```
 1  // joi/3/shapes/Box.java
 2  //
 3  //
 4  // Copyright 2003 Bill Campbell and Ethan Bolker
 5
 6  /**
 7   * A Box has a width, a height and a paintChar used
 8   * used to paint the Box on a Screen.
 9   *
10   * Examples:
11   * <pre>
12   *  new Box( 3, 4, 'G' )   new Box( 1, 1, '$' )
13   *
14   *          GGG                     $
15   *          GGG
16   *          GGG
17   *          GGG
18   * </pre>
19   *
20   * @version 3
21   */
22
23  public class Box
24  {
25      private int  width;      // width  in (character) pixels
26      private int  height;     // height in (character) pixels
27      private char paintChar;  // character used for painting
28
29      /**
30       * Construct a box.
31       *
32       * @param width width in (character) pixels.
33       * @param height height in (character) pixels.
34       * @param paintChar character used for painting this Box.
35       */
36
37      public Box( int width, int height, char paintChar )
38      {
39          this.width     = width;
40          this.height    = height;
41          this.paintChar = paintChar;
42      }
43
44      /**
45       * Paint this Box on Screen s at position (x,y).
46       *
47       * @param s the screen on which this box is to be painted.
48       * @param x the x position for the box.
49       * @param y the y position for the box.
50       */
51
52      public void paintOn( Screen s, int x, int y )
53      {
54          HLine hline = new HLine( width, paintChar );
55          for ( int i = 0; i < height; i++ ) {
56              hline.paintOn( s, x, y+i );
```



```
57          }
58      }
59
60      /**
61       * Paint this Box on Screen s at position (0,0).
62       *
63       * @param s the Screen on which this box is to be painted.
64       */
65
66      public void paintOn( Screen s )
67      {
68          paintOn( s, 0, 0 );  // or this.paintOn(s,0,0);
69      }
70
71      /**
72       * Get the width of this Box.
73       *
74       * @return width of box (expressed as a number
75       *         of characters).
76       */
77
78      public int getWidth()
79      {
80          return width;
81      }
82
83      /**
84       * Get the height of this Box.
85       *
86       * @return the height in (character) pixels.
87       */
88
89      public int getHeight()
90      {
91          return height;
92      }
93
94      /**
95       * Set the width of this Box.
96       *
97       * @param width the new width in (character) pixels.
98       */
99
100     public void setWidth( int width )
101     {
102         this.width = width;
103     }
104
105     /**
106      * Set the height of this Box.
107      *
108      * @param height the new height in (character) pixels.
109      */
110
111     public void setHeight( int height )
112     {
```

```
113         this.height = height;
114     }
115
116     /**
117      * Unit test for class Box,
118      * assuming Screen and Terminal work.
119      */
120
121     public static void main( String[] args )
122     {
123         Terminal terminal = new Terminal();
124
125         terminal.println( "Unit test of Box.");
126         terminal.println( "You should see this Screen twice: " );
127         terminal.println( "+++++++++++++++++++++");
128         terminal.println( "+RRRR                +");
129         terminal.println( "+RRRR                +");
130         terminal.println( "+RRGGG               +");
131         terminal.println( "+RRGGG               +");
132         terminal.println( "+RRGGG               +");
133         terminal.println( "+  GGRRRRRRR         +");
134         terminal.println( "+++++++++++++++++++++");
135         terminal.println();
136
137         Screen screen   = new Screen( 20, 6 );
138
139         Box box1 = new Box( 4, 5, 'R' );
140         Box box2 = new Box( 3, 4, 'G' );
141
142         box1.paintOn( screen );
143         box2.paintOn( screen, 2, 2 );
144
145         // test reference model for objects
146         box2 = box1;
147         int oldWidth = box2.getWidth();
148         box1.setWidth(oldWidth+3);
149         box2.paintOn( screen, 4, 5 );
150
151         screen.draw( terminal );
152     }
153 }
```