```
#include<stdio.h>
#include<stdlib.h>

#define MAX 30
struct poly
{
        int coeff;
        int exp;
}term[MAX];
void polyadd(int af,int al,int bf,int bl,int free);
char compare(int a, int b);
int newterm(int a, int b,int fsize);
void main()
{
        int i,j,num1,num2,free;
        int af,al,bf,bl;
        printf("Enter the number of terms of the first polynomial \n");
        scanf("%d",&num1);
        printf("Enter the coefficents and exponents of the first polynomial\n");
        for(i=0; i<num1; i++) {
                scanf("%d",&term[i].coeff);
                scanf("%d",&term[i].exp);
        }
        printf("Enter the number of terms of the second polynomial\n");
        scanf("%d",&num2);
        free = (num1+num2);
    printf("Enter the coefficents and exponents of the second polynomial\n");
```

```
for(i=num1; i<free; i++) {
        scanf("%d",&term[i].coeff);
        scanf("%d",&term[i].exp);
}
printf("Entered polynomials are:\n");
i=0;
while(i<num1)
{
        printf("%dx^%d ",term[i].coeff,term[i].exp);
        i++;
        if(i==num1)
                break;
        printf("+ ");
}
printf("\n");
i=num1;
while(i<free)
{
        printf("%dx^%d ",term[i].coeff,term[i].exp);
        i++;
        if(i==free)
                break;
        printf("+ ");
}
printf("\n");
      af=0;al=num1-1;bf=num1;bl=free-1;
polyadd(af,al,bf,bl,free);
```

```
}
void polyadd(int af,int al,int bf,int bl,int free)
{
	int p,i,q,e,sum=0,free1;
	free1 = free;
	p = af;
	q = bf;
	while((p<=al)&&(q<=bl))
	{
		switch(compare(term[p].exp,term[q].exp))
		{
		case '=':
		{
		    sum = term[p].coeff + term[q].coeff;
		    if(sum!=0)
		     {
		     free =newterm(sum,term[p].exp,free);
				p++; // for next element
				q++; // for next element
		     }
		     break;
		}
		case '>': // term[p].exp > term[q].exp
		{
			free =newterm(term[p].coeff,term[p].exp,free);
			p++;
			break;
```

```
        }
        case '<': // term[p].exp < term[q].exp
        {
                free = newterm(term[q].coeff,term[q].exp,free);
                q++;
                break;
        }
        }
      }
        while(p<=al)
        {
                free = newterm(term[p].coeff,term[p].exp,free);
                p++;
        }
        while(q<=bl)
        {
                free = newterm(term[q].coeff,term[q].exp,free);
                q++;
        }
printf("Resultant Polynomial is:\n");
i=free1; // orignal value of free
while(i<free)
{
        printf("%dx^%d ",term[i].coeff,term[i].exp);
        i++;
        if(i==free)
                break;
```

```
            printf("+ ");
        }
        printf("\n");
}
char compare(int a,int b)
{
        if(a==b)
            return '=';
        else if(a>b)
            return '>';
        else
            return '<';
}
int newterm(int a, int b,int fsize )
{
            if (fsize >= MAX)
            {
                        printf("Space is insufficent\n");
                        exit(0);

            }
            else
            {
                        term[fsize].coeff = a;
                        term[fsize].exp = b;
                        fsize++;
                        return fsize;
```

```
        }


}
```

```
Enter the number of terms of the first polynomial
3
Enter the coefficents and exponents of the first polynomial
3
2
2
1
5
0
Enter the number of terms of the second polynomial

6
Enter the coefficents and exponents of the second polynomial
6
5
5
4
4
3
6
2
2
1
5
0
Entered polynomials are:
3x^2 + 2x^1 + 5x^0
6x^5 + 5x^4 + 4x^3 + 6x^2 + 2x^1 + 5x^0
Resultant Polynomial is:
6x^5 + 5x^4 + 4x^3 + 9x^2 + 4x^1 + 10x^0
```