**Roll No-** 2019329

**Name-** Nikita Arora

**Q- Wap a menu driven program of various Sorting algorithms (BubbleSort, Insertion Sort, Selection Sort) using classes and templates.**

#include<iostream>

using namespace std;

template <class T>

class Sorting

{

private:

T ar[10];

int n;

public:

void input();

void bubbleSort();

void insertionSort();

void selectionSort();

void display();

};

template <class T>

void Sorting<T>:: input()

{

cout<<"Enter the size of the array ";

cin>>n;

cout<<"Enter the elements of the array:"<<endl;

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

cin>>ar[i];

}

template <class T>

void Sorting<T>:: bubbleSort()

{

int temp,flag=0;

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

{

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

{

if(ar[j]>ar[j+1])

{

temp=ar[j];

ar[j]=ar[j+1];

ar[j+1]=temp;

flag=1;

}

}

if(flag==0)

break;

}

}

template <class T>

void Sorting<T>:: insertionSort()

{

int temp,j;

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

{

temp=ar[i];

j=i-1;

while(j>=0&&ar[j]>temp)

{

ar[j+1]=ar[j];

j--;

}

ar[j+1]=temp;

}

}

template <class T>

void Sorting<T>:: selectionSort()

{

int temp;

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

{

int min=i;

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

{

if(ar[j]<ar[min])

min=j;

}

if(min!=i)

{

temp=ar[i];

ar[i]=ar[min];

ar[min]=temp;

}

}

}

template <class T>

void Sorting<T>:: display()

{

cout<<"Sorted Array: "<<endl;

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

{

cout<<ar[i];

cout<<" ";

}

}

int main()

{

int x;

char ch='y';

Sorting<int>ob1;

ob1.input();

do

{

cout<<"1.Bubble Sort "<<endl;

cout<<"2.Insertion Sort "<<endl;

cout<<"3.Selection Sort "<<endl;

cout<<"Enter your choice "<<endl;

cin>>x;

switch(x)

{

case 1: ob1.bubbleSort();

ob1.display();

break;

case 2: ob1.insertionSort();

ob1.display();

break;

case 3: ob1.selectionSort();

ob1.display();

break;

}

cout<<"\n Do you want to continue ";

cin>>ch;

}while(ch=='y');

return 0;

}

