SIT315 Programming Paradigms

Module2 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 multi-threaded 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.