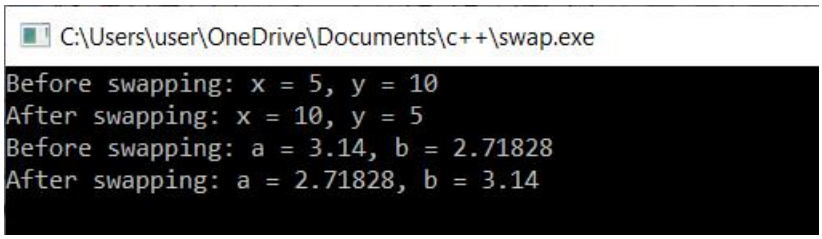
MODULE: 4.2 (C, C++ Templates)

1. Write a program of to swap the two values using templates

Code:

```
#include <iostream>
using namespace std;

template <typename T>
void swapValues(T& a, T& b) {
   T temp = a;
   a = b;
   b = temp;
}

int main() {
   int x = 5, y = 10;
   cout << "Before swapping: x = " << x << ", y = " << y <<endl;

   swapValues(x, y);
   cout << "After swapping: x = " << x << ", y = " << y <<endl;

   double a = 3.14, b = 2.71828;
   cout << "Before swapping: a = " << a << ", b = " << b <<endl;

   swapValues(a, b);

   cout << "After swapping: a = " << a << ", b = " << b <<endl;

   return 0;
}
```

Output:


C:\Users\user\OneDrive\Documents\c++\swap.exe
Before swapping: x = 5, y = 10
After swapping: x = 10, y = 5
Before swapping: a = 3.14, b = 2.71828
After swapping: a = 2.71828, b = 3.14

2. Write a program of to sort the array using templates.

Code:

```
#include <iostream>
using namespace std;

template <class T> void bubbleSort(T a[], int n)
{
	for (int i = 0; i < n - 1; i++)
		for (int j = n - 1; i < j; j--)
			if (a[j] < a[j - 1])
				swap(a[j], a[j - 1]);
}
int main()
{
	int a[5] = { 10, 50, 30, 40, 20 };
	int n = sizeof(a) / sizeof(a[0]);
	bubbleSort<int>(a, n);

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

	return 0;
}
```

Output: