Special Topic 2.2

Applets

Applets are programs that run inside a web browser.

In the preceding section, you learned how to write a program that displays graphical shapes. Some people prefer to use **applets** for learning about graphics programming. Applets have two advantages. They don't need separate component and viewer classes; you only implement a single class. And, more importantly, applets run inside a web browser, allowing you to place your creations on a web page for all the world to admire.

To implement an applet, use this code outline:

```
public class MyApplet extends JApplet
{
   public void paint(Graphics g)
   {
      // Recover Graphics2D
      Graphics2D g2 = (Graphics2D) g;

      // Drawing instructions go here
      . . .
   }
}
```

This is almost the same outline as for a component, with two minor differences:

1. You extend JApplet, not JComponent.
2. You place the drawing code inside the paint method, not inside paintComponent.

The following applet draws two rectangles:

ch02/applet/RectangleApplet.java

```
 1  import java.awt.Graphics;
 2  import java.awt.Graphics2D;
 3  import java.awt.Rectangle;
 4  import javax.swing.JApplet;
 5
 6  /*
 7     An applet that draws two rectangles.
 8  */
 9  public class RectangleApplet extends JApplet
10  {
11     public void paint(Graphics g)
12     {
13        // Prepare for extended graphics
14        Graphics2D g2 = (Graphics2D) g;
15
16        // Construct a rectangle and draw it
17        Rectangle box = new Rectangle(5, 10, 20, 30);
18        g2.draw(box);
19
20        // Move rectangle 15 units to the right and 25 units down
21        box.translate(15, 25);
22
23        // Draw moved rectangle
24        g2.draw(box);
25     }
26  }
```

> To run an applet, you need an HTML file with the `applet` tag.

To run this applet, you need an HTML file with an `applet` tag. HTML, the hypertext markup language, is the language used to describe web pages. (See Appendix F for more information on HTML.) Here is the simplest possible file to display the rectangle applet:

ch02/applet/RectangleApplet.html

```
1  <applet code="RectangleApplet.class" width="300" height="400">
2  </applet>
```
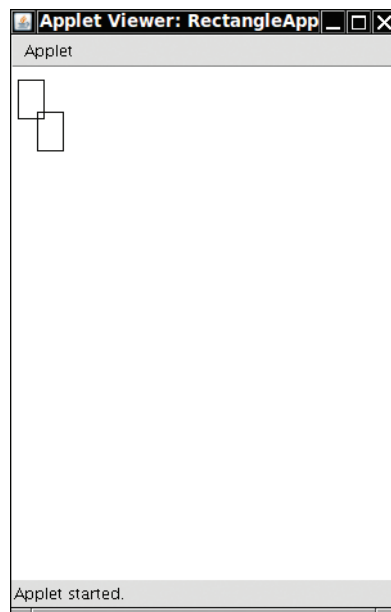
If you know HTML, you can proudly explain your creation, by adding text and more HTML tags:

ch02/applet/RectangleAppletExplained.html

```
 1  <html>
 2     <head>
 3        <title>Two rectangles</title>
 4     </head>
 5     <body>
 6        <p>Here is my <i>first applet</i>:</p>
 7        <applet code="RectangleApplet.class" width="300" height="400">
 8        </applet>
 9     </body>
10  </html>
```
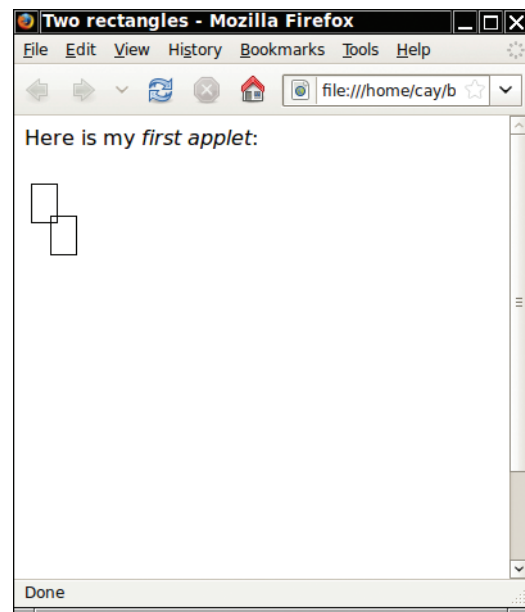
An HTML file can have multiple applets. Simply add a separate `applet` tag for each applet.

You can give the HTML file any name you like. It is easiest to give the HTML file the same name as the applet. But some development environments already generate an HTML file with the same name as your project to hold your project notes; then you must give the HTML file containing your applet a different name.

An Applet in the Applet Viewer

An Applet in a Web Browser

To run the applet, you have two choices. You can use the applet viewer, a program that is included with the Java Software Development Kit from Sun Microsystems. You simply start the applet viewer, giving it the name of the HTML file that contains your applets:

```
appletviewer RectangleApplet.html
```

You view applets with the applet viewer or a Java-enabled browser.

The applet viewer only shows the applet, not the HTML text (see the left figure).

You can also show the applet inside any Java-enabled web browser, such as Firefox or Safari. (If you use Internet Explorer, you probably need to configure it. By default, Microsoft supplies either an outdated version of Java or no Java at all. Go to the java.com web site and install the Java plugin.) The second figure shows the applet running in a browser. As you can see, both the text and the applet are displayed.