DSA Assignment

Structures and Pointers

1.

```
#include <stdio.h>

#include <string.h>

//declaring a structure Type

struct Type {

   char type[20]; // School, College or Area friend

   char common_friends[50];// common friends name

   int places_visited; //no. of places visited

};


//declaring another structure Friends

struct Friends{

   char name[50];                    //name of friend

   char pet_name[20];                  // his/her pet name

   char phone_number[15];               // his / her ph.no.

   struct Type type;                   //nesting Type into Friends by creating object inside Friends

} ;


int main() {                          //declaring main()

   int n;

   printf("Enter the number of friends to add: ");

   scanf("%d", &n);                    // getting no. of friends


   struct Friends friends[n];            // creatibg n no. of objects for Friends
```

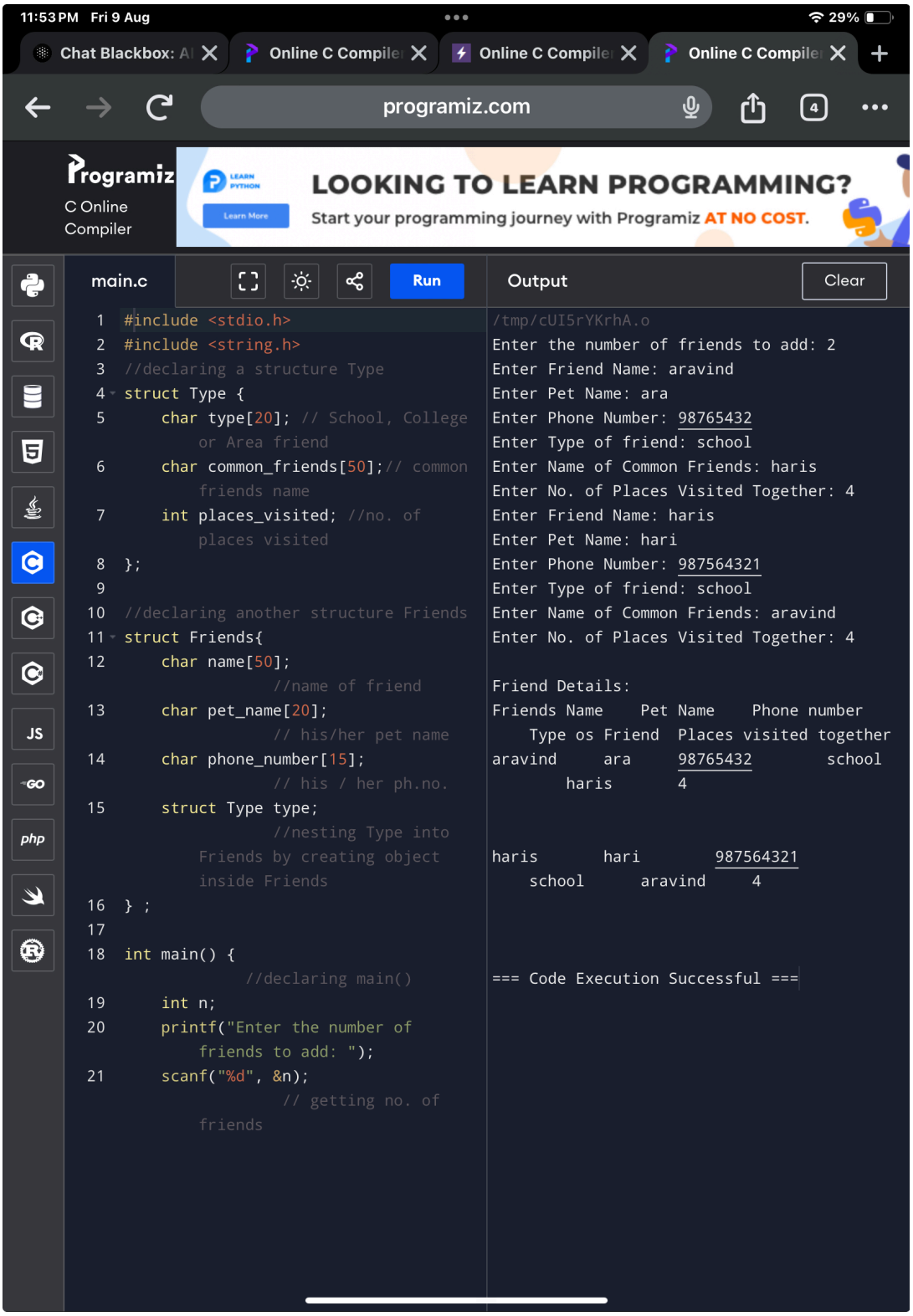
```
for (int i = 0; i < n; i++) {            //getting inputs using fir loop dynamically
   printf("Enter Friend Name: ");
   scanf("%s", friends[i].name);        //dot operator is used to access variables of objects
   printf("Enter Pet Name: ");
   scanf("%s", friends[i].pet_name);
   printf("Enter Phone Number: ");
   scanf("%s", friends[i].phone_number);
   printf("Enter Type of friend: ");
   scanf("%s", friends[i].type.type);     //using dot operator twice to access variables in nested structure
   printf("Enter Name of Common Friends: ");
   scanf("%s", friends[i].type.common_friends);
   printf("Enter No. of Places Visited Together: ");
   scanf("%d", &friends[i].type.places_visited);
}
```

```
printf("\nFriend Details:\n");            //printing details obtained using for loop
printf("Friends Name\tPet Name\tPhone number\tType os Friend\tPlaces visited together");
for (int i = 0; i < n; i++) {
   printf("\n%s\t\t", friends[i].name);
   printf("%s\t\t", friends[i].pet_name);
   printf("%s\t\t", friends[i].phone_number);
   printf("%s\t\t", friends[i].type.type);
   printf("%s\t\t", friends[i].type.common_friends);
   printf("%d\n\n", friends[i].type.places_visited);
```

```
    }

    return 0;

}
```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main.c
Run
Output
Clear
#include <stdio.h>
#include <string.h>
//declaring a structure Type
struct Type {
char type[20]; // School, College or Area friend
char common_friends[50];// common friends name
int places_visited; //no. of places visited
};
//declaring another structure Friends
struct Friends{
char name[50]; //name of friend
char pet_name[20]; // his/her pet name
char phone_number[15]; // his / her ph.no.
struct Type type; //nesting Type into Friends by creating object inside Friends
} ;
int main() { //declaring main()
int n;
printf("Enter the number of friends to add: ");
scanf("%d", &n); // getting no. of friends
/tmp/cUI5rYKrhA.o
Enter the number of friends to add: 2
Enter Friend Name: aravind
Enter Pet Name: ara
Enter Phone Number: 98765432
Enter Type of friend: school
Enter Name of Common Friends: haris
Enter No. of Places Visited Together: 4
Enter Friend Name: haris
Enter Pet Name: hari
Enter Phone Number: 987564321
Enter Type of friend: school
Enter Name of Common Friends: aravind
Enter No. of Places Visited Together: 4
Friend Details:
Friends Name Pet Name Phone number
Type os Friend Places visited together
aravind ara 98765432 school
haris 4
haris hari 987564321
school aravind 4
=== Code Execution Successful ===

2.

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

// Define the Product structure
struct Product {
   char name[50];        //declaring variables inside the structure
   char id[10];
   float price;
};

int main() {                  //main function
   int n, i;
   float totalCost = 0;
   struct Product products[5];       // creating objects for struct Product
   struct Product *mostExpensive, *leastExpensive; //creating pointers for structuree

   printf("Enter the number of products: ");
   scanf("%d", &n);                    //getting no. of products as input daynamically

   // Input details for each product
   for(i = 0; i < n; i++) {                //getting inputs for all the object using variable dynamically
      printf("Enter details for product %d:\n", i + 1);

      printf("Product Name: ");
      scanf("%s", products[i].name);

      printf("Product ID: ");
```

```
    scanf("%s", products[i].id);

    printf("Price: ");
    scanf("%f", &products[i].price);
  }

  // Initializing mostExpensive and leastExpensive pointers
  mostExpensive = &products[0];
  leastExpensive = &products[0];

  // Calculating total cost and find most/least expensive products using linear sorting algorithm
  for(i = 0; i < n; i++) {
    totalCost += products[i].price;

    if(products[i].price > mostExpensive->price) {          //using linear sorting algorithm
      mostExpensive = &products[i];                    //complexity O(n)
    }
    if(products[i].price < leastExpensive->price) {
      leastExpensive = &products[i];
    }
  }

  // printing all product details
  printf("\nProduct Details:\n");
  for(i = 0; i < n; i++) {
    printf("Product Name: %s, Product ID: %s, Price: %.2f\n", products[i].name, products[i].id,
products[i].price);
```

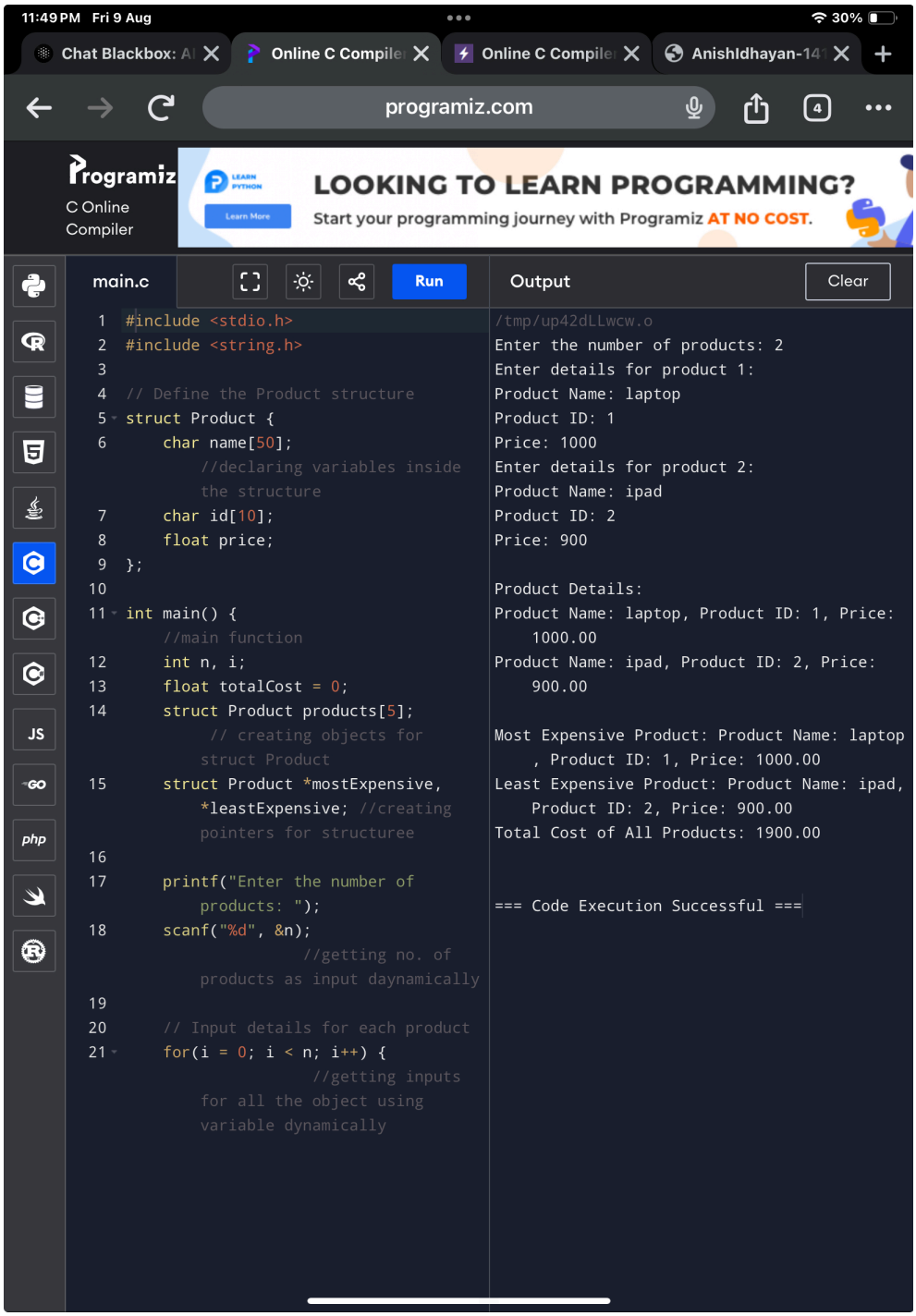
```
    }

    // printing the most expensive product
    printf("\nMost Expensive Product: ");
    printf("Product Name: %s, Product ID: %s, Price: %.2f\n", mostExpensive->name, mostExpensive->id, mostExpensive->price);

    // printing the least expensive product
    printf("Least Expensive Product: ");
    printf("Product Name: %s, Product ID: %s, Price: %.2f\n", leastExpensive->name, leastExpensive->id, leastExpensive->price);

    // printing the total cost of all products
    printf("Total Cost of All Products: %.2f\n", totalCost);

    return 0;
}
```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main.c
Run
Output
Clear
#include <stdio.h>
#include <string.h>
// Define the Product structure
struct Product {
char name[50];
//declaring variables inside the structure
char id[10];
float price;
};
int main() {
//main function
int n, i;
float totalCost = 0;
struct Product products[5];
// creating objects for struct Product
struct Product *mostExpensive, *leastExpensive; //creating pointers for structuree
printf("Enter the number of products: ");
scanf("%d", &n);
//getting no. of products as input daynamically
// Input details for each product
for(i = 0; i < n; i++) {
//getting inputs for all the object using variable dynamically
/tmp/up42dLLwcw.o
Enter the number of products: 2
Enter details for product 1:
Product Name: laptop
Product ID: 1
Price: 1000
Enter details for product 2:
Product Name: ipad
Product ID: 2
Price: 900
Product Details:
Product Name: laptop, Product ID: 1, Price: 1000.00
Product Name: ipad, Product ID: 2, Price: 900.00
Most Expensive Product: Product Name: laptop, Product ID: 1, Price: 1000.00
Least Expensive Product: Product Name: ipad, Product ID: 2, Price: 900.00
Total Cost of All Products: 1900.00
=== Code Execution Successful ===