PROGRAM :-

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#include<stdio.h>
#include<stdlib.h>

typedef struct node
{
int coeff;
int exp;
struct node*link;
}NODE;

NODE *poly1=NULL,*poly2=NULL,*poly=NULL;
void create(NODE*);
void show(NODE*);
void polyadd(NODE*,NODE*,NODE*);

void main()
{
printf("\n\t\tPROGRAM TO ADD TWO POLYNOMIALS\n");
printf("\n");
poly=(NODE*)malloc(sizeof(NODE));
poly1=(NODE*)malloc(sizeof(NODE));
poly2=(NODE*)malloc(sizeof(NODE));
printf("\n\t\tEnter 1st polynomial: ");
create(poly1);
printf("\n\t\t1st polynomial is: ");
show(poly1);
printf("\n\t\tEnter 2nd polynomial: ");
create(poly2);
printf("\n\t\t2nd polynomial is: ");
show(poly2);
polyadd(poly1,poly2,poly);
printf("\n\t\tNew polynomial is: ");
show(poly);
}

void create(NODE*ptr)
{
char c;
printf("\n");
do
{
printf("\t\tEnter the Coefficient: ");
scanf("%d",&ptr->coeff);
printf("\t\tEnter the Exponent value: ");
scanf("%d",&ptr->exp);
ptr->link=(NODE*)malloc(sizeof(NODE));
ptr=ptr->link;
ptr->link=NULL;
printf("\t\tDo you want to continue(y/n) ");
scanf(" %c",&c);
}
while(c=='y'||c=='Y');
}

void show(NODE*ptr)
{
printf("\n\t\t");
```

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while(ptr->link!=NULL)
{
if(ptr->exp==0)
printf("%d",ptr->coeff);
else
printf("%dX^%d+",ptr->coeff,ptr->exp);
ptr=ptr->link;
}
}

void polyadd(NODE*ptr1,NODE*ptr2,NODE*ptr)
{
while(ptr1->link!=NULL&&ptr2->link!=NULL)
{
if(ptr1->exp>ptr2->exp)
{
ptr->coeff=ptr1->coeff;
ptr->exp=ptr1->exp;
ptr1=ptr1->link;
ptr->link=(NODE*)malloc(sizeof(NODE));
ptr=ptr->link;
ptr->link=NULL;
}
else if(ptr1->exp<ptr2->exp)
{
ptr->coeff=ptr2->coeff;
ptr->exp=ptr2->exp;
ptr2=ptr2->link;
ptr->link=(NODE*)malloc(sizeof(NODE));
ptr=ptr->link;
ptr->link=NULL;
}
else
{
ptr->coeff=ptr1->coeff+ptr2->coeff;
ptr->exp=ptr1->exp;
ptr1=ptr1->link;
ptr2=ptr2->link;
ptr->link=(NODE*)malloc(sizeof(NODE));
ptr=ptr->link;
ptr->link=NULL;
}
}
if(ptr1->link!=NULL)
{
while(ptr1->link!=NULL)
{
ptr->coeff=ptr1->coeff;
ptr->exp=ptr1->exp;
ptr1=ptr1->link;
ptr->link=(NODE*)malloc(sizeof(NODE));
ptr=ptr->link;
ptr->link=NULL;
}
}
else if(ptr2->link!=NULL)
{
while(ptr2->link!=NULL)
{
ptr->coeff=ptr2->coeff;
ptr->exp=ptr2->exp;
ptr2=ptr2->link;
ptr->link=(NODE*)malloc(sizeof(NODE));
ptr=ptr->link;
ptr->link=NULL;
}
}
}
```