Assignment 2: Discrete Event Simulation

January 4, 2019

For this simulation assignment, each student has to hand in their own report and code.
Deadline: Monday January 21, 2019 at 11:00

DESCRIPTION: For this assignment, you are to design a simulation model for a grocery store. For the sake of simplicity, we will assume the following:

- The store is always opened.

- The arrival process of customers at the registry is a Poisson Process with rate λ.

- Each customer will have a service-time drawn from a Exponential distribution with average μ, irrespective of the registry where the customer is helped.

With regard to the registries where the customers are served, the following rules have to be applied.

- There are five registries at which customers can be serviced.

- One registry is always opened.

- Other registries will be opened if there 3 waiting customers at all already open registries.

- Registries close when all but one queues are empty.

- Upon arrival at the registries, the customer chooses the least crowded registry for his or her service.

- Customers can't switch between registries after they joined a queue.

ASSIGNMENT:

1. Write a function that returns the shortest queue.

2. Write a function that returns if a new registry should be opened.

3. Write a function that closes all registries that can be closed.

4. Implement the grocery shop in SSJ and report on the occupancy of the registries and the waiting time per customer.

- A written report in which you sketch your implementation of the grocery shop (max. 2 pages in pdf format).

- The compiled version of your Business Simulation project (*.jar file) See Canvas for instructions on the .jar file.