COMP 200
Data Structures and Algorithms
Programming Assignment # 2

In this programming assignment, we are going to simulate the operation of an airport. The airport has just one runway. Here, you have to maintain two queues, one for landing and the other for takeoff. The following are the specifications of the problem:

1. Simulate a timer that operates on one-minute intervals. This means that events take place on 1 minute scales.

2. At the start of every hour, generate two random numbers LandingRate and TakeoffRate (between 0 and 30) that specify the average number of planes expected to land and takeoff respectively within the next hour.

3. For each minute, generate two random numbers between 0 and 1. If the first number is less than LandingRate / 60, then a plane has come in for landing and should be added to the landing queue. Similarly, if the second number is less than TakeoffRate / 60 , then a plane has come in for takeoff and should be added to the takeoff queue.

4. When a plane comes in for landing or takeoff, generate a random number between 1 and 3 which specifies the amount of time that particular plane is going to spend using the runway for either landing or takeoff.

5. Next, check whether the runway is empty. If it is, take the plane at the front of the landing queue and have it land on the runway. If the landing queue is empty, only then check the takeoff queue and have the plane at the front of the takeoff queue takeoff from the runway.

Run your simulation for 1 week (24*7 hours) and compute the following statistics:

1. The average time a plane spends in the takeoff queue.

2. The average time a plane spends in the landing queue.

3. The average length of the landing queue.

4. The average length of the takeoff queue.