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//Created By Ritwik Chandra Pandey on 25/02/21
//183215
//Insert Asc/Des in Polynomial

#include<stdio.h>
#include<stdlib.h>
struct polynode //structure definition for polynode
{
    int coef;
    int exp;
    struct polynode *next;
};
typedef struct polynode *polyptr;

polyptr createPolyDescending(polyptr P1,int exp,int coef){
    polyptr temp = (polyptr)malloc(sizeof(struct polynode));
    polyptr t = P1;
    if(temp!=NULL){
        temp->coef = coef;
        temp->exp = exp;
        temp->next = NULL;
    }
    if(P1==NULL || P1->exp<=exp){
        temp->next=P1;
        P1=temp;
        return P1;
    }
    while(t!=NULL){
        if(t->exp>exp && ((t->next)==NULL||((t->next)->exp<=exp)))
        {temp->next=t->next;
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            t->next=temp;
            return P1;
        }
        t=t->next;
    }
    return P1;
}
polyptr createPolyAscending(polyptr P1,int exp,int coef){
    polyptr temp = (polyptr)malloc(sizeof(struct polynode));
    polyptr t = P1;
    if(temp!=NULL){
        temp->coef = coef;
        temp->exp = exp;
        temp->next = NULL;
    }
    if(P1==NULL || P1->exp>=exp){
        temp->next=P1;
        P1=temp;
        return P1;
    }
    while(t!=NULL){
        if(t->exp<exp && ((t->next)==NULL||((t->next)->exp>=exp)))
        {temp->next=t->next;
            t->next=temp;
            return P1;
        }
        t=t->next;
    }
    return P1;
}
```

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void display(polyptr poly)
{
    polyptr list;
    list=poly;
    while(list!=NULL)
    {
        if(list->next==NULL){
            printf("%d X^ %d " ,list->coef,list->exp);
            break;}
        else
        {
            printf("%d X^ %d + " ,list->coef,list->exp);
            list=list->next;}
    }
    printf("\n");
}

int main()
{ int exp,coef;
    polyptr Apoly=NULL, Bpoly=NULL;
    printf("\n\tFirst Polynomial uses InsertDescending and Second Polynomial uses InsertAscending\n\n");
    printf("Enter the first polynomial : \n");
    printf("Enter exponent and coeffiecient : (-1 -1 to end)\n");
    scanf("%d %d",&exp,&coef);
    while(exp!=-1 && coef!=-1){

        Apoly=createPolyDescending(Apoly,exp,coef);
        printf("Enter exponent and coeffiecient : \n");
        scanf("%d %d",&exp,&coef);}
```

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    display(Apoly);
    printf("\n");
    printf("Enter the second polynomial : \n");
    printf("Enter exponent and coeffiecient : (-1 -1 to end)\n");
    scanf("%d %d",&exp,&coef);
    while(exp!=-1 && coef!=-1){
        Bpoly=createPolyAscending(Bpoly,exp,coef);
        printf("Enter exponent and coeffiecient : \n");
        scanf("%d %d",&exp,&coef);}

    display(Bpoly);

}
```