BT1:

#include <iostream>

#include <cmath>

using namespace std;

struct point{double x,y;};

struct segment{point A,B;};

struct line{double a,b,c;};

struct vector{point source,target;};

struct triangle{point a,b,c;};

struct rectangle{point a,b,c,d;};

struct circle{point i; float r;};

float dodai(segment cc){

float val;

val = sqrt(pow(cc.B.x-cc.A.x,2) + pow(cc.B.y-cc.A.y,2));

return val;

}

void inputPoint(point &A){

cout<<"Nhap X: "; cin>>A.x;

cout<<"Nhap Y: "; cin>>A.y;

}

void inputTG(triangle &T){

cout<<"Nhap diem A"<<endl; inputPoint(T.a);

cout<<"Nhap diem B"<<endl; inputPoint(T.b);

cout<<"Nhap diem C"<<endl; inputPoint(T.c);

}

void inputLine(line &A){

cout<<"PT Ax + By +C = 0"<<endl;

cout<<"Nhap A B C: "; cin>>D.a>>D.b>>D.c;

}

void inputVT(vector &A){

cout<<"Nhap diem Source: "; inputPoint(A.source);

cout<<"Nhap diem Target: "; inputPoint(A.target);

}

bool checkTG(triangle A){

segment AB = {A.a,A.b},AC = {A.a,A.c},BC = {A.b,A.c};

if (dodai(AB)+dodai(BC) > dodai(AC) && dodai(AB)+dodai(AC) > dodai(BC) && dodai(AC)+dodai(BC) > dodai(AB))

return true;

else return false;

}

float distanceP2L(point A, line D){

float kc = abs(D.a\*A.x +D.b\*A.y +D.c)/sqrt(pow(D.a,2)+pow(D.b,2));

return kc;

}

bool checkVTZero(vector A){

if (A.source.x == A.target.x && A.source.y == A.target.y)

return true;

return false;

}

float gocHaiVT(vector A, vector B){

float s = acos((A.source.x\*A.target.x + A.source.x\*A.target.y)/(sqrt(pow(A.source.x,2)+pow(A.source.y,2))\*sqrt(pow(A.target.x,2)+pow(A.target.y,2))));

return s;

}

BT3:

#include <iostream>

using namespace std;

int n;

struct SinhVien{

int id;

string ten;

int tuoi;

float diem;

};

void inputSV(SinhVien \*&S, int &n){

cout<<"SL Sinh Vien: "; cin>>n;

S = new SinhVien[n];

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

cout<<"Nhap SV"<<i+1<<endl;

cout<<"Nhap ID: "; cin>>(S+i)->id;

cout<<"Nhap Ten: "; cin.ignore(); getline(cin, (S+i)->ten);

cout<<"Nhap Tuoi: "; cin>>(S+i)->tuoi;

cout<<"Nhap Diem: "; cin>>(S+i)->diem;

}

}

void xuatAllSV(const SinhVien \*S){

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

cout<<"SV "<<i+1<<":";

cout<<endl<<"ID: "<<(S+i)->id;

cout<<endl<<"Ten: "<<(S+i)->ten;

cout<<endl<<"Tuoi: "<<(S+i)->tuoi;

cout<<endl<<"Diem: "<<(S+i)->diem;

cout<<endl<<"---------\*---------\n";

}

}

void xuatSV(const SinhVien \*S,int currPos){

cout<<endl<<"ID: "<<(S+currPos)->id;

cout<<endl<<"Ten: "<<(S+currPos)->ten;

cout<<endl<<"Tuoi: "<<(S+currPos)->tuoi;

cout<<endl<<"Diem: "<<(S+currPos)->diem<<endl;

}

float diemTB(const SinhVien \*S, int n){

float d = 0;

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

d+=(S+i)->diem;

return (d/n);

}

float diemCN(const SinhVien \*S,int currPos,float ln){

while (currPos < n){

if ((S+currPos)->diem > ln)

ln = (S+currPos)->diem;

return diemCN(S,currPos+1,ln);

}

return ln;

}

void xuatSVDiemCN(const SinhVien \*S){

cout<<"Sinh vien co diem cao nhat: ";

float ln = diemCN(S,0,0);

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

if ((S+i)->diem == ln)

xuatSV(S,i);

}

float diemTN(const SinhVien \*S,int currPos,float nn){

while (currPos < n){

if ((S+currPos)->diem < nn){

nn = (S+currPos)->diem;

}

return diemTN(S,currPos+1,nn);

}

return nn;

}

void xuatSVDiemTN(const SinhVien \*S){

cout<<"Sinh vien co diem thap nhat: ";

float tn = diemTN(S,0,10);

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

if ((S+i)->diem == tn)

xuatSV(S, i);

}

void timSVtheoID(const SinhVien \*S){

int nid;

cout<<"Nhap ID can tim: "; cin>>nid;

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

if(nid == (S+i)->id)

xuatSV(S,i);

}

void sortTongDiemThi(SinhVien \*S){

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

if((S+i)->diem != diemCN(S,i,0)){

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

if((S+j)->diem == diemCN(S,i,0)){

int id = (S+j)->id; string ten = (S+j)->ten; int tuoi = (S+j)->tuoi; float diem = (S+j)->diem;

(S+j)->id = (S+i)->id; (S+j)->ten = (S+i)->ten; (S+j)->tuoi = (S+i)->tuoi; (S+j)->diem = (S+i)->diem;

(S+i)->id = id; (S+i)->ten = ten; (S+i)->tuoi = tuoi; (S+i)->diem = diem;

break;

}

}

}

}

int main(){

int opt; SinhVien\* S = nullptr;

while (true) {

cout << "==============================MENU============================" << endl;

cout << "1. Nhap thong tin sinh vien lop hoc" << endl;

cout << "2. Hien thi tat ca sinh vien" << endl;

cout << "3. Tinh diem trung binh cua lop hoc" << endl;

cout << "4. Hien thi sinh vien co tong diem cao nhat" << endl;

cout << "5. Hien thi sinh vien co tong diem thap nhat" << endl;

cout << "6. Tim sinh vien boi ID" << endl;

cout << "7. Sap xep cac ban ghi boi tong diem thi cua sinh vien" << endl;

cout << "8. Exit"<<endl;

cout << "Nhap lua chon: "; cin >> opt;

switch (opt) {

case 1:

inputSV(S,n);

break;

case 2:

xuatAllSV(S);

break;

case 3:

cout<<"Diem TB cua ca lop: "<<diemTB(S,n)<<endl;

break;

case 4:

xuatSVDiemCN(S);

break;

case 5:

xuatSVDiemTN(S);

break;

case 6:

timSVtheoID(S);

break;

case 7:

sortTongDiemThi(S);

cout<<"Da sap xep!"<<endl;

break;

case 8:

delete[] S;

return 0;

default:

cout << "Lua chon khong hop le. Vui long chon tu 1 den 8." << endl;

break;

}

}

}