SIT315 Programming Paradigms

Module 2 Concurrent Programming

TaskM2.T3D: Traffic Control Simulator

Overview of the task

To fulfill the requirements of this task, you will need to demonstrate your skills to implement multithreaded bounded-buffer producer-consumer pattern to simulate traffic control where:

- Traffic producers simulate the generation of traffic signal data { timestamp , traffic light id, number of cars passed by }
- Traffic consumers process traffic signal data to reflect the top N most congested traffic light every hour.

You can simulate X number of traffic signals, 12 measurements per hour - measurement every 5 minute (this is for the timestamp)

Submission Details

Please make sure to provide the following:

- Document of your solution design listing data structures used and status of thread-safe, blocking vs non-blocking,
- Your project code,
- Snapshot of your solution running, and
- Example datafile you used as input for your simulation a file where each line has timestamp,
 traffic light id and number of cars recorded

Instructions

- 1. Design your solution to have flexible number of producer and consumer threads
- 2. Make sure to use the right data strucutre (containers)
- 3. Develop a test data file
- 4. Implement your sequential solution
- 5. Break it down to producer reads data, puts them in the queue; and consumer that reads from the queue and update a sorted list of top locations with highest records.
- 6. Test your program, and document your solution details.
- 7. Submit your task as detailed on the submission details section above to OnTrack.