

APPLICATIONS OF AARRAY			
File Name	polynomial.c	Compiler	gcc
Experiment No	4	Operating System	Ubuntu
Date	13.08.2024		
Aim	Write a C program to implement a) sparse matrix b) polynomial sum		
Program			
<pre>#include&lt;stdio.h&gt;  struct Polynomial{     int coef;     int exp; };  int main(){     int deg1,deg2;     int i=0,j=0,k=0;     struct Polynomial poly1[10], poly2[10], result[10];     printf("Enter the degree of first polynomial");     scanf("%d",&amp;deg1);     printf("Enter the degree of second polynomial");     scanf("%d",&amp;deg2);      printf("For the first polynomial ..");     for(int i=0;i&lt;deg1;i++){         printf("Enter the coefficient of the %d term",i);         scanf("%d",&amp;poly1[i].coef);         printf("Enter the exponent of the %d term",i);         scanf("%d",&amp;poly1[i].exp);     }      printf("For the second polynomial ..");     for(int i=0;i&lt;deg2;i++){         printf("Enter the coefficient of %d th term",i);         scanf("%d",&amp;poly2[i].coef);         printf("Enter the exponent of the %d term",i);         scanf("%d",&amp;poly2[i].exp);     }      printf("The first polynomial is \n");     for(int i=0; i&lt;deg1; i++){         printf("%dx^%d ",poly1[i].coef,poly1[i].exp);         if(i &lt; deg1 - 1) {             printf("+");         }     } }</pre>			

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printf("\n The Second polynomial is \n");
for(int i=0; i<deg2; i++){
    printf("%dx^%d",poly2[i].coef,poly2[i].exp);
    if(i < deg2 - 1) {
        printf("+");
    }
}

while(i < deg1 && j < deg2 ){
    if(poly1[i].exp == poly2[j].exp){
        result[k].exp = poly1[i].exp;
        result[k].coef = poly1[i].coef + poly2[j].coef;
        k++;
        i++;
        j++;
    }else if(poly1[i].exp < poly2[j].exp){
        result[k].exp = poly2[j].exp;
        result[k].coef = poly2[j].coef;
        j++;
        k++;
    }else if(poly1[i].exp > poly2[j].exp){
        result[k].exp = poly1[i].exp;
        result[k].coef = poly1[i].coef;
        i++;
        k++;
    }
}

while( i < deg1){
    result[k].exp = poly1[i].exp;
    result[k].coef = poly1[i].coef;
    i++;
    k++;
}

while( j < deg2){
    result[k].exp = poly2[j].exp;
    result[k].coef = poly2[j].coef;
    j++;
    k++;
}

printf("\n The resultant polynomial is ... \n");
for(int i=0; i<k; i++){
    printf(" %dx^%d" ,result[i].coef,result[i].exp);
    if(i < k -1) {

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        }
    }
}

printf(" + ");

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## Output

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student@CSLAB1PC26:~/Naveen$ gcc polynomial.c
student@CSLAB1PC26:~/Naveen$ ./a.out
Enter the degree of first polynomial 3
Enter the degree of second polynomial 3
For the first polynomial ..Enter the coefficient of the 0 term 9
Enter the exponent of the 0 term 2
Enter the coefficient of the 1 term 8
Enter the exponent of the 1 term 1
Enter the coefficient of the 2 term 4
Enter the exponent of the 2 term 0
For the second polynomial ..Enter the coefficient of 0 th term 5
Enter the exponent of the 0 term 2
Enter the coefficient of 1 th term 2
Enter the exponent of the 1 term 1
Enter the coefficient of 2 th term 7
Enter the exponent of the 2 term 0
The first polynomial is
9x^2 +8x^1 +4x^0
The Second polynomial is
5x^2+2x^1+7x^0
The resultant polynomial is ...
14x^2 + 10x^1 + 11x^0student@CSLAB1PC26:~/Naveen$

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