Instructions: Try to solve all problems on your own. If you have difficulties, ask the instructor or TAs.

This lab-session is dedicated to simulating queueing systems that have different types of customers.

Exercise 1: Simple Case: Single Queue
Consider a system where we have a single server and a single queue. Two different types of customers arrive in the queue. Both type of customers have exponential inter-arrival times, first with mean 4 minutes, the second with mean 2 minute. Mean service times for the two are 2 minutes and 45 seconds (0.75 mins) respectively. Both service times are also exponentially distributed. The server follows first-come-first-serve policy. Simulate this queueing system and report important performance measures.

Exercise 2: Mumbai Local Ticket Counter
Now consider a variation of the above system. Suppose the customer arrivals and service times follow the same distribution as above. Now assume that the two types of customers form two different queues. Customers in queue one being of higher priority, the server follows the following policy. If the server is serving customers in the first queue, it will continue to serve them until the queue becomes empty and then it will switch to the second queue. If the server is serving customers in the second queue and a new customer arrives in the first queue, the server finishes serving the customer (currently being served) in second queue and switches to the first queue. Simulate this queueing system and report important performance measures. Assume that the switching time from one queue to the other is zero.
Rigorously compare the two systems and highlight the differences using the performance measures.