

CSCI 4060U – Laboratory #2

Barriers in OpenMP

Lab Due: Monday, February 3, 2025 at 11:00pm (Canvas)

Introduction

The main purpose of this lab is to explore parallelization in OpenMP using a barrier.

Activity #1 [6 marks]

Write a parallel program that meets the following criteria:

- Your program should take as input the set of files in CSCI_4060U_Lab02_data.zip. Each file contains student data (randomly generated) for a particular program. The format of each file is:

```
FirstName1,LastName1,GPA1
FirstName2,LastName2,GPA2
FirstName3,LastName3,GPA3
...
```

- First, your program should find the student with the highest GPA in each academic program.
[Hint: use a barrier after finding the highest GPAs but before the next step]
- Next, your program should take the top student (by GPA) from each program and sort this new list by GPA (highest to lowest) before displaying it as output.

Activity #2 [4 marks]

In the second activity, you will assess the performance of your program from Activity #1. You should record the real time (seconds) of your program using 1, 2, 4, 8 threads – record these times in the header comments of your program. It is best to record multiple times and average your results.

Submission

You should submit your source file for Activity #1 with the performance data in the comments as csci4060u_lab02.c through the lab drop box in Canvas.