

FUNDAMENTALS OF PROGRAMMING

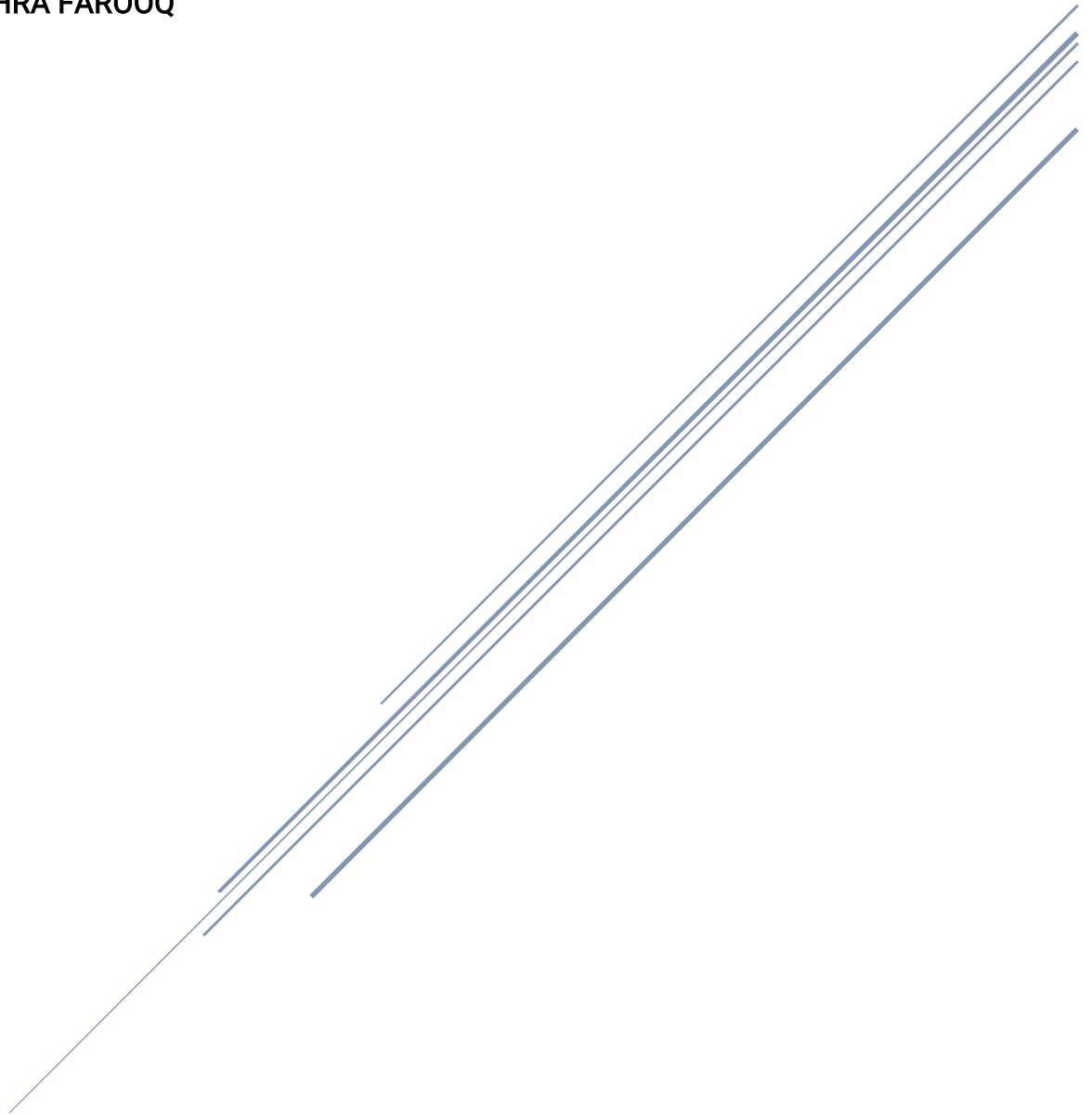
LAB MANUAL # 08 (HOME TASK)

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QUESTION # 01

Take an array and find the most repeated element in that array.

```
#include <iostream>
```

```
#include <unordered_map>
```

```
int findMostRepeatedElement(const int arr[], int size) {
```

```
    std::unordered_map<int, int> frequencyMap;
```

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

```
        frequencyMap[arr[i]]++;
```

```
    }
```

```
    int mostRepeatedElement = arr[0];
```

```
    int maxFrequency = frequencyMap[arr[0]];
```

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

```
        if (frequencyMap[arr[i]] > maxFrequency) {
```

```
            mostRepeatedElement = arr[i];
```

```
            maxFrequency = frequencyMap[arr[i]];
```

```
        }
```

```
    }
```

```
    return mostRepeatedElement;
```

```
}
```

```
int main() {
```

```
    int arr[] = {1, 2, 2, 3, 4, 2, 5, 2, 6, 2};
```

```
    int size = sizeof(arr) / sizeof(arr[0]);
```



```

int mostRepeated = findMostRepeatedElement(arr, size);

std::cout << "The most repeated element is: " << mostRepeated << std::endl;

return 0;
}

```

```

main.cpp
1 #include <iostream>
2 #include <unordered_map>
3
4 int findMostRepeatedElement(const int arr[], int size) {
5     std::unordered_map<int, int> frequencyMap;
6
7     for (int i = 0; i < size; ++i) {
8         frequencyMap[arr[i]]++;
9     }
10
11     int mostRepeatedElement = arr[0];
12     int maxFrequency = frequencyMap[arr[0]];
13
14     for (int i = 1; i < size; ++i) {
15         if (frequencyMap[arr[i]] > maxFrequency) {
16             mostRepeatedElement = arr[i];
17             maxFrequency = frequencyMap[arr[i]];
18         }
19     }
20
21     return mostRepeatedElement;

```

Output

```

/tmp/T1oLa76MvG.o
The most repeated element is: 2

```

QUESTION #02

Let's say an array is $a[8] = \{13, 15, 17, 9, 99, 77, 65, 43\}$. Find largest and smallest element.

```

#include <iostream>

using namespace std;

void findLargestAndSmallest(const int arr[], int size) {
    if (size == 0) {
        cout << "Array is empty." << endl;
        return;
    }

    int smallest = arr[0];
    int largest = arr[0];

```



```

    for (int i = 1; i < size; ++i) {
        if (arr[i] < smallest) {
            smallest = arr[i];
        } else if (arr[i] > largest) {
            largest = arr[i];
        }
    }

    cout << "Smallest element: " << smallest << endl;
    cout << "Largest element: " << largest << endl;
}

int main() {
    int a[] = {13, 15, 17, 9, 99, 77, 65, 43};
    int size = sizeof(a) / sizeof(a[0]);

    findLargestAndSmallest(a, size);

    return 0;
}

```



```
#include <iostream>
using namespace std;
void findLargestAndSmallest(const int arr[], int size) {
    if (size == 0) {
        cout << "Array is empty." << endl;
        return;
    }

    int smallest = arr[0];
    int largest = arr[0];

    for (int i = 1; i < size; ++i) {
        if (arr[i] < smallest) {
            smallest = arr[i];
        } else if (arr[i] > largest) {
            largest = arr[i];
        }
    }

    cout << "Smallest element: " << smallest << endl;
    cout << "Largest element: " << largest << endl;
}

/tmp/T1oLa76MvG.o
Smallest element: 9
Largest element: 99
```

QUESTION #03

Develop a program that takes 5 array elements from user. Swap position [2] element with position [4] element. (Hint: Use the same method of swapping values we used for variables using a third variable temp).

```
#include <iostream>
using namespace std;
int main() {
    const int arraySize = 5;
    int myArray[arraySize];

    // Input 5 array elements from the user
    cout << "Enter 5 array elements:" << endl;
    for (int i = 0; i < arraySize; ++i) {
        cout << "Element " << i + 1 << ": ";
        cin >> myArray[i];
    }

    // Swap position [2] element with position [4] element
```



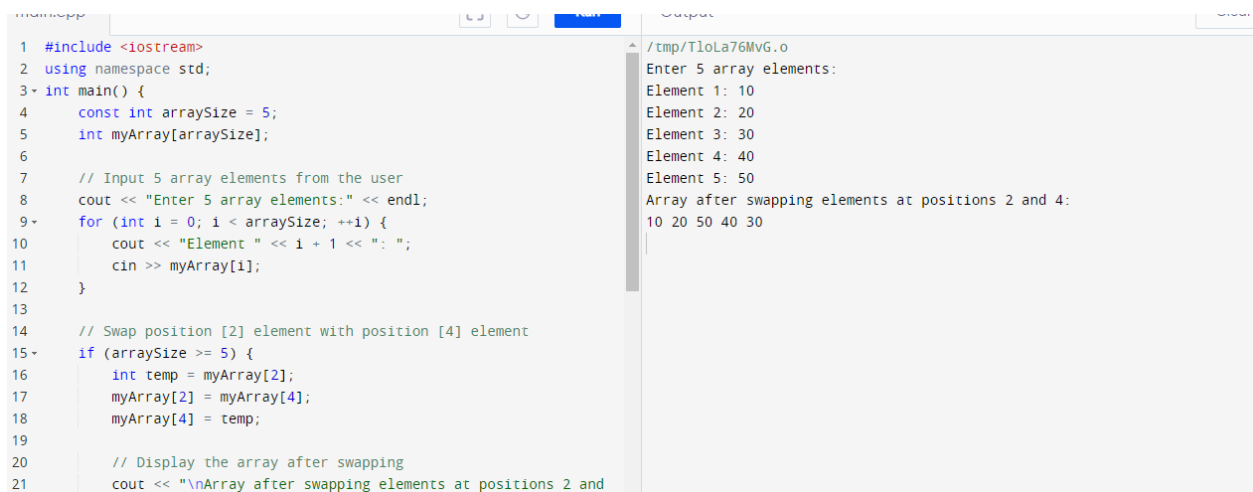
```

if (arraySize >= 5) {
    int temp = myArray[2];
    myArray[2] = myArray[4];
    myArray[4] = temp;

    // Display the array after swapping
    cout << "\nArray after swapping elements at positions 2 and 4:" << endl;
    for (int i = 0; i < arraySize; ++i) {
        cout << myArray[i] << " ";
    }
    cout << endl;
} else {
    cout << "Array size is less than 5. Unable to perform the swap." << endl;
}

return 0;
}

```



```

1  #include <iostream>
2  using namespace std;
3  int main() {
4      const int arraySize = 5;
5      int myArray[arraySize];
6
7      // Input 5 array elements from the user
8      cout << "Enter 5 array elements:" << endl;
9      for (int i = 0; i < arraySize; ++i) {
10         cout << "Element " << i + 1 << ": ";
11         cin >> myArray[i];
12     }
13
14     // Swap position [2] element with position [4] element
15     if (arraySize >= 5) {
16         int temp = myArray[2];
17         myArray[2] = myArray[4];
18         myArray[4] = temp;
19
20         // Display the array after swapping
21         cout << "\nArray after swapping elements at positions 2 and

```

```

/tmp/T1oLa76MvG.o
Enter 5 array elements:
Element 1: 10
Element 2: 20
Element 3: 30
Element 4: 40
Element 5: 50
Array after swapping elements at positions 2 and 4:
10 20 50 40 30

```

