#include <iostream>

#include <algorithm>

using namespace std;

class set{

int arr[10];

int it;

public:

set(){

it=0;

}

void add(int ele){

bool found = false;

for(int i = 0;i<it;i++){

if(arr[i] == ele){

found = true;

break;

}

}

if(!found){

arr[it++] = ele;

}

sort(arr,arr+it);

}

void remove(int ele){

int elem\_idx = 0;

for(int i=0;i<10;i++){

if(arr[i] == ele){

elem\_idx = i;

break;

}

}

for(int i = elem\_idx + 1;i<it;i++){

int temp = arr[i-1];

arr[i-1] = arr[i];

arr[i] = temp;

}

it--;

}

int size(){

return it;

}

bool contains(int ele){

bool found = false;

for(int i = 0;i<it;i++){

if(arr[i] == ele){

found = true;

break;

}

}

return found;

}

set union\_set(set s1,set s2){

set res;

for(int i = 0;i<s1.size();i++){

res.arr[res.it++] = s1.arr[i];

}

for(int i = 0;i<s2.size();i++){

bool found = false;

for(int j = 0;j<s1.size();j++){

if(s2.arr[i] == s1.arr[j]){

found = true;

break;

}

}

if(!found){

res.arr[res.it++] = s2.arr[i];

}

}

sort(res.arr,res.arr+res.it);

return res;

}

int iterator(){

return it;

}

set intersection(set s1,set s2){

set res;

for(int i = 0;i<s1.size();i++){

bool found = false;

for(int j = 0;j<s2.size();j++){

if(s1.arr[i] == s2.arr[j]){

found = true;

break;

}

}

if(found){

res.arr[res.it++] = arr[i];

}

}

return res;

}

void diff(set s1,set s2){

set res;

for(int i = 0;i<s1.size();i++){

bool found = false;

for(int j = 0;j<s2.size();j++){

if(s1.arr[i] == s2.arr[j]){

found = true;

break;

}

}

if(!found){

res.add(s1.arr[i]);

}

}

res.disp();

}

void disp(){

for(int i = 0;i<it;i++){

cout<<arr[i]<<" ";

}cout<<endl;

}

};

int main() {

set s;

int ch;

cout<<"How many elements do you want to add in set1 : ";

int size1;

cin>>size1;

cout<<"Enter the elemets for set1 : ";

for(int i = 0;i<size1;i++){

int ele;

cin>>ele;

s.add(ele);

}

cout<<"How many elements do you want to add in set2 : ";

int size2;

cin>>size2;

set s1;

cout<<"Enter the elemets for set2 : ";

for(int i = 0;i<size2;i++){

int ele;

cin>>ele;

s1.add(ele);

}

while(ch!=10){

cout<<"\n 1..Add element in the set \n 2.Remove element from the set \n 3.Size of the set \n 4.Display the elements in the set \n 5.Check if element is present or not \n 6.Union of two sets \n 7.Intersection of two sets \n 8.Return iterator \n 9.Difference in two sets \n 10.Exit \n";

cout<<"Enter your choice :";

cin>>ch;

if(ch == 1){

cout<<"In which set do you want to add elemets?(s1 or s2) :";

string ans;

cin>>ans;

if(ans == "s1"){

int ele;

cin>>ele;

s.add(ele);

}

else{

int ele;

cin>>ele;

s1.add(ele);

}

}

else if(ch==2){

cout<<"From which set you have to delete the element? (s1 or s2) : ";

string res;

cin>>res;

if(res == "s1"){

cout<<"Enter the element to be deleted :";

int ele;

cin>>ele;

s.remove(ele);

}

else{

cout<<"Enter the element to be deleted :";

int ele;

cin>>ele;

s1.remove(ele);

}

}

else if(ch == 3){

cout<<"Size of the set1 is : "<<s.size()<<endl;

cout<<"Size of the set2 is : "<<s1.size()<<endl;

}

else if(ch==4){

cout<<"Set 1 :"<<endl;

s.disp();

cout<<endl;

cout<<"Set 2 :"<<endl;

s1.disp();

}

else if(ch == 5){

cout<<"Enter the element :";

int ele;

cin>>ele;

bool status = s.contains(ele);

if(status){

cout<<"Given element is present in the set"<<endl;

}

else{

cout<<"Given element is not present in the set"<<endl;

}

}

else if(ch == 6){

set res;

res = res.union\_set(s,s1);

res.disp();

}

else if(ch==7){

set res2;

res2 = res2.intersection(s,s1);

res2.disp();

}

else if(ch==8){

cout<<"Iterator of set1 : "<<s.iterator()<<endl;

cout<<"Iterator of set2 : "<<s1.iterator()<<endl;

}

else if(ch==9){

set res;

res.diff(s,s1);

res.disp();

}

else if(ch==10){

cout<<"Exited"<<endl;

break;

}

else{

cout<<"Invalid Input"<<endl;

}

}

return 0;

}