EXNO:4A REPRESENT A POLYNOMIAL AS A LINKED LIST

AIM:

To write program in C to convert given infix expression in to postfix notation

DESCRIPTION: A polynomial is homogeneous ordered list of pairs <exponent,

coefficient>, where each coefficient is unique.

Example:

$3x^2+5x+7$

Linked list representation

The main fields of polynomial are coefficient and exponent, in linked list it will have one more filed called „link‟ field to point to next term in the polynomial.

If there are „n‟ terms in the polynomial then „'n‟ such nodes have to be created.

ALGORITHM:

1: Get the two polynomials. First polynomial is P1 and second polynomial is P2

2: For addition of two polynomials if exponents of both the polynomials are same then we ad the coefficients. For storing the result we will create the third linked lists say P3.

3: If Exponent of P2 is greater than exponent of P1 then keep the P3 as P2.

4: If Exponent of P2 is greater than exponent of P1 then keep the P3 as P1

5: If Exponent of P2 is equal to the exponent of P1 then add the coefficient of P1 and coefficient of P2 as coefficient of P3.

6: Continue the above step from 3 to 5 until end o the two polynomials.

7: If any of the polynomial is ended keep P3 as the remaining polynomial.

8: Stop the execution.

PROGRAM:

```
#include<stdio.h>
#include<conio.h>
  main() { int a[10], b[10], c[10],m,n,k,k1,i,j,x;
  clrscr();   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]);
```

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printf("\n\tFirst polynomial is:");  k1=0; if(a[k1+1]==1)
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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])
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{ 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-
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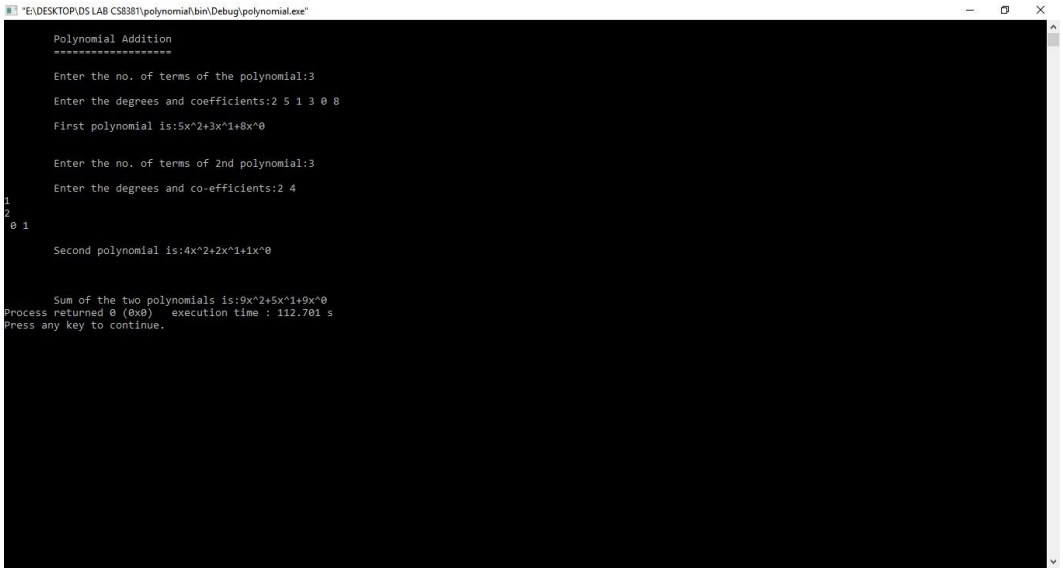
-; j+=2; } k+=2; }  while (m>0) { c[k+1]=a[i+1]; c[k]=a[i]; k+=2; i+=2; m--;
}   while (n>0) { c[k+1]=b[j+1]; c[k]=b[j]; k+=2; j+=2; n--; }
      printf("\n\n\n\n\tSum of the two polynomials is:"); k1=0; if
      (c[k1+1]==1) printf("x^%d", c[k1]); else
      printf("%dx^%d", c[k1+1],c[k1]); k1+=2; while (k1<k) { if
      (c[k1+1]==1) printf("+x^%d", c[k1]); else
      printf("+%dx^%d", c[k1+1], c[k1]); k1+=2; } getch(); return 0;

      }
```

OUTPUT



RESULT:

Thus the program in C to convert given infix expression in to postfix notation