Design, Develop and Implement Program in C for the following operations on Singly Linked List (SLL) with header nodes

b. Find the sum of two polynomials POLY1(x,y,z) and POLY2(x,y,z) and store the result in POLYSUM(x,y,z) Support the program with appropriate functions for each of the above operations

//program to add two polynomials implemented as a singly linked lists

#include<stdio.h>

#include<stdlib.h>

#include<math.h>

struct node

{

int coeff;

int px;

int py;

int flag;

struct node \*next;

};

void createpoly(struct node \*\*);

void insert\_tail(int,int,int,struct node\*\*);

void display(struct node\*);

void polyadd(struct node\*,struct node\*, struct node\*\*);

int main()

{

struct node \*first,\*second,\*third;

first = NULL;

second=NULL;

third=NULL;

int cf,px,py,result;

printf("\nCreating first polynomial..\n");

createpoly(&first);

printf("\nCreating the second polynomial..\n");

createpoly(&second);

printf("\nAdding the two polynomials & displaying the result..\n");

polyadd(first,second,&third);

display(third);

}

void createpoly(struct node \*\*p)

{

int cf,px,py;

while(1)

{

printf("\nEnter the coefficient..");

scanf("%d",&cf);

if(cf==0)

break;

printf("\nEnter the power of x..");

scanf("%d",&px);

printf("\nEnter the power of y...");

scanf("%d",&py);

insert\_tail(cf,px,py,p);

}

printf("\nThe polynomial created...\n");

display(\*p);

}

void display(struct node \*q)

{

while(q!=NULL)

{

if(q->coeff>0)

printf(" +%d ",q->coeff);

else

printf(" %d ",q->coeff);

if(q->px>0)

{

if(q->px==1)

printf("X");

else

printf("X^%d",q->px);;

}

if(q->py>0)

{

if(q->py==1)

printf("Y");

else

printf("Y^%d",q->py);

}

q=q->next;

}

}

void insert\_tail(int cf,int px,int py, struct node \*\*p)

{

struct node \*q,\*temp;

temp=(struct node\*)malloc(sizeof(struct node));

temp->coeff=cf;

temp->px=px;

temp->py=py;

temp->flag=1;

temp->next=NULL;

q=\*p;

if(q==NULL)//if it is the first node

\*p=temp;

else

{

while(q->next!=NULL)//go to the last node

q=q->next;

q->next=temp;

}

}

void polyadd(struct node \*p,struct node \*q,struct node \*\*t)

{

int x1,y1,cf,c1,x2,y2,c2;

struct node \*q1;

while(p!=NULL)

{

c1=p->coeff;

x1=p->px;

y1=p->py;

q1=q;

while(q1!=NULL)

{

c2=q1->coeff;

x2=q1->px;

y2=q1->py;

if((x1==x2)&&(y1==y2))

break;

q1=q1->next;

}

if(q1!=NULL)//still in mid of second poly and found the powers equal

{

cf=c1+c2;//add the coefficient

q1->flag=0;

if(cf!=0)

insert\_tail(cf,x1,y1,t);//add the sum coeff to the poly

}

else

insert\_tail(c1,x1,y1,t);//add the first term to poly;

p=p->next;

}

q1=q;

while(q1!=NULL)

{

if(q1->flag==1)

insert\_tail(q1->coeff,q1->px,q1->py,t);

q1=q1->next;

}

}