CL-1002
Programming Fundamentals
Lab # 14

Objectives:

- Practice and understanding on basic c++ programs

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. There must be a block of comments at start of every question's code by students; the block should contain brief description about functionality of code.
2. Comment on every function about its functionality.
3. Use understandable name of variables.
4. Proper indentation of code is essential.
5. Write a C++ statement(s) for each of the following task one after the other, in the same order.
6. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of **every task output in MS word and submit .cpp file with word file**.
7. Make separate .cpp files for all tasks and use this format **23F-1234_Task1.cpp.**
8. First think about statement problems and then write/draw your logic on copy.
9. After copy pencil work, code the problem statement on MS Studio C++ compiler.
10. At the end when you done your tasks, attached C++ created files in MS word file and make your submission on Google classroom. (Make sure your submission is completed).
11. Please submit your word file in this format **23F-1234_L1.docx**
12. Do not submit your assignment **after the deadline**.
13. **Do not copy code from any source otherwise you will be penalized with negative marks.**

Problem: 1 |

Initialize 3d array of size 2x2x2 and then display the array.

Problem: 2 | 2d Array

You have a class of 20 students. Each student has been graded on two subjects, Math and English. The grades range from 0 to 100.

- Create a 2-dimensional array to store the grades of each student.
- Populate the array with random grades for Math and English for each student.
- Calculate and display the average Math and English grades for the class.
- Identify and display the student with the highest average grade.

Problem: 3 | 2d Array

You are developing a simple console-based Tic-Tac-Toe game. The game board is represented by a 3x3 grid. Each cell can be empty (0), filled by Player X (1), or filled by Player O (2).

- Create a 3x3 2-dimensional array to represent the Tic-Tac-Toe game board. Initialize it with all cells empty.
- Display the initial game board.
- Allow two players, X and O, to take turns making moves. Prompt the players to enter the row and column where they want to place their mark.
- Check for a winner after each move. A player wins if they have three of their marks in a row (horizontal, vertical, or diagonal).
- If there is a winner, display a congratulatory message. If the board is filled without a winner, display a message indicating a draw.