Georgia State University
Department of Computer Science

CSC 2720: Fall 2017

Instructor: J. L. Bhola
Programming Assignment #6

Due Wednesday, November 15th, 2017 at 11:00 p.m. in iCollege dropbox A#6.

Objectives:

1. To gain experience with with Queues.
2. To gain experience with library functions that generates random numbers and provide time.
3. To use arrays.

Documentation:

1. Explain the purpose of the program as detail as possible - **8%.**
2. Develop a solution for the problem and mention algorithms to be used - **12%.**
3. List data structures to be used in solution. - **5%.**
4. Give a description of how to use the program and expected input/output - **5%.**
5. Explain the purpose of each class you develop in the program. - **5%.**

Programming:

1. For each method, give the pre and post conditions and invariant, if any - **10%.**
2. Program execution **according to the requirements given** - **50%.**
3. Naming of program as required - **5%.**

Description of Program

You are to write a program name **bank.java** that simulates a bank. The program will prompt the user asking if they want to run the program again. If yes, then start the program over. If no, then terminate the program. **Note:** use the array to store the 5 tellers.

The execution phase run for 2 minutes (must invoke a clock in your program) during which time customers will arrive **randomly** between 2 - 6 seconds and be placed into a queue. Each customer will have a property relating to the amount of time he/she wants to spend with a teller, which is to be **randomly generated** to be between 2 and 5 seconds.

There would be a maximum of 5 tellers to attend to the customers. When you start the simulation, each teller is occupied.You will need to generate a random time for each of the first 5 customers occupying the tellers at the begining of the 2 minutes simulation.

As they finish attending a customer (based upon the amount of time associated with each customer), that teller becomes available for the next customer in the queue. As a customer is removed from the queue and sent to an "available" teller, then their availability is set to "False". Customers are allocated to any one of the 5 tellers that becomes available, and so on... until the time of 2 minutes for the simulation is finished.

If after 2 minutes, there are still customers in the queue, we would discard them, but still count them in the total count of customers that visited the bank. Also add into the total count of customer the first five customers that the tellers started out with as well as to the individual teller's total.

Finally display on the screen (at the end of each execution):

1. The total amount of customers that visited the bank for that 2 minutes.
2. The total amount of customers that each teller helped.
3. The total amount of time that each teller was occupied.
4. The total amount of customers that did not get to see a teller.

What to turn in:

1. bank.java (or Main.java and all other java files you have used).
2. bank.class (or bank.jar) and
3. Submit in the A#6 Folder in iCollege on Wednesday, 11/15/2015 before 11:00 p.m..