CS-UY 3913 / Java

Final Exam – 7-14 May 2020
Prof. Katz

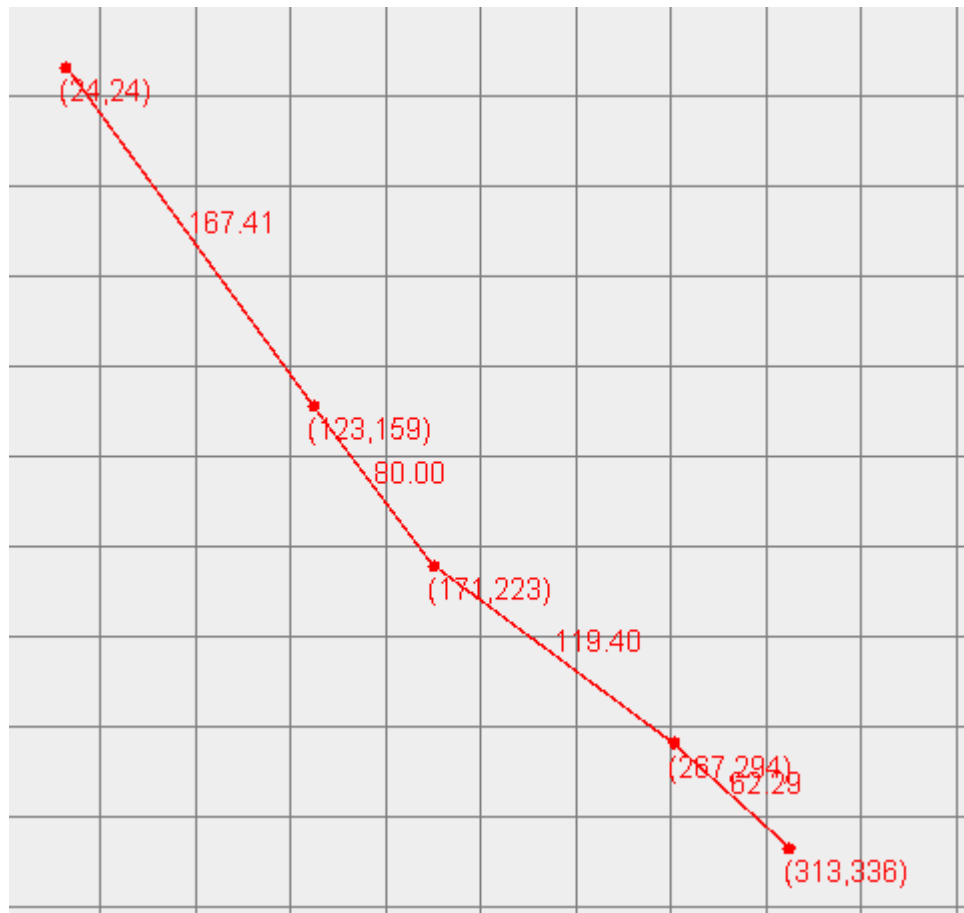Name: _____

NetID(first part of email):_____

- Please submit ONLY 4 files. The first should be a TXT of your answers to section 1, the other three are java files.
- You can expect that the user inputs the appropriate values (int/float/etc where required).
- Comments are not required
- Anyone found cheating on this exam will receive a zero for the exam.
- If you have a question please email the professor!

Section 1, Multiple Choice. (3 pts per question):
1. If we wanted to store a collection of items in a way that would allow us to access the data in random time, we should use an
    a. ArrayList
    b. LinkedList
    c. TreeSet
    d. TreeMap
2. For an SQL query such as "Insert into table" which statement function should you use
    a. execute
    b. executyQuery
    c. perform
    d. lookup
3. In creating a server, we would like to be able to support multiple clients simultaneously. As such, we would need an
    a. Interface
    b. Thread
    c. ClientSocket
    d. Graphics
4. In an android application, which of the following classes represents a button
    a. Button
    b. AndroidWidget
    c. JButton
    d. TextView
5. Which of the following keywords would help us solve a concurrency problem with threads?
    a. yield
    b. sleep
    c. implements
    d. synchronized

6. (5 pts) On a scale of 1-5, one meaning not at all and five meaning perfectly, how well do you think you learned the material in this course?

Long Answer:

1. (30 pts) In an X,Y coordinate plane, the distance between any two points is a straight line. We're going to design a program which will allow us to choose points on an x/y scale and will tell us the distance between those points. As the user continues to click on points, the program will continue to calculate distances from the new point to the previously clicked point. In the example below, I clicked on points starting from the upper left to the lower right. I have provided an example program, which you can use as a model, you should try to copy my results as closely as possible.

NB: In your answer, you may want to use the NumberFormat and Decimal Formatter classes which can be constructed as such:
NumberFormat formatter = new DecimalFormat("#0.00");

The NumberFormat class has a "format" function which may be useful.

2. (25 Pts) You have been hired to write a program which reports on the quality of products based on their online reviews. Buyers will rate the products on a 1-5 scale. We would like to produce a list of the best products based on their ratings. All rating information is stored in SQL tables (MariaDB/mysql) which you should query. Each product has a unique PID which is an integer for just that product and its product name, a string. Each review will contain the PID that is being reviewed and the rating (1-5 integer) that the customer gave. Your output, to System.out, will be the list of product names, one per line in order from best product (highest rated) to worst product.

The tables are as follows:

Products: PID, ProductName
    Select * from Products;

Reviews: ReviewID, PID, Rating
    Select Rating from Reviews where PID=#####;

If you know SQL, it would be trivial to combine the two, but let's pretend we don't since this is a Java final. DO NOT CREATE YOUR OWN SQL STATEMENTS!

Your login parameters are:
    Server: localhost
    Username:CS3913
    Password: GettingAnA+

3. (25 pts) We would like to design a program to model students in a queue at a cafeteria food station. For this we will need a class called CafeQueue. The CafeQueue class will have an "enterQueue" function which takes, as a parameter, a string and a "serveCustomer" parameter which returns the oldest string in the queue (normal queue operations). For storage in this class, we will use a LinkedList. Since there are multiple ways to enter and exit the CafeQueue, we must recognize that there will be multiple threads calling enterQueue and serveCustomer.

Please submit the code for the CafeQueue class.