**EXP.NO: 4.1**

**AIM:** Write a c++ program to illustrate the use of function templates

**PROGRAM:**

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

template <typename T>
void bubbleSort(T a[], int n) {
   T temp;
   for (int i = 0; i < n - 1; i++) {
      for (int j = 0; j < n - 1 - i; j++) {
         if (a[j] > a[j + 1]) {
            temp = a[j];
            a[j] = a[j + 1];
            a[j + 1] = temp;
         }
      }
   }
}

template <typename T>
void print(T a[], int n) {
   for (int i = 0; i < n; i++) {
      cout << a[i] << "  ";
   }
   cout << endl;
}
int main() {
   int a[5] = {12, 97, 34, 56, 3};
   char c[5] = {'s', 'e', 'a', 'm', 'h'};
```

```
    float f[5] = {2.5, 14.7, 98.2, 33.5, 58.4};

    cout << "Original int array: ";
    print(a, 5);
    bubbleSort(a, 5);
    cout << "Sorted int array: ";
    print(a, 5);

    cout << "\nOriginal char array: ";
    print(c, 5);
    bubbleSort(c, 5);
    cout << "Sorted char array: ";
    print(c, 5);

    cout << "\nOriginal float array: ";
    print(f, 5);
    bubbleSort(f, 5);
    cout << "Sorted float array: ";
    print(f, 5);

    return 0;
}
```

**Output:**

```
/Users/yaswanthkakarla/CLionProjects/untitled5/cmake-build-debug/untitled5
Original int array: 12 97 34 56 3
Sorted int array: 3 12 34 56 97

Original char array: s e a m h
Sorted char array: a e h m s

Original float array: 2.5 14.7 98.2 33.5 58.4
Sorted float array: 2.5 14.7 33.5 58.4 98.2

Process finished with exit code 0
```

**EXP.NO: 4.2**

**AIM: :** Write a c++ program to implement template class

**PROGRAM:**

```
#include<iostream>
using namespace std;
template <class T>
class Sample
{
	private:
		T n;
	public:
		void get()
		{
			cout << "Enter n value:";
			cin >> n;
		}
		void show()
		{
			cout << "n= " << n << endl;
		}
};
int main()
{
	Sample<int> s1;
	s1.get();

	s1.show();

	Sample<char> s2;
	s2.get();
	s2.show();
```

```
    Sample<float> s3;
    s3.get();

    s3.show();

    return 0;
}
```

**Output:**

```
/Users/yaswanthkakarla/CLionProjects/untitled5/cmake-build-debug/untitled5
Enter n value: 10
n = 10
Enter n value: y
n = y
Enter n value: 171
n = 171

Process finished with exit code 0
```

**EXP.NO: 4.3**

**AIM:** Write a c++ program to implement class templates with multiple parameters

**PROGRAM:**

```
#include<iostream>
using namespace std;
template <class T1, class T2>

class Sample
{
	private:
		T1 x;
		T2 y;
	public:
		void get()
		{
			cin >> x >> y;
		}
		void show()
		{
			cout << "x= " << x << endl;
			cout << "y= " << y << endl;
		}
};
int main()
{
	Sample<int, float> s1;

	cout << "Enter int , float value:";
	s1.get();
	s1.show();
```

```
    Sample<char, int> s2;
    cout << "Enter char , int value:";
    s2.get();
    s2.show();
    Sample<float, char> s3;
    cout << "Enter float, char value:";
    s3.get();
    s3.show();
    return 0;
}
```

**Output:**

```
/Users/yaswanthkakarla/CLionProjects/untitled5/cmake-build-debug/untitled5
Enter int and float value: 10 10.55
x = 10
y = 10.55
Enter char and int value: y 171
x = y
y = 171
Enter float and char value: 10.55 y
x = 10.55
y = y

Process finished with exit code 0
```