

Lab 9 – Simple Classes

For this part of the lab, you will be working with a functional program. The program calculates the Manhattan distance between two points. The Manhattan distance assumes that you cannot move diagonally, just like most travelers cannot in Manhattan.

Part 1

Find the *BlueJ* project folder named `Lab9_Start` in the `Resource` folder (or download and decompress `Lab9_Start.zip` on Blackboard). Copy this to your home directory. Rename your copy to `Lab9_lastname_firstname`. This project contains a program which you will use for the first part of the lab.

Look over the `Point` class and the methods in `Part1`. Using *BlueJ*, you can perform the steps of the `run` method in `Part1`. Perform the following steps:

1. Create a new `Part1` object named “program” by right-clicking the class and selecting `new Part1()`.
2. Right-click on the new object (the red rounded-rectangle) and select `Point readPoint()`.
3. Give the point the coordinates `x = 1`, and `y = 2`.
4. A dialog box will appear indicating that a `Point` object was returned by the method. Select `Get` and then give it the name “start”. Then close the dialog box. You should now have two objects shown in the main *BlueJ* window.
5. Repeat steps 2-4 with `x = 5` and `y = -3` and give the second point the name “end”.
6. Right-click on the program object (the leftmost object), and select `double computeDistance (Point a, Point b)`.
7. Type “start” in the first box and “end” in the second box, and then press `OK`. At this point, a dialog should appear indicating that the distance between the points is 9.
8. Run the program normally and give it the same inputs (1, 2, 5, -3), and you will see that the same distance is calculated.

Part 2

For this part, write a `ComplexNumber` class which has two fields, both doubles. The first field should be named “real” and the second should be named “imaginary”. Write a program that will ask the user for two complex numbers (each composed of two parts, real and imaginary) and then add them together. (To add two complex numbers, simply add the real parts to get the sum’s real part and add the imaginary parts to get the sum’s imaginary part.) The sum should be stored in a third object. Finally, print the three complex numbers (the two entered by the user, and the third which is the sum of the first two). The way that a complex number is printed is as follows:

*real + imaginary*i*

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I do not recommend you use methods for your initial attempt.

Submission

Submit your work in the usual way.