main.c

```c
/*ADDITION OF TWO POLYNOMIALS*/
#include<stdio.h>
#include<stdlib.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("out of memory\n");
   exit(0);
   }
   return x;
}
NODE insert_rear(float cf,float x,float y,NODE head)
{
   NODE temp,cur;
   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;
}
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    temp->link=head;
    return head;
}
void display(NODE head)
{
    NODE temp;
    if(head->link==head)
    {
    printf("Polynomial does not exist\n");
    return;
    }
    temp=head->link;
    while(temp!=head)
    {
    printf("+%5.2fx^%3.1fy^%3.1f",temp->cf,temp->px,temp->py);
    temp=temp->link;
    }
    printf("\n");
}
NODE add_poly(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;
    }
```

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76      if(p2!=h2)
77      {
78      cf=cf1+cf2;
79      p2->flag=1;
80      if(cf!=0)
81      h3=insert_rear(cf,x1,y1,h3);
82      }
83      else
84      h3=insert_rear(cf1,x1,y1,h3);
85      p1=p1->link;
86      }
87      p2=h2->link;
88      while(p2!=h2)
89      {
90         if(p2->flag==0)
91         {
92           h3=insert_rear(p2->cf,p2->px,p2->py,h3);
93         }
94         p2=p2->link;
95      }
96      return h3;
97  }
98  NODE read_poly(NODE head)
99  {
100     int i;
101     float px;
102     float py;
103     float cf;
104     printf("Enter the coefficients as -999 to end the polynomial\n");
105     for(i=1; ;i++)
106     {
107         printf("enter the %d term\n",i);
108         printf("coeff=");
109         scanf("%f",&cf);
110         if(cf==-999)
111         break;
112         printf("power of x=");
113         scanf("%f",&px);
114         printf("power of y=");
```

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105     for(i=1; ;i++)
106     {
107         printf("enter the %d term\n",i);
108         printf("coeff=");
109         scanf("%f",&cf);
110         if(cf==-999)
111         break;
112         printf("power of x=");
113         scanf("%f",&px);
114         printf("power of y=");
115         scanf("%f",&py);
116         head=insert_rear(cf,px,py,head);
117     }
118     return head;
119 }
120
121 void main()
122 {
123     NODE h1,h2,h3;
124     h1=getnode();
125     h2=getnode();
126     h3=getnode();
127     h1->link=h1;
128     h2->link=h2;
129     h3->link=h3;
130     printf("Enter the first polynomial:\n");
131     h1=read_poly(h1);
132     printf("Enter the second polynomial:\n");
133     h2=read_poly(h2);
134     h3=add_poly(h1,h2,h3);
135     printf("The first polynomial is:\n");
136     display(h1);
137     printf("The second polynomial is:\n");
138     display(h2);
139     printf("The sum of two polynomial is:\n");
140     display(h3);
141 }
142
143
```

input

```
Enter the first polynomial:
Enter the coefficients as -999 to end the polynomial
enter the 1 term
coeff=5
power of x=3
power of y=2
enter the 2 term
coeff=3
power of x=2
power of y=0
enter the 3 term
coeff=4
power of x=3
power of y=1
enter the 4 term
coeff=-5
power of x=0
power of y=0
enter the 5 term
coeff=-999
Enter the second polynomial:
Enter the coefficients as -999 to end the polynomial
enter the 1 term
coeff=4
power of x=3
power of y=2
enter the 2 term
coeff=3
power of x=1
power of y=0
enter the 3 term
coeff=-2
power of x=1
power of y=1
enter the 4 term
coeff=2
power of x=0
```

input

```
power of y=1
enter the 4 term
coeff=-5
power of x=0
power of y=0
enter the 5 term
coeff=-999
Enter the second polynomial:
Enter the coefficients as -999 to end the polynomial
enter the 1 term
coeff=4
power of x=3
power of y=2
enter the 2 term
coeff=3
power of x=1
power of y=0
enter the 3 term
coeff=-2
power of x=1
power of y=1
enter the 4 term
coeff=2
power of x=0
power of y=0
enter the 5 term
coeff=-999
The first polynomial is:
+ 5.00x^3.0y^2.0+ 3.00x^2.0y^0.0+ 4.00x^3.0y^1.0+-5.00x^0.0y^0.0
The second polynomial is:
+ 4.00x^3.0y^2.0+ 3.00x^1.0y^0.0+-2.00x^1.0y^1.0+ 2.00x^0.0y^0.0
The sum of two polynomial is:
+ 9.00x^3.0y^2.0+ 3.00x^2.0y^0.0+ 4.00x^3.0y^1.0+-3.00x^0.0y^0.0+ 3.00x^1.0y^0.0+-2.00x^1.0y^1.0


...Program finished with exit code 10
Press ENTER to exit console.
```

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```c
/*EVALUATION OF POLYNOMIAL*/
#include<stdio.h>
#include<math.h>
#include<stdlib.h>
#include<string.h>
struct node
{
   float cf;
   float px;
   float py;
   struct node*link;
};
typedef struct node*NODE;
NODE getnode()
{
   NODE x;
   x=(NODE)malloc(sizeof(struct node));
   if(x==NULL)
   {
       printf("out of memory\n");
       exit(0);
   }
   return x;
}
NODE insert_rear(float cf,float x,float y,NODE head)
{
    NODE temp,cur;
    temp=getnode();
    temp->cf=cf;
    temp->px=x;
    temp->py=y;
    cur=head->link;
    while(cur->link!=head)
        cur=cur->link;
        cur->link=temp;
        temp->link=head;
        return head;
}
NODE read_poly(NODE head)
```

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```
37          return head;
38  }
39  NODE read_poly(NODE head)
40  {
41      int i;
42      float cf,px,py;
43      printf("Enter the coefficient as -999 to end the polynomial\n");
44      for(i=1;;i++)
45      {
46          printf("Enter the %d term\n",i);
47          printf("Coeff=");
48          scanf("%f",&cf);
49          if(cf==-999)
50          break;
51          printf("pow x=");
52          scanf("%f",&px);
53          printf("pow y=");
54          scanf("%f",&py);
55          head=insert_rear(cf,px,py,head);
56      }
57      return head;
58  }
59  float evaluate(NODE head)
60  {
61      float x,y,sum=0;
62      NODE poly;
63      printf("Enter the value of x and y\n");
64      scanf("%f%f",&x,&y);
65      poly=head->link;
66      while(poly!=head)
67      {
68          sum=sum+poly->cf*pow(x,poly->px)*pow(y,poly->py);
69          poly=poly->link;
70      }
71      return sum;
72  }
73  void display(NODE head)
74  {
75      NODE temp;
```

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```
    poly=head->link;
    while(poly!=head)
    {
        sum=sum+poly->cf*pow(x,poly->px)*pow(y,poly->py);
        poly=poly->link;
    }
    return sum;
}
void display(NODE head)
{
    NODE temp;
    if(head->link==head)
    {
        printf("polynomial does not exist\n");
        return;
    }
    temp=head->link;
    while(temp!=head)
    {
       printf("+%5.2fx^%3.1fy^%3.1f",temp->cf,temp->px,temp->py);
       temp=temp->link;
    }
    printf("\n");
}
void main()
{
    NODE head;
    float res;
    head=getnode();
    head->link=head;
    printf("Enter the polyinomial\n");
    head=read_poly(head);
    res=evaluate(head);
    printf("The given polynomial is\n");
    display(head);
    printf("The result is %f\n",res);
}
```

input

```
Enter the polyinomial
Enter the coefficient as -999 to end the polynomial
Enter the 1 term
Coeff=5
pow x=3
pow y=2
Enter the 2 term
Coeff=3
pow x=2
pow y=0
Enter the 3 term
Coeff=4
pow x=3
pow y=1
Enter the 4 term
Coeff=-5
pow x=0
pow y=0
Enter the 5 term
Coeff=-999
Enter the value of x and y
1 2
The given polynomial is
+ 5.00x^3.0y^2.0+ 3.00x^2.0y^0.0+ 4.00x^3.0y^1.0+-5.00x^0.0y^0.0
The result is 26.000000


...Program finished with exit code 24
Press ENTER to exit console.
```