THE UNIVERSITY *of*
NEW MEXICO

Lab 3: Inside or Outside?

Overview:

Exercise 3.22 and 3.23 in the textbook, *Introduction to Java Programming* by Y. Daniel Liang, ask if a point is inside or outside of a circle and an axis aligned rectangle. Your assignment is based on those two (The solutions to those exercises were developed in class).

Grading Rubric [20 points total]:

[File Name: 1 point]: Attached one file in Blackboard Learn with the file name:
InsideOutside_*yourName***.java**.

[Circle Input: 2 points]: Your program must prompt the user for three floating point numbers that specify a circle's center (circleX0, circleY0) and its radius (circleRadius).

[Rectangle Input: 2 points]: Your program must prompt the user for four floating point numbers that specify a rectangle's center (rectX0, rectY0) and its width (rectWidth), and height (rectHeight)

[Query Point Input: 2 points]: Your program must prompt the user for two floating point numbers that specify a query point's location (pointX, pointY).

[Inside Circle: 6 points]: Your program must correctly report whether the query point is inside or outside the given circle. Your program will be tested with 6 unknown query points for 6 unknown circles. You earn 1 point for each correct answer.

[Inside Rectangle: 7 points]: Your program must correctly report whether the query point is inside or outside the given rectangle. Your program will be tested with 6 unknown query points for 6 unknown rectangles. You earn 1 point for each correct answer.

Note 1: All variable names given above are *suggestions*, not requirements.

Note 2: To avoid different answers caused by slight rounding errors, no query points used to test your program will be on or very near the edge of either the circle or the rectangle.

Note 3: Assume all input numbers are legal double characters (you will not be given a circle center of "Joel" or "2.43X.-4" or any other characters that to not represent a legal double in Java).

Note 4: You may assume that all the input numbers are [-1000, 1000]. You do not need to check for this. You do not need to worry about being given very large or very small numbers such as a circle with center at circleX0=1033387433234. Just worry about numbers up to +- 1000.

Penalties:

[-5 points]: Code does not adhere to those parts of the hallowed CS-152 coding standard thus far covered:

1) Correct indenting (no tabs and two spaces per block level).
2) Correct placement of brackets.
3) A comment at the top of the class giving your full name and the date.
4) In-line comments as needed. "As needed".
5) Must compile without warnings with IntelliJ's default warning settings.

Note: all 5 points are lost if any **one** of the standards is severely broken.

Note: No more than -5 even will be assigned for this section even of the code is a total mess and breaks all our coding standards.

Examples:

The exact text of the questions and output are not specified. That means you may make a **reasonable** choice for these things on your own. For example, the following might be the total input and output of a run of your program:

```
Circle: Enter center and radius (x y r) 0 0 10
Rectangle: Enter center, width and height (x y w h) 0 0 10 5
Query Point: Enter point (x y): 11 0
The point (11.0, 0.0) is outside the circle
The point (11.0, 0.0) is outside the rectangle
```

   or

```
Circle: Enter center and radius (x y r) 2 1 2
Rectangle: Enter center, width and height (x y w h) 2 1 6 4
Query Point: Enter point (x y): -0.5 0.5
The point (-0.5, 0.5) is outside the circle
The point (-0.5, 0.5) is on or inside the rectangle
```