FUNDAMENTALS OF PROGRAMMING

LAB MANUAL # 08

(HOME TASK)

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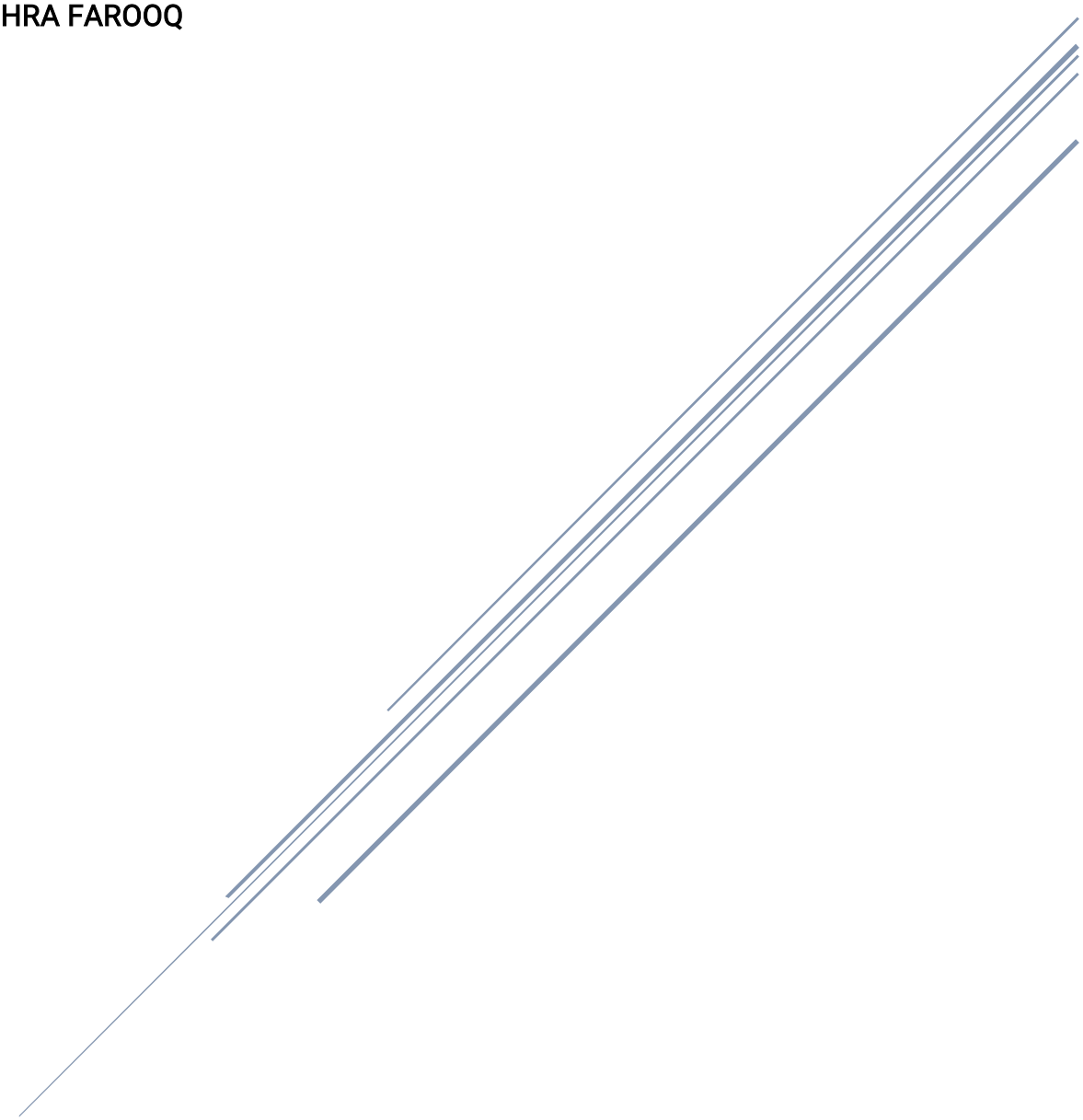
DATE: 7/12/2023

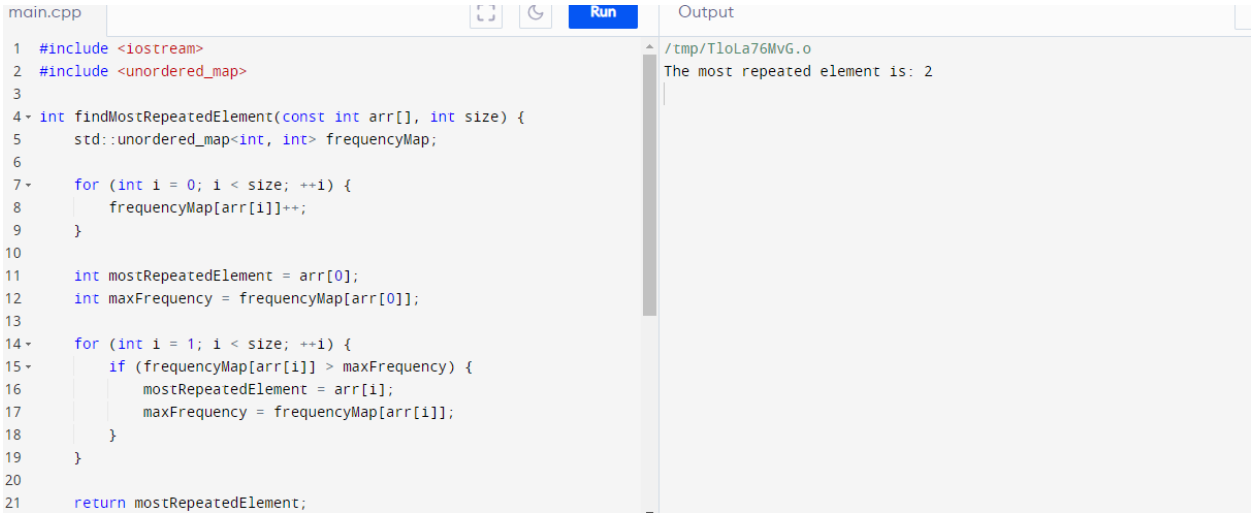


QUESTION # 01

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;
}
```

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#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;
```

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;
    }

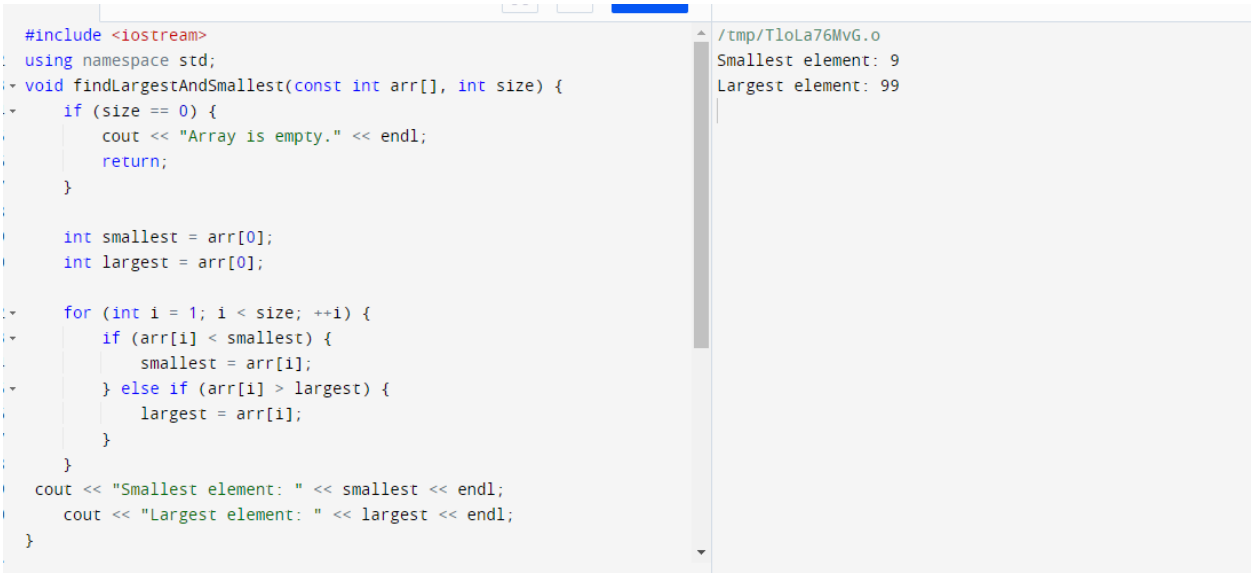
    int smallest = arr[0];
    int largest = arr[0];
```

```
    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;
}
```



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#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;
}
```
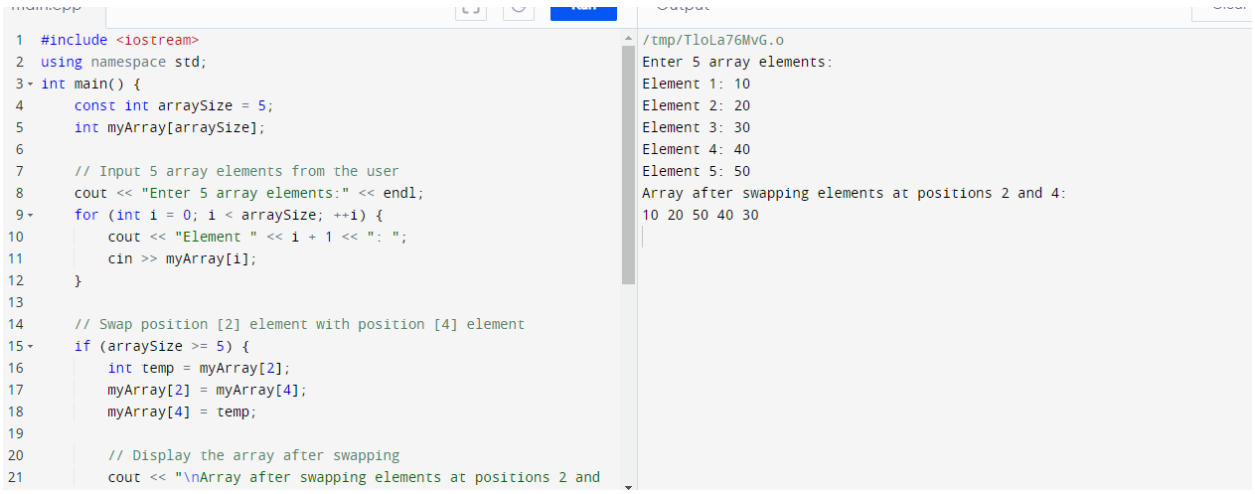

```
/tmp/TloLa76MvG.o
Smallest element: 9
Largest element: 99
```

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;
}
```



```
#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
```

```
/tmp/TloLa76MvG.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
```