

Lab 2 – Lots of Squares

CSCI 1101B – Spring 2015
Due: February 10, 10 pm

Objective: To gain experience working with variables, methods, and numbers.

In this lab you will create a program that allows the user to create and move numbered squares of random size and color in a canvas window, and to print out information about the squares in an output window. Figure 1 shows a sample of the canvas window with 12 squares and Figure 2 shows the corresponding information in the output window.

What Your Program Needs to Do

When the user starts your program, a blank canvas window should appear. When the user presses the mouse at a point in the canvas window, three things should happen:

- A square should appear in the *canvas* window with:
 - a side length chosen randomly from 30 to 200 pixels (**inclusive**),
 - a random color from the entire range of colors,
 - a black outline, and
 - the number of the square (the first square drawn is 1, the second square drawn is 2, etc.) in the square's lower-right corner.

The square, however, should be drawn so that the mouse arrow is pointing to the *center* of the square, not the upper-left corner. Also, please leave a little space to the right of and below the square number so it's not pushed right into the corner. Note that the square number will be hard to read on dark squares, but that's fine. Also, if a square is positioned over a previous square, it will (and should) obscure the part of the previous square it covers (including, possibly, the previous square's number). An example window with 12 squares is shown in Figure 1.

- The square number, size, and color should be printed in the *output* window using the same formatting shown in Figure 2.
- The user should be able to drag the square to any position on the canvas window until the mouse is released. Of course, nothing about the square (size, color, or number) should change while it is being moved. The mouse arrow should continue to point to the center of the square while it is being dragged.

When the mouse is moved out of the canvas window, the entire canvas should clear and the user should be able to start again (from square 1). Also, when the mouse re-enters the canvas window, print 3 blank lines to the output window to clearly

indicate that the information that will be printed is from a new set of squares. You can print a blank line by calling `System.out.println()` with no arguments.

Be sure to declare and use named constants where appropriate, e.g. (but not limited to) the minimum and maximum square side lengths.

Submitting Your Work

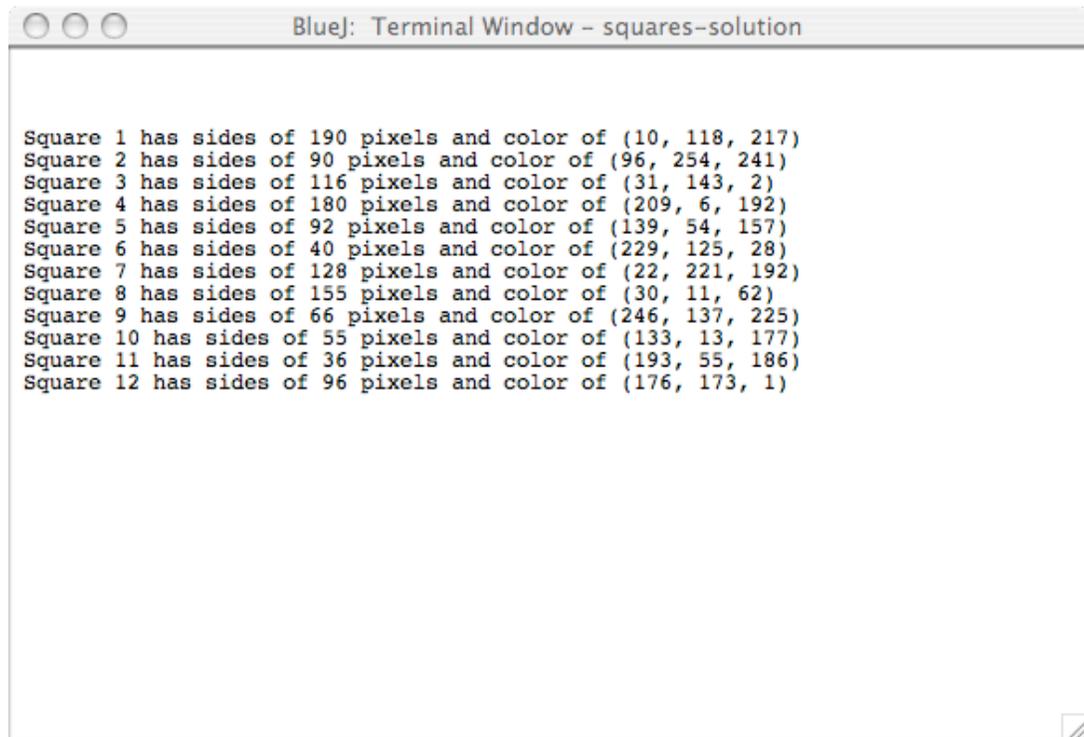
Submit your program via Blackboard in the same way as lab 1. The submission steps you should follow are copied from the lab 1 handout below:

1. Save your program and quit BlueJ (this is necessary because BlueJ gets confused if you perform step 2 – renaming your project directory – while the project is open).
2. Rename your project folder (which is the folder that contains `Events.java`, `package.bluej`, and possibly a few other files) so that it is named `username-lab2` (with your actual username). For example, I would rename my folder `sbarker-lab2`.
3. Create a single, compressed `.zip` archive of your project folder. On a Mac, right-click (or, if you have no right mouse button, control-click) on your project folder and select “Compress your-folder-name” from the menu that appears. On a Windows machine, right-click on the folder, select “Send To,” and then select “Compressed (zipped) Folder.” In either case, you should now have a `.zip` file that contains your project, named something like `sbarker-lab2.zip` (with your actual username).
4. Open a web browser and go to Blackboard, then browse to the **Lab Submissions** folder in your appropriate lab section. Click on **Lab 2** and then **Start New Submission**. In Section 2, you can, but do not need to, provide any comments. Then select **Browse My Computer** and browse to the `.zip` file you created in step 3. Select that file, then click on **Submit**.

You’re done submitting your lab, but remember to save a copy of your project folder somewhere other than on the desktop of the machine you are working on. If you just leave it on the desktop, it will only be available on that machine—if you log into any other machine on campus, it will not be there. I would suggest that you keep a `cs1101-labs` folder containing your labs, the `objectdraw` library (the file `objectdraw.jar`), and the starter project in Dropbox (or any similar service) or in your folder on the `microwave` server. Refer to the lab 1 handout if you need help connecting to `microwave`.



Figure 1: A sample canvas window with 12 squares.

A terminal window titled "BlueJ: Terminal Window - squares-solution" with three window control buttons (minimize, maximize, close) in the top-left corner. The window contains 12 lines of text, each describing a square's side length and color. The text is as follows:

```
Square 1 has sides of 190 pixels and color of (10, 118, 217)
Square 2 has sides of 90 pixels and color of (96, 254, 241)
Square 3 has sides of 116 pixels and color of (31, 143, 2)
Square 4 has sides of 180 pixels and color of (209, 6, 192)
Square 5 has sides of 92 pixels and color of (139, 54, 157)
Square 6 has sides of 40 pixels and color of (229, 125, 28)
Square 7 has sides of 128 pixels and color of (22, 221, 192)
Square 8 has sides of 155 pixels and color of (30, 11, 62)
Square 9 has sides of 66 pixels and color of (246, 137, 225)
Square 10 has sides of 55 pixels and color of (133, 13, 177)
Square 11 has sides of 36 pixels and color of (193, 55, 186)
Square 12 has sides of 96 pixels and color of (176, 173, 1)
```

Figure 2: Output window information corresponding to the canvas window in Figure 1.