Programming Fundamentals

Assignment # 02

Note:

- First think about a problem statement and then write/draw your logic on paper.
- Copied tasks will be awarded **zero** marks.
- Comment your code properly.
- Assignment after the due date will not be accepted.
- Understanding questions is part of the assignment.
- Plagiarism of any shape or form will not be tolerated. In case of plagiarism, The particular question will be marked zero and 50% marks from total obtained marks will be deducted.

NOTE : if anyone use any AI ChatBot there will be strong consequences

Problem 1

`Objective:`

Write a C++ program to perform addition, subtraction, and multiplication on two complex numbers without using loops, functions, or classes. You will handle the real and imaginary parts of the complex numbers manually.

Problem Description:
A complex number is represented as a+bi where:

- a is the real part.
- a is the imaginary part.

For two complex numbers, represented as **(a1 + b1i)** and **(a2 + b2i)** perform the following operations:

Addition:

Add the real parts and the imaginary parts separately.

Sum=(a1+a2)+(b1+b2)i

Subtraction:

Subtract the real parts and the imaginary parts separately.

Difference=(a1−a2)+(b1−b2)i

Multiplication:

Use the following formula to multiply the complex numbers:

Product=”create the logic on your own”

Task:

1. Declare four variables to store the real and imaginary parts of the two complex numbers.
2. Take input for the real and imaginary parts of both complex numbers from the user.
3. Calculate and display the results of:
    - **Addition:** Sum of the real parts and sum of the imaginary parts.

      And print in this **a + bi** format

    - **Subtraction:** Difference between the real parts and difference between the imaginary parts.

      And print in this **a + bi** format

    - **Multiplication:** Calculate the real and imaginary parts of the product using the formula provided.

Input Format:

- You will enter the real and imaginary parts of two complex numbers in the following format:
    - For the first complex number: `a1 b1`
    - For the second complex number: `a2 b2`

Output Format:

- Display the results of the operations in the following format:
    - Result of addition: `real + imaginary i`

- Result of subtraction: `real - imaginary i`
- Result of multiplication: `real + imaginary i`

Problem 2

Problem Description:

Write a C++ program that takes a three-digit number as input and prints the number with its digits reversed. For example, if the input is **123**, the output should be **321.**

Task:

1. Declare a variable to store the three-digit number.
2. Use arithmetic operations (division and modulus) to extract the digits of the number.
3. Rearrange and print the digits in reverse order.

Input Format:

- Take three digit number from user e.g 123

Output Format:

- The number with its digits reversed. E.g 321

Problem 3

Total Expense Calculation :

Objective:

Write a C++ program to calculate the total expenses over a month.

Problem Description:

You need to compute the total expenses given daily expenses for a week and the number of weeks in a month.

Task:

1. Declare variables to store:
    - Daily expense amount
    - Number of weeks in a month
2. Take input for the daily expense and the number of weeks from the user.
3. Calculate the total expense as follows:
   TotalExpense=Daily Expense×7×Number of Weeks
4. Display the result in a clear format.

Important Instructions:

You must submit the **.cpp** file and write the code by hand on paper and submit it. Submit the .**cpp** file on GCR, and the hard copy will be collected by the CR, who will hand it over to **Muhammad Adil.**

Files must be submitted in the format:

2xp-xxxx_Fname_Lname_Section_Asst_0x_Quest_0x.cpp