#include<stdio.h>

#include<iostream>

#include<time.h>

#include<conio.h>

using namespace std;

typedef struct ThiSinh{

int MATS;

char HoTen[30];

bool ketQua;

float Diem1, Diem2, Diem3;

};

typedef struct Node

{

ThiSinh data;

struct Node \* pNext;} ;

typedef struct List{Node \*pHead;

Node \*pTail;};

void TaoList(List &l)

{

l.pHead=NULL;

l.pTail=NULL;

}

List l;

int n;

//Nhap xau

//1. Tao node

Node\* GetNode(ThiSinh dulieu)

{

Node \*p=new Node;

if(p==NULL) return NULL;

p->data=dulieu;

p->pNext=NULL;

return p;

}

void AddCuoiXau(List &l, Node \*p)

{

if(l.pHead==NULL) {

l.pHead=l.pTail=p;}

else {

l.pTail->pNext=p;

l.pTail=p;

}

}

void nhapxau (List &l)

{ printf("Nhap so phan tu cua xau: ");

scanf("%d", &n);

ThiSinh ts;

Node \* p;

float diemTB;

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

{

printf("Nhap thong tin thi sinh thu %5d \n",i);

printf("Nhap Ma so thi sinh \n"); scanf(" %d", &ts.MATS);

printf("Nhap Ho ten thi sinh \n"); scanf(" %s", &ts.HoTen);

printf("Nhap Diem thi mon thu 1 \n "); scanf(" %f", &ts.Diem1);

printf("Nhap Diem thi mon thu 2 \n");scanf(" %f", &ts.Diem2);

printf("Nhap Diem thi mon thu 3 \n"); scanf(" %f", &ts.Diem3);

diemTB = (ts.Diem1 \*2 + ts.Diem2 + ts.Diem3)/4;

if(diemTB >= 5.0){

ts.ketQua = true;

}else{

ts.ketQua = false;

}

p=GetNode(ts);

if(p==NULL)break;

else

{

AddCuoiXau(l,p);

}

}

}

void xuatxau (List l)

{

Node \*p=l.pHead;

printf("Thong tin thi sinh \n");

while(p!=NULL) {

printf("%d ",p->data.MATS);

printf("%s ",p->data.HoTen);

printf("%f ",p->data.Diem1);

printf("%f ",p->data.Diem2);

printf("%f ",p->data.Diem3);

if(p->data.ketQua){

printf("Dat");

}else{

printf("Khong dat");

}

printf("\n");

p=p->pNext;

}

}

void TimX(List l)

{

int x;

printf("Nhap phan tu can tim : ");

scanf("%d", &x);

Node \*p=l.pHead;

while(p!=NULL)

{

if(p->data.MATS == x)

{

printf("Tim thay %d ",x) ;

printf("\n");

return; }

p=p->pNext;

}

printf("Khong tim thay %d",x);

printf("\n");

}

void RemoveX(List &l)

{ Node \*p,\*q; q = NULL; p=l.pHead;

int x;

printf("Nhap phan tu can tim va huy : ");

scanf(" %d",&x);

while((p!=NULL)&&(p->data.MATS!=x)) //tìm

{ q=p;

p=p->pNext;

}

if(p==NULL) //không tìm th?y ph?n t? có khoá b?ng x

{

printf("Khong tim thay %d \n",x);

return ;}

if(q!=NULL) //tìm th?y ph?n t? có khoá b?ng x

{ if(p==l.pTail)

l.pTail =q; //c?p nh?t l?i pTail

q->pNext=p->pNext;

delete p; }

else //phan tu can xoa nam dau List

{ l.pHead=p->pNext;

if(l.pHead==NULL)

l.pTail=NULL; }

}

void AddHead(List &l, Node \*p)

{

if(l.pTail==NULL)

{

l.pTail=l.pHead=p;

}

else{

p->pNext=l.pHead;

l.pHead=p;

}

}

void QuickSort(List &l)

{

Node \*p,\*X;//X luu d?a ch? c?a ph?n t? c?m canh

List l1,l2;

if(l.pHead==l.pTail) return;//dã có th? t?

TaoList(l1);

TaoList(l2);

X=l.pHead;

l.pHead=X->pNext;

while(l.pHead!=NULL)//tách L = L1 va L2

{ p=l.pHead;

l.pHead=p->pNext;

p->pNext=NULL;

if(p->data.MATS<=X->data.MATS)

AddHead(l1,p);

else

AddHead(l2,p);

}

QuickSort(l1);//G?i d? quy s?p x?p L1

QuickSort(l2);//G?i d? quy s?p x?p L2

if(l1.pHead!=NULL)//n?i l1, l2 va X vao l

{

l.pHead=l1.pHead;

l1.pTail->pNext=X;//n?i X vào

}

else

l.pHead=X;

X->pNext=l2.pHead;

if(l2.pHead!=NULL) //l2 có trên m?t ph?n t?

l.pTail=l2.pTail;

else //l2 không có ph?n t? nào

l.pTail=X;

}

void RemoveList(List &l)

{

Node \*p;

while(l.pHead!=NULL) //còn ph?n t? trong List

{

p = l.pHead;

l.pHead = p->pNext;

delete p;

}

}

void main(){

TaoList(l);

nhapxau(l);

QuickSort(l);

TimX(l);

RemoveX(l);

xuatxau(l);

RemoveList(l);

system("PAUSE");

}