**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 template in C++ to sort the elements of integer and float array.

**Description:** A template named Selection\_sort() is used of type T. T is the generic data-type. This template is used to input, sort and output the elements of array type T. In main(), The template is called twice one with integer data-type and other with float data-type.

**OOP Concept used:**

**Templates:** Function templates are special functions that can operate with generic types. This allows us to create a function template whose functionality can be adapted to more than one type or class without repeating the entire code for each type.  
  
In C++ this can be achieved using template parameters. A template parameter is a special kind of parameter that can be used to pass a type as argument: just like regular function parameters can be used to pass values to a function, template parameters allow to pass also types to a function. These function templates can use these parameters as if they were any other regular type.  
The format for declaring function templates with type parameters is:

template <class identifier> function\_declaration;  
template <typename identifier> function\_declaration;

**Conclusion:** The C++ template concept was implemented successfully.

**Program:**

#include<iostream>

using namespace std;

template<class T1>

T1 selection()

{

int i,j,k,n,minIndex;

T1 a[100],temp;

cout<<"\nEnter the no.array elements\n";

cin>>n;

cout<<"\nEnter the elements in the array\n";

for(i=0;i<n;i++)

{

cin>>a[i];

}

// Selection sort

for(i=0;i<n-1;i++)

{

minIndex=i;

for(j=i+1;j<n;j++)

{

if(a[j]<a[minIndex])

minIndex=j;

}

temp=a[i];

a[i]=a[minIndex];

a[minIndex]=temp;

cout<<"\n Pass"<<i+1<<":";

for(k=0;k<n;k++)

{

cout<<"\t"<<a[k];

}

cout<<"\n";

}

}

int main()

{

int ch;

do

{

cout<<"\n Enter your choice\n";

cout<<"\n0.Exit. 1.float type. 2.int type\n";

cin>>ch;

switch(ch)

{

case 0:

break;

case 1:

selection<float>();

break;

case 2:

selection<int>();

break;

case 3:

cout<<"\n Invalid choice\n";

break;

}

}while(ch>0);

return 0;

}



