***//Assignment-2 Data Structures Lab***

***//A program to implement Insertion sort, Bubble sort or Selection sort using template function***

#include <iostream>

using namespace std;

template<class T>

void Bubble(T \*a, int n)

{

int i,j,temp;

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

{

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

{

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

{

temp=a[j];

a[j]=a[j+1];

a[j+1]=temp;

}

}

}

cout<<"\n Sorting order is: ";

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

{

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

}

}

template<class T>

void Selection(T \*a, int n)

{

int i,temp,min,j;

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

{

min=i;

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

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

{

min=j;

temp=a[min];

a[min]=a[i];

a[i]=temp;

}

}

cout<<"\n Sorting order is: ";

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

{

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

}

}

template <class T>

void Insertion(T \*a,int n)

{

int i,j,temp;

for(int i=1;i<5;i++)

{

temp=a[i];

j=i-1;

while(j>=0 && temp<a[j])

{

a[j+1]=a[j];

j--;

}

a[j+1]=temp;

}

cout<<"\n Sorting order is: ";

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

{

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

}

}

int main()

{

int b[5];

int op,i;

while(1)

{

cout<<"\n 1. Bubble Sort \n 2. Selection Sort \n 3. Insertion Sort \n 4. Exit \n";

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

cin>>op;

switch(op)

{

case 1:

cout<<"\n Enter 5 Integers: \n";

for(i=0;i<5;i++)

{

cin>>b[i];

}

Bubble(b,5);

break;

case 2:

cout<<"\n Enter 5 Integers: \n";

for(i=0;i<5;i++)

{

cin>>b[i];

}

Selection(b,5);

break;

case 3:

cout<<"\n Enter 5 Integers: \n";

for(i=0;i<5;i++)

{

cin>>b[i];

}

Insertion(b,5);

break;

case 4:

exit (0);

}

}

return 0;

}

**OUTPUT:**

1. Bubble Sort

2. Selection Sort

3. Insertion Sort

4. Exit

Enter your choice: 1

Enter 5 Integers:

12

36

96

56

42

Sorting order is: 12 36 42 56 96

1. Bubble Sort

2. Selection Sort

3. Insertion Sort

4. Exit

Enter your choice: 2

Enter 5 Integers:

23

63

53

93

43

Sorting order is: 23 43 53 63 93

1. Bubble Sort

2. Selection Sort

3. Insertion Sort

4. Exit

Enter your choice: 3

Enter 5 Integers:

44

54

14

24

94

Sorting order is: 14 24 44 54 94