**CS 114 Assignment 6**

**Topic: Queue (4 points)**

**For each task, submit the source code with detail comments electronically (no hardcopy).**

1. **Simple simulation (2 points)**

**Use java.util.LinkedList to create a system to simulate customers being served at the bank. Download Customer.java & Line.java from Moodle.**

1. **Assume there is only one service line at the bank and it is first come, first served.**
2. **The number of customer arriving at the bank varies from 1 to 5 and the number of tellers available to serve the customer varies from 1 to 4.**
3. **Each customer will receive a sequential ID number when he/she join the line. The program should display the message “Customer xxx joins the line” to indicate the occurrence of the event.**
4. **At the same token, when the teller serves the customer, the program should display “Customer xxx is being served”.**
5. **If the line is empty, display “Teller waiting”.**
6. **Simulate the cycle for 10 times as the end of bank’s business day.**
7. **The service line should be empty after the bank is closed.**

1. **Using Queue: Ticket Counter Simulation (2 points)**

**Our simulated ticket counter will use the following assumptions:**

**. There is only one line and it is first come, first served**

**. Ticket buyers arrive on average every 15 seconds**

**. If there is a cashier available, processing begins immediately upon arrival**

**. Processing a ticket buyer request takes on average two minutes (120**

**seconds) from the ticket buyer reaches a cashier.**

**Download TicketBuyer.java from Moodle.**

**Use java.util.Queue to write a java program to create a queue of ticket buyers and then see how long it takes to process those ticket buyers if there is only one cashier. Then you will process the same queue of ticket buyers with two cashiers. You continue this process for up to ten cashiers. Display the average times that it takes to process a ticket buyer with different number of cashier.**