CSC171 — Homework 13

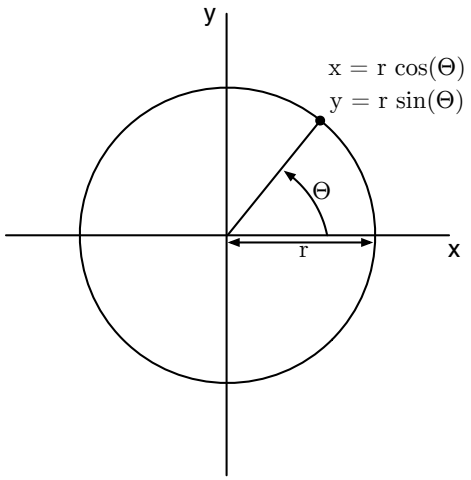
Animation

The goal of this assignment is to give you experience creating animations using Java and Swing. By now you know the basics of creating graphical applications, so use them for these questions. If you don't remember what these are, look at the prior homeworks. Usually you would use a `JPanel` for drawing, including animation, and add it to a `JFrame` for display. As always, the Java Tutorial Trail: Creating a GUI with JFC/Swing is an excellent resource for this.

Questions

1. Create a simple Swing application that animates a shape diagonally across its window once. You may set the size of the window and assume that it doesn't change.
2. Extend your application from the previous question to do the following:
   - Have the animation work properly even if the window is resized; and
   - Have the animation restart at the beginning once the shape reaches the other side.
3. Create an application that animates a square around a circular path centered in the application's window. That is, you're drawing a square whose position changes in time along a circular path. The animation should stop after one complete rotation.

   The following diagram illustrates how the x and y coordinates change along a circular path (where Θ ranges from 0 to 2π around the circle):



   Optional: Make the square rotate as it moves. You can either use the `Graphics2D` geometry transform methods for this, or draw the rotated square yourself using a bit of math. See the Java 2D API for more on drawing.

4. Create a “screen saver” application:
   (a) Create a graphical application that draws 100 random lines in a canvas.
   (b) Extend your application so that it repaints itself every five seconds.
   (c) Extend your application to provide a GUI for setting the number of lines to draw.

Grading Scheme

Equal weight for each part.

Doesn’t compile or is trivial	$< 50\%$
Compiles and is non-trivial	$\geq 50\%$
Complete and correct with good style and comments	100%
Incomplete, incorrect, bad style, no comments	$< 100\%$

Submission Requirements

Your submission **MUST** include a file named “`README.txt`” with your name, your NetID, the assignment number, and your lab section. This file should explain anything we need to know about how to build and run your project. In particular, be sure to explain how to run what parts of your submission for each question in the assignment.

Submit your solution as a single ZIP archive to BlackBoard before the deadline.

Late homeworks will not be graded and will receive a grade of 0.

All assignments and activities associated with this course must be performed in accordance with the University of Rochester’s Academic Honesty Policy.