CSCI 4060U – Laboratory #3
Critical Regions in OpenMP
Lab Due: <u>Monday, February 10, 2025 at 11:00pm (Canvas)</u>

Introduction

The main purpose of this lab is to implement a parallel program with two queues – one storing latitudes and one storing longitudes in decimal degrees. You should manage reads/writes to each queue using independent critical regions.

Hint: you may want to start by looking at `critical_ex1.c` from Lecture #7.

Activity

Write a parallel program that meets the following criteria:

- Your program should implement two queues containing doubles – each queue is of length 10. Implement each queue using an array.
- In parallel:
    - you should continuously populate empty space at the end of each queue (i.e., using enqueue) with the values stored in `latitude.csv` and `longitude.csv.`
    - You should dequeue the front element from each queue and convert the latitude (or longitude) represented in decimal degrees to the degrees, minutes, seconds (DMS) format. Once this is complete you should print out a message similar to:
        - "38.8897° converted to 38° 53′ 23″ N"
- Your program should finish once all data in the files has been read and processed.
- Include performance (timing information) for your program in the comments.

Submission

You should submit your *source file* with the performance data in the *comments* as `lab03.c` through the lab drop box in Blackboard.