CSE 1133 – Introduction to Programming

2018 – 2019 Fall Semester Project

1. m-th degree Summation (20 pts)

Write a program to calculate m-th degree summation with the integers m and n, which are get from the user. You must write the function in 2 different ways: **recursive** and **iterative** approach. (See lab documents of week 8 for examples.)

Calculate the m-th degree Sum(n,m) by the following definition:

- Find the summation of numbers from 1 to n, get the result (let say "t")
- Find the summation of numbers from 1 to t.
- …
- Repeat the same operation m times.

Example:

Sum(5,3)

i. 1+2+3+4+5 = 15
ii. 1+2+…+14+15 = 120
iii. 1+2+…+119+120 = 7260

Sum(5,3) = 7260

2. Fully sentence (30 pts)

A fully sentence is a sentence using every letter of a given alphabet at least once.

Example:

"Two driven jocks help fax my big quiz."
"The quick brown fox jumps over the lazy dog."

a. Write a program that checks the given sentence is fully or not.
b. Find the frequency of the letter that most occurred in the sentence.

3. Matrix Operations (40 pts)

Write a C program for matrix operations. You should display a simple console menu to ask to user which operations will be done.

1) Transpose
2) Addition
3) Multiplication

Transpose

Program gets the dimensions from the user and generates a matrix. Then, calculates the transpose of matrix and displays both the generated and the transpose of that matrix.

Addition

Program gets the dimensions from the user and generates two different matrices with same dimensions. Then, calculates the addition of matrices and displays all three matrices, generated ones and the result of the addition.

Multiplication

Program gets the dimensions for matrix 1 and matrix 2 from the user and check if the dimensions are proper for multiplication, if they are not, warns the user and wants another dimension. Then, calculates the multiplication of matrices and displays all three matrices, generated ones and the result of the multiplication.

- You must write your own functions for operations.
- You can use *srand()* function for different random values.
- Matrix means 2 dimensional array, so you should use array of arrays for a matrix.

!!! Your implementations should be **efficient** as possible. Write your own algorithms!

P.S.:

- You can prepare your project yourself (single person) or as **at most two** people groups. (It means you cannot work as a three/four-people group!)

-You must submit a **report (10 pts)** and C code of your program. (You can use any IDE you want.) Please upload your compressed (zip/rar) file (that includes your report and C source code files – not project files) to the **moodle** page of the course to the appropriate area (projects that are sent via e-mail or other different ways of sending, will not be accepted!) before **23 December 2018, Sunday**, **23:00.** (**Projects that not uploaded to moodle page of the course until this time, will definitely not be accepted!**). One of the group member's project upload is sufficient, but please write your numbers and names to your report.

-Your submission file name should be in this format:
name_surname_studentNumber

Very important note: Every student (each member of the group individually) is going to demonstrate his/her project to the lab assistants in a specific time. (The program will be announced later). So, uploading your project is not sufficient, you must come and explain your algorithms and codes.