**Gr no 21810819**

**Assignment No:4**

**Problem Statement:** Write a function template and class template selection Sort. Write a program that inputs, sorts and outputs an integer array and a float array.

**Aim of Assignment:** To implement function template and class template in program for generic data sorting.

**Description:**

• **Generics in C++**

• Generics is the idea to allow type (Integer, String, ... etc and user- defined types) to be a parameter to methods, classes and interfaces. For example, classes like an array, map, etc, which can be used using generics very efficiently. We can use them for any type.

• The method of Generic Programming is implemented to increase the efficiency of the code. Generic Programming enables the programmer to write a general algorithm which will work with all data types. It eliminates the need to create different algorithms if the data type is an integer, string or a character.

• The advantages of Generic Programming are Code Reusability, Avoid Function Overloading, once written it can be used for multiple times and cases.

• Generics can be implemented in C++ using Templates. Template is a simple and yet very powerful tool in C++. The simple idea is to pass data type as a parameter so that we don’t need to write the same code for different data types. For example, a software company may need sort() for different data types. Rather than writing and maintaining the multiple codes, we can write one sort() and pass data type as a parameter.

• **Templates in C++**

A template is a simple and yet very powerful tool in C++. The simple idea is to pass data type as a parameter so that we don’t need to write the samecode for different data types. For example, a software company may need sort() for different data types. Rather than writing and maintaining the multiple codes, we can write one sort() and pass data type as a parameter.

• C++ adds two new keywords to support templates: *‘template’* and *‘typename’*. The second keyword can always be replaced by keyword ‘class’.

**Code :**

#include<iostream>

#include<limits>

using namespace std;

template<class T> // template class

T selection\_sort() //Template function

{

T a[10];

T temp;

for(int i=0;i<10;i++) //Accepting elements

{

cout<<"a["<<i<<"]=";

cin>>a[i];

}

for(int i=0;i<10;i++) //selection Sorting

{

for(int j=i+1;j<10;j++)

{

if(a[i]>a[j])

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

}

for(int i=0;i<10;i++) //Displaying sorted element

{

cout<<a[i]<<"\n";

}

}

int main()

{

cout<<" Selection Sort"<<endl;

cout<<"Integer sorting"<<endl;

selection\_sort<int>(); // sorting int element

cout<<"Floating sorting"<<endl; // sorting float element

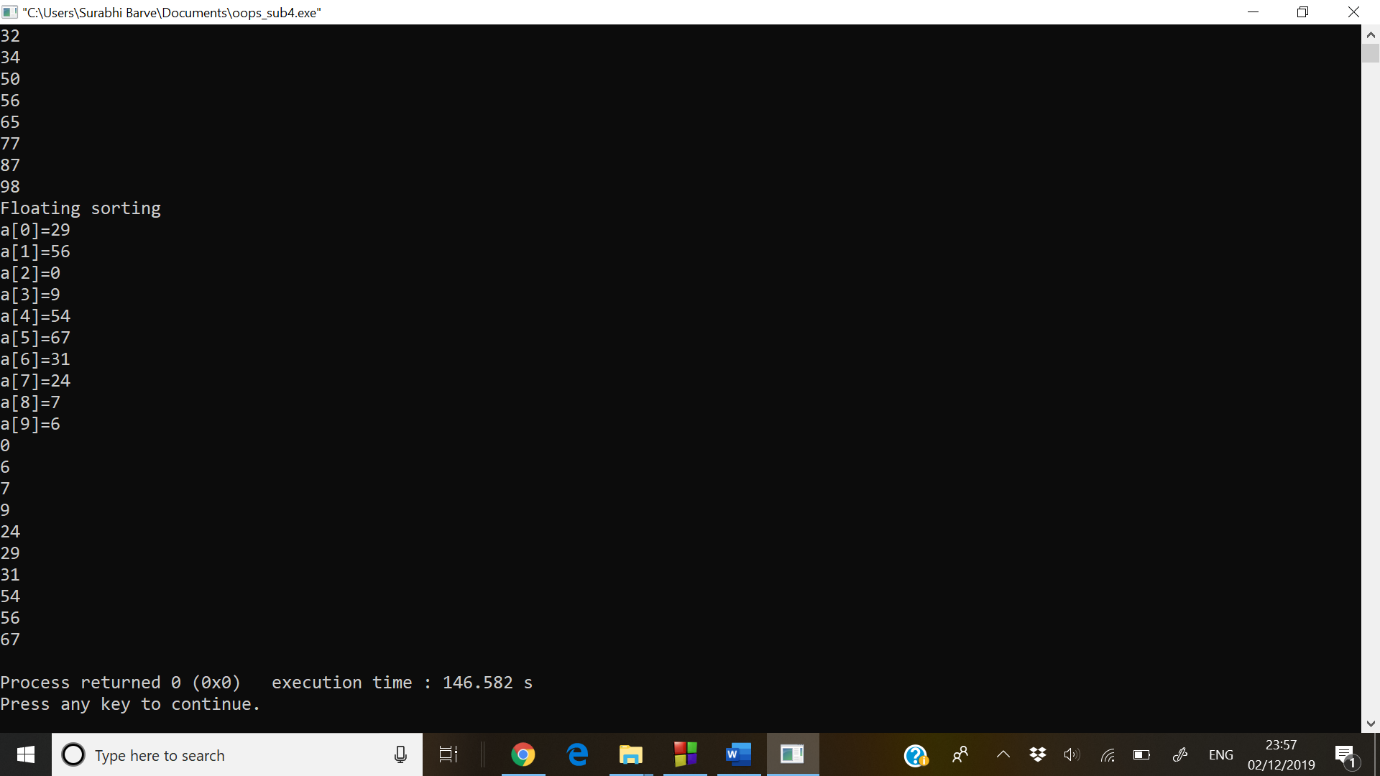
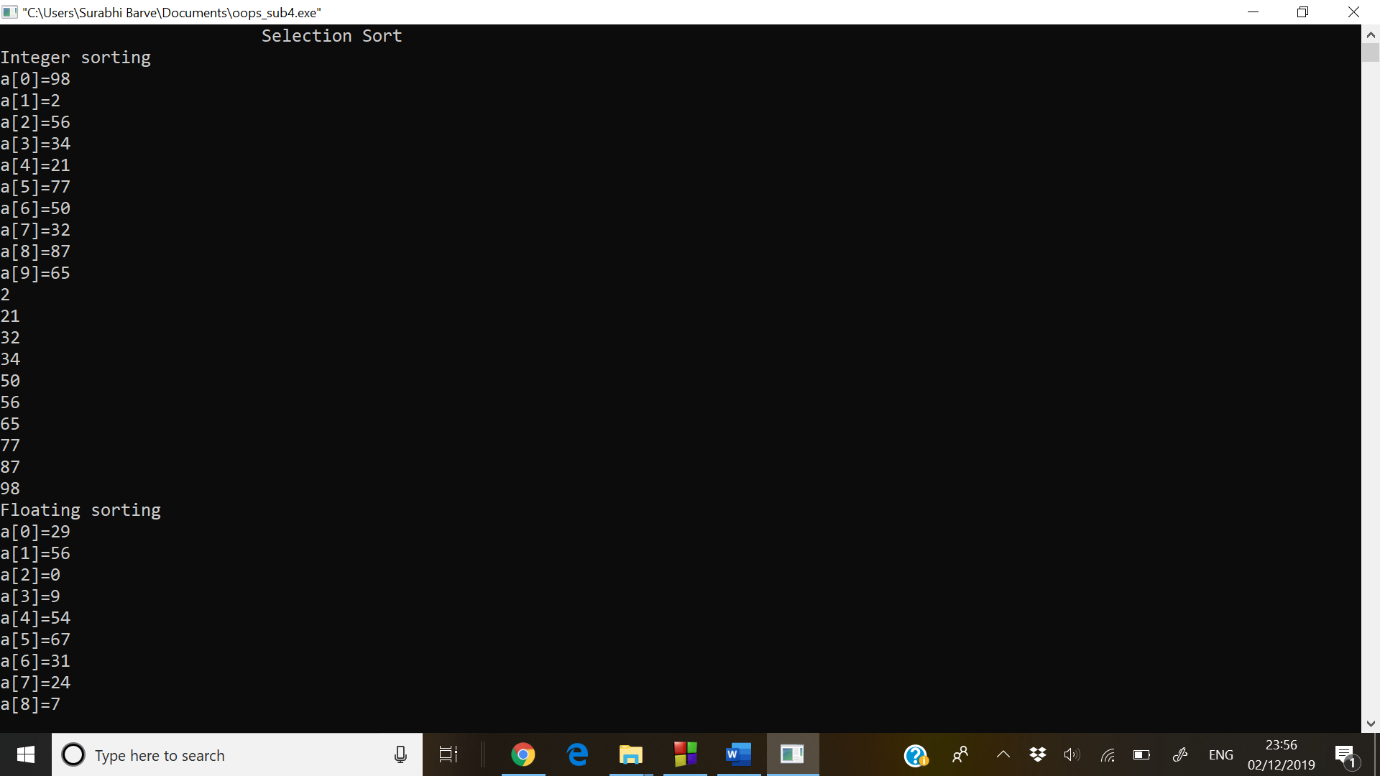
selection\_sort<float>();

return 0;

}

**Conclusion:**

Thus, we successfully implement program for function template and class template.

**Screenshots:**