ACADEMY OF TECHNOLOGY

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➢ Laboratory *Assignment 1*

Q1.Write a C program to perform polynomial representation and addition between two given polynomials.

Ans:

```
#include<stdio.h>
 struct poly
 {
        int coeff;
        int expo;
 };

 struct poly p1[10],p2[10],p3[10];

 int readPoly(struct poly []);
 int addPoly(struct poly [],struct poly [],int ,int ,struct poly []);
 void displayPoly( struct poly [],int terms);

 int main()
 {
       int t1,t2,t3;
       t1=readPoly(p1);
       printf(" \n First polynomial : ");
       displayPoly(p1,t1);
```

```
        t2=readPoly(p2);
        printf(" \n Second polynomial : ");
        displayPoly(p2,t2);

        t3=addPoly(p1,p2,t1,t2,p3);
        printf(" \n\n Resultant polynomial after addition : ");
        displayPoly(p3,t3);
        printf("\n");

        return 0;
}
int readPoly(struct poly p[10])
{
        int t1,i;

        printf("\n\n Enter the total number of terms in the
polynomial:");
        scanf("%d",&t1);

        printf("\n Enter the COEFFICIENT and EXPONENT in
DESCENDING ORDER\n");
        for(i=0;i<t1;i++)
        {
                printf("   Enter the Coefficient(%d): ",i+1);
                scanf("%d",&p[i].coeff);
                printf("     Enter the exponent(%d): ",i+1);
```

```
            scanf("%d",&p[i].expo);
        }
        return(t1);
}
int addPoly(struct poly p1[10],struct poly p2[10],int t1,int t2,struct poly p3[10])
{
        int i,j,k;
        i=0;
        j=0;
        k=0;

        while(i<t1 && j<t2)
        {
            if(p1[i].expo==p2[j].expo)
            {
                p3[k].coeff=p1[i].coeff + p2[j].coeff;
                p3[k].expo=p1[i].expo;

                i++;
                j++;
                k++;
            }
            else if(p1[i].expo>p2[j].expo)
            {
                p3[k].coeff=p1[i].coeff;
```

```
            p3[k].expo=p1[i].expo;
            i++;
            k++;
        }
        else
        {
            p3[k].coeff=p2[j].coeff;
            p3[k].expo=p2[j].expo;
            j++;
            k++;
        }
    }

    while(i<t1)
    {
        p3[k].coeff=p1[i].coeff;
        p3[k].expo=p1[i].expo;
        i++;
        k++;
    }

    while(j<t2)
    {
        p3[k].coeff=p2[j].coeff;
        p3[k].expo=p2[j].expo;
```

```
            j++;
            k++;
        }
        return(k);
}
void displayPoly(struct poly p[10],int term)
{
        int k;

        for(k=0;k<term-1;k++)
        printf("%d(x^%d)+",p[k].coeff,p[k].expo);
        printf("%d(x^%d)",p[term-1].coeff,p[term-1].expo);
}
```

OUTPUT =>

```
Enter the total number of terms in the polynomial:5

 Enter the COEFFICIENT and EXPONENT in DESCENDING ORDER
  Enter the Coefficient(1): 7
    Enter the exponent(1): 5
  Enter the Coefficient(2): 6
    Enter the exponent(2): 4
  Enter the Coefficient(3): 8
    Enter the exponent(3): 2
  Enter the Coefficient(4): 9
    Enter the exponent(4): 1
  Enter the Coefficient(5): 2
```

Enter the exponent(5): 0

First polynomial : 7(x^5)+6(x^4)+8(x^2)+9(x^1)+2(x^0)

Enter the total number of terms in the polynomial:4

Enter the COEFFICIENT and EXPONENT in DESCENDING ORDER

Enter the Coefficient(1): 3

Enter the exponent(1): 4

Enter the Coefficient(2): 7

Enter the exponent(2): 3

Enter the Coefficient(3): 5

Enter the exponent(3): 1

Enter the Coefficient(4): 8

Enter the exponent(4): 0

Second polynomial : 3(x^4)+7(x^3)+5(x^1)+8(x^0)

Resultant polynomial after addition :
7(x^5)+9(x^4)+7(x^3)+8(x^2)+14(x^1)+10(x^0)

...Program finished with exit code 0

Press ENTER to exit console.