

Lab 9: Pointers

Task 1: Swap Two Numbers Using Pointers

Objective

Create a C++ program to swap the values of two variables using pointers.

Instructions

1. **Function Arguments:**
 - A pointer to the first integer.
 - A pointer to the second integer.
2. **Function Logic:**
 - The function should **not return any value**.
 - Instead, it should swap the values of the two integers by dereferencing their respective pointers.
3. **Use Temporary Variable:**
 - Use a temporary variable to hold one of the values during the swap process.
4. **Input:**
 - The user must input two integers.
5. **Output:**
 - Display the values of the two integers before and after swapping.

Function Signature:

```
void swapNumbers(int* num1, int* num2)
```

Sample Output

```
Enter two numbers: 5 10
```

```
Before swapping: a = 5, b = 10
```

```
After swapping: a = 10, b = 5
```

Task 2: Find Largest and Smallest Elements in an Array Using Pointers

Objective

Create a C++ program to find the **largest** and **smallest** elements in an array of integers using pointers.

Instructions

1. Function Arguments:

- A pointer to the array of integers.
- The size of the array.
- A pointer to an integer variable to store the largest element.
- A pointer to an integer variable to store the smallest element.

2. Function Logic:

- The function should **not return any value**.
- Instead, it should directly modify the largest and smallest values via their respective pointers.

3. Use Pointer Arithmetic:

- Traverse the array using pointer arithmetic to find the largest and smallest elements.

4. Input:

- The user must input 8 integers to populate the array.

5. Output:

- Display the largest and smallest elements in the array.

Function Signature:

```
void findLargestSmallest(int* arr, int size, int* largest, int* smallest)
```

Hint:

*(arr + 2) refers to the 3rd element in the array pointed to by arr.

Sample Output

```
Enter 8 integers: 12 45 3 22 8 11 23 40
The largest element is: 45
The smallest element is: 3
```