

# Lab 12

## Functions and Files

**NOTE:** Outputs should be properly formatted.

### Problem 01

Write a program to manage student records stored in a text file. Each record should contain the following information for a student:

- Name
- Roll Number
- Marks

The program should provide the following options to the user through a menu:

- Add a new student record (Append to the file).
- Display all student records (Read and display the file content).
- Exit the program

Use **functions** for each of the operations to modularize the code.

### Problem 02

Write a program that evaluates the following formula using the concept of function overloading. The program should have functions that take q1 and q2 as double as well as integers. Both the functions should return value in double. Pi and Epsilon should be passed as default arguments in both functions.

- double evaluate (int x, int y, double pi=3.142, double epsilon=8.85418)
- double evaluate (double x, double y, double pi=3.142, double epsilon=8.85418)

The first function should return value accurate to three decimal places and second function should return value accurate to 4 decimal places.

$$F = \frac{|q_1 q_2|}{4\pi\epsilon_0 r^2}$$

### Problem 03

Define a floating array of length  $n$  ( $n$  must be greater than 10). The array would be passed to a function along with its calculated size and the function would traverse the entire array from starting item to the last item and check whether the item being traversed is prime or not.

1. If the item is prime, then the item must be halved (divide by 2). And the halved item should be passed to another function where it would modify the passed value as per the following formula :  $(1 - n^2) / (n + 2)$

**float formula1 (float);**

2. If the item is not prime, the item would not be halved in this case. The item would then be passed to another function where it would modify the passed value as per the following formula:  $(n - (1/2 + n)) / (2n + 2)$

**float formula1 (float);**

3. A function that should check whether a received item is prime or not.

**bool isPrime (int);**