CSCI 410: Modeling and Simulation

Programming Assignment 2

Due December 8th, 23:59:59PM.

A bank currently has 2 cashiers. The number of its customers has increased dramatically recently. Customers would be happy if they spend less than 5 minutes waiting in line on average. The manager is pondering upon the necessity to hire additional cashiers in order to keep customers happy. It is known that the inter-arrival time of customers can be modeled by an exponential distribution with the mean of 3 minutes, the time to serve one customer by a single cashier can be modeled by an exponential distribution with the mean of 5 minutes. Assume only one single waiting line of customers. Customers in the line are served by the next available cashier on a first-come-first-serve basis. Write a C++ program to do the simulation to help the manager answer the following questions.

(1) Are the customers happy currently?

(2) If not, how many additional cashiers need to be hired to make customers happy?

Materials to be submitted in a single zipped file:

- (1) Source code of the simulation program.
- (2) Simulation report, including simulation input, simulation output, statistics calculated from the output, the analysis, and the conclusions.