LEBANESE AMERICAN UNIVERSITY
Department of Computer Science and Mathematics
CSC 447: Parallel Programing
Spring 2021

Lab I (C Programming Review)

Problem1: Matrix Multiplication

Write a C program that takes, as a command line argument, the name of a file and reads from it first two integers that correspond to the dimensions (number of columns and number of rows) of the first matrix followed by the elements of the matrix, then two integers that correspond to the dimensions of the second matrix followed by the elements of the second matrix. The two matrices are read into two 2-dimensional arrays. Your program should compute their multiplication and write the result to an output file. **Note**: you must handle the case when the matrices cannot be multiplied by printing "Dimensions Don't Match" in this case.

Sample input:

```
3
4
1 2 5 0
3 0 1 4
5 2 2 3
4
2
0 2
1 5
3 1
1 6
```

Sample output:

```
17  17
7   31
11  40
```

- Test your program on the provided text file *Input.txt*

Compile and run this C program and verify its output by following these steps:

- Use an IDE (Visual Studio or Visual Studio Code) to write your program and save it with the name: *YourName*_Prob1.c
- Compile your program
- Then, open a terminal window and run your C program on the provided text file Input.txt by typing the command: ./a.out Input.txt
- Verify that your program gives the correct output

Problem 2: Merge Sort

Write a C program that takes as command line argument the name of a text file containing first an integer n followed by an array of n integers. Your program should first read from the text file the array elements then apply the merge sort algorithm to sort the array. The sorted array elements should be printed out into an output text file. Save your program with the name *YourName*_Prob2.c.

Test your program on the provided text file *Input2.txt*

Submission Instructions:

Place your solutions in one compressed folder with the name *YourFirstName_YourLastName*_Lab1.zip and submit it on the provided Submission Link on Blackboard. **This lab assignment is due on Tuesday February 23 at 8:00 a.m.**