

Mid-exam assignments (1132): (CI002 D1/D2)

Problem 1

Write a C++ program to calculate the sum of elements in an array using a function and pointer arithmetic.

Requirements:

- Define a function `int sumArray(int* arr, int size)` to compute the sum.
- Use pointers to iterate over the array inside the function.
- Return the sum and display it in the `main()` function.

Problem 2

Write a C++ program that reverses an array of integers using a function and pointer.

Requirements:

- Define a function `void reverseArray(int* arr, int size)` to reverse the array.
- In the `main()` function, display the array before and after the reversal.
- Use pointers to swap the elements of the array.

Problem 3

Write a program that finds both the maximum and minimum values in an array of integers using functions.

Requirements:

- Define a function `void findMinMax(int* arr, int size, int &min, int &max)` to find the minimum and maximum.
- The function should return the values by reference.
- Display the minimum and maximum values in the `main()` function.

Problem 4

Write a C++ class `Student` that stores the student's name, ID, and grades. Implement the constructor, destructor, and member functions to set and display student details.

Requirements:

- Create a `Student` class with private members: name, id, and grades (array of integers).
- Define a constructor to initialize these values.
- Implement a destructor to display a message when an object is destroyed.
- Implement member functions to set and display the student's details.

Problem 5

Write a program to multiply two matrices using function pointers.

Requirements:

- Define a function `void multiplyMatrices(int* mat1, int* mat2, int* result, int rows, int cols)` to perform matrix multiplication.
- Use pointers to represent matrices and perform the multiplication.
- Display the resulting matrix.

Problem 6

Write a program that counts the number of even and odd numbers in an array using a function.

Requirements:

- Define a function void countEvenOdd(int* arr, int size, int &evenCount, int &oddCount) to count even and odd numbers.
- Use pointers to iterate over the array and update the counts.
- Display the result in the main() function.

Problem 7

Write a C++ program that checks if a given string (array of characters) is a palindrome using pointers.

Requirements:

- Define a function bool isPalindrome(char* str, int size) to check if the string is a palindrome.
- Use pointer arithmetic to compare characters from both ends of the string.
- Return true if it is a palindrome and false otherwise.

Problem 8

Write a C++ program that swaps two numbers using pointers.

Requirements:

- Define a function void swap(int* a, int* b) that swaps the values of two integers using pointers.
- In the main() function, declare two integers, call the swap function, and display the swapped values.