ASSIGNMENT 4

Title:

Write c++ program of function template and class template of selection sort to implement that input sort and output’s an integer array and a float array.

Objectives:

To create template with their function and class by using selection sort to implements that inputs sort and output’s an integer array and a float array.

Theory :

* A template is a simple and very powerful tool in C++.
* Templates are expanded at compiler time. This is like macros. The difference is, compiler does type checking before template expansion.
* **Function Templates:**  We write a generic function that can be used for different data types.

function templates are sort(), max(), min(), printArray().

* **Class Templates** : Like function templates, class templates are useful when a class defines something that is independent of the data type. Can be useful for classes like LinkedList, BinaryTree, Stack, Queue, Array,

Syntax:

template <class T>

void selectionSort(T a[], int n)

Sourcecode :

#include<iostream>

using namespace std;

template <class T>

void selection\_sort(T a[],int n)

{

int i,j;

T temp;

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

{

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

{

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

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

}

}

void input()

{

int n,i,ch;

int a[n];

float b[n];

cout<<"\nEnter type of Array\n~press 1 for INTEGER\n~press 2 for FLOAT\n";

cin>>ch;

switch(ch)

{

case 1: cout<<"\nEnter no. of elements\n";

cin>>n;

cout<<"\nEnter array elements : ";

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

{

cin>>a[i];

}

selection\_sort(a,n);

cout<<"\nAfter sort:";

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

{

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

}

break;

case 2: cout<<"\nEnter no. of elements\n";

cin>>n;

cout<<"\nEnter array elements : ";

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

{

cin>>b[i];

}

selection\_sort(b,n);

cout<<"\nAfter sort:";

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

{

cout<<b[i]<<" ";

}

break;

default: cout<<"\nERROR! enter correct choice.";

break;

}

char ch1;

cout<<"\ndo you want to continue(press Y/N)\n";

cin>>ch1;

if(ch1=='y'||ch1=='Y')

input();

}

int main()

{

input();

return 0;

}

Output :

/\*

Enter type of Array

~press 1 for INTEGER

~press 2 for FLOAT

1

Enter no. of elements

4

Enter array elements : 12

16

7

23

After sort:7 12 16 23

do you want to continue(press Y/N)

n

--------------------------------

Process exited after 28.26 seconds with return value 0

Press any key to continue . . .

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Conclusion: by using template we conclude that template’s are easier and efficient way of sorting program . template are good approach to be an reusability and flexibility of the programs.