CL-118
Programming
Fundamentals Lab # 15

Objectives:

- Practice and understanding on basic c++ programs
- Parallel Array
- Multi-dimensional Array

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

1. Use proper **font family (Calibri or Times New Roman)** and **font size** of the **title (16 points), heading (14 points), subheading (12 points),** and **normal text (10 points)**.
2. First think about the problem statement and then write/draw your logic on paper.
3. **Microsoft Visual Studio** should be used to make c++ programs. Programs made with any other software would not be accepted.
4. For each task in the manual create a new C++ program with the naming convention as follows:
   TASK-NO
5. **Mention what is happening in each line of code using comments**.
6. Write all codes one by one with proper numbering and also paste screen shot of each problem using the **snipping tool** (default screen capture software in windows) on **Microsoft word file.**
7. Please submit your file with this naming convention
   ROLLNO_SECTION_GROUPNO_LABNO.
8. Do not copy from any source otherwise, you will be penalized with zero marks.
9. Submit your lab on **Google Classroom**.

Problem: 1 | 2d array

Write a program which input a 2-Dimensional array of size 5x5, find the largest element in it

Problem: 2 | 2d Array

Write a C++ Program to Find if an Array is a Square Matrix and Print the Diagonals.
The program takes an array and checks if it is a square matrix and prints the diagonals. A square matrix is one which has equal number of row and columns.

Problem: 3 | 2d Array

Write a C++ Program to Find the Transpose of a Matrix.
The program takes a matrix and prints the transpose of the matrix. In a transpose matrix, rows become columns and vice versa.

Problem: 4 | 2d Array

Write a C++ Program to Perform Matrix Multiplication.

1. The program takes two matrices and multiplies them
2. If number of columns of matrix A is not equal to number of rows of matrix B, then matrices cannot be added.
3. The program is exited.
4. Else they are multiplied and the result is printed.
5. Exit.

Problem: 5 | Code detection | parallel Array

When a message is transmitted in secret code over a transmission channel, it is usually sent as a sequence of bits, that is, 0s and 1s. Due to noise in the transmission channel, the transmitted message may become corrupted. That is, the message received at the destination is not the same as the message transmitted; some of the bits may have been changed. There are several techniques to check the validity of the transmitted message at the destination. One technique is to transmit the same message twice. At the destination, both copies of the message are compared bit by bit. If the corresponding bits are the same, the message received is error-free Let's write a program to check whether the message received at the destination is error free. For simplicity, assume that the secret code representing the message is a sequence of digits (0 to 9) and the maximum length of the message is 250 digits.

Also, the first number in the message is the length of the message. For example, if the secret code is:
7 9 2 7 8 3 5 6
Then the actual message is 7 digits long, and it is transmitted twice.
The above message is transmitted as:
7 9 2 7 8 3 5 6 7 9 2 7 8 3 5 6
Input: Sequence of numbers containing the secret code and its copy
Output: The secret code, its copy, and a message—if the received code is errorfree—in the following form:

Code Digit	Code Digit Copy
9	9
2	2
7	7
8	8
3	3
5	5
6	6

Message transmitted OK.
Because we have to compare the corresponding digits of the secret code and its copy, we first read the secret code and store it in an array. Then we read the first digit of the copy and compare it with the first digit of the secret code, and so on. If any of the corresponding digits are not the same, we indicate this fact by printing a message next to the digits. Because the maximum length of the message is 250, we use an array of 250 components. The first number in the secret code, and in the copy of the secret code, indicates the length of the code.
Write code and use parallel array concept.

Problem: 6 | C-Array

Write a program to input a sentence in char array and two integer that indicates the indexes (startIndex and stopIndex). Now your program holds the section between the two indexes.
Example:
Entered string is “My name is Ali”
Start index: 4
Stop index: 7
Section between starting and Ending Index: name

Problem: 7 | C-Array

Write a program in C++ that takes 5 to 10 lines as input text from the user and save it into a file “myfile.txt”. Now write a function in C++ to count and display the number of lines not starting with alphabet 'A' present in a text file “myfile.txt".

Example: Sample input: If the file " myfile.txt" contains the following lines,
The rose is red.
A girl is playing there.
There is a playground.
An airplane is in the sky.
Numbers are not allowed in the password.
Sample Output:
The rose is red.
There is a playground.
Numbers are not allowed in the password.
Count Value is: 3

Best of luck ☺

You are done with your exercise, submit on slate at given time.