

Concordia University

Electrical and Computer Engineering

COEN 346 Lab Assignment #1 Description

Merge-Sort using multithreading

The program gets a list of integer values specified in an input file called input.txt. Using the recursive threading method and merge sort technique, the program should sort the input list. The output (output.txt) should be the sequence of the strings indicating the starting/stopping of each thread as well as the sorted sub-list corresponding to each thread.

Input.txt

```
3304
8221
26849
14038
1509
6367
7856
21362
```

Output.txt

```
Thread 1 started
Thread 10 started
Thread 11 started
Thread 101 started
Thread 100 started
Thread 110 started
Thread 111 started
Thread 1010 started
Thread 1010 finished: 26849,
Thread 1000 started
Thread 1000 finished: 3304,
Thread 1011 started
Thread 1011 finished: 14038,
Thread 1001 started
Thread 1001 finished: 8221,
Thread 100 finished: 3304, 8221,
Thread 101 finished: 14038, 26849,
Thread 1100 started
Thread 1100 finished: 1509,
Thread 1101 started
Thread 1101 finished: 6367,
Thread 1110 started
Thread 1110 finished: 7856,
Thread 110 finished: 1509, 6367,
Thread 10 finished: 3304, 8221, 14038, 26849,
Thread 1111 started
```

```
Thread 1111 finished: 21362,  
Thread 111 finished: 7856, 21362,  
Thread 11 finished: 1509, 6367, 7856, 21362,  
Thread 1 finished: 1509, 3304, 6367, 7856, 8221, 14038, 21362, 26849,
```

The assignment should be done in a group of three students. Please not that you cannot change your group after submitting the first assignment.

The deliverable consists of the following items:

- 1- A well-commented code
- 2- A two page report specifying the high level description of the code (description of the methods/functions/threads and the flow of the program). The report should also include a brief conclusion, discussing you experience with threading and your suggestion for an example application of threads other than the ones discussed so far. Don't forget to write the names of all team members in the report.

This assignment will count for 15% of your total mark for programming assignments. Also, for this assignment 80% of the mark is for the quality and correctness of your code, and 20% for the quality of your report.

The code and the report should be submitted in one zip file through Moodle by Friday February 12th, 2021 (11:59 pm).

Also, you will have to demonstrate your work as a team to your TA during a lab session. This will done through Zoom.