Problem Set 4 Exercise #05: My Point

Reference: Lecture 10 Unit 2 notes

Learning objective: Object-oriented programming

Estimated completion time: 40 minutes

Problem statement:

You are given two skeleton files **PS4_Ex05_MyPoint.java** and **PS4_Ex05_TestMyPoint.java**.

In **PS4_Ex05_MyPoint.java**, you are to write a class that defines a 2D point with x-coordinate and y-coordinate, both values of type **`double`**. Name this class **`MyPoint`** to distinguish it from the **`java.awt.Point`** class.

The **`MyPoint`** class contains the following methods:

- **`setX(double)`**, **`setY(double)`**, **`double getX()`** and **`double getY()`**
- **`double distanceTo(MyPoint another)`** that returns the distance between "this" and "another" points.
- **`double computeRectArea(MyPoint another)`** that computes the area of a rectangle whose sides are parallel to the x- or y-axis and has "this" and "another" points as two opposite corners.
- **`String toString()`** that returns string representation of a point. The x- and y-coordinates should be shown in 3 decimal places.

In **PS4_Ex05_TestMyPoint.java**, you are to write the following:

- Create two points **p** and **q** as follows. The user is prompted to enter a positive **`double`** value (we call it a *seed*).
    - x-coordinate of point **p**: divide *seed* by the constant value **17** and takes the result (quotient) of the division.
    - y-coordinate of point **p**: divide *seed* by the constant value **53** and takes the remainder of the division.
    - x-coordinate of point **q**: divide *seed* by the constant value **11** and takes the result (quotient) of the division.
    - y-coordinate of point **q**: divide *seed* by the constant value **41** and takes the remainder of the division.
- Display the two points (by calling their **`toString()`** method implicitly), followed by the distance between them and the area of the rectangle whose sides are parallel to the x- or y-axis, assuming that the two points **p** and **q** represent the opposite corners of the rectangle. The distance and area are to be displayed correct to 5 decimal places.

Sample run #1:

```
Enter seed: 100
p = (5.882, 47.000)
q = (9.091, 18.000)
Distance = 29.17696
Area = 93.04813
```

Sample run #2:

```
Enter seed: 171
p = (10.059, 12.000)
q = (15.545, 7.000)
Distance = 7.42315
Area = 27.43316
```

Note:

Though a bit counter-intuitive, in Java, the modulus operator (%) applies to real numbers as well.