January 2023 CSE 106
Online Assignment on Queues

Time: 30 minutes

Subsections B1 & B2

Consider there is a bank and there are lots of loan applications. Three officers (A, B, C) work night and day so that the bank runs smoothly. Each loan application undergoes two levels of scrutiny. First, a junior officer (B or C) checks an application. Then the manager (A) issues the loan. Each junior officer maintains a separate FIFO queue to facilitate his/her business. However, the manager does not care much about fairness and uses a LIFO stack for his/her business.

When a customer first enters the bank, s/he checks the length of the queues of the two junior officers, and joins the smaller queue. When two queues are equal, s/he can join any of the two. When any of the two junior officers validates a customer's application, the customer goes to the manager. The manager never rejects a customer validated by a junior officer. On the other hand, when any of the two junior officers find faults in a loan application, the customer is sent back and s/he joins the larger of the queues of the two junior officers to fix the fault. Again, when two queues are equal, s/he joins the queue of C.

You have to simulate the bank using the ADTs (queue and stack using queue) you just implemented. Please follow the provided I/O formatting as much as possible. The output lines are marked blue for your convenience. You can assume all customers will have distinct identifiers.

Sample I/O

```
enter 1
Customer 1 enters queue B
enter 5
Customer 5 enters queue C
enter 8
Customer 8 enters queue B
enter 2
Customer 2 enters queue C
B approve
Customer 1 enters queue A
C approve
Customer 5 enters queue A
A approve
Customer 5 gets the loan
B approve
Customer 8 enters queue A
B approve
Queue B was already empty
A approve
Customer 8 gets the loan
enter 40
Customer 40 enters queue B
enter 43
Customer 43 enters queue B
C reject
Customer 2 enters queue B
A approve
Customer 1 gets the loan
terminate
```