COM 252 OOP
Term Project 2
Due: May 10, 5pm (UBIS System)

You are given a text file with x and y coordinate values and the group they belong to whose format is given below.

2,2,0
1,2,0
3,3,0
2,1,0
1,8,1
2,10,1
3,8,1
9,1,2
9,3,2
8,2,2
8,3,2
8,8,3
8,9,3
9,9,3
9,8,3

where each line is a point in the Cartesian plane of which the first is the x-coordinate, the second the y-coordinate and the last column is the group it belongs to. For example, the second line (point) has 1,2,0 has 1 as its x value, 2 as its y value and 0 (zero) as its group. If you draw these points in the Cartesian coordinate system, you will see that they are clustered in 4 groups (bottom left, bottom right, top left and top right).

- Your task is to read the file and create a group (0,1,2,3) for each point polymorphically, that is, do not write an if statement to decide which group to create based on the group (digit) reading.
- Each group should have its own symbol representation. For example, group 0 is associated with "+", group 1 with "*", group 2 with "$" and group 3 with "@".
- Each group should have a reference to a point object, that is, create a Point class with x and y coordinate data fields. Each group's point is given on the same line as its group.
- As yo read the lines place each group with its point in an ArrayList of Group's. All different group objects (for this assignment you have only 4) should be placed in this ArrayList. As you can imagine, it would be good to have a Group super class with subgroup classes.
- You will ask the user for a point in the Cartesian plane and tell the user this point is likely to belong to what group based on its distance from each group. To determine which group the given new point belongs to you should use the Euclidean distance between points in a two dimensional space (Cartesian plane). Find the closest three points and based on the majority of their groups, decide which group this new point belongs to.
- When reporting to the user which group this given new point is like to belong, print also its group symbol polymorphically. For example, if the user has entered (10,10) point, the closest 3 will be group 3 so that you should print to the terminal the following message:

  "(10,10) belongs to the group @"

Deliverables:

1. Your project file with a readme.txt file. The readme.txt file should contain what you have accomplished and what you could not. Explain anything you think may help me understand your work.