CIS365 Programming Assignment 2

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1   Overview

In this assignment you will use the .NET Collection Classes to build a simulation of an airline ticket counter.

2   Problem Assignment

You have the misfortune to have a taken a job in the IT department of Paranoid Airlines ("They Hate To Fly, And They Hate You, Too!"). Paranoid Airlines has just received the "award" for the worst customer service in history (so bad that even the cable companies look good in comparison). So, they want you to do some simulations to just see how bad their business has become.

Paranoid Airlines arranges their check-in counters so that they have one customer service position for Economy passenger, Business Class passengers, and First Class passengers. They also have three lines, one line for each class of passenger.

2.1 A few rules

- If the line for First Class passengers is empty, then the agent serving the First Class line can assist customers in the Business Class line.

- If the line for First Class passengers is empty and the line for Business Class passengers is empty, then the agent on the First Class line can assist passengers in the Economy line.

- If the line for Business Class passengers is empty, then the agent at the Business Class customer position will first see if there are customers in the First Class line. If that line is empty, then the customer service agent will service customers in the Economy line.

- If the Economy class line is empty, then the customer service agent in that position will assist First Class passengers first, and then Business class passengers.

2.2 Customer arrival rates and service times

- The system will keep a simulated clock that starts at zero and counts the simulated number of minutes in the simulation.

- The simulation will run 12 hours (or 720 minutes).

- Customers will randomly arrive in the Economy line at the rate of 1 every 3 simulated minutes

- Customers will randomly arrive in the Business Class line at the rate of 1 every 15 simulated minutes.

- Customers will randomly arrive in the First Class line at the rate of 1 every 30 simulated minutes

- It takes a customer service agent randomly between 5 - 10 minutes to assist an Economy Class customer

- It takes a customer service agent randomly between 6-12 minutes to assist a Business Class customer

- It takes a customer service agent randomly between 5 - 20 minutes to assist an First Class customer

2.3   Output

Your simulation needs to run for a simulated 12 hours (720 minutes). Every 10 time ticks, your program needs to display how many customers are in each line and whether or not a customer agent is assisting the customer.

At the end of the simulation, your program needs to display the average time customers spent in each line, the total numbers of customers assisted in each class, and the average and maximum length of each line over the course of simulation

2.4   Implementation requirements

- Don't do this as one large function in your Main() method. You're using an object-oriented language... take advantage of that fact.

- Don't implement your own data structures! Use the classes in the System.Collection.Generic framework.

- Use Console output.

3   Submitting your program

Please combine your source code with a screen shot of the output from your simulation into a single PDF document. Your submission document must be in PDF format; submission of documents in any other format will result in deduction of points from your grade. Attach your submission to the assignment entry in Blackboard.