#include <iostream>

#include <conio.h>

#include <math.h>

using namespace std;

struct DonThuc

{

float hs;

int sm;

};

struct node

{

DonThuc info;

node \*next;

};

struct DaThuc

{

node \*head;

node \*tail;

};

node\* getnode(DonThuc x)

{

node \*p;

p=new node;

if(p==NULL)

{

cout<<"\n Khong du bo nho! Thu lai! ";

return NULL;

}

p->info=x;

p->next=NULL;

return p;

}

void KhoiTao(DaThuc &L)

{

L.head=NULL;

L.tail=NULL;

}

void addhead(DaThuc &L,node \*p)

{

if(L.tail==NULL)

{

L.head=p;

L.tail=p;

}

else

{

p->next=L.head;

L.head=p;

}

}

void ThemDau(DaThuc &L,DonThuc x)

{

node \*p;

p=getnode(x);

addhead(L,p);

}

void Nhap(DonThuc &x)

{

cout<<"\n Nhap Vao Don Thuc";

cout<<"\n Nhap vao he so: ";

cin>>x.hs;

cout<<"\nNhap so mu: ";

cin>>x.sm;

}

void NhapDaThuc(DaThuc &L)

{

int n;

DonThuc x;

node \*p;

p=L.head;

cout<<"\n Nhap Da Thuc";

cout<<"\n Nhap vao so luong don thuc: ";

cin>>n;

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

{

cout<<"\n Don Thuc "<<i+1 <<" = ";

Nhap(x);

ThemDau(L,x);

}

}

void CongDaThuc (DaThuc L,DaThuc L1,DaThuc &T)

{

node \*p,\*q;

int flag;

p=L.head;

while(p!=NULL)

{

ThemDau(T,p->info);

p=p->next;

}

p=L1.head;

q=T.head;

while (q!=NULL)

{

p=L1.head;

while (p!=NULL)

{

if(p->info.sm==q->info.sm)

q->info.hs+=p->info.hs;

p=p->next;

}

q=q->next;

}

p=L1.head;

while (p!=NULL)

{

flag=0;

q=T.head;

while (q!=NULL)

{

if(q->info.sm==p->info.sm)

flag=1;

q=q->next;

}

if(flag==0)

ThemDau(T,p->info);

p=p->next;

}

}

void TruDaThuc(DaThuc &L,DaThuc &L1,DaThuc &H)

{

node \*p,\*q;

int flag;

p=L.head;

while(p!=NULL)

{

ThemDau(H,p->info);

p=p->next;

}

p=L1.head;

q=H.head;

while (q!=NULL)

{

p=L1.head;

while (p!=NULL)

{

if(p->info.sm==q->info.sm)

q->info.hs-=p->info.hs;

p=p->next;

}

q=q->next;

}

p=L1.head;

while (p!=NULL)

{

flag=0;

q=H.head;

while (q!=NULL)

{

if(q->info.sm==p->info.sm)

flag=1;

q=q->next;

}

if(flag==0)

{

p->info.hs\*=-1;

ThemDau(H,p->info);

p->info.hs\*=-1;

}

p=p->next;

}

}

void NhanDaThuc(DaThuc &L,DaThuc &L1,DaThuc &Ti)

{

node \*p,\*q;

int flag;

p=L.head;

while(p!=NULL)

{

ThemDau(Ti,p->info);

p=p->next;

}

p=L1.head;

q=Ti.head;

while (q!=NULL)

{

p=L1.head;

while (p!=NULL)

{

q->info.hs\*=p->info.hs;

q->info.sm+=p->info.sm;

p=p->next;

}

q=q->next;

}

}

void XuatDaThuc(DaThuc L)

{

cout<<"\n";

node \*p;

p=L.head;

while(p!=NULL)

{

cout<<(p->info).hs<<"x^"<<(p->info).sm;

if(p->next!=NULL)

cout<<"+";

p=p->next;

}

}

int main()

{

DaThuc L,L1,T,H,Ti;

KhoiTao(L);

KhoiTao(L1);

KhoiTao(T);

KhoiTao(H);

KhoiTao(Ti);

DonThuc x;

NhapDaThuc(L);

cout<<"\n Da thuc can cong ";

NhapDaThuc(L1);

cout<<"\n Hai da thuc ";

XuatDaThuc(L);cout<<"\n";

XuatDaThuc(L1);

CongDaThuc(L,L1,T);

XuatDaThuc(T);

cout<<"\nDa thuc 1 tru da thuc 2";

TruDaThuc(L,L1,H);

XuatDaThuc(H);

cout<<"\n Da thuc tich \n";

NhanDaThuc(L,L1,Ti);

XuatDaThuc(Ti);

getch();

}