

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

```
struct poly{
```

```
    int coef;
```

```
    int exp;
```

```
};
```

```
void add(struct poly p1[], struct poly p2[], struct poly result[], int n1, int n2, int *n3) {
```

```
    int i = 0, j = 0, k = 0;
```

```
    while (i < n1 && j < n2) {
```

```
        if (p1[i].exp == p2[j].exp) {
```

```
            result[k].coef = p1[i].coef + p2[j].coef;
```

```
            result[k].exp = p1[i].exp;
```

```
            i++;
```

```
            j++;
```

```
            k++;
```

```
        } else if (p1[i].exp > p2[j].exp) {
```

```
            result[k] = p1[i];
```

```
            i++;
```

```
            k++;
```

```
        } else {
```

```
            result[k] = p2[j];
```

```
            j++;
```

```
            k++;
```

```
        }
```

```
    }
```

```
    while (i < n1) {
```

```
        result[k] = p1[i];
```

```
        i++;
```

```
        k++;
```

```
    }
```

```
    while (j < n2) {
```

```
        result[k] = p2[j];
```

```
        j++;
```

```
        k++;
```

```
    }
```

```

    *n3 = k;
}

void display(struct poly pol[], int n) {
    for (int i = 0; i < n; i++) {
        printf("%dX^%d", pol[i].coef, pol[i].exp);
        if (i != n - 1) {
            printf(" + ");
        }
    }
}

int main() {
    struct poly poly1[100], poly2[100], result[200];
    int n1, n2, n3;
    printf("Enter the number of terms in the first polynomial: ");
    scanf("%d", &n1);
    for (int i = 0; i < n1; i++) {
        printf("Enter the coefficient and exponent of %d term:\n", i+1);
        scanf("%d %d", &poly1[i].coef, &poly1[i].exp);
    }
    printf("Enter the number of terms in the second polynomial: ");
    scanf("%d", &n2);
    for (int i = 0; i < n2; i++) {
        printf("Enter the coefficient and exponent of %d term:\n", i+1);
        scanf("%d %d", &poly2[i].coef, &poly2[i].exp);
    }
    add(poly1, poly2, result, n1, n2, &n3);
    printf("\nFirst Polynomial: ");
    display(poly1, n1);
    printf("\nSecond Polynomial: ");
    display(poly2, n2);
    printf("\nResultant Polynomial: ");
    display(result, n3);
}

```

`(kali@kali) - [~/Desktop/DS]``$./a.out`

Enter the number of terms in the first polynomial: 3

Enter the coefficient and exponent of 1 term:

2

3

Enter the coefficient and exponent of 2 term:

4

1

Enter the coefficient and exponent of 3 term:

2

0

Enter the number of terms in the second polynomial: 3

Enter the coefficient and exponent of 1 term:

2

2

Enter the coefficient and exponent of 2 term:

4

1

Enter the coefficient and exponent of 3 term:

0

0

First Polynomial: $2X^3 + 4X^1 + 2X^0$ Second Polynomial: $2X^2 + 4X^1 + 0X^0$ Resultant Polynomial: $2X^3 + 2X^2 + 8X^1 + 2X^0$ `(kali@kali) - [~/Desktop/DS]``$``(kali@kali) - [~/Desktop/DS]``$./a.out`

Enter the number of terms in the first polynomial: 3

Enter the coefficient and exponent of 1 term:

3

2

Enter the coefficient and exponent of 2 term:

4

1

Enter the coefficient and exponent of 3 term:

5

0

Enter the number of terms in the second polynomial: 3

Enter the coefficient and exponent of 1 term:

2

2

Enter the coefficient and exponent of 2 term:

4

1

Enter the coefficient and exponent of 3 term:

1

0

Enter the number of terms in the second polynomial: 3

First Polynomial: $3X^2 + 4X^1 + 5X^0$ Second Polynomial: $2X^2 + 4X^1 + 1X^0$ Resultant Polynomial: $5X^2 + 8X^1 + 6X^0$ `(kali@kali) - [~/Desktop/DS]`