JavaScript, Sixth Edition

Chapter 10 Solutions

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.

1. 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.

1. 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

1. 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.

1. 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.

1. 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.

1. 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.

# Review Questions

* + - 1. Which type of events focus on responding to finger touches on a touchscreen?
         1. Mouse events
         2. Touch events
         3. Pointer events
         4. Drag events
      2. Which type of events aim to handle input from a mouse, finger, or stylus with each event?
         1. Mouse events
         2. Touch events
         3. Pointer events
         4. Drag events
      3. Mobile devices use touch to perform browser and device interactions, known as \_\_\_\_\_\_\_\_\_\_, for activities such as scrolling the page.
         1. touches
         2. points
         3. clicks
         4. gestures
      4. \_\_\_\_\_\_\_\_\_\_ devices allow for multiple touches on the screen at the same time.
         1. Pointer
         2. Desktop
         3. Touchpad
         4. Multitouch
      5. In the touch events model, which of the following is an array containing the coordinates of all touches on the current element?
         1. touches
         2. targetTouches
         3. changedTouches
         4. touchesXY
      6. You can access methods of the Geolocation API using the geolocation property of the \_\_\_\_\_\_\_\_\_\_ object.
         1. Window
         2. Screen
         3. Navigator
         4. Document
      7. The *success* and *fail* arguments of the getCurrentPosition() method, which are executable code, are examples of \_\_\_\_\_\_\_\_\_\_\_.
         1. callbacks
         2. properties
         3. API keys
         4. minifiers
      8. Which option property do you add to a getCurrentPosition() request to specify a length of time to wait before cancelling the request?
         1. enableHighAccuracy
         2. timeout
         3. maximumAge
         4. coords
      9. Converting a physical address to a pair of latitude and longitude coordinates is known as \_\_\_\_\_\_\_\_\_\_.
         1. minifying
         2. geolocation
         3. a callback
         4. geocoding
      10. If your browser does not ask whether you want to share your location information while testing an app that uses geolocation, you may need to \_\_\_\_\_\_\_\_.
          1. implement touch events
          2. implement pointer events
          3. clear your saved geolocation preferences
          4. minify your files
      11. Which API provides access to properties and methods related to the device battery?
          1. Geolocation API
          2. Battery Status API
          3. Device Orientation API
          4. WebRTC API
      12. Which API provides access to data from a device’s gyroscope and accelerometer?
          1. Geolocation API
          2. Battery Status API
          3. Device Orientation API
          4. WebRTC API
      13. Which API enables apps to receive data from a device’s camera and microphone, as well as to send and receive audio, video, and other types of data in real time?
          1. Geolocation API
          2. Battery Status API
          3. Device Orientation API
          4. WebRTC API
      14. A(n) \_\_\_\_\_\_\_\_\_\_ waits for something else to happen before running.
          1. minifier
          2. prettifier
          3. asynchronous callback
          4. synchronous callback
      15. \_\_\_\_\_\_\_\_\_\_ removes comments, indents, and line breaks, and tweaks code in other ways to make it smaller.
          1. Minifying files
          2. Responsively loading scripts
          3. Implementing the Geolocation API
          4. Implementing touch events
      16. What is a touch cascade?

In a touch cascade, a browser checks a touched element for an event handler for multiple events, including some mouse events, in the following order: touchstart, touchend, mouseover, mousemove, mousedown, mouseup, click.

* + - 1. Why is it useful to add a timeout to a getCurrentLocation() request using the setTimeout() method of the Window object?

If a user ignores or doesn’t notice the request, the timeout specified as a parameter 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.

* + - 1. Explain the roles of the Geolocation API and the Google Maps API in displaying a map showing a user’s current position in your app.

You use the Geolocation API to obtain information about a user’s current position. The Google Maps API enables you to add content provided by the Google Maps service, including maps, to your own apps.

* + - 1. What is a gyroscope? What is an accelerometer? Explain how data from these devices can be useful in a web app.

A device’s gyroscope detects its orientation in space, and its accelerometer detects changes in speed. By comparing changes in orientation from the gyroscope, your code can respond to user actions including tilting a device. The accelerometer reports values for acceleration and rotation, which you could use to determine if a user is moving or standing still.

* + - 1. Explain how to load a script responsively.

First you divide your external JavaScript code into at least two files: one containing code that must be loaded when the page loads, and a second containing code that isn’t needed immediately. You include a script element in your HTML to load the first .js file. Then in the JavaScript code for the first .js file, you include code that adds a node referencing the second JavaScript file only if it is needed.

# Case Projects

## Individual Case Project

In your individual web site, enhance your existing page about browser security to show users their current location on a map. Note that you must specify a height and width using CSS for the element in which you display the map; these dimensions can be any size you choose. Also enhance the page to display the user’s latitude, longitude, and altitude, with a label for each value.

Grading rubric: Users should submit an enhanced page from their individual web site that includes the following:

* a map that shows the user’s current location
* the user’s labeled latitude, longitude, and altitude values

## Group Case Project

Divide into two or three subgroups, with each group taking responsibility for downloading, installing, and becoming familiar with the testing tool for a touchscreen or mobile operating system: Google Android, Apple iOS, and, optionally, Microsoft Windows Phone. Note that the testing tools for Apple iOS can be installed only on an Apple Mac computer, so ensure that the subgroup responsible for this OS includes at least one member with the necessary hardware.

In your group, download your group’s tool using the appropriate URL:

* **Android**: *https://developer.android.com/sdk/index.html*
* **iOS**: *https://developer.apple.com/xcode/downloads/*
* **Windows Phone**: *http://www.visualstudio.com/en-us/downloads#d-express-windows-8* (Visual Studio Express for Windows Phone)

Read the documentation at the same URL or included with the tool to learn how to open and test a web app using the tool. Open your Group Case Project web app in your subgroup’s tool, and then test the following aspects of your app:

* Appearance on at least three virtual devices with different screen sizes
* Functionality of your navigation interface
* Functionality of your form

Note the results of each test, even if the result is that the app performs the same as on a desktop computer.

Share your results with the other subgroups, and then as a group create a report describing the following:

* Areas where your app functioned as you expected in each OS
* Areas where your app functioned unexpectedly in each OS
* Aspects of the app that you would have liked to test in each tool, but may have been unable to
* At least two advantages and two disadvantages of each tool

Grading rubric: Groups should gain experience with testing tools for Google Android, Apple iOS, and potentially Windows Phone. The group should submit a report summarizing their experience with each tool in the following areas:

* Areas where their group app functioned as they expected in each OS
* Areas where their group app functioned unexpectedly in each OS
* Aspects of the app that they would have liked to test in each tool, but may have been unable to
* At least two advantages and two disadvantages of each tool