National University of Science and Technology, NUST

School of Mechanical and Manufacturing Engineering, SMME

Department of Mechanical Engineering, DME

Prepared by:

Name	Class	CMS ID	Section	
Muhammad Asim Shah	ME-15	470574	C	

Lab Manual # 08 Lab Task

Task 1: Write a C++ Program to calculate average of number of arrays.

Input:

```
#include <iostream>

int main() {
    const int size = 5;  // Change the
size accordingly
    int numbers[size];

    // Input numbers into the array
    std::cout << "Enter " << size << "
numbers:\n";
    for (int i = 0; i < size; ++i) {
        std::cin >> numbers[i];
    }

    // Calculate the sum
    int sum = 0;
    for (int i = 0; i < size; ++i) {
        sum += numbers[i];
    }

    // Calculate the average
    double average = static_cast<double>
(sum) / size;

    // Output the result
    std::cout << "Average: " << average
<< std::endl;

    return 0;
}
```

Output:

```
Enter 5 numbers:
5782
356
33
4
7
Average: 1236.4


...Program finished with exit co
de 0
Press ENTER to exit console.
```

National University of Science and Technology, NUST

School of Mechanical and Manufacturing Engineering, SMME

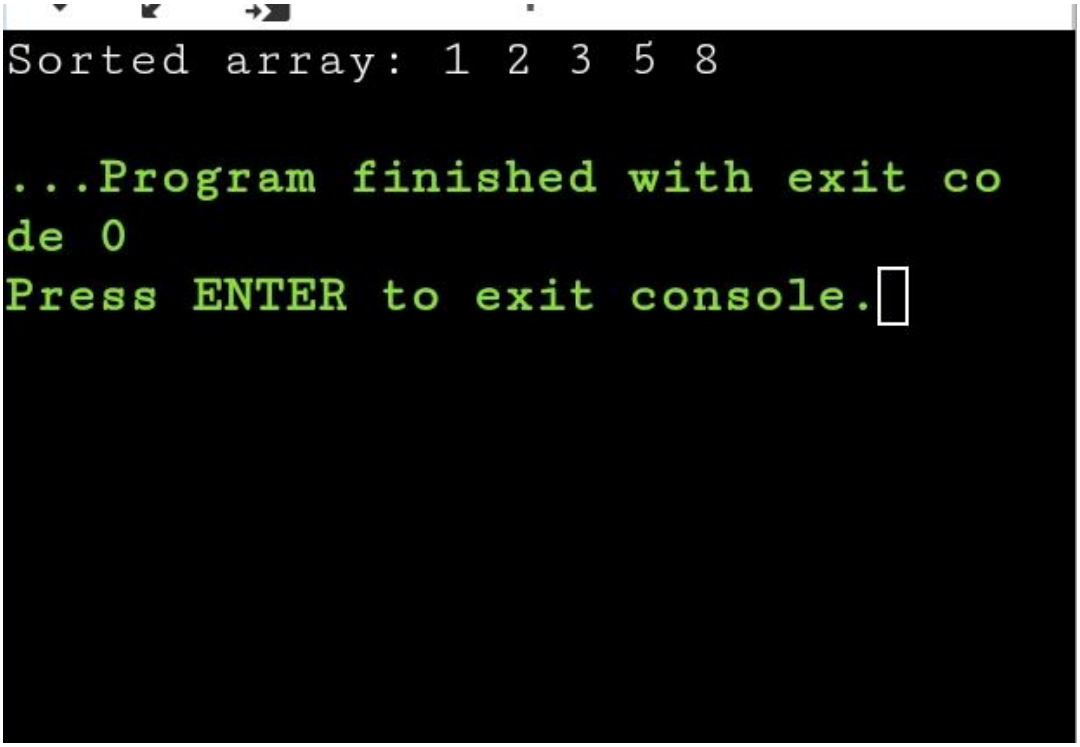
Department of Mechanical Engineering, DME

Task 2: Implement Bubble sort on an array of 5 Integer.

Input:

```
#include <iostream>

using namespace std;

int main() {
    int arr[] = {5, 2, 8, 1, 3};
    int n = sizeof(arr) / sizeof(arr[0]);

    for (int i = 0; i < n - 1; ++i) {
        for (int j = 0; j < n - i - 1;
++j) {
            if (arr[j] > arr[j + 1]) {
                // Swap elements
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
        }
    }

    cout << "Sorted array: ";
    for (int i = 0; i < n; ++i)
        cout << arr[i] << " ";

    return 0;
}
```

Output:


Sorted array: 1 2 3 5 8
...Program finished with exit co
de 0
Press ENTER to exit console.

National University of Science and Technology, NUST

School of Mechanical and Manufacturing Engineering, SMME

Department of Mechanical Engineering, DME

Task 3: Implement Selection Sort on an array of 5 Integer:

Input:

```
#include <iostream>

using namespace std;

int main() {
    int arr[5];

    cout << "Enter 5 integers:\n";
    for (int i = 0; i < 5; ++i) {
        cin >> arr[i];
    }

    for (int i = 0; i < 4; ++i) {
        int minIndex = i;
        for (int j = i + 1; j < 5; ++j) {
            if (arr[j] < arr[minIndex]) {
                minIndex = j;
            }
        }
        if (minIndex != i) {
            int temp = arr[i];
            arr[i] = arr[minIndex];
            arr[minIndex] = temp;
        }
    }

    cout << "Sorted array: ";
    for (int i = 0; i < 5; ++i)
        cout << arr[i] << " ";

    return 0;
}
```

Output:

```
Enter 5 integers:
5
2
1
8
9
Sorted array: 1 2 5 8 9

...Program finished with exit co
de 0
Press ENTER to exit console.
```