CCS1063 | CSE1062 Fundamentals of Programming

- Lab Sheet 07 -

1. Create a multiplication table storing the values in a 2D array and then print the table.

```
          Multiplication Table up to 10

       1   2   3   4   5   6   7   8   9  10
-----------------------------------------------
  1 |  1   2   3   4   5   6   7   8   9  10
-----------------------------------------------
  2 |  2   4   6   8  10  12  14  16  18  20
-----------------------------------------------
  3 |  3   6   9  12  15  18  21  24  27  30
-----------------------------------------------
  4 |  4   8  12  16  20  24  28  32  36  40
-----------------------------------------------
  5 |  5  10  15  20  25  30  35  40  45  50
-----------------------------------------------
  6 |  6  12  18  24  30  36  42  48  54  60
-----------------------------------------------
  7 |  7  14  21  28  35  42  49  56  63  70
-----------------------------------------------
  8 |  8  16  24  32  40  48  56  64  72  80
-----------------------------------------------
  9 |  9  18  27  36  45  54  63  72  81  90
-----------------------------------------------
 10 | 10  20  30  40  50  60  70  80  90 100
-----------------------------------------------
```

2. Using the following two matrixes write functions for matrixes addition, subtraction and multiplication.

$$\begin{pmatrix} 3 & 2 & 4 \\ 0 & 2 & 1 \\ 8 & 6 & 5 \end{pmatrix} \quad \begin{pmatrix} 5 & 1 & 8 \\ 6 & 4 & 9 \\ 2 & 7 & 3 \end{pmatrix}$$

3. Declare an array in the main method to store 15 double numbers given below.

34.5	56.7	12.6	98.4	54.21
89.55	54.2	98.4	73.2	21.45
34.5	98.4	21.45	98.4	9.3

Write separate methods in the C program to perform the following operations.

   a. Calculate the total of the elements in the array and then return the total.
   b. Calculate the average of the elements in the array and then return the average.
   c. Find the minimum element in the array and return.
   d. Find the maximum elements in the array and return.
   e. Find the element(s) which appears the maximum number of times in the array.

   Call the above-defined methods within the main method.

4. Write a program for given values of five students' scores, gets the best score, and then assign grades based on the following scheme:

   The grade is A If the score is >= best - 10;

   The grade is B If the score is >= best - 20;

   The grade is C If the score is >= best - 30;

   The grade is D If the score is >= best - 40;

   The grade is F otherwise.

5. Write a C program that reads in ten numbers and displays the number of distinct numbers and distinct numbers. (i.e., if a number appears multiple times, it is displayed only once).

6. The selection-sort method repeatedly finds the smallest number in the current array and swaps it with the first number in the array. Rewrite this sorting by finding the largest number and swapping it with the last number in the array. Write a C program for given ten integer numbers to display the sorted numbers.

7. Write a C program that shows the bubble sort algorithm for given 10 double numbers to display the sorted numbers. Use (6.0, 4.4, 1.9, 2.9, 3.4, 2.9, 3.5, 2.3, 7.5, 4.8) to test the program.

   (Hint: Bubble Sort is the simplest sorting algorithm that works by repeatedly swapping the adjacent elements if they are in the wrong order).

8. Given 5 non-negative integers, write a C program to arrange them such that they form the largest possible number. Ex: 50, 2, 1, 9, 0 The largest formed number is 950210.

9. Write a method to count the number of 2s in a given range of integers. E.g.: 10,11,12,13,14,15,16,17,18,19,20. Output is 2.

10. Write a C program to add 'ing' at the end of a given string (length should be at least 3). If the given string already ends with 'ing' then add 'ly' instead. If the string length of the given string is less than 3, leave it unchanged.

    - Sample String: eat
    - Expected Result: 'eating'
    - Sample String: 'string'
    - Expected Result: 'stringly