***Project: Multi-threaded Ticket Sellers (project 3)***

***Class: CSC 502***

***Project Participants:***

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**Project Scope**: To build simulation written in C or Java programming language that simulates ticket sellers simultaneously selling concert tickets during one hour.

**Assumptions:**

* Each seller can expect N customers to arrive at random times during the hour.
* Program will keep track of time in units of a minute. Therefore, customers arrive only at the start of a minute.
* High-price ticket customers get the fastest service (i.e. 1 or 2 minutes) to complete a ticket sale.
* Medium-price ticket customers requires randomly exactly 2,3, or 4 minutes to complete a ticket sale.
* Low-price ticket customers require randomly exactly 4,5,6, or 7 minutes to complete a ticket sale.

**Design:**

* Clock\_Simulator Class: Generic timer class to represent ‘time simulation’ for the Seller class.
* Customer\_Handler Class: Handler for customer properties setting like customer name, arrival time, etc. ‘compareTo’ method return the customer which needs to served first based on their arrival time.
* Seats\_Handler Class: It holds the layout of a theater through a 2D string array. It also keeps track of seats sold.
* Seller\_Handler Class: Assigns customers to different sellers. Initiates the run method to allow particular seller to start selling process in time limit. It also keeps track of ‘turnedaway’ customers.
* Process\_Handler Class: Main class to handle all the functionality. It creates object of all three type of sellers. Using this object, it generates 10 new threads for each and starts the execution of that threads. Run method keeps track of total number of tickets sold and number of customer turned away.

**Final outputs and outcome:**

We performed 3 different runs according to **N = 5, 10 and 15** where **N** is the number of customers per ticket seller. Here is our final output for all three runs.

* Final seating chart for N = 5

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H1-0 | H1-1 | H1-2 | H1-3 | H1-4 | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| M2-0 | M1-0 | M3-0 | M1-1 | M2-1 | M3-1 | M2-2 | M3-2 | M2-3 | M2-4 |
| M1-2 | M1-3 | M3-3 | M1-4 | M3-4 | --- | --- | --- | --- | --- |
| L3-3 | L6-4 | L5-3 | L2-4 | L3-4 | L1-3 | L5-4 | L4-3 | L1-4 | --- |
| L4-1 | L1-1 | L6-2 | L1-2 | L3-2 | L4-2 | L5-2 | L2-2 | L6-3 | L2-3 |
| L5-0 | L6-0 | L4-0 | L3-0 | L2-0 | L1-0 | L2-1 | L3-1 | L6-1 | L5-1 |

* Final seating chart for N = 10

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H1-0 | H1-1 | H1-2 | H1-3 | H1-4 | H1-5 | H1-6 | H1-7 | H1-8 | H1-9 |
| L6-7 | L3-8 | L4-9 | L1-8 | L2-8 | --- | --- | --- | --- | --- |
| L2-6 | L5-9 | M3-8 | L6-6 | L1-7 | L3-7 | L4-8 | L2-7 | M1-9 | M3-9 |
| L2-5 | L5-8 | M3-6 | L6-5 | L1-6 | M1-8 | M2-9 | M3-7 | L4-7 | L3-6 |
| M2-7 | M1-7 | L2-4 | M2-8 | L5-7 | L1-5 | M3-5 | L6-4 | L4-6 | L3-5 |
| M1-0 | M1-1 | M3-0 | M3-1 | M2-0 | M3-2 | M2-1 | M2-2 | M1-2 | M2-3 |
| M1-3 | M1-4 | M2-4 | M2-5 | M3-3 | M1-5 | M2-6 | M3-4 | L5-6 | M1-6 |
| L2-2 | L6-2 | L3-3 | L1-3 | L5-5 | L2-3 | L3-4 | L1-4 | L6-3 | L4-5 |
| L3-1 | L4-2 | L2-1 | L1-1 | L5-3 | L3-2 | L4-3 | L1-2 | L4-4 | L5-4 |
| L5-0 | L4-0 | L6-0 | L5-1 | L3-0 | L2-0 | L4-1 | L1-0 | L5-2 | L6-1 |

* Final seating chart for N = 15

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H1-0 | H1-1 | H1-2 | H1-3 | H1-4 | H1-5 | H1-6 | H1-7 | H1-8 | H1-9 |
| H1-10 | H1-11 | H1-12 | H1-13 | H1-14 | M3-10 | L2-6 | L3-8 | M2-11 | M1-12 |
| L5-6 | L4-6 | M2-10 | L3-7 | M3-9 | L1-8 | L5-7 | L6-7 | M1-11 | L4-7 |
| M3-7 | L4-5 | M1-9 | M2-9 | M3-8 | L3-6 | L6-6 | L1-7 | M1-10 | L2-5 |
| M2-7 | M1-6 | M1-7 | M2-8 | L5-5 | L2-4 | L6-5 | L3-5 | L1-6 | M1-8 |
| M3-0 | M2-0 | M3-1 | M2-1 | M2-2 | M1-0 | M2-3 | M2-4 | M1-1 | M3-2 |
| M2-5 | M1-2 | M3-3 | M1-3 | M3-4 | M2-6 | M3-5 | M1-4 | M1-5 | M3-6 |
| L4-3 | L2-2 | L6-3 | L1-4 | L5-4 | L3-4 | L6-4 | L4-4 | L2-3 | L1-5 |
| L6-1 | L1-2 | L3-2 | L5-2 | L4-2 | L2-1 | L1-3 | L6-2 | L5-3 | L3-3 |
| L3-0 | L5-0 | L1-0 | L4-0 | L3-1 | L6-0 | L1-1 | L4-1 | L5-1 | L2-0 |