Airport Simulation

Introduction

Suppose that a certain airport has one runway; that each airplane takes `landingTime` minutes to land and `takeOff` minutes take off; and that on the average, `takeOffRate` planes take off and `landingRate` planes land each hour. Assume that the planes arrive at random instants of time. (Delays make the assumption of randomness quite reasonable.) There are two types of queues: a queue of airplanes waiting to land and a queue of airplanes waiting to take off. Because it is more expensive to keep a plane airborne than to have one waiting on the ground, we assume that the airplanes in the landing queue have priority over those in the takeoff queue.

Problem Statement

Write a program to simulate this airport's operation.

Processing Notes

You may assume a simulated clock that advances in one-minute intervals. For each minute, generate two random numbers: If the first is less than **landingRate/60**, a "landing arrival" has occurred and is added to the landing queue; and if the second is less than **takeOffRate/60**, a "takeoff arrival" has occurred and is added to the takeoff queue. Next, check whether the runway is free. If it is, first check whether the landing queue is nonempty, and if so, allow the first airplane to land; otherwise, consider the takeoff queue.

Have the program calculate the average queue length and the average time that an airplane spends in a queue. You might also investigate the effect of varying arrival and departure rates to simulate the prime and slack times of day, or what happens if the amount of time to land or take off is increased or decreased.

Deliverables
- The source code of your program renamed using the following naming convention:
  LastName-FristName-AssignmentNumber.cpp
- The input file you used to test your program.

Submission Instructions
- A listing of the source code of your program named as described above.
- Submit your deliverables as indicated above in the drop box dedicated for this assignment.