National University of Science and Technology, NUST
School of Mechanical and Manufacturing Engineering, SMME
Department of Mechanical Engineering, DME

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Lab Manual08 Home task

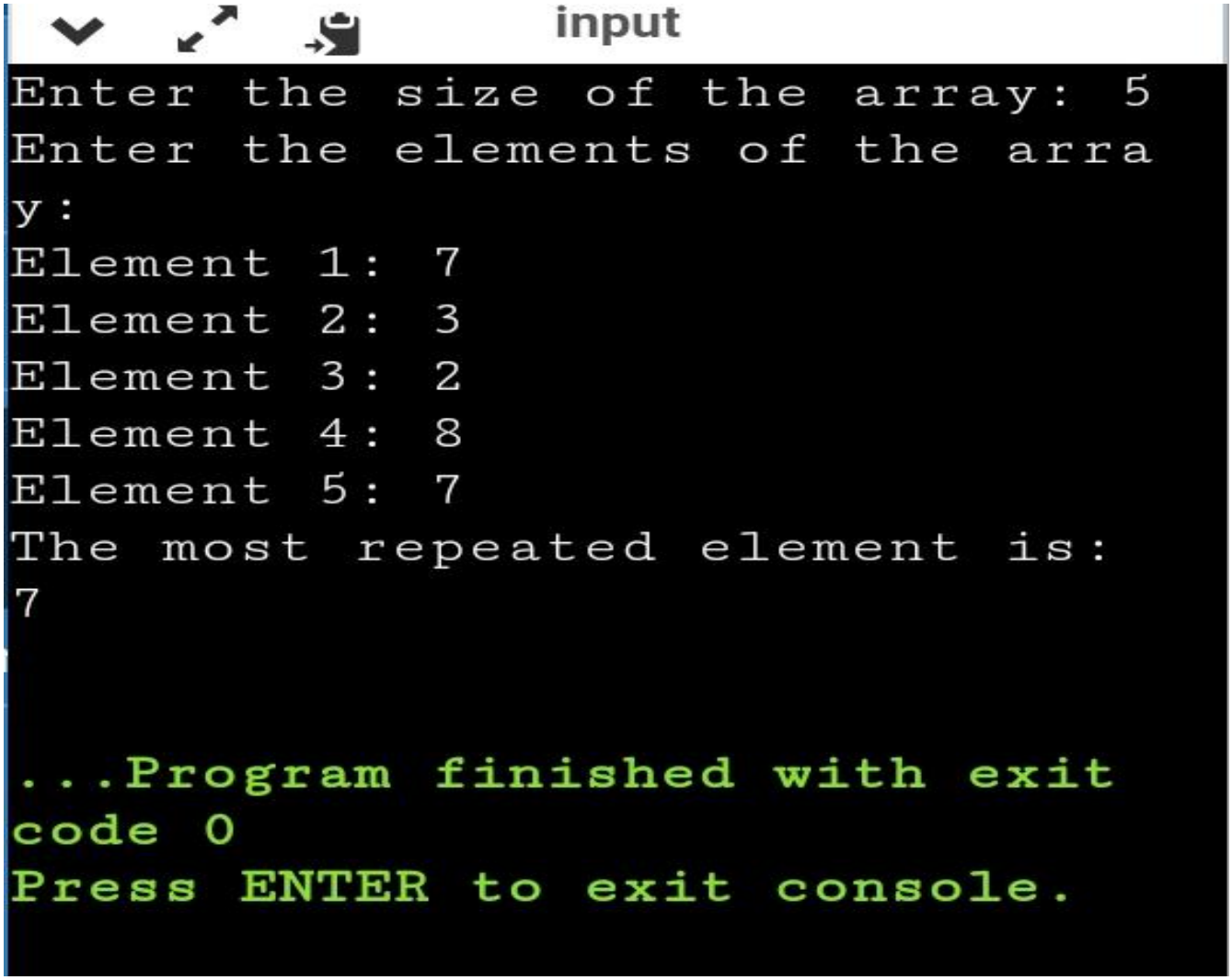
Task 01: Take an array and find the most repeated element in that array.

Input:

```
#include <iostream>
#include <unordered_map>

int findMostRepeatedElement(int arr[],
int size) {
    std::unordered_map<int, int>
frequencyMap;

    // Count the frequency of each
element in the array
    for (int i = 0; i < size; ++i) {
        frequencyMap[arr[i]]++;
    }

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

    // Find the element with the maximum
frequency
    for (int i = 0; i < size; ++i) {
        if (frequencyMap[arr[i]] >
maxFrequency) {
            mostRepeatedElement = arr[i];
            maxFrequency =
frequencyMap[arr[i]];
        }
    }

    return mostRepeatedElement;
}

int main() {
    int size;
    std::cout << "Enter the size of the
array: ";
    std::cin >> size;
```

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

    std::cout << "Enter the elements of
the array:\n";
    for (int i = 0; i < size; ++i) {
        std::cout << "Element " << i + 1
<< ": ";
        std::cin >> array[i];
    }

    // Find and print the most repeated
element
    int result =
findMostRepeatedElement(array, size);
    std::cout << "The most repeated
element is: " << result << std::endl;

    delete[] array; // Release dynamic
memory

    return 0;
}
```

Output:



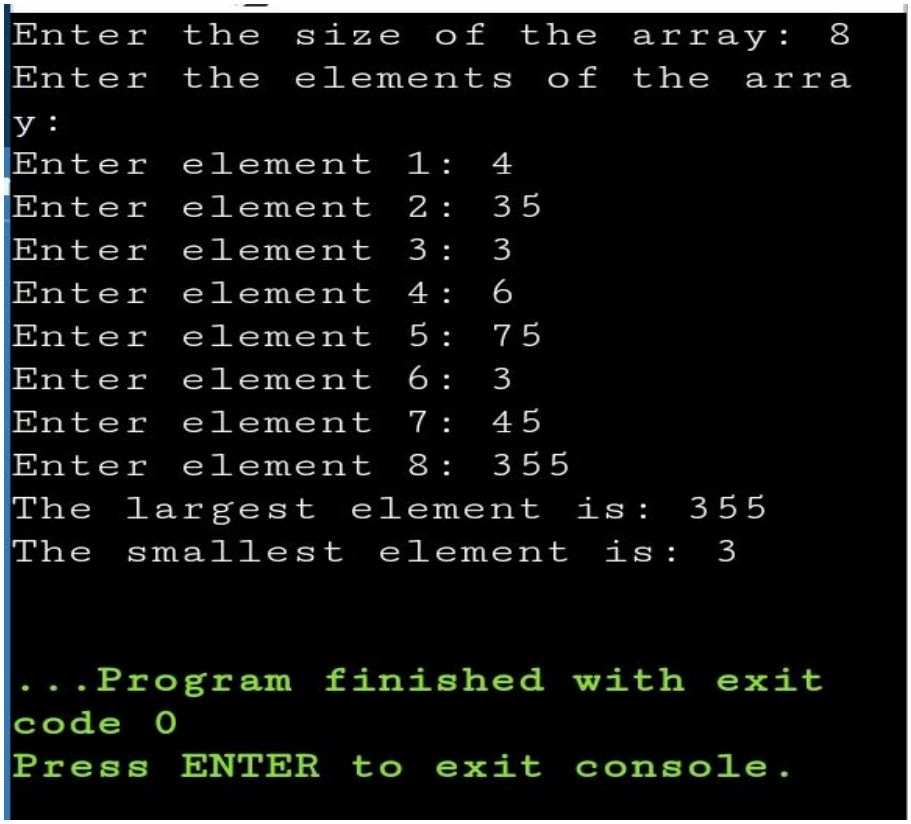
Task 2: Let's say an array is a [8] = {13, 15, 17, 9, 99, 77, 65, 43}. Find Largest and smallest number.

Input:

```
#include <iostream>
#include <climits>

int main() {
    int n;

    // Get the size of the array from the
user
    std::cout << "Enter the size of the
array: ";
    std::cin >> n;

    // Check if the array size is valid
    if (n <= 0) {
        std::cerr << "Invalid array size.
Exiting...\n";
        return 1;
    }

    int arr[n];

    // Get array elements from the user
    std::cout << "Enter the elements of
the array:\n";
    for (int i = 0; i < n; ++i) {
        std::cout << "Enter element " <<
i + 1 << ": ";
        std::cin >> arr[i];
    }

    // Initialize variables to store the
largest and smallest elements
    int largest = INT_MIN;
    int smallest = INT_MAX;

    // Find the largest and smallest
elements in the array
```

```
    for (int i = 0; i < n; ++i) {
        if (arr[i] > largest) {
            largest = arr[i];
        }
        if (arr[i] < smallest) {
            smallest = arr[i];
        }
    }

    // Display the results
    std::cout << "The largest element is:
" << largest << "\n";
    std::cout << "The smallest element
is: " << smallest << "\n";

    return 0;
}
```

Output:



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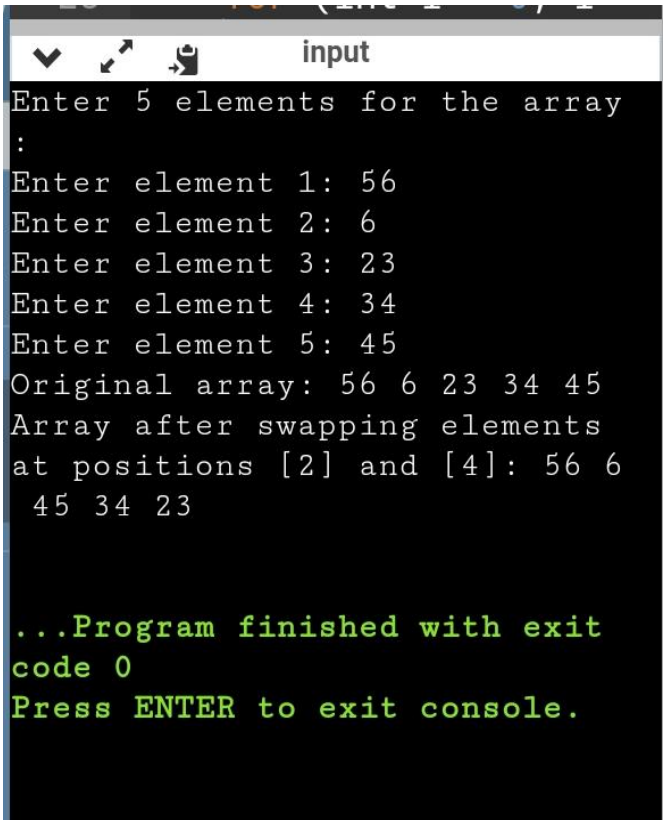
Task 03: Develop a prgram that takes 5 array elements from user.

Input:

```
#include <iostream>

int main() {
    const int arraySize = 5;
    int arr[arraySize];

    // Get array elements from the user
    std::cout << "Enter 5 elements for
the array:\n";
    for (int i = 0; i < arraySize; ++i) {
        std::cout << "Enter element " <<
i + 1 << ": ";
        std::cin >> arr[i];
    }

    // Display the original array
    std::cout << "Original array: ";
    for (int i = 0; i < arraySize; ++i) {
        std::cout << arr[i] << " ";
    }
    std::cout << "\n";

    // Swap elements at positions [2] and
[4] using a temporary variable
    int temp = arr[2];
    arr[2] = arr[4];
    arr[4] = temp;

    // Display the array after swapping
    std::cout << "Array after swapping
elements at positions [2] and [4]: ";
    for (int i = 0; i < arraySize; ++i) {
        std::cout << arr[i] << " ";
    }
    std::cout << "\n";

    return 0;
}
```

Output:


input
Enter 5 elements for the array
:
Enter element 1: 56
Enter element 2: 6
Enter element 3: 23
Enter element 4: 34
Enter element 5: 45
Original array: 56 6 23 34 45
Array after swapping elements
at positions [2] and [4]: 56 6
45 34 23
...Program finished with exit
code 0
Press ENTER to exit console.