

**/\*addition and subtraction polynomial\*/**

#include<stdio.h>

#include<stdlib.h>

struct node

{

int coeff;

int exp;

struct node\*link;

};

struct node\*header1;

struct node\*header2;

struct node\*headeradd;

struct node\*headersub;

struct node\*create\_poly(struct node\*);

struct node\*display\_poly(struct node\*);

struct node\*add\_poly(struct node\*,struct node\*,struct node\*);

struct node\*sub\_poly(struct node\*,struct node\*,struct node\*);

struct node\*add\_node(struct node\*,int ,int);

int main()

{

int choice;

while(choice!=9)

{

printf("\*\*\*main menu\*\*\n");

printf("1.enter the 1st poly\n2.display the 1st poly\n3.enter the 2nd poly\n4.display  
the 2nd poly\n5.add the polynomials\n6.display the result of addition\n7.subtraction of the  
polynomials\n8.display the result of subtraction\n9.exit\n");

printf("enter your choice\n");

scanf("%d",&choice);

switch(choice)

{

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        case 1:header1=create_poly(header1);
        break;
        case 2:header1=display_poly(header1);
        break;
        case 3:header2=create_poly(header2);
        break;
        case 4:header2=display_poly(header2);
        break;
        case 5:headeradd=add_poly(header1,header2,headeradd);
        break;
        case 6:headeradd=display_poly(headeradd);
        break;
        case 7:headersub=sub_poly(header1,header2,headersub);
        break;
        case 8:headersub=display_poly(headersub);
        break;
        case 9:exit(0);
        default:
            printf("invalid choice\n");
    }
}

struct node*create_poly(struct node*header)
{
    struct node*new_node,*ptr;
    int e,c;
    printf("enter the exp num: \n");
    scanf("%d",&e);
    printf("enter its coefficient: \n");
    scanf("%d",&c);
    while(e!=-1)

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{
    if(header==NULL)
    {
        new_node=(struct node*)malloc(sizeof(struct node*));
        new_node->exp=e;
        new_node->coeff=c;
        new_node->link=NULL;
        header=new_node;
    }
    else
    {
        ptr=header;
        while(ptr->link!=NULL)
        {
            ptr=ptr->link;
        }
        new_node=(struct node*)malloc(sizeof(struct node*));
        new_node->exp=e;
        new_node->coeff=c;
        new_node->link=NULL;
        ptr->link=new_node;
    }
    printf("enter the no of exp: \n");
    scanf("%d",&e);
    if(e==-1)
    {
        break;
        printf("enter its coefficient: \n ");
        scanf("%d",&c);
    }
}

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        printf("polynomial is created\n");
        return header;
    }
}

struct node*display_poly(struct node*header)
{
    printf("the polynomial is below\n");
    struct node*ptr;
    ptr=header;
    while(ptr!=NULL)
    {
        printf("%dx%d\t\n",ptr->coeff,ptr->exp);
        ptr=ptr->link;
    }
    return header;
}

struct node*add_poly(struct node*header1,struct node*header2,struct node*headeradd)
{
    struct node*ptr1,*ptr2;
    int sum_coeff;
    ptr1=header1;
    ptr2=header2;
    while(ptr1!=NULL && ptr2!=NULL)
    {
        if(ptr1->exp==ptr2->exp)
        {
            sum_coeff=ptr1->coeff+ptr2->coeff;
            headeradd=add_node(headeradd,ptr1->exp,sum_coeff);
            ptr1=ptr1->link;
            ptr2=ptr2->link;
        }
        else if(ptr1->exp>ptr2->exp)

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        {
            headeradd=add_node(headeradd,ptr1->exp,ptr1->coeff);
            ptr1=ptr1->link;
        }
        else if(ptr1->exp<ptr2->exp)
        {
            headeradd=add_node(headeradd,ptr2->exp,ptr2->coeff);
            ptr2=ptr2->link;
        }
    }
    /*if(ptr1==NULL)
    {
        while(ptr2!=NULL)
        {
            headeradd=add_node(headeradd,ptr2->exp,ptr2->coeff);
            ptr2=ptr2->link;
        }
    }
    if(ptr2==NULL)
    {
        while(ptr1!=NULL)
        {
            headeradd=add_node(headeradd,ptr1->exp,ptr1->coeff);
            ptr1=ptr1->link;
        }
    }*/
    printf("addition of polynomial is done\n");
    return headeradd;
}

struct node*sub_poly(struct node*header1,struct node*header2,struct node*headersub)
{

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struct node*ptr1,*ptr2;

int sub_coeff;

ptr1=header1;
ptr2=header2;
while(ptr1!=NULL && ptr2!=NULL)
{
    if(ptr1->exp==ptr2->exp)
    {
        sub_coeff=ptr1->coeff-ptr2->coeff;
        headersub=add_node(headersub,ptr1->exp,sub_coeff);
        ptr1=ptr1->link;
        ptr2=ptr2->link;
    }
    else if(ptr1->exp>ptr2->exp)
    {
        headersub=add_node(headersub,ptr1->exp,ptr1->coeff);
        ptr1=ptr1->link;
    }
    else if(ptr1->exp<ptr2->exp)
    {
        headersub=add_node(headersub,ptr2->exp,ptr2->coeff);
        ptr2=ptr2->link;
    }
}
/*if(ptr1==NULL)
{
    while(ptr2!=NULL)
    {
        headersub=add_node(headersub,ptr2->exp,ptr2->coeff);
        ptr2=ptr2->link;
    }
}
*/

```

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    }
    if(ptr2==NULL)
    {
        while(ptr1!=NULL)
        {
            headersub=add_node(headersub,ptr1->exp,ptr1->coeff);
            ptr1=ptr1->link;
        }
    }*/
    printf("subtraction of polynomial is done\n");
    return headersub;
}

struct node*add_node(struct node*HEADER,int E,int C)
{
    struct node*NEW_NODE,*PTR;
    if(HEADER==NULL)
    {
        NEW_NODE=(struct node*)malloc(sizeof(struct node*));
        NEW_NODE->exp=E;
        NEW_NODE->coeff=C;
        NEW_NODE->link=NULL;
        HEADER=NEW_NODE;
    }
    else
    {
        PTR=HEADER;
        while(PTR->link!=NULL)
        {
            PTR=PTR->link;
        }
        NEW_NODE=(struct node*)malloc(sizeof(struct node*));
    }
}

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NEW_NODE->exp=E;

NEW_NODE->coeff=C;

NEW_NODE->link=NULL;

PTR->link=NEW_NODE;

    }

return HEADER;

}

```

```

C:\Users\HP\OneDrive\Desktop\collage work 3rd sem\addition and subtraction polynomial.exe
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
1
enter the exp num:
4
enter its coefficient:
2
enter the no of exp:
5
enter the no of exp:
2
enter the no of exp:
1
enter the no of exp:
-1
polynomial is created
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
2
the polynomial is below
2x4
2x3
2x2
2x1
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
3
enter the exp num:
4
enter its coefficient:
1
enter the no of exp:
3
enter the no of exp:
2
enter the no of exp:
1
enter the no of exp:
-1
polynomial is created
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
4

```



```
C:\Users\HP\OneDrive\Desktop\collage work 3rd sem\addition and subtraction polynomial.exe
8.display the result of subtraction
9.exit
enter your choice
4
the polynomial is below
1x4
1x3
1x2
1x1
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
5
addition of polynomial is done
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
6
the polynomial is below
1x4
3x3
3x2
3x1
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
7
subtraction of polynomial is done
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
8
the polynomial is below
1x4
1x3
1x2
1x1
**main menu**
1.enter the 1st poly
2.display the 1st poly
3.enter the 2nd poly
4.display the 2nd poly
5.add the polynomials
6.display the result of addition
7.subtraction of the polynomials
8.display the result of subtraction
9.exit
enter your choice
9
-----
Process exited after 70.11 seconds with return value 0
Press any key to continue . . .
```