PRACTICAL 5

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Batch: B3-B3

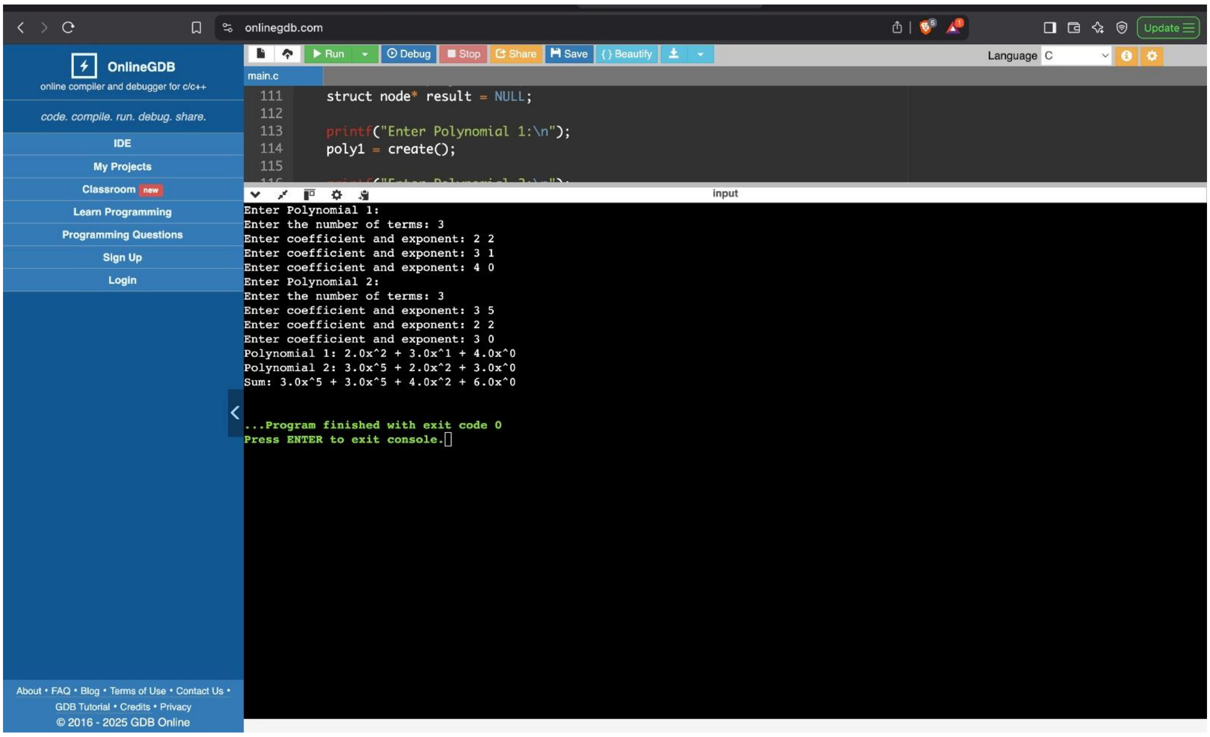
Roll no. : 59

```
#include<stdio.h>

#include<stdlib.h>

struct node{

   float co;

   int expo;

   struct node*link;


};


struct node* insert(struct node* head, float co, int expo) {

   struct node* temp = (struct node*)malloc(sizeof(struct node));

   temp->co = co;

   temp->expo = expo;

   temp->link = NULL;



   if (head == NULL || head->expo < expo) {

      temp->link = head;

      return temp;

   }


   struct node* temp1 = head;



   while (temp1->link != NULL && temp1->link->expo > expo) {

      temp1 = temp1->link;
```

```
    }



    if (temp1->link != NULL && temp1->link->expo == expo) {
        temp1->link->co += co;
        free(temp);
    } else {

        temp->link = temp1->link;
        temp1->link = temp;
    }

    return head;
};
struct node* create() {
    struct node* head = NULL;
    int n, expo;
    float co;

    printf("Enter the number of terms: ");
    scanf("%d", &n);

    for (int i = 0; i < n; i++) {
        printf("Enter coefficient and exponent: ");
        scanf("%f %d", &co, &expo);
        head = insert(head, co, expo);
    }

    return head;
}
```

```
struct node* add(struct node* head, struct node* head1){
    struct node* temp=head1;
    struct node* temp1=head1;
    struct node* head2=NULL;
    while (temp != NULL && temp1 != NULL) {
        if (temp1->expo == temp1->expo) {
            head2 = insert(head2, temp1->co, temp1->expo);
            temp1 = temp1->link;
        } else if (temp->expo > temp1->expo) {
            head2 = insert(head2, temp->co, temp->expo);
            temp = temp->link;
        } else if (temp1->expo>temp->expo){
            head2 = insert(head2, temp1->co + temp1->co, temp1->expo);
            temp1 = temp1->link;
            temp1 = temp1->link;
        }
    }
    while(temp!=NULL){
        head2=insert(head2,temp->co,temp->expo);
        temp=temp->link;
    }
    return head2;
}
void print(struct node* head) {
    if (head == NULL) {
        printf("0\n");
        return;
    }

    struct node* temp = head;
    while (temp != NULL) {
        printf("%.1fx^%d", temp->co, temp->expo);
        if (temp->link != NULL)
            printf(" + ");
        temp = temp->link;
    }
    printf("\n");
}


void freeList(struct node* head) {
    struct node* temp;
    while (head != NULL) {
        temp = head;
        head = head->link;
        free(temp);
    }
}


int main() {
    struct node* poly1 = NULL;
    struct node* poly2 = NULL;
    struct node* result = NULL;

    printf("Enter Polynomial 1:\n");
    poly1 = create();

    printf("Enter Polynomial 2:\n");
    poly2 = create();

    printf("Polynomial 1: ");
    print(poly1);

    printf("Polynomial 2: ");
    print(poly2);



    result = add(poly1, poly2);

    printf("Sum: ");
    print(result);



    freeList(poly1);
    freeList(poly2);
    freeList(result);

    return 0;
}
```

Output:



```
    struct node* result = NULL;

    printf("Enter Polynomial 1:\n");
    poly1 = create();

```

```
Enter Polynomial 1:
Enter the number of terms: 3
Enter coefficient and exponent: 2 2
Enter coefficient and exponent: 3 1
Enter coefficient and exponent: 4 0
Enter Polynomial 2:
Enter the number of terms: 3
Enter coefficient and exponent: 3 5
Enter coefficient and exponent: 2 2
Enter coefficient and exponent: 3 0
Polynomial 1: 2.0x^2 + 3.0x^1 + 4.0x^0
Polynomial 2: 3.0x^5 + 2.0x^2 + 3.0x^0
Sum: 3.0x^5 + 3.0x^5 + 4.0x^2 + 6.0x^0


...Program finished with exit code 0
Press ENTER to exit console.
```