CL-118
Programming
Fundamentals Lab # 13

Objectives:

- Practice and understanding on basic c++ programs
- File Handling
- One-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 **title (16 points), heading (14 points), sub heading (12 points)** and **normal text (10 points)**.
2. First think about 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 **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 negative marks.
9. Submit your lab on **Google Classroom**.

Problem: 1 | File Handling(Read file)

1. Write a c++ program that opens a already created file firstfile.txt (that you have created in first question).
2. Now read the data of file and display it. (Read the data until you reach end of file).
3. Now remove all the text from file.

Problem: 2 | File Handling(Read/Write file)

Write a program to add two numbers.

1. Write a c++ program that creates a file.
2. Ask user to input two numbers
3. Take their sum and store in variable.
4. Write both numbers and their sum in file.
5. Now read it from file and display

Problem: 3 | File Handling(Read/Write file)

Write a program to do arithmetic operations.

1. Write a c++ program that creates a file.
2. Prompt user to enter a number for writing its table, write the table in file you have created.
3. Now read your complete file. Display the contents of your file.

Problem: 4 | Arrays 1 dimensional

Write a program to declare an integer array of size 10. Now input some values in all indexes of array without using any loop. Finally display value at index 6.

Problem: 5 | Arrays 1 dimensional

Write a program to initialize array of size 5 in single statement.

Problem: 6 | Arrays 1 dimensional, Random Numbers

Write a program to initialize 100 random numbers using array. Display all numbers

Problem: 7 | Arrays 1 dimensional

Write a program to read ten numbers. Find there sum. Now prints numbers in reverse order.

Problem: 8 | Arrays 1 dimensional

Suppose list is an array of six components of type int. What is stored in list after the following C++ code executes?

```
list[0] = 5;
for (int i = 1; i < 6; i++)
{
    list[i] = i * i + 5;
    if (i > 2)
        list[i] = 2 * list[i] - list[i - 1];
}
```

Problem: 9 | Array 1 dimensional

a) Determine whether the following array declarations are valid

a. `int a[5] = {0, 4, 3, 2, 7};`
b. `int b[10] = {0, 7, 3, 12};`
c. `int c[7] = {12, 13, , 14, 16, , 8};`
d. `double lengths[] = {12.7, 13.9, 18.75, 20.78};`
e. `char name[8] = "Samantha";`

b) Suppose that you have the following declaration:

```
int list[10] = {8, 9, 15, 12, 80};
```

Problem: 10 | Array 1 dimensional

Write a C++ program that declares an array alpha of 50 components of type double. Initialize the array so that the first 25 components are equal to the square of the index variable, and the last 25 components are equal to three times the index variable. Output the array so that 10 elements per line are printed.

Problem: 11 | Array 1 dimensional, Duplicate Elimination

Use a one-dimensional array to solve the following problem. Read in 20 numbers, each of which is between 10 and 100, inclusive. As each number is read, validate it and store it in the array only if it isn't a duplicate of a number already read. After reading all the values, display only the unique values that the user entered. Provide for the "worst case" in which all 20 numbers are different. Use the smallest possible array to solve this problem

Problem: 12 | Array 1 dimensional, Sorting, File handling

Write a program to initialize 100 randomly generated numbers. Sort all numbers in ascending order. Write all sorted numbers in file sortedNumbers.txt