Q. Add two polynomials

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

struct poly {
   int coeff;
   int deg;
   struct poly *next;
};

int main(){
   int n=0,c=0,d=0;
   struct poly *polynomial1 = (struct poly*)malloc(sizeof(struct poly));
   polynomial1->coeff = 0;
   polynomial1->deg = 0;
   polynomial1->next=NULL;
   struct poly *temp=polynomial1;
   printf("Enter the first polynomial, specifying the coefficient and degree respectively.\n");
   printf("Number of terms\n");
   scanf("%d", &n);
   int p=0;
   while(p<n){
      printf("\nCoefficient:");
      scanf("%d", &c);
      printf("Degree:");
      scanf("%d", &d);
      struct poly *newterm = (struct poly*)malloc(sizeof(struct poly));
      temp->next=newterm;
      newterm->coeff = c;
      newterm->deg = d;
      newterm->next=NULL;
      temp=newterm;
      p++;
   }
   n=0;
```

```
temp=polynomial1->next;
struct poly * polynomial2 = (struct poly*)malloc(sizeof(struct poly));
polynomial2->coeff = 0;
polynomial2->deg = 0;
polynomial2->next=NULL;
struct poly *temp2 = polynomial2;
printf("\n\nEnter the second polynomial\n");
printf("Number of terms\n");
scanf("%d", &n);
int q=0;
while(q<n){
   printf("\nCoefficient:");
   scanf("%d", &c);
   printf("Degree:");
   scanf("%d", &d);
   struct poly *newterm = (struct poly*)malloc(sizeof(struct poly));
   temp2->next=newterm;
   newterm->coeff = c;
   newterm->deg = d;
   newterm->next=NULL;
   temp2=newterm;
   q++;
}
temp2=polynomial2->next;
struct poly * result = (struct poly*)malloc(sizeof(struct poly));
result->coeff = 0;
result->deg=0;
result->next=NULL;
struct poly * temp3 = result;
 while(temp!=NULL && temp2!=NULL){
   if(temp->deg == temp2->deg){
      struct poly* resultterm = (struct poly*)malloc(sizeof(struct poly));
      temp3->next = resultterm;
      resultterm->coeff = (temp->coeff) + (temp2->coeff);
      resultterm->deg = temp->deg;
      resultterm->next=NULL;
      temp3=resultterm;
```

```
            temp=temp->next;
            temp2=temp2->next;
        }
        else{
            if(temp->deg > temp2->deg){
                struct poly* resultterm = (struct poly*)malloc(sizeof(struct poly));
                temp3->next = resultterm;
                resultterm->coeff = (temp->coeff);
                resultterm->deg = (temp->deg);
                temp3=resultterm;
                temp=temp->next;
            }
            if(temp->deg < temp2->deg){
                struct poly* resultterm = (struct poly*)malloc(sizeof(struct poly));
                temp3->next = resultterm;
                resultterm->coeff = temp2->coeff;
                resultterm->deg = temp2 ->deg;
                temp3=resultterm;
                temp2=temp2->next;
            }
        }
    }
    temp3 = result->next;
    int i=0;
    printf("Resultant polynomial:\n");
    while(temp3!=NULL){
            i++;
        printf("\tTerm %d:\tCoeff: %d\tDeg: %d\n",i, temp3->coeff, temp3->deg);
        temp3=temp3->next;
    }
    return 0;
}
```

```
C:\Users\Tarun\ENGG\SEASOI
Enter the first polynomial, specifying the coefficient and degree respectively.
Number of terms
3

Coefficient:5
Degree:5

Coefficient:3
Degree:2

Coefficient:9
Degree:0


Enter the second polynomial
Number of terms
4

Coefficient:11
Degree:5

Coefficient:4
Degree:4

Coefficient:8
Degree:3

Coefficient:3
Degree:0
Resultant polynomial:
        Term 1: Coeff: 16       Deg: 5
        Term 2: Coeff: 4        Deg: 4
        Term 3: Coeff: 8        Deg: 3
        Term 4: Coeff: 3        Deg: 2
        Term 5: Coeff: 12       Deg: 0

Process returned 0 (0x0)   execution time : 19.815 s
Press any key to continue.
```

Q. Polynomial addition using single linked list

```
#include <stdio.h>

#include <stdlib.h>


struct poly {

   int coeff;

   int deg;

   struct poly *next;

};

void addTerm(struct poly **head, int coeff, int deg) {

   struct poly *temp = *head;

   struct poly *prev = NULL;

   while (temp != NULL && temp->deg > deg) {

      prev = temp;

      temp = temp->next;

   }
```

```
    if (temp != NULL && temp->deg == deg) {
        temp->coeff += coeff;
    } else {
        struct poly *newterm = (struct poly*)malloc(sizeof(struct poly));
        newterm->coeff = coeff;
        newterm->deg = deg;
        newterm->next = temp;
        if (prev == NULL) {
            *head = newterm;
        } else {
            prev->next = newterm;
        }
    }
}
void printPoly(struct poly *head) {
    struct poly *temp = head;
    int i = 1;
    while (temp != NULL) {
        printf("Term %d: Coeff: %d Deg: %d\n", i++, temp->coeff, temp->deg);
        temp = temp->next;
    }
}

int main() {
    int n = 0, c = 0, d = 0;
    struct poly *polynomial1 = NULL;

    printf("Enter the first polynomial, specifying the coefficient and degree respectively.\n");
    printf("Number of terms: ");
    scanf("%d", &n);

    for (int i = 0; i < n; i++) {
        printf("\nCoefficient: ");
        scanf("%d", &c);
        printf("Degree: ");
        scanf("%d", &d);
        addTerm(&polynomial1, c, d);
```

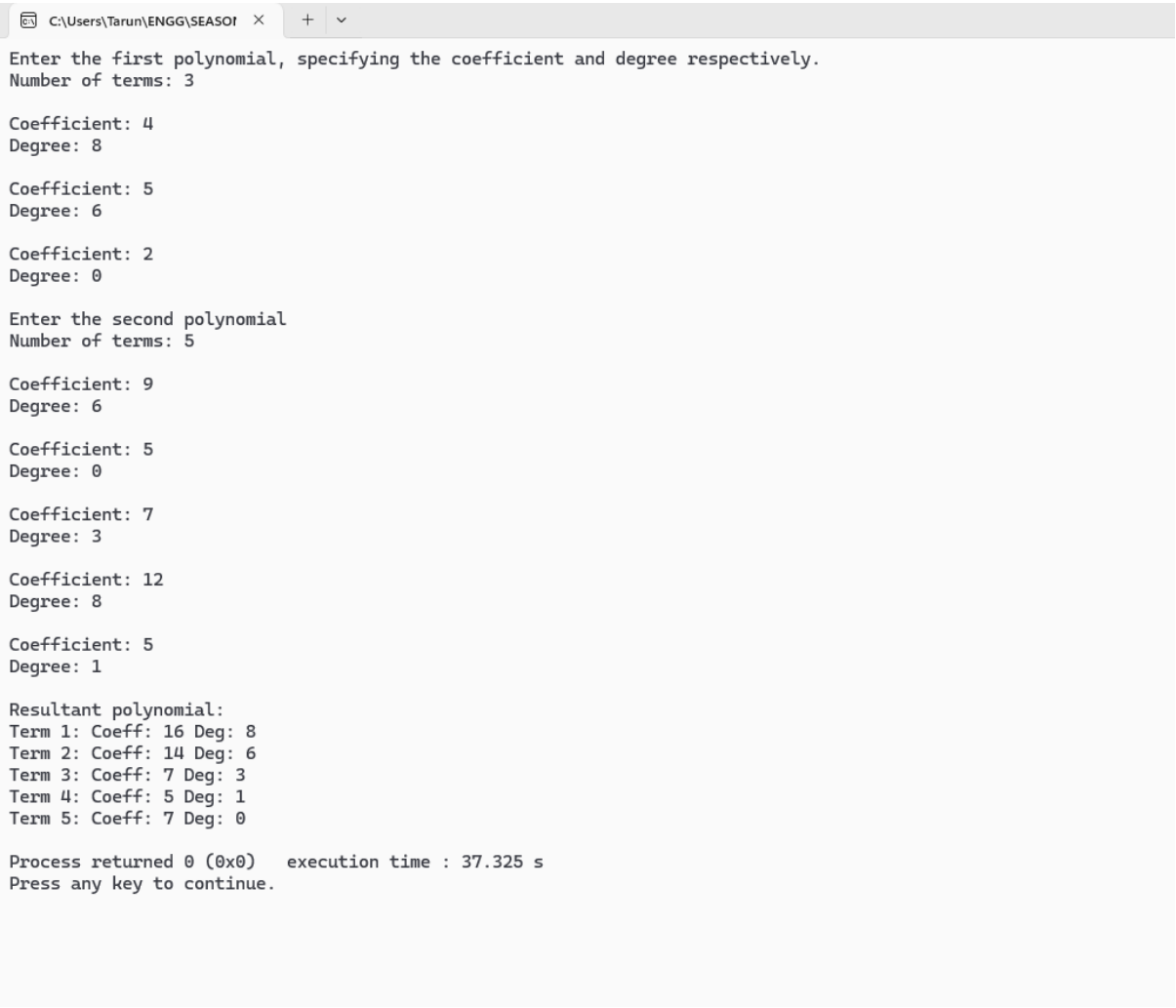
```
}

printf("\nEnter the second polynomial\n");
printf("Number of terms: ");
scanf("%d", &n);

for (int i = 0; i < n; i++) {
   printf("\nCoefficient: ");
   scanf("%d", &c);
   printf("Degree: ");
   scanf("%d", &d);
   addTerm(&polynomial1, c, d);
}

printf("\nResultant polynomial:\n");
printPoly(polynomial1);

return 0;}
```


C:\Users\Tarun\ENGG\SEASOI
Enter the first polynomial, specifying the coefficient and degree respectively.
Number of terms: 3
Coefficient: 4
Degree: 8
Coefficient: 5
Degree: 6
Coefficient: 2
Degree: 0
Enter the second polynomial
Number of terms: 5
Coefficient: 9
Degree: 6
Coefficient: 5
Degree: 0
Coefficient: 7
Degree: 3
Coefficient: 12
Degree: 8
Coefficient: 5
Degree: 1
Resultant polynomial:
Term 1: Coeff: 16 Deg: 8
Term 2: Coeff: 14 Deg: 6
Term 3: Coeff: 7 Deg: 3
Term 4: Coeff: 5 Deg: 1
Term 5: Coeff: 7 Deg: 0
Process returned 0 (0x0) execution time : 37.325 s
Press any key to continue.