Sửa một số bài tập

**Bài 1. Lớp sinh sinh viên**

#include <iostream>

#include <iomanip>

using namespace std;

class Sinhvien

 {

 private:

 char masv[10],ht[30];

 float dtb;

 public:

 void nhap();

 void xuat();

float get\_dtb(); //Lay ra dtb

 };

void Sinhvien::nhap()

 {

 cout<<"\n Nhap ma sv :";

 cin.get(masv,10);

 cin.ignore();

cout<<"\n Nhap ho ten sv :";

cin.get(ht,30);

 cout<<"\n Diem trung binh :"; cin>>dtb;

cin.ignore();

 }

void Sinhvien::xuat()

 {

 cout<<setw(10)<<masv  <<setw(30)<<ht

 <<setw(5)<<dtb<<endl;  }

float Sinhvien::get\_dtb()

 {

 return dtb;

 }

class Quanly

{

private:

Sinhvien sv[50];

 int n;

 public:

 void nhap\_sv();

 void in\_sv();

};

void Quanly::nhap\_sv()

{

 cout<<"\n Nhap so sinh vien :";  cin>>n;

 cin.ignore();

 for (int i = 0;i<n;i++)

 sv[i].nhap();

}

void Quanly::in\_sv()

{

//Tim Max cua dtb

 float max = sv[0].get\_dtb();

 for (int i=1; i<n ; i++)

 if (max < sv[i].get\_dtb())

 max = sv[i].get\_dtb();

 //In sv co dtb dat max

 cout<<"\nDanh sach sinh vien co dtb cao nhat: "<<endl;  cout<<setw(10)<<" Ma sv"

 <<setw(30)<<" Ho va ten"

 <<setw(20)<<" Diem trung binh"<<endl;  for (int i=0; i<n ; i++)

if (sv[i].get\_dtb() == max)

 sv[i].xuat();

}

int main()

{

 Quanly ob;

 ob.nhap\_sv();

 ob.in\_sv();

 return 0;

}

**Bài 3.9 Lớp Date**

#include <iostream>

using namespace std;

class Date

{

 private:

 int D,M,Y; //ngày, tháng, nam

 public:

 int nhuan(); //kiem tra nam nhuan

 int ngaythang(); //tra ve so ngay trong thang  void nhap(); //co kiem tra du lieu

 void xuat();

 Date cong\_1(); //cong 1 ngay vao dtuong

 Date cong\_k(int k);

 int ngaynam(); //tra ve so ngay cua nam

int khoangcach(Date d2);

};

int Date::nhuan() //tra ve 1 neu Y nhuan, 0 neu khong nhuan {

 return ((Y % 4 == 0 and Y % 100 != 0) || (Y % 400 == 0)); }

int Date::ngaythang()

{

if (M==4 or M==6 or M==9 or M==11)

 return 30;

else if (M==2)

 return 28 + nhuan();

else

 return 31;

}

void Date::nhap()

{

 int S;

 int k;

 do

 {

 cout<<"\nNhap vao ngay thang nam : "<<endl;

 cin>>D>>M>>Y;

 S = ngaythang();

 if ((D > 0) and (D <= S) and (M >= 1) and (M <= 12 ) and Y > 0)  k = 1; //hop le

 else

{ cout<<"\nSai ngay! Hay nhap lai. "<<endl;

 k = 0; //khong hop le

}

 } while(k == 0);

}

void Date::xuat()

{

 cout<<D<<'/'<<M<<'/'<<Y<<endl; }

Date Date::cong\_1()

{

 int S;

 S =ngaythang();

 if (++D>S)

 {

 D = 1;

 if (++M>12)

 { M = 1;

 Y = Y + 1;

 }

}

 return \*this; //doi tuong ma this tro toi }

Date Date::cong\_k(int k)

{

 Date t;

 t.D = D;

 t.M= M;

 t.Y = Y;

 for (int i=1;i<=k;i++)

 t.cong\_1();

 return t;

}

int Date::ngaynam()

 {

 return nhuan()?366:365;

 }

//Ham tinh khoang cach giua 2 dt ngay

int Date::khoangcach(Date d2)

 {

 Date d;

 int s1=0,s2=0,T=0;

 for (d.M=1,d.Y=Y; d.M<M; d.M++)

 s1+=d.ngaythang();

 s1 += D;

 //cout<<"\n so ngay cua dt 1 tinh tu moc thang 1: "<<s1; //gia su d1 goi phuong thuc  for (s2=0;d2.M<=12;d2.M++)

 s2+=d2.ngaythang();

 s2 -= d2.D;

 //cout<<"\n so ngay cua dt 2 tinh den moc cuoi thang 12 la: "<<s2;

 if (d2.Y==Y) // X-----------d2---d1--------X, vd d1 = 20/10/2021, d2 = 15/7/2021  T= s1 + s2 - ngaynam();

 else //X-------d2----X--------------X------d1-------X

 { //1 12 1 12

 for (d2.Y++;d2.Y<Y;++d2.Y)

 T+=d2.ngaynam();

 T+=s1+s2;

 }

 return T;

 }

int main()

{

 Date d; int k;

 cout<<"\n Nhap doi tuong ob: ";

 d.nhap();

 cout<<"\n Du lieu cua doi tuong: ";

 d.xuat();

 d.cong\_1();

 cout<<"\n Sau khi tang 1 ngay: ";

 d.xuat();

 Date d1, d2;

 cout<<"\n Nhap ngay thu nhat"; d1.nhap();

 cout<<"\n Nhap ngay thu hai"; d2.nhap();

 cout<<"\n Khoang cach giua d1 va d2 la: "<<d1.khoangcach(d2);

 return 0;

}

**Bài 3.10. Lớp Phanso**

#include<iostream>

#include<math.h>

using namespace std;

class Phanso

 {

 int t,m; //tu so va mau so  public:

 friend int ucln(int a,int b);  void nhap();

 void xuat();

 Phanso cong(Phanso p2);

 Phanso nhan(Phanso p2);

 Phanso chia(Phanso p2);

 };

int ucln(int a,int b) //thuat toan Euclid {

 a = fabs(a);

 b = fabs(b);

 while (a!=b)

 {

 if(a>b)

 a=a-b;

 else

 b=b-a;

 }

 return a;

}

void Phanso::nhap()

{

 cout<<"\nNhap tu so:";cin>>t;  do

{

 cout<<"\nNhap mau so:";cin>>m;

 }while(m==0);

}

void Phanso::xuat()

{

 cout<<t<<"/"<<m<<endl;

}

Phanso Phanso::cong(Phanso p2)

{

 Phanso p;

 p.t = t\*p2.m+m\*p2.t; //t/m + p2.t/p2.m  p.m = m\*p2.m;

 if (p.t !=0)

 {

 int k = p.t/ucln(p.t,p.m);

 p.m = p.m/ucln(p.t,p.m);

 p.t = k;

 }

 return p;

}

Phanso Phanso::nhan(Phanso p2)

{ Phanso tam;

 tam.t = t\*p2.t;

 tam.m = m\*p2.m;

 if (tam.t!=0)

 {

 int k = tam.t/ucln(tam.t,tam.m);

 tam.m = tam.m/ucln(tam.t,tam.m);  tam.t = k;

 }

return tam;

}

Phanso Phanso::chia(Phanso p2)

{Phanso tam;

 tam.t = t\*p2.m;

 tam.m = m\*p2.t;

 if (tam.t)

 {

 int k = tam.t/ucln(tam.t,tam.m);

 tam.m = tam.m/ucln(tam.t,tam.m);  tam.t = k;

 }

return tam;

}

int main()

 {

 Phanso p1,p2,p3;

 cout<<"\nNhap phan so thu nhat:";p1.nhap();  cout<<"\nNhap phan so thu hai:",p2.nhap();  cout<<"\nPhan so thu nhat:";p1.xuat();  cout<<"\nPhan so thu hai:";p2.xuat();

 p3 = p1.cong(p2);

 cout<<"\nTong hai phan so p1 va p2 :";p3.xuat();

 p3 = p1.nhan(p2);

 cout<<"\nTich hai phan so p1 va p2 :";p3.xuat();

 p3= p1.chia(p2);

 cout<<"\nThuong hai phan so p1 va p2 :";p3.xuat();

 return 0;

 }

**Bài 3. Lớp Time**

//Bai tap 3.8 trong giao trinh

#include <iostream>

using namespace std;

class Time

{

 private:

int h,m,s;

 public:

//cac ham tao

Time();

Time(int a,int b,int c);

//ham nhap, xuat

void nhap();

void xuat();

void chuanhoa(); //chuan hoa gio, phut va giay

void giatang(int a, int b, int c);//tang gio hien tai

void dieuchinh(int a, int b,int c); //dieu chinh lai gio hien tai theo gio moi

};

Time::Time()

{ h=m=s=0; }

Time::Time(int a,int b,int c)

{ h=a; m=b; s = c;}

void Time::nhap()

{

while(1)

 {

 cout << "Nhap vao gio, phut va giay: ";  cin>>h>>m>>s;

 if (h >= 0 and m >=0 and s>=0)  break;

 cout << "Nhap sai! Hay nhap lai." << endl;  }

}

void Time::xuat()

{ cout<<h<<":"<<m<<":"<<s<<"\n"; }

/\* cach 1

void Time::chuanhoa()

{

if(s>=60)

{ m = m+s/60;

s = s%60; //chuan hoa giay

}

if(m>=60)

{

h = h+m/60;

m = m%60; //chuan hoa phut

}

if(h>=24)

 h = h%24; //chuan hoa gio

}

\*/

//cach 2

void Time::chuanhoa()

{

 int tong = h\*3600 + m\*60 + s; //tinh ra giay  h = (tong/3600)%24;

 m = (tong/60)%60;

 s = tong%60;

}

void Time::giatang(int a, int b, int c) {

h=h+a;

m=m+b;

s=s+c;

 chuanhoa(); //goi phuong thuc chuanhoa }

void Time::dieuchinh(int a, int b, int c)  {

 h = a;

 m = b;

 s = c;

 chuanhoa();

 }

int main()

{

Time ob1(25,65,75),ob2;

cout<<"\n Doi tuong ob1: ";

ob1.xuat();

cout<<"\n Sau khi chuan hoa ob1: "; ob1.chuanhoa();//2:6:15

ob1.xuat();

cout<<"\n Gia tang ob1: ";

ob1.giatang(20, 50, 70);

cout<<"\n ob1 sau khi gia tang: "; ob1.xuat(); //22:57:25

cout<<"\n Dieu chinh ob1: ";

ob1.dieuchinh(15, 70, 90);

cout<<"\n ob1 sau khi dieu chinh: ";

ob1.xuat(); //16:11:30

cout<<"\n Nhap doi tuong ob2: \n ";

ob2.nhap();

cout<<"\n Doi tuong ob2: \n";

ob2.xuat();

cout<<"\n Sau khi chuan hoa ob2: "; ob2.chuanhoa();

ob2.xuat();

return 0;

}

**Bài tập 3.13. Lớp Đa thức**

#include <iostream>

#include <stdlib.h>

using namespace std;

class dathuc

{

int heso[100]; //luu cac he so cua da thuc int bac; //bac cua da thuc  public:

void nhap();

void xuat();

dathuc cong(dathuc p);

};

void dathuc:: nhap()

{

//vd : 2x^0 + 3x + 5x^2 + 4x^3

cout<<"Nhap vao bac cua da thuc: ";

cin>>bac;

cout<<"Nhap vao cac he so cua da thuc: ";

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

 {

 cout<<"He so bac "<<i<<" la: ";

cin>>heso[i];

 }

}

void dathuc::xuat() //in ra chua dat yeu cau ! hay sua lai

 {

 for (int i=0; i<=bac; i++)

 if (heso[i] !=0)

 cout<<heso[i]<<"x^"<<i<<"+";

 cout<<"\n\n";

 }

dathuc dathuc::cong(dathuc p)

{ dathuc c; //c la da thuc ket qua

 int i;

//vd: da thuc hien tai: 2 + 3x + 5x^2 + 4x^3

//vd: da thuc 2 (da thuc p): 3 + 2x + 6x^2 + 9x^3 + 3x^4 + 2x^5

//vd: da thuc tong 5 + 5x + 11x^2 + 13x^3 + 3x^4 + 2x^5 if (bac < p.bac) //bac =3, p.bac = 5

{ c.bac = p.bac;

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

c.heso[i] = heso[i] + p.heso[i];

for (i=bac+1; i<=p.bac;i++)

c.heso[i] = p.heso[i];

}

//vd: da thuc hien tai: 5 + 3x + 6x^2 + 9x^3 + 3x^4 + 2x^5 //vd: da thuc p: 4 + 2x + 5x^2 + 4x^3

//vd: da thuc tong 9 + 5x + 11x^2 + 13x^3 + 3x^4 + 2x^5

else //bac = 5, p.bac =3

{ c.bac = bac;

for (i=0; i<=p.bac;i++)

 c.heso[i] = heso[i] + p.heso[i];

for (i=p.bac+1; i<=bac;i++)

c.heso[i]=heso[i];

}

return c;

}

int main()

{

 dathuc ob1,ob2,ob3;

 ob1.nhap();

 ob2.nhap();

 cout<<"\n Da thuc thu nhat : "; ob1.xuat();cout<<endl;  cout<<"\n Da thuc thu hai : ";ob2.xuat();cout<<endl;

 ob3=ob1.cong(ob2);

 cout<<"\n Da thuc tong : ";

 ob3.xuat();cout<<endl;

 return 0;

}

**Bài tập 3.11 Lớp Chuỗi**

#include <string.h>

#include <iostream>

#include <stdio.h>

using namespace std;

class Chuoi

 {

 char str[100]; //cach khai bao chuoi cua ngon ngu C  int n; //kich thuoc chuoi

 public:

 Chuoi();

 Chuoi(char st[]);

 void nhap();

void hienthi();

char phantu(int i); //tra ve ky tu thu i cua chuoi Chuoi noi(Chuoi ob2); //ket noi 2 chuoi

 };

 Chuoi::Chuoi() //ham tao mac dinh

 {}

 Chuoi::Chuoi(char st[]) //ham tao khoi gan chuoi  {

 strcpy(str,st); //loi khi go str = st

 }

 void Chuoi::nhap()

 {

 cout<<"\n Nhap chuoi:";

 gets(str);

 n = strlen(str);

 }

 void Chuoi::hienthi()

 {

 cout<<str<<endl;

 }

 char Chuoi::phantu(int i)

 {

 if (i<0 || i >= n)

 return -1;

 return str[i];

 }

 Chuoi Chuoi::noi(Chuoi ob2)

 {

 Chuoi ob; //loi khi go ob = str + ob2.str;  strcpy(ob.str,str);

 strcat(ob.str,ob2.str); //noi xong 2 chuoi  ob.n = strlen(ob.str);

 return ob;

 }

int main()

 {

 Chuoi ob1("Khoa"),ob2("CNTT"),ob3;

 ob3 = ob1.noi(ob2);

 cout<<"\n ob1 = ";ob1.hienthi();

 cout<<"\n ob2 = ";ob2.hienthi();

 cout<<"\n ob3 = ";ob3.hienthi();

 cout<<"\nPhan tu thu 5 cua ob3 la: "<<ob3.phantu(4);

 ob1.nhap();

 ob2.nhap();

ob3= ob1.noi(ob2);

 cout<<"\n ob1 = ";ob1.hienthi();

 cout<<"\n ob2 = ";ob2.hienthi();

 cout<<"\n ob3 = ";ob3.hienthi();

 cout<<"\nPhan tu thu 5 cua ob3 la: "<<ob3.phantu(4); return 0;

 }

**Bài tập 3.15 Lớp Mảng**

#include<iostream>

#include <stdlib.h>

using namespace std;

class Mang

{

 int \*a; //dung mang cap phat dong  int n; //kich thuoc mang

 public:

 void nhap();

 void xuat();

 Mang cong(Mang m2);

};

void Mang::nhap()

 {

 cout<<"\n Nhap n (n>0) ";cin>>n;  a = new int [n];

 if (a == NULL)

 {

 cout<<"\n Loi cap phat bo nho!";  return;

 }

 for(int i = 0;i < n;i++)

 { cout<<"\n a["<<i<<"]=";

 cin>>a[i];

}

}

void Mang::xuat()

{

 for(int i=0;i<n;i++)

 cout<<a[i]<<" ";

}

Mang Mang::cong(Mang m2)

 {

 Mang m;

 //hai doi tuong cong duoc phai cung kich thuoc   if (n != m2.n) //kiem tra kich thuoc  { cout<<"\n 2 mang khong cung kich thuoc";  exit(1);

 }

 m.a = new int [n];

if (m.a == NULL)

 {

 cout<<"\n Loi cap phat bo nho!";

 exit(1);

 }

 for(int i = 0;i<n;i++)

 m.a[i] = a[i] + m2.a[i];

m.n = n; //gan kich thuoc cua mang m la n return m;

 }

int main()

 {

 Mang m1,m2,m3;

 cout<<"\n\nNhap mang thu nhat:";m1.nhap();  cout<<"\n Mang thu nhat: "; m1.xuat();

cout<<"\n\nNhap mang thu hai:";m2.nhap();

 cout<<"\n Mang thu hai: "; m2.xuat();

m3 = m1.cong(m2);

cout<<"\n\nTong hai mang :";

m3.xuat();

 return 0;

 }

**Bài tập 3.16 Lớp Điểm**

#include <iostream>

#include <math.h>

#define n 5 //KICH THUOC n LA 5

using namespace std;

class Khonggian //moi doi tuong se co dung n thanh phan {

private: int a[n]; //cac thanh phan cua doi tuong diem public:

void nhap();

void xuat();

float khoangcach(Khonggian d2);

Khonggian cong(Khonggian d2);

};

void Khonggian::nhap()

{

 for(int i=0;i<n;++i)

 { cout<<"a["<<i<<"]=";

 cin>>a[i];

}

}

void Khonggian::xuat()

{

 cout<<"(";

 for(int i=0;i<n-1;++i)

 cout<<a[i]<<",";

 cout<<a[n-1]<<")"<<endl;

}

float Khonggian::khoangcach(Khonggian d2)  { float S = 0.0;

 for(int i =0; i<n;i++)

 S = S + pow(d2.a[i]-a[i],2);

 return sqrt(S);

 }

 Khonggian Khonggian::cong(Khonggian d2)  {

 Khonggian d;

 for(int i =0; i<n;i++)

 d.a[i] = a[i] + d2.a[i];

 return d;

 }

int main()

{

Khonggian d1,d2,d3;

cout<<"\n Nhap du lieu cho doi tuog thu 1: "; d1.nhap();

cout<<"\n Nhap du lieu cho doi tuog thu 2: "; d2.nhap();

cout<<"\n Doi tuong d1: "; d1.xuat();

cout<<"\n Doi tuong d2: "; d2.xuat();

 cout<<"\n Khoang cach giua d1 va d2: "  <<d1.khoangcach(d2);

d3 = d1.cong(d2);

 cout<<"\n d1 + d2 = ";

 d3.xuat();

return 0;

}

**Bài tập về DSLK**

#include <iostream>

#include <stdlib.h>

#include <string.h>

#include <stdio.h>

using namespace std;

//mo ta cau truc cua nut trong dslk

class Hocphan

{

private:

char \*mahp,\*tenhp;

int sotc;

public:

Hocphan \*next;

//ham tao de khoi tao gia tri cac thuoc tinh Hocphan(char \*mhp,char \*thp, int tc)

{

mahp = new char[strlen(mhp)+1];

tenhp = new char[strlen(thp)+1];

strcpy(mahp,mhp);

strcpy(tenhp,thp);

sotc = tc;

}

//cac ham lay gia tri thuoc tinh

char \*GetMaHP()

{

return mahp;

}

char \*GetTenHP()

{

return tenhp;

}

int GetSoTC()

{

return sotc;

}

//ham gan gia tri cho cac thuoc tinh, dung cho ham sapxep void Set(char \*mhp,char \*thp, int tc)

{

mahp = new char[strlen(mhp)+1];

tenhp = new char[strlen(thp)+1];

strcpy(mahp,mhp);

strcpy(tenhp,thp);

sotc = tc;

}

};

//lop List de mo ta cac doi tuong la dslk

class List

{

private:

Hocphan \*first;

public:

List() //khoi tao danh sach rong

{

first = NULL;

}

void Nhap();

void HienThi();

void SapXep();

Hocphan \*TimKiem(char \*hp);

void Xoa(char \*hp);

};

void List::Nhap() //bo sung dau danh sach {

char mhp[10],thp[30];

int tc;

do

{

 cout<<"\n Nhap ma hoc phan: ";

 fflush(stdin); gets(mhp);

 if(strcmpi(mhp,"") != 0)

 {

 cout<<"\n Nhap ten hoc phan: ";

 fflush(stdin); gets(thp);

 cout<<"\n Nhap so tin chi: "; cin>>tc;

 //cap phat bo nho va gan du lieu cho p

 Hocphan \*p = new Hocphan(mhp,thp,tc);  //chen dau dslk

 p->next = first;

 first = p;

 }

}while(strcmpi(mhp,"") != 0) ;

}

void List::HienThi()

{

Hocphan \* p = first;

while(p != NULL)

{

 cout<<"\n\n-----------------------------";

 cout<<"\n Ma hoc phan: "<<p->GetMaHP();  cout<<"\n Ten hoc phan: "<<p->GetTenHP();  cout<<"\n So tin chi: "<<p->GetSoTC();

 cout<<"\n\n-----------------------------";

 p = p->next;

}

}

void List::SapXep()

{

Hocphan \*p,\*q;

char temmahp[30],temthp[30];

int temtc;

if(first != NULL)

for(p = first; p->next != NULL; p= p->next)

 for(q = p->next; q != NULL; q = q->next)

 if(strcmp (p->GetMaHP(),q->GetMaHP()) > 0)  {

strcpy(temmahp,p->GetMaHP());

strcpy(temthp,p->GetTenHP());

temtc = p->GetSoTC();

p->Set(q->GetMaHP(),q->GetTenHP(),

 q->GetSoTC());

q->Set(temmahp,temthp,temtc);

 }

 }

Hocphan \* List::TimKiem(char \*mhp)

{

Hocphan \*p = first;

while (p!=NULL && strcmpi(p->GetMaHP(),mhp)!=0)  p = p->next;

return p;

}

void List::Xoa(char \*mhp)

{

while (first!=NULL &&

 strcmpi(first ->GetMaHP(),mhp) == 0) //xoa nut dau {

Hocphan \*tam = first;

first = first ->next;

delete tam;

}

if(first!=NULL)

 {

 Hocphan \*p = first;

 while(p->next!=NULL)

 if(strcmpi(p->next->GetMaHP(),mhp) == 0)

 {

 Hocphan \*tam = p->next;

 p->next = p->next->next;

 delete tam;

 }

else

 p = p->next;

}

}

int main()

{

List ds; //khai bao 1 ds doi tuong cua lop List ds.Nhap();

cout<<"\n Hien thi danh sach hoc phan: "; ds.HienThi();

ds.SapXep();

cout<<"\n Hien thi sau khi sap xep: ";

ds.HienThi();

char mhp[10],thp[30];

cout<<"\n Nhap vao ma hp muon xoa: ";   fflush(stdin); gets(mhp);

ds.Xoa(mhp);

cout<<"\n Hien thi sau khi xoa: ";

ds.HienThi();

cout<<"\n Nhap vao ma hp muon tim kiem ";   fflush(stdin); gets(mhp);

Hocphan \*p = ds.TimKiem(mhp);

char c;

if(p!= NULL)

{

cout<<"\n Da tim thay hp cua ban! ";

cout<<"\n Ma hp :"<<p->GetMaHP();

cout<<"\n Ten hp:"<<p->GetTenHP();

cout<<"\n So tc:"<<p->GetSoTC();

}

else

cout<<"\n Khong tim thay ma hoc phan nay"; return 0;

}