Ex. No. 4a **Polynomial Addition**

Date:

**Aim**

To add any two given polynomial using linked lists.

**Algorithm**

1. Create a structure for polynomial with exp and coeff terms.

2. Read the coefficient and exponent of given two polynomials p and q.

3. While p and q are not null, repeat step 4.

If powers of the two terms are equal then

Insert the sum of the terms into the sum Polynomial

Advance p and q

Else if the power of the first polynomial> power of second then

Insert the term from first polynomial into sum polynomial

Advance p

Else

Insert the term from second polynomial into sum polynomial

Advance q

4. Copy the remaining terms from the non empty polynomial into the sum polynomial

5. Stop

**Program**

/\* Polynomial Addition \*/

/\* Add two polynomials \*/

#include<stdio.h>

#include<stdlib.h>

void main()

{

int a[10], b[10], c[10],m,n,k,k1,i,j,x;

system("clear");

printf("\n\tPolynomial Addition\n");

printf("\t===================\n");

printf("\n\tEnter the no. of terms of the polynomial:");

scanf("%d", &m);

printf("\n\tEnter the degrees and coefficients:");

for (i=0;i<2\*m;i++)

scanf("%d", &a[i]);

printf("\n\tFirst polynomial is:");

k1=0;

if(a[k1+1]==1)

printf("x^%d", a[k1]);

else

printf("%dx^%d", a[k1+1],a[k1]);

k1+=2;

while (k1<i)

{

printf("+%dx^%d", a[k1+1],a[k1]);

k1+=2;

}

printf("\n\n\n\tEnter the no. of terms of 2nd polynomial:");

scanf("%d", &n);

printf("\n\tEnter the degrees and co-efficients:");

for(j=0;j<2\*n;j++)

scanf("%d", &b[j]);

printf("\n\tSecond polynomial is:");

k1=0;

if(b[k1+1]==1)

printf("x^%d", b[k1]);

else

printf("%dx^%d",b[k1+1],b[k1]);

k1+=2;

while (k1<2\*n)

{

printf("+%dx^%d", b[k1+1],b[k1]);

k1+=2;

}

i=0;

j=0;

k=0;

while (m>0 && n>0)

{

if (a[i]==b[j])

{

c[k+1]=a[i+1]+b[j+1];

c[k]=a[i];

m--;

n--;

i+=2;

j+=2;

}

else if (a[i]>b[j])

{

c[k+1]=a[i+1];

c[k]=a[i];

m--;

i+=2;

}

else

{

c[k+1]=b[j+1];

c[k]=b[j];

n--;

j+=2;

}

k+=2;

}

while (m>0)

{

c[k+1]=a[i+1];

c[k]=a[i];

k+=2;

i+=2;

m--;

}

while (n>0)

{

c[k+1]=b[j+1];

c[k]=b[j];

k+=2;

j+=2;

n--;

}

printf("\n\n\n\n\tSum of the two polynomials is:");

k1=0;

if (c[k1+1]==1)

printf("x^%d", c[k1]);

else

printf("%dx^%d", c[k1+1],c[k1]);

k1+=2;

while (k1<k)

{

if (c[k1+1]==1)

printf("+x^%d", c[k1]);

else

printf("+%dx^%d", c[k1+1], c[k1]);

k1+=2;

}

}

**Output**

**Result**

Thus the two given polynomials were added using lists.