CSMT503 **Advanced Programming Lab 1**

CSMT533 **Data Structures and Algorithms Lab**

Assignment 1.1

Objectives:
To review basics of file handling in C/C++, structures, arrays.

Exercises:
Consider the attached CSV file containing marks of 4 tests each of 60 students. Write a program that reads the file. The file name should be given as input by the user, preferably as a command line argument. After reading the file, the program should do the following:

A. Define a structure that can hold all the details of a student, and store the information in the file as an array of structures.
B. Calculate the total marks, percentage, and percentile of each student. Write the results in the same CSV file in new columns.
C. Compute mean (μ) and standard deviation (σ) of the total marks obtained by students. The grade of each student is then calculated using the following rule:
   total >= $\mu + 3\sigma$: A+
   $\mu + 3\sigma$ > total >= $\mu + 2\sigma$: A
   $\mu + 2\sigma$ > total >= $\mu + \sigma$: B+
   $\mu + \sigma$ > total >= $\mu - \sigma$: B
   $\mu - \sigma$ > total >= $\mu - 2\sigma$: C
   $\mu - 2\sigma$ > total >= $\mu - 3\sigma$: P
   $\mu - 3\sigma$ > total : F
   Display a statistics of how many students are in each grade category, the highest, lowest, and average scores of the students.

Submission Instructions:

1. Rename the files using your own roll number and the assignment number. For example, if your roll number is CSE22001 and the file corresponds to Assignment 1, then the filename will be *CSE22001_Lab1.c.*
2. Students are expected to explain their code and show a demo of the output to the course instructor or teaching assistant. Only after the demo, the marks for the corresponding assignment will be recorded. Simply uploading the file in Google Classroom will not be considered as a submission.
3. All assignments will be initially scored out of 10 (unless stated otherwise), and then added to the final evaluation plan with a weight.
4. Out of 10 marks: 1 is for timely submission, 3 for output, and 6 for explanation.