Lab 03: Objects, and Class Methods

Part 1 (5):

Start by creating a new class called MyPoint that can be initialized with either of these constructors:

```
MyPoint p1 = new MyPoint();

MyPoint p2 = new MyPoint(2.0, 4.0);
```

The two arguments given to the constructor are **x (2.0) and y (4.0) co-ordinates**. Don't forget to include getters and setters as these should be **private** instance variables!

Part 2 (7):

Create a `toString()` instance method that returns the co-ordinates of the point in a String form to allow you to print the point using `System.out.println(p1)`.

Add two instance methods that return the Euclidean distance to **another MyPoint instance**, or to **another (x, y)** co-ordinate. Example:

```
double distance = p2.distance(p1);
```

The Euclidean distance between two points is: $d = \sqrt{x^2 + y^2}$

You will need to make use of methods from the Math package:
https://docs.oracle.com/en/java/javase/17/docs/api/java.base/java/lang/Math.html

Test your constructors and the new methods.

Part 3 (8):

Create a class method, `contains(MyPoint[] points, MyPoint p)`, that checks if the point `p` is in the array `points` and returns a boolean. Hint: an `equals` method could be helpful.

Finally, add a class method `horizontal(MyPoint[] points)` that determines if an array of points is in a horizontal line and returns a boolean.

Test these new class methods.

Grading Criteria:

Style/submission guidelines: https://gmierzwinski.github.io/bishops/cs321/style_guidelines.html

Comments, Formatting, & Readability	**5 Marks**
Submission Guidelines	**5 Marks**
Testing	**5 Marks**
Program	**20 Marks** **See (X) above**
Total	**35 Marks**