Third Year B. Tech (EL & CE)

Semester: V **Subject:** Object-Oriented Programming Lab

Name: Shreerang Mhatre **Class: SY**

Roll No: 52 **Batch: A3**

Experiment No: 07

Name of the Experiment: Bubble sort Algorithm

Performed on: 27/09/2023

Submitted on: 27/09/2023

Problem Statement:
Perform bubble sort operation using the template for integer and floating data types

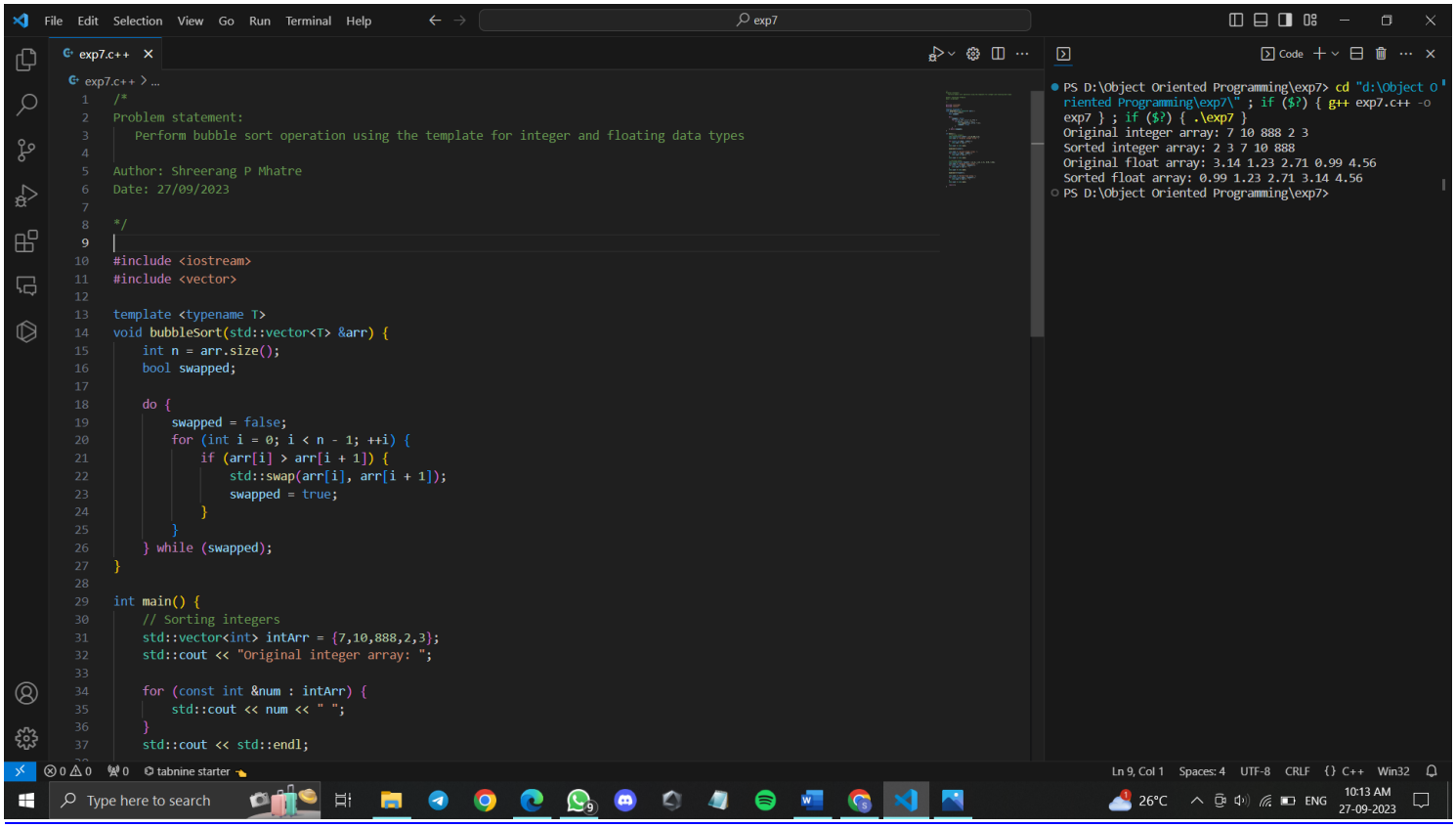
Output:

```
Original integer array: 7 10 888 2 3
Sorted integer array: 2 3 7 10 888
Original float array: 3.14 1.23 2.71 0.99 4.56
Sorted float array: 0.99 1.23 2.71 3.14 4.56
```

Code:

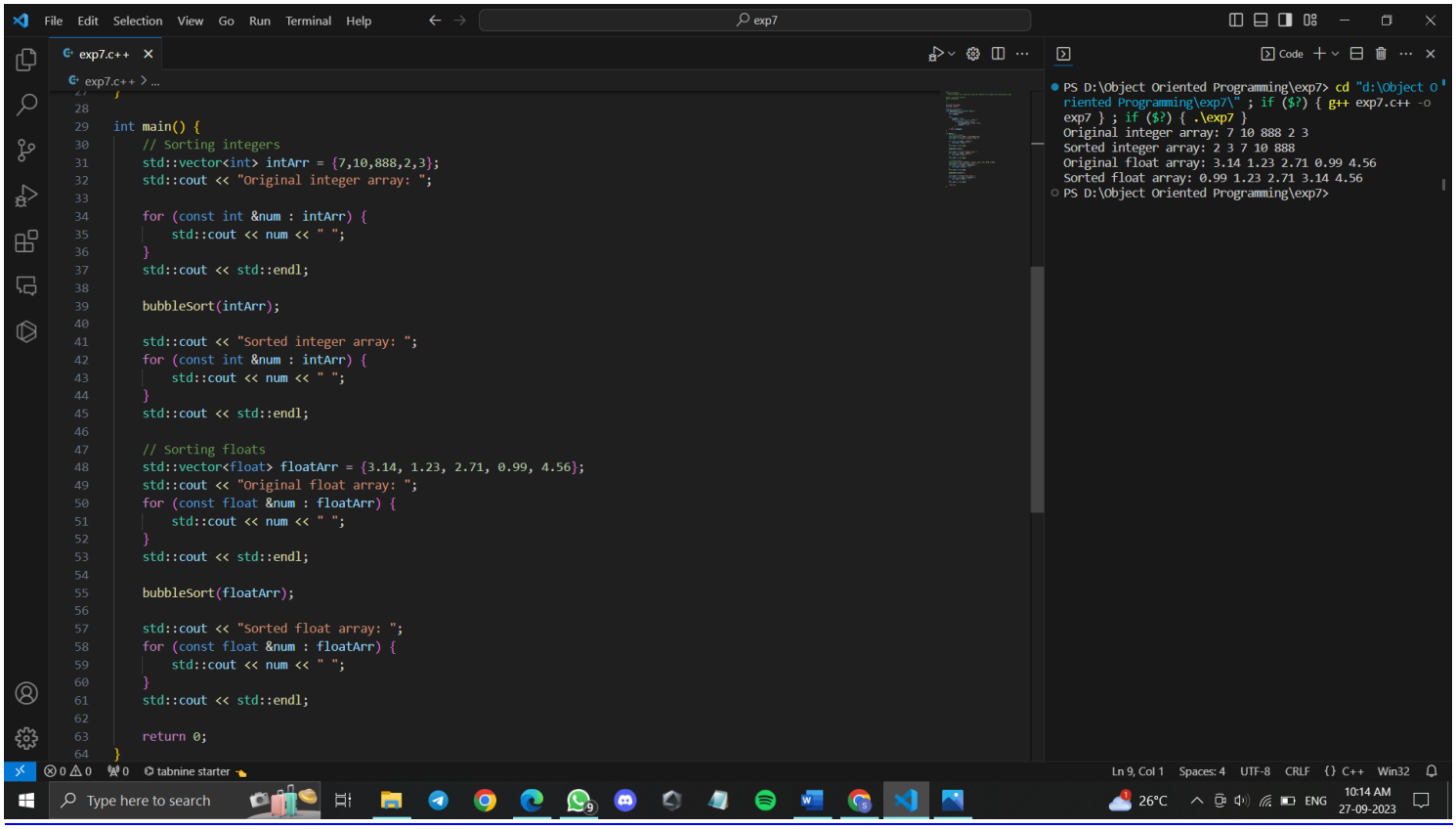
```
#include <iostream>
#include <vector>

template <typename T>
void bubbleSort(std::vector<T> &arr) {
    int n = arr.size();
    bool swapped;

    do {
        swapped = false;
        for (int i = 0; i < n - 1; ++i) {
            if (arr[i] > arr[i + 1]) {
```

```
            std::swap(arr[i], arr[i + 1]);
            swapped = true;
        }
      }
    } while (swapped);
}

int main() {
    // Sorting integers
    std::vector<int> intArr = {7,10,888,2,3};
    std::cout << "Original integer array: ";

    for (const int &num : intArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    bubbleSort(intArr);

    std::cout << "Sorted integer array: ";
    for (const int &num : intArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    // Sorting floats
    std::vector<float> floatArr = {3.14, 1.23, 2.71, 0.99, 4.56};
    std::cout << "Original float array: ";
    for (const float &num : floatArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    bubbleSort(floatArr);

    std::cout << "Sorted float array: ";
    for (const float &num : floatArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    return 0;
}
```



```cpp
/*
Problem statement:
   Perform bubble sort operation using the template for integer and floating data types

Author: Shreerang P Mhatre
Date: 27/09/2023

*/
#include <iostream>
#include <vector>

template <typename T>
void bubbleSort(std::vector<T> &arr) {
    int n = arr.size();
    bool swapped;

    do {
        swapped = false;
        for (int i = 0; i < n - 1; ++i) {
            if (arr[i] > arr[i + 1]) {
                std::swap(arr[i], arr[i + 1]);
                swapped = true;
            }
        }
    } while (swapped);
}

int main() {
    // Sorting integers
    std::vector<int> intArr = {7,10,888,2,3};
    std::cout << "Original integer array: ";

    for (const int &num : intArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;
```

```
PS D:\Object Oriented Programming\exp7> cd "d:\Object Oriented Programming\exp7\" ; if ($?) { g++ exp7.c++ -o exp7 } ; if ($?) { .\exp7 }
Original integer array: 7 10 888 2 3
Sorted integer array: 2 3 7 10 888
Original float array: 3.14 1.23 2.71 0.99 4.56
Sorted float array: 0.99 1.23 2.71 3.14 4.56
PS D:\Object Oriented Programming\exp7>
```



```cpp
int main() {
    // Sorting integers
    std::vector<int> intArr = {7,10,888,2,3};
    std::cout << "Original integer array: ";

    for (const int &num : intArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    bubbleSort(intArr);

    std::cout << "Sorted integer array: ";
    for (const int &num : intArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    // Sorting floats
    std::vector<float> floatArr = {3.14, 1.23, 2.71, 0.99, 4.56};
    std::cout << "Original float array: ";
    for (const float &num : floatArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    bubbleSort(floatArr);

    std::cout << "Sorted float array: ";
    for (const float &num : floatArr) {
        std::cout << num << " ";
    }
    std::cout << std::endl;

    return 0;
}
```

```
PS D:\Object Oriented Programming\exp7> cd "d:\Object Oriented Programming\exp7\" ; if ($?) { g++ exp7.c++ -o exp7 } ; if ($?) { .\exp7 }
Original integer array: 7 10 888 2 3
Sorted integer array: 2 3 7 10 888
Original float array: 3.14 1.23 2.71 0.99 4.56
Sorted float array: 0.99 1.23 2.71 3.14 4.56
PS D:\Object Oriented Programming\exp7>
```