

Task_13

Question_1

You are tasked with developing a simple **Student Grade Management System** for a class. The goal is to create a program that can handle the grades of a fixed number of students, allowing the user to enter grades, calculate the average grade, and determine the highest and lowest grades. The class size is limited to a maximum of 10 students.

To complete this task, you will use pointers to manipulate the grades stored in the array. The program will include several core functionalities: First, it will allow the user to input each student's grade, storing the data using a pointer to the array. Then, it will calculate the average of all grades using pointer arithmetic. Additionally, the program will determine the highest and lowest grades using a pointer-based approach. All these calculations will be performed within separate functions, with pointers passed to these functions to handle the data efficiently.

Question_2

In this task, you are developing a **Number Frequency Tracker** for a simple data analysis tool. The goal is to track how many times each number appears in a list provided by the user. The system will allow the user to input up to 15 integers, and then it will calculate and display the frequency of each unique number in the list. The program will use two parallel arrays: one to store the numbers and another to store the corresponding frequencies of these numbers. To solve this problem, the program will perform several key operations: it will count how many times each number appears, display the frequency of each unique number, identify and display the most frequent number (mode), and handle duplicates efficiently.

The system will prompt the user to input a sequence of integers, which will be stored in an array. Using pointers, the program will traverse through the array to count the occurrences of each number. It will then use another array to store the frequency of each number, updating it based on the comparisons made. The program will also be able to display the frequencies of all the numbers and find the mode by identifying the number with the highest frequency. To implement these functionalities, the program will utilize pointer arithmetic to access and manipulate array elements efficiently.

For example, when counting the occurrences of each number, the program will use pointers to compare each number with others in the list and increment its frequency. Additionally, pointers will be used to display the number frequencies and to identify the most frequent number by comparing the frequency array values. By using pointers to access elements directly, the program avoids using array indexing, reinforcing the understanding of pointer-based operations in C++ and providing an efficient solution to track number frequencies and identify the mode.