#include<iostream>

#include<string.h>

using namespace std;

int const size=3;

struct student{

int rno;

char name[20];

float SGPA;

};

void accept(struct student list [size]);

void display(struct student list [50]);

void bubblesort(struct student list [size]);

void insertsort(struct student list [size]);

void Search(struct student list [size]);

void binarysearch(struct student list [size]);

main(){

int ch;

struct student data[20];

accept (data);

cout<<"\n1:Bubble sort";

cout<<"\n2:Insertion sort";

cout<<"\n3:Search sort";

cout<<"\n4:Binarysearch sort";

cout<<"\n Select your choice";d

cin>>ch;

switch (ch)

{

case 1:

bubblesort(data);

display(data);

break;

case 2:

insertsort(data);

display(data);

break;

case 3:

Search(data);

display(data);

break;

case 4:

bubblesort(data);

display(data);

break;

default:

cout<<"Invalid choice......"<<endl;

}

}

void accept(struct student list[size])

{

int i;

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

{

cout<<"Enter rollno , name and SGPA:";

cin>>list[i].rno>>list[i].name>>list[i].SGPA;

}

}

void display(struct student list[80])

{

int i;

cout<<"\n Roll no \t name \t SGPA\n";

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

{

cout<<"\n"<<list[i].rno<<"\t"<<list[i].name<<"\t"<< list[i].SGPA;

}

}

void bubblesort(struct student list[size])

{

int i,j;

struct student temp;

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

{

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

{

if(list[j].rno>list[j+1].rno)

{

temp= list[j];

list[j]=list[j+1];

list[j+1]=temp;

}

}

}

}

void insertsort(struct student list[size])

{

int j,k;

struct student temp;

for(k=1;k<size;k++)

{

temp=list[k];

j=k-1;

while(strcmp (list[j].name,temp.name)>0&&j>=0)//compare element with temp array

{

list[j+1]=list[j];

--j;

}

list[j+1]=temp;

}

}

void Search(struct student list[size])

{

float SGPA;

int i;

cout<<"\n Enter SGPA to search";

cin>>SGPA;

cout<<"\n Roll no \t Name \t SGPA\n";

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

{

if(SGPA == list[i].SGPA)

cout<<"\n"<<list[i].rno<<"\t"<<list[i].name<<"\t"<< list[i].SGPA;

}

}

void binarysearch(struct student list[size])

{

int k,lower,upper,mid;

char Search[80];

cout<<"\n Enter name of student you wanna to search";

cin>>Search;

lower=0;

upper=size-1;

mid=(lower+upper)/2;

while(lower<=upper)

{

if(strcmp(list[mid].name,Search)<0)

lower=mid+1;

else if(strcmp(list[mid].name,Search)==0)

{

cout<<"\n"<<list[mid].rno<<"\t"<<list[mid].name<<"\t"<< list[mid].SGPA;

break;

}

else

upper=mid-1;

mid=(lower+upper)/2;

}

if(lower>upper)

cout<<Search<<"Not found in list";

}