

```

1 // foj/3/shapes/Screen.java
2 //
3 //
4 // Copyright 2003 Bill Campbell and Ethan Bolker
5
6 /**
7  * A Screen is a (width*height) grid of (character) 'pixels'
8  * on which we may paint various shapes.  It can be drawn to
9  * a Terminal.
10 *
11 * @version 3
12 */
13
14 public class Screen
15 {
16     /**
17      * The character used to paint the screen's frame.
18      */
19
20     private static final char FRAMECHAR = '+';
21     private static final char BLANK = ' ';
22     private int width;
23     private int height;
24     private char[][] pixels;
25
26     /**
27      * Construct a Screen.
28      *
29      * @param width the number of pixels in the x direction.
30      * @param height the number of pixels in the y direction.
31      */
32
33     public Screen( int width, int height )
34     {
35         this.width = width;
36         this.height = height;
37         pixels = new char[width][height];
38         clear();
39     }
40
41     /**
42      * Clear the Screen, painting a blank at every pixel.
43      */
44
45     public void clear()
46     {
47         for (int x = 0; x < width; x++) {
48             for (int y = 0; y < height; y++) {
49                 pixels[x][y] = BLANK;
50             }
51         }
52     }
53
54     /**
55      * Paint a character pixel at position (x,y).

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57
58     * @param c the character to be painted.
59     * @param x the (horizontal) x position.
60     * @param y the (vertical) y position.
61     */
62
63     public void paintAt( char c, int x, int y )
64     {
65         if ( 0 <= x && x < width &&
66             0 <= y && y < height ) {
67             pixels[x][y] = c;
68         }
69         // Otherwise off the Screen - nothing is painted.
70     }
71
72     /**
73      * How wide is this Screen?
74      *
75      * @return the width.
76      */
77
78     public int getWidth()
79     {
80         return width;
81     }
82
83     /**
84      * How high is this Screen?
85      *
86      * @return the height.
87      */
88
89     public int getHeight()
90     {
91         return height;
92     }
93
94     /**
95      * Draw this Screen on a Terminal.
96      *
97      * @param t the Terminal on which to draw this Screen.
98      */
99
100     public void draw( Terminal t )
101     {
102         for (int col = -1; col < width+1; col++) { // top edge
103             t.print(FRAMECHAR);
104         }
105         t.println();
106         for (int row = 0; row < height; row++) {
107             t.print(FRAMECHAR);
108             for (int col = 0; col < width; col++) { // left edge
109                 t.print( pixels[col][row] );
110             }
111             t.println( FRAMECHAR ); // right edge
112         }
113         for (int col = -1; col < width+1; col++) { // bottom edge

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```
113         t.print("FRAMECHAR");  
114     }  
115     t.println();  
116 }  
117 }
```