**Lab 18 – Arrays and functions**

**Lab Task 1**

**Program Name:** Array Palindrome

**Program Purpose:** Array manipulation and passing to functions

**Problem Background:**

A palindrome is a sequence of elements, which, when reversed, produces the exact same sequence of elements. E.g. {1, 2, 3, 2, 1} and {5, 9, 20, 20, 9, 5} are palindromes. But, {1, 2, 3, 4, 5} is not a palindrome.

**Problem Statement:**

If an array **arr** contains **n** elements, then write a function to check if the array is a palindrome or not. i.e. **arr[0] = arr[n-1]**, **arr[1] = arr[n-2]** and so on. The function prototype is given below:

**bool** isPalindrome(**int** arr[], **int** sz);

For example an array {5, 8, 0, -1, 0, 8, 5} is a palindrome, but {3, 4, 9, 1, 9, 5, 4} is not.

**Hint 1:** Inside the function, you will need 2 counters; one in increasing order and the other in the decreasing order.

**Hint 2:** you might need a flag-controlled loop to correctly implement this program.

**Lab Task 2**

**Program Name:** TwoArrays sum

**Program Purpose:** Array manipulation and passing to functions

**Problem Background:**

Input Array formal parameter: The array is provided only as input to the function and the function is not intended to change the array. In this case, a ‘const’ keyword is used with the array parameter.

Output Array formal parameter: In this case, the function is intended to change the array. In this case, no ‘const’ keyword is used with the array parameter.

**Problem Statement:**

Write a function called sumArrays, which receives 2 input arrays and an output array along with their sizes as formal parameters. The function prototype might look like the following:

**void** sumArrays(**const int** arr1[], **int** sz1, **const int** arr2[], **int** sz2, **int** arrSum[], **int** sz3);

The function should add the corresponding elements of arr1 and arr2 and store it into the corresponding element of arrSum. (**Hint:** You need to run a single loop for this task. Nested loop is NOT needed.)

**Lab Task 3**

**Program Name:** Searching an array

**Program Purpose:** Passing array to function

**Problem Statement:**

* An array is initialized with twenty-five numbers using array initializer list.
* Then, a number is entered through the keyboard by the user, which should be searched in the array.
* Write down a function, which displays whether the searched number is present in the array or not? (Linear search) Decide the required parameters of the function yourself.
* If the number is present in the array, display the number of times it appears in the array.

**HINT:**

1. Use a counter (other than the loop counter) to keep track of how many times the number is found. Increment this counter each time the match is successful.

**NOTE:** Write this program WITHOUT using the Flag-controlled loop.

**Sample Outputs:**

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated