declaring and initializing a variable?

Using the let, var, or const keywords 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.

**Feedback**: Variables can be declared with or without an initial value. JavaScript, being a loosely typed language (as discussed in Chapter 2) can be introduced with a formal declaration, but that is considered poor programming practice.

1. What is returned by expression "100" + 10?

10010

**Feedback**: When the + operator is used with text strings, it combines the text strings even if those strings contain numeric values.

1. 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.

**Feedback**: Event handlers are required for JavaScript code to respond to actions or events occurring within the web page or web browser after the script has been completely loaded. These events can be such things as a user clicking a form button, text being typed into a input control, or a form being submitted to the server for processing.

Quick Check 4

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, 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 that content. This ensures that users can see and interact with the entire web page as quickly as possible.

**Feedback**: By default, when the browser encounters a script it immediately executes the contents of the script before continuing to load the rest of the web page. If the script needs to work with elements of the web page as referenced in the Document Object Model, all of the web page should be loaded and, thus, it is best to put the script at the end of the HTML file. However, this can be mitigated for external JavaScript files by placing the defer attribute in the <script> tag.

1. How do you incorporate the contents of a JavaScript source file into an HTML document?

To access JavaScript code that is saved in an external file, you use the src attribute of the script element. You assign to the src attribute the URL of a JavaScript source file.

**Feedback**: When the browser encounters a <script> tag that loads an external JavaScript file it will immediately load the contents of that file (pausing the loading of the rest of the web page) unless the defer or async attribute is included with the tag.

# Review Questions Answers

1. A programming language like Java requires a:
	1. Interpreter
	2. Document Object Model
	3. compiler
	4. Browser Object Model

**Answer:** C

**Feedback**: Programming languages which are not interpreted need a compiler to transform the program code into machine code

1. HTML is an example of a:
	1. programming language
	2. machine language
	3. scripting language
	4. markup language

**Answer:** D

**Feedback**: A markup language is a language that defines the content, structure, and appearance of a document.

1. The syntax specifications for JavaScript are defined in:
	1. HTML
	2. the Document Object Model
	3. the Browser Object Model
	4. ECMAScript

**Answer:** D

**Feedback**: JavaScript is a scripting language based on the standards of ECMAScript which is constantly developed and adapted to meet the needs of modern browsers and devices.

1. JavaScript is built upon:
	1. ECMAScript
	2. the Document Object Model
	3. the Browser Object Model
	4. ECMAScript, the Document Object Model, and the Browser Object Model

**Answer:** D

**Feedback**: JavaScript is built on three foundations: the scripting language ECMAScript, the Document Object Model (DOM) that describes how to access the contents and actions within a web page, and the Browser Object Model (BOM) that describes how to access the features and behaviors of the browser

1. The specifications for the Document Object Model are determined by:
	1. each browser alone
	2. each device alone
	3. the World Wide Web Consortium (W3C)
	4. the European Computer Manufacturers Association (ECMA)

**Answer:** C

**Feedback**: The specifications of the DOM are maintained by the World Wide Web Consortium (W3C) which also is responsible for the development of standards for HTML and CSS.

1. Which of the following is not a language used by web developers?
	1. JavaScript
	2. HTML
	3. CSS
	4. machine code

**Answer:** D

**Feedback**: Machine code is code that is understand by computers or computer devices. Programming languages which are compiled translate their commands into machine code.

1. A system consisting of a client and a server is known as a \_\_\_\_\_\_\_\_\_\_.
	1. mainframe topology
	2. double-system architecture
	3. two-tier system
	4. wide area network

**Answer:** C

**Feedback**: In traditional client/server architecture, the server is usually some sort of database from which a client requests information. A system consisting of a client and a server is known as a two-tier system.

1. What is usually the primary role of a client?
	1. locating records that match a request
	2. heavy processing, such as calculations
	3. data storage
	4. the presentation of an interface to the user

**Answer:** D

**Feedback**: 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 returned from the server. In traditional client/server architecture, the server is usually some sort of database from which a client requests information. A system consisting of a client and a server is known as a two-tier system.

1. Which of the following functions does the processing tier not handle in a three-tier client/server system?
	1. processing and calculations
	2. reading and writing of information to the data storage tier
	3. the return of any information to the client tier
	4. data storage

**Answer:** D

**Feedback**: A three-tier client/server system—also known as a multitier client/server system or n-tier client/server system—consists of three distinct pieces: the client tier, the processing tier, and the data storage tier.

1. Which of the following uses the correct case?
	1. Document.write()
	2. document.write()
	3. document.Write()
	4. Document.Write()

**Answer:** B

**Feedback**: JavaScript objects and methods are written in all lowercase letters.

1. Which of the following is *not* a valid identifier?
	1. $InterestRate
	2. 2QInterest Rate
	3. interestRate
	4. \_interestRate

**Answer**: B

**Feedback**: You can use numbers in an identifier but not as the first character.

1. When you assign a specific value to a variable on its creation, you \_\_\_\_\_\_\_\_\_\_ it.
	1. declare
	2. call
	3. assign
	4. initialize

**Answer**: D

**Feedback**: Before you can use a variable, you declare it which creates the variable for storing data and objects; optionally, the variable can be initialized which assigns it an initial value.

1. Code that tells a browser what to do in response to a specific event on a specific element is called a(n) \_\_\_\_\_\_\_\_\_\_.
	1. method
	2. event handler
	3. response
	4. procedure

**Answer**: B

**Feedback**: 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.

1. Which method displays a dialog box with an OK button?
	1. document.write()
	2. document.writeln()
	3. window.alert()
	4. window.popup()

**Answer**: C

**Feedback**: The window.alert() method displays a dialog box with an OK button.

1. Which of the following is not a JavaScript keyword used to declare a variable?
	1. variable
	2. var
	3. let
	4. const

**Answer**: A

**Feedback**: Variables are declared using the var, let, or const keywords. If the script references page elements which have not been loaded by the browser an error will result and the script will fail to run.

1. What potential problems can occur if you load a script prior to the page being entirely loaded by the browser?

If the JavaScript program attempts to reference a page element prior to that element being loaded by the browser, an error will result.

1. How can you make the browser not parse and load an external script file until after the page has loaded?

Add the defer attribute to the <script> tag.

1. When should you use an external JavaScript file instead of embedding your JavaScript code within the HTML file?

There are several situations where this is preferable: a) When you need to share code among several different web pages, b) When you working in a team with different team members responsible for different aspects of the website development (such as content, design and layout, and programming) and you want to keep those files separate, and c) In order to dedicate documents to the tasks for which they are design with HTML files solely focused on page content and structure, CSS files focused only on page layout and design, and JavaScript files dedicated only to programming-related tasks.

1. Provide the JavaScript code to write the text “Copyright 2023” as a line comment. Provide the code to write the same text as a block comment.

// Copyright 2023
/\*
 Copyright 2023
\*/

1. What is a library?

In addition to storing scripts for multiple pages in the same website, sometimes JavaScript source files store especially useful generic scripts used on many different websites. These files, known as libraries, are often developed by a single programmer or a team of programmers and distributed online. Many libraries are developed to solve a problem on one website and turn out to be useful for other sites as well. Programmers often make libraries available for free reuse.

# Hands-On Project Solutions

Hands-On Project 1-1

See project01-01.html in the js01/project01 folder posted on the Instructor Companion Site.

Hands-On Project 1-2

See project01-02.html and project01-02.js in the js01/project02 folder posted on the Instructor Companion Site.

Hands-On Project 1-3

See project01-03.html in the js01/project03 folder posted on the Instructor Companion Site.

Hands-On Project 1-4

See project01-04.html and project01-04.js in the js01/project04 folder posted on the Instructor Companion Site.

Hands-On Project 1-5 (Debugging Challenge)

See project01-05.html in the js01/project05 folder posted on the Instructor Companion Site.

# Case Project Solutions

Individual Case Project

The Individual Case Project for each chapter in this book will build on a website that you create on a subject of your choice. To begin, choose a topic for your website. This can be a topic related to your major, or a personal interest or activity. Plan a website containing at least four pages with a common layout and navigation system. Note that you’ll add pages to your site in later chapters, so ensure that your navigation system can support additional content. Ensure that all of your web pages pass validation.

**Grading rubric:**

* Website containing at least four HTML documents, all incorporating a common navigation system
* All pages must pass validation.

Team Case Project

Working in a team of 4–8 people, discuss and agree on a topic for your website. This may be a topic related to your major, another area of study, your college or university, or a shared interest. Work together to plan a website containing, at a minimum, a number of pages equal to the number of group members and to create a common layout and navigation system. Note that you’ll add pages to your site in later chapters, so ensure that your navigation system can support additional content. Decide as a group who will create which page and create the pages individually. When you’ve finished creating the individual pages, ensure they pass validation and then work together to assemble the resulting website, identifying and fixing any issues as a group.

**Grading rubric:**

* Website containing at least as many HTML documents as there are group members, all incorporating a common navigation system
* All pages must pass validation.