Write a program to perform addition of two polynomial functions.

```
#include<stdio.h>
#include<process.h>
#include<math.h>
struct NODE
{
 float cf;
 float px;
 float py;
 int flag;
 struct NODE *link;
};
typedef struct NODE *node;
node getnode()
{
 node x;
 x=(node)malloc(sizeof(struct NODE));
 if(x == NULL)
 {
 printf("Memory is full.\n");
 exit(0);
 }
```

```
 return x;
}
node insert_rear(float cf,float x,float y,node head)
{
 node temp,cur;
 int flag;
 temp=getnode();
 temp->cf=cf;
 temp->px=x;
 temp->py=y;
 temp->flag=0;
 cur=head->link;
 while(cur->link!=head)
 cur=cur->link;
 cur->link=temp;
 temp->link=head;
 return head;
}
node read_polynomial(node head)
{
 int i;
 float cf,px,py;
 printf("Enter the coefficient as -999 to end the polynomial.\n");
 for(i=0;;i++)
```

```
 {
 printf("Enter term %d:\n",i+1);
 printf(" Coefficient: ");
 scanf("%f",&cf);
 if(cf == -999)
 break;
 printf(" Pow of x: ");
 scanf("%f",&px);
 printf(" Pow of y: ");
 scanf("%f",&py);
 head=insert_rear(cf,px,py,head);
 }
 return head;
}
node add_polynomial(node h1,node h2,node h3)
{
 node p1,p2;
 int x1,x2,y1,y2,cf1,cf2,cf;
 p1=h1->link;
 while(p1!=h1)
 {
 x1=p1->px;
 y1=p1->py;
 cf1=p1->cf;
```

```
p2=h2->link;
while(p2!=h2)
{
x2=p2->px;
y2=p2->py;
cf2=p2->cf;
if(x1==x2 && y1==y2)
break;
p2=p2->link;
}
if(p2!=h2)
{
cf=cf1+cf2;
p2->flag=1;
if(cf!=0)
h3=insert_rear(cf,x1,y1,h3);
}
else
h3=insert_rear(cf1,x1,y1,h3);
p1=p1->link;
}
p2=h2->link;
while(p2!=h2)
{
```

```
 if(p2->flag==0)
 {
 h3=insert_rear(p2->cf,p2->px,p2->py,h3);
 }
 p2=p2->link;
 }
 return h3;
}
void display(node head)
{
 node temp;
 if(head->link==head)
 {
 printf("Polynomial does not exist.\n");
 return;
 }
 temp=head->link;
 while(temp!=head)
 {
 if(temp->cf >= 0)
 {
 if (temp->link != NULL)
 printf(" +");
 }
```

```
 printf("%5.1fx^%3.1fy^%3.1f",temp->cf,temp->px,temp->py);
 temp=temp->link;
 }
 printf("\n");
}
int main()
{
 node h1,h2,h3;
 h1=getnode();
 h2=getnode();
 h3=getnode();
 h1->link=h1;
 h2->link=h2;
 h3->link=h3;
 printf("Enter the first polynomial:\n");
 h1=read_polynomial(h1);
 printf("\nEnter the second polynomial:\n");
 h2=read_polynomial(h2);
 h3=add_polynomial(h1,h2,h3);
 printf("\nThe first polynomial:\n");
 display(h1);
 printf("\nThe second polynomial:\n");
 display(h2);
 printf("\nThe sum of the 2 polynomials:\n");
```

```
 display(h3);

}
```

```
Enter the first polynomial:
Enter the coefficient as -999 to end the polynomial.
Enter term 1:
 Coefficient: -7
 Pow of x: 3
 Pow of y: 1
Enter term 2:
 Coefficient: 4
 Pow of x: 2
 Pow of y: 2
Enter term 3:
 Coefficient: -2
 Pow of x: 0
 Pow of y: 0
Enter term 4:
 Coefficient: -999

Enter the second polynomial:
Enter the coefficient as -999 to end the polynomial.
Enter term 1:
 Coefficient: 5
 Pow of x: 3
 Pow of y: 2
Enter term 2:
 Coefficient: 8
 Pow of x: 0
 Pow of y: 0
Enter term 3:
 Coefficient: -4
 Pow of x: 2
 Pow of y: 2
Enter term 4:
 Coefficient: -999

The first polynomial:
 -7.0x^3.0y^1.0 +  4.0x^2.0y^2.0 -2.0x^0.0y^0.0

The second polynomial:
 +  5.0x^3.0y^2.0 +  8.0x^0.0y^0.0 -4.0x^2.0y^2.0

The sum of the 2 polynomials:
 -7.0x^3.0y^1.0 +  6.0x^0.0y^0.0 +  5.0x^3.0y^2.0
```