CSCI 1320 (Principles of Computer Science I), Fall 2014

Homework 8

Credit: 10 points.

1 Reading

Be sure you have read (or at least skimmed) chapters 11 and 12.

2 Programming Problems

Do the following programming problems. You will end up with at least one code file per problem. Submit your program source (and any other needed files) by sending mail to `bmassing@cs.trinity.edu`, with each file as an attachment. Please use a subject line that mentions the course and the assignment (e.g., "csci 1320 homework 8" or "CS1 hw8"). You can develop your programs on any system that provides the needed functionality, but I will test them on one of the department's Linux machines, so you should probably make sure they work in that environment before turning them in.

1. (10 points)   Your mission for this problem is to write a Scala program that illustrates some basic GUI and graphics functionality. Specifically, the program should, at user request, draw a picture consisting of concentric ellipses of alternating contrasting colors (as shown in the sample screen shot in Figure 1 below). That is, initially the main display should be blank, and when the user requests a "draw" operation (using one of the options for user input described below), the program should draw something like the picture shown, and when the user requests a "clear" it should return to blank. The program should also provide a way for the user to exit it. Options for user input are the following:

   - A menu with "draw", "clear", and "exit" items.
   - Buttons for "draw", "clear", and "exit".
   - A display area that responds to "d", "c" for clear, and "x" for exit.

   You will get full credit for implementing one of these choices, extra credit for each additional choice.

   Hints:

   - The graphics sample programs show how to draw solid rectangles using the `Rectangle` library class. You can draw ellipses using the Java library class `Ellipse2D.Double`, which takes similar arguments (coordinates of top left corner, dimensions) of type `Double`. To use this class you need an `import` for `java.awt.geom.Ellipse2D._`. Within the `paint` method of a Scala `Panel` you have access to variables `size.width` and `size.height` giving the panel's current width and height, in the same units needed by the library methods that draw and fill shapes. You can get the effect of concentric rings by drawing several ellipses, largest first.
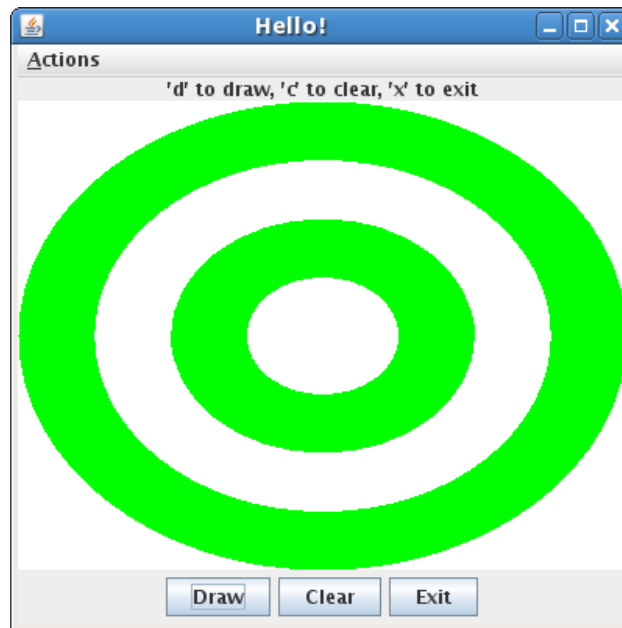
Figure 1: Sample screen shot of program after "draw" has been selected.

- Remember that in order to change the display you need to call `repaint`. In this problem you may need to explicitly fill a rectangle the size of the display in order to clear it.

- For some reason I'm not sure I understand, you-as-user may need to click in the main display window before it will accept keyboard input.

- The sample screen shot shows what I think is a reasonable layout for a program that implements all the mentioned methods of getting user input. Your program doesn't have to look exactly like the figure, as long as it's reasonably clear how to use it.