

LAB TASK 1

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CS3-1

Data Structures.

Q1)

```
#include <iostream>

using namespace std;

int main() {

    const int size = 10;

    int ages[size];


    cout << "Enter the ages of " << size << " students: " << endl;

    for (int i = 0; i < size; ++i) {

        cout << "Student [" << i + 1 << "]: ";

        cin >> ages[i];

    }


    int largest = ages[0];

    for (int i = 1; i < size; ++i) {

        if (ages[i] > largest) {

            largest = ages[i];

        }

    }

    cout << "The largest age is: " << largest << endl;

    return 0;

}
```

```
Enter the ages of 10 students:
Student [1]: 1
Student [2]: 2
Student [3]: 3
Student [4]: 4
Student [5]: 5
Student [6]: 6
Student [7]: 7
Student [8]: 8
Student [9]: 9
Student [10]: 55
The largest age is: 55

...Program finished with exit code 0
Press ENTER to exit console.
```

Q2)

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int size;
```

```
    cout << "Enter the size of the arrays: ";
```

```
    cin >> size;
```

```
    int* array1 = new int[size];
```

```
    int* array2 = new int[size];
```

```
int* array3 = new int[size];
int* sumArray = new int[size];

cout << "Enter elements for Array 1: " << endl;
for (int i = 0; i < size; ++i) {
    cout << "Element [" << i << "]: ";
    cin >> array1[i];
}

cout << "Enter elements for Array 2: " << endl ;
for (int i = 0; i < size; ++i) {
    cout << "Element [" << i << "]: ";
    cin >> array2[i];
}

// Input values for the third array
cout << "Enter elements for Array 3: " << endl;
for (int i = 0; i < size; ++i) {
    cout << "Element [" << i << "]: ";
    cin >> array3[i];
}

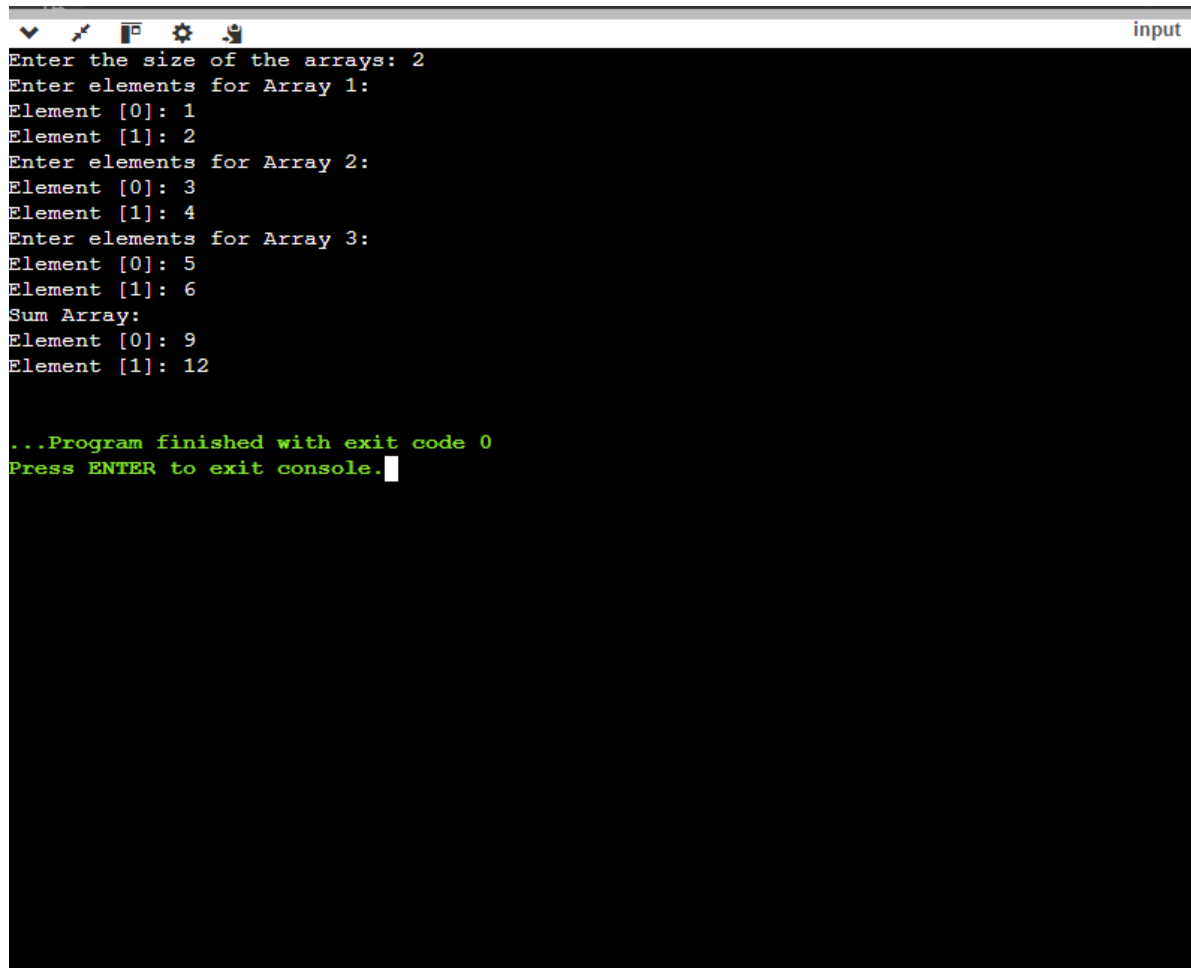
// Add the arrays
for (int i = 0; i < size; ++i) {
    sumArray[i] = array1[i] + array2[i] + array3[i];
}

// Output the result
cout << "Sum Array: " << endl;
for (int i = 0; i < size; ++i) {
```

```
        cout << "Element [" << i << "]: " << sumArray[i] << endl;
    }

    // Free the allocated memory
    delete[] array1;
    delete[] array2;
    delete[] array3;
    delete[] sumArray;

    return 0;
}
```

A screenshot of a Windows command prompt window titled "input". The window has a standard Windows toolbar at the top with icons for back, forward, search, and other navigation functions. The console output shows the execution of a C++ program. It starts with the prompt "Enter the size of the arrays: 2", followed by "Enter elements for Array 1:". The user enters "1" for Element [0] and "2" for Element [1]. Then it prompts for "Enter elements for Array 2:", with "3" for Element [0] and "4" for Element [1]. Next is "Enter elements for Array 3:", with "5" for Element [0] and "6" for Element [1]. The program then calculates the sum array, showing "Sum Array:" followed by "Element [0]: 9" and "Element [1]: 12". At the end, it displays "...Program finished with exit code 0" and "Press ENTER to exit console." with a cursor at the end of the line.

```
input
Enter the size of the arrays: 2
Enter elements for Array 1:
Element [0]: 1
Element [1]: 2
Enter elements for Array 2:
Element [0]: 3
Element [1]: 4
Enter elements for Array 3:
Element [0]: 5
Element [1]: 6
Sum Array:
Element [0]: 9
Element [1]: 12

...Program finished with exit code 0
Press ENTER to exit console.
```

Q3)

```
#include <iostream>
```

```
using namespace std;
```

```
int main() {
```

```
    int size;
```

```
    cout << "Enter the size of the array: ";
```

```
    cin >> size;
```

```
    int* array = new int[size];
```

```
    cout << "Enter elements of the array: " << endl;
```

```
    for (int i = 0; i < size; ++i) {
```

```
        cout << "Element [" << i << "]: ";
```

```
        cin >> array[i];
```

```
    }
```

```
    int item;
```

```
    cout << "Enter the item to search for: ";
```

```
    cin >> item;
```

```
    bool found = false;
```

```
    for (int i = 0; i < size; ++i) {
```

```
        if (array[i] == item) {
```

```
            found = true;
```

```
            cout << "Item found at index: " << i << endl;
```

```
            break;
```

```
        }
```

```
}
```

```
if (!found) {
```


```
    cout << "Item not found in the array. " << endl;
```

```
}
```

```
delete[] array;
```

```
return 0;
```

```
}
```



```
Enter the size of the array: 3
Enter elements of the array:
Element [0]: 1
Element [1]: 2
Element [2]: 3
Enter the item to search for: 2
Item found at index: 1

...Program finished with exit code 0
Press ENTER to exit console.
```