# 24

The wheel that squeaks the loudest ... gets the grease. —John Billings (Henry Wheeler Shaw)

We'll use a signal I have tried and found far-reaching and easy to yell. Waa-hoo! —Zane Grey

There is a natural hootchykootchy motion to a goldfish. –Walt Disney

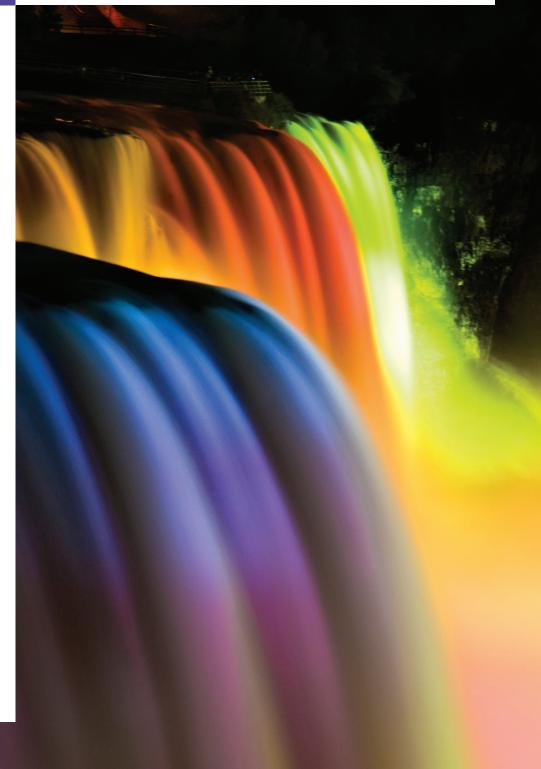
Between the motion and the act falls the shadow. —Thomas Stearns Eliot

### Objectives

In this chapter you'll learn:

- How to get, display and scale images.
- How to create animations from sequences of images.
- How to create image maps that can sense when the cursor is over them.
- How to get, play, loop and stop sounds using an AudioClip.
- How to play video using interface Player.

## Multimedia: Applets and Applications, Solutions



#### 2 Chapter 24 Multimedia: Applets and Applications, Solutions

#### **Self-Review Exercises**

**24.1** Fill in the blanks in each of the following statements:

- a) Graphics method \_\_\_\_\_ displays an image on an applet.
- ANS: drawImage.
- b) Java provides two mechanisms for playing sounds in an applet—the Applet's play method and the play method of the \_\_\_\_\_\_ interface.

#### ANS: AudioClip.

- c) A(n) \_\_\_\_\_ is an image that has hot areas that the user can click to accomplish a task such as loading a web page.
- ANS: image map.
- d) Method \_\_\_\_\_ of class ImageIcon displays the ImageIcon's image.
- ANS: paintIcon.
- e) Java supports several image formats, including \_\_\_\_\_, \_\_\_\_ and \_\_\_
- ANS: Graphics Interchange Format (GIF), Joint Photographic Experts Group (JPEG), Portable Network Graphics (PNG).
- f) The JNLP \_\_\_\_\_ class's static lookup method obtains a reference to the File-OpenService.
- ANS: ServiceManager.
- 24.2 Determine whether each of the following statements is *true* or *false*. If *false*, explain why.
  - a) A sound is marked for garbage collection after it plays via the play method of class Applet.
  - ANS: True.
  - b) Class ImageIcon provides constructors that allow an ImageIcon object to be initialized only with an image from the local computer.
  - ANS: False. ImageIcon can load images from the Internet as well.
  - c) Method play of class AudioClip continuously loops an audio clip.
  - ANS: False. Method play of class AudioClip plays an audio clip once. Method loop of class AudioClip continuously loops an audio clip.
  - d) The Java Image I/O API is used for adding 3D graphics to a Java application.
  - ANS: False. The Java 3D API is used for creating and modifying 3D graphics. The Java Image I/O API is used for reading from and outputting images to files.
  - e) Applet method getDocumentBase returns, as an object of class URL, the location on the Internet of the HTML file that invoked the applet.
  - ANS: True.
  - f) FileOpenService methods openFileDialog and openMultiFileDialog return a File-Contents object and an array of FileContents objects, respectively.

ANS: True.

#### Exercises

NOTE: Solutions to the programming exercises are located in the ch24solutions folder. Each exercise has its own folder named ex24\_## where ## is a two-digit number representing the exercise number. For example, exercise 24.10's solution is located in the folder ex24\_10.

24.3 Describe how to make an animation "browser friendly."

**ANS:** Begin the animation with the start method of class Timer and suspend/terminate the animation in the stop method of class Timer. The animation should stop when the user switches web pages. If the user returns to the web page with the animation, the animation should be restarted.

#### **24.4** Describe the Java methods for playing and manipulating audio clips.

- ANS: Class Applet method play and the AudioClip interface method play both load the sound and play it once. AudioClip method loop continuously loops the audio clip in the background. AudioClip method stop terminates an audio clip that is currently playing.
- 24.5 Explain how image maps are used. List several examples of their use.
  - ANS: Image maps are used to create interactive web pages that: a) load different web pages based on user choice, b) show descriptive messages for images within the image maps, c) define regions for an image, when the mouse enters the image region, display the image, d) when the mouse clicks an image region, link the user to the URL associated with the image.