Digital Assignment – 1

Data Structures

Submitted by: Hari Krishna Shah

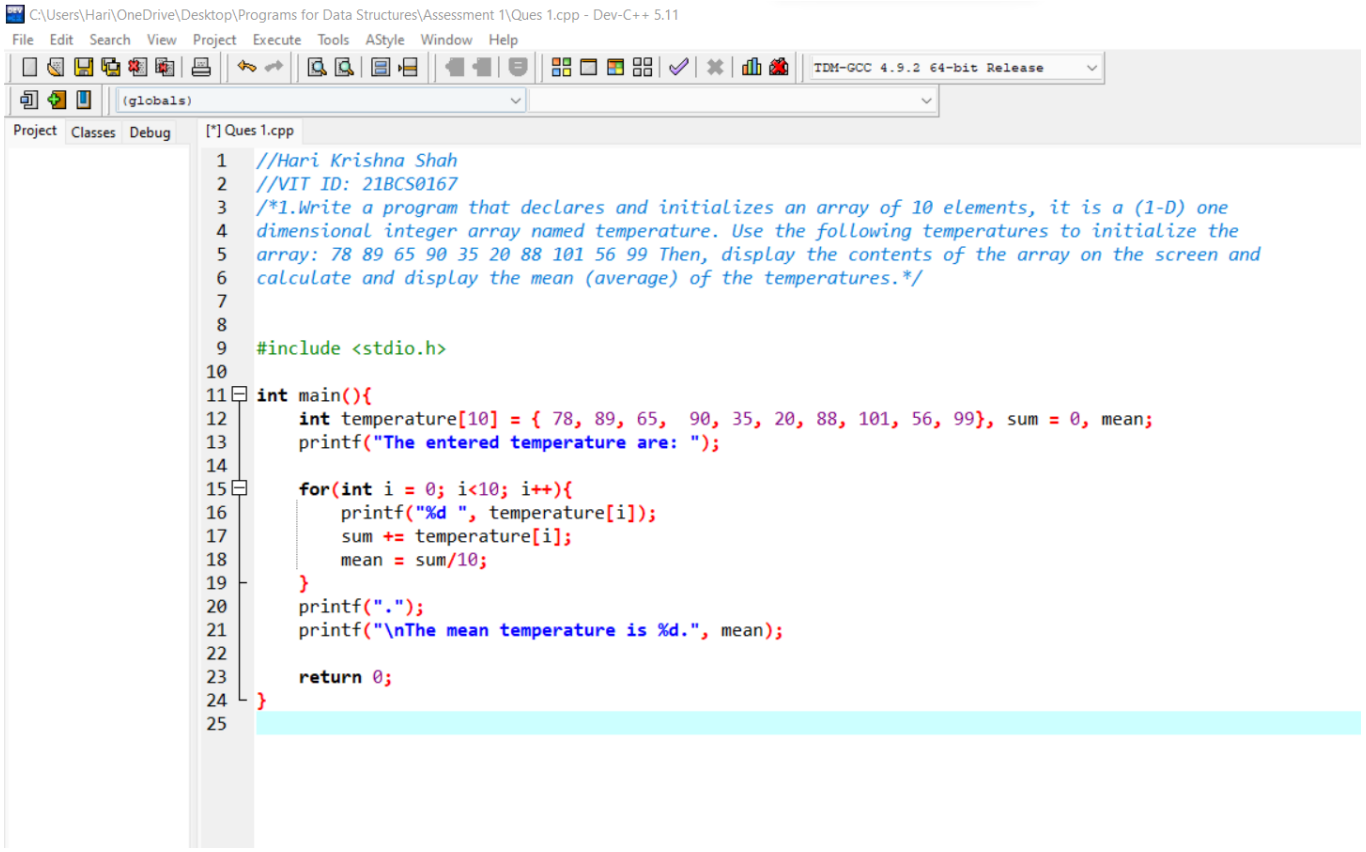
VIT ID: 21BCS0167

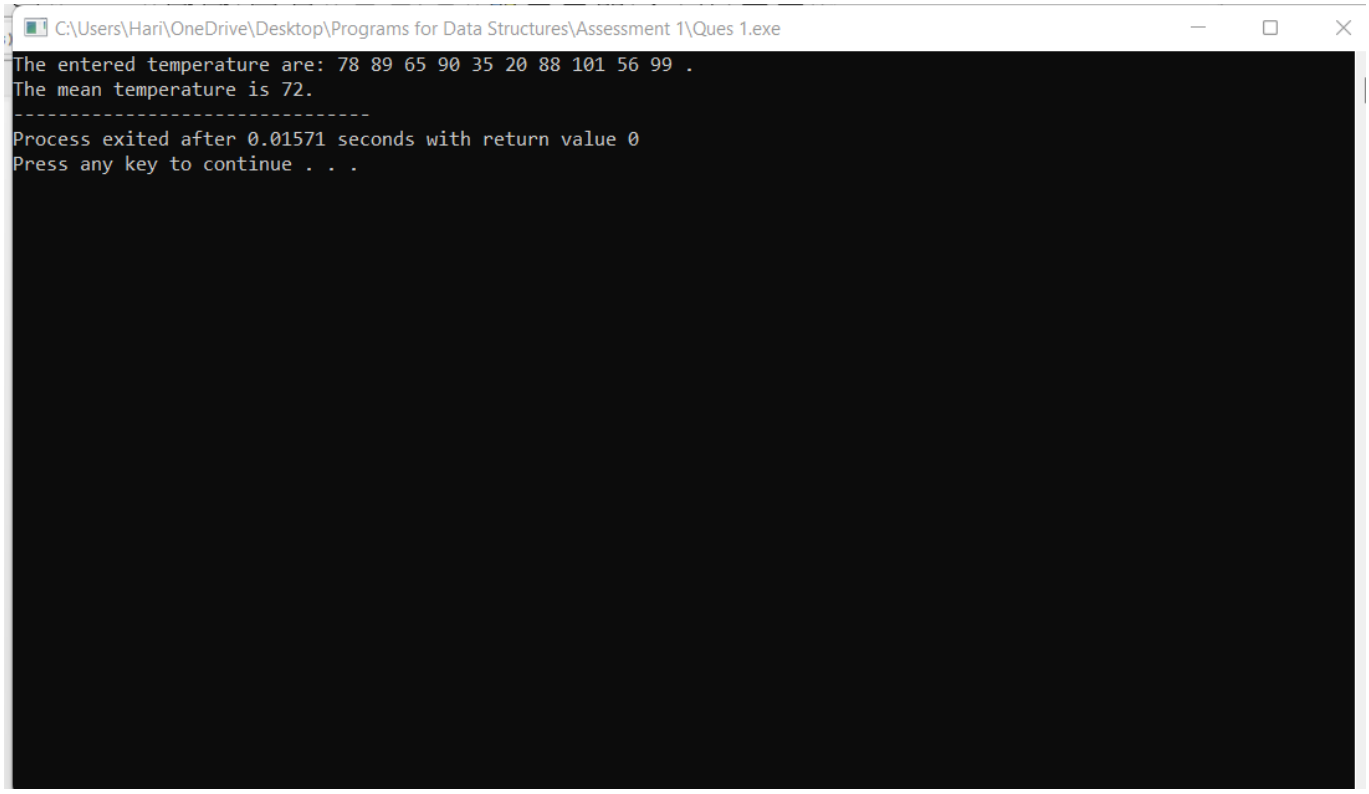
Ques 1. Write a program that declares and initializes an array of 10 elements, it is a (1-D) one dimensional integer array named temperature. Use the following temperatures to initialize the array: 78 89 65 90 35 20 88 101 56 99 Then, display the contents of the array on the screen and calculate and display the mean (average) of the temperatures.

Answer:

```
//Hari Krishna Shah
//VIT ID: 21BCS0167
#include <stdio.h>
int main(){
    int temperature[10] = { 78, 89, 65,  90, 35, 20, 88, 101, 56, 99}, sum = 0, mean;
    printf("The entered temperature are: ");

    for(int i = 0; i<10; i++){
        printf("%d ", temperature[i]);
        sum += temperature[i];
        mean = sum/10;
    }
    printf(".");
    printf("\nThe mean temperature is %d.", mean);
```

```
    return 0;
}
```


C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Assessment 1\Ques 1.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
[*] Ques 1.cpp
1 //Hari Krishna Shah
2 //VIT ID: 21BCS0167
3 /*1.Write a program that declares and initializes an array of 10 elements, it is a (1-D) one
4 dimensional integer array named temperature. Use the following temperatures to initialize the
5 array: 78 89 65 90 35 20 88 101 56 99 Then, display the contents of the array on the screen and
6 calculate and display the mean (average) of the temperatures.*/
7
8
9 #include <stdio.h>
10
11 int main(){
12 int temperature[10] = { 78, 89, 65, 90, 35, 20, 88, 101, 56, 99}, sum = 0, mean;
13 printf("The entered temperature are: ");
14
15 for(int i = 0; i<10; i++){
16 printf("%d ", temperature[i]);
17 sum += temperature[i];
18 mean = sum/10;
19 }
20 printf(".");
21 printf("\nThe mean temperature is %d.", mean);
22
23 return 0;
24 }
25


C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Assessment 1\Ques 1.exe
The entered temperature are: 78 89 65 90 35 20 88 101 56 99 .
The mean temperature is 72.

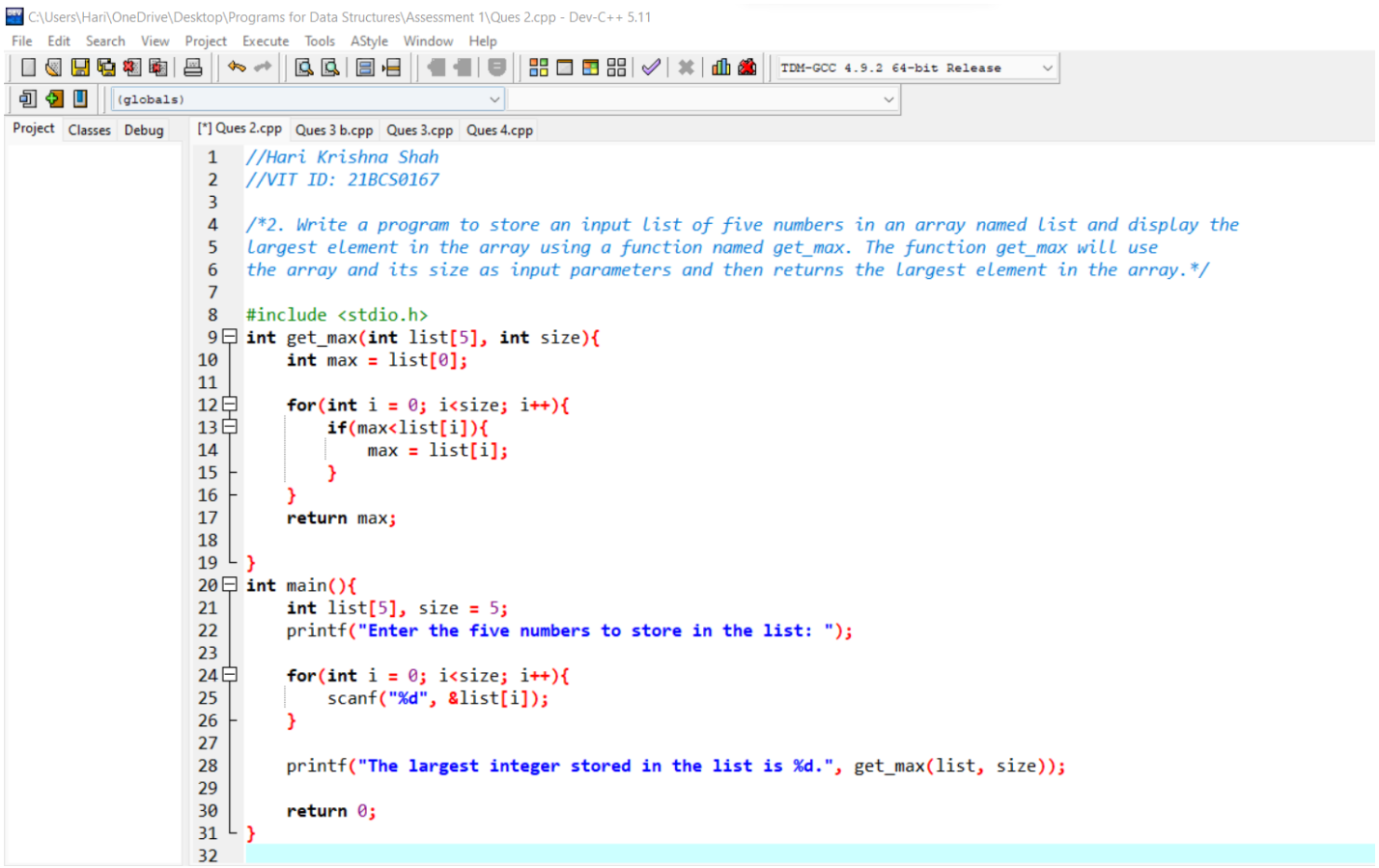
Process exited after 0.01571 seconds with return value 0
Press any key to continue . . .

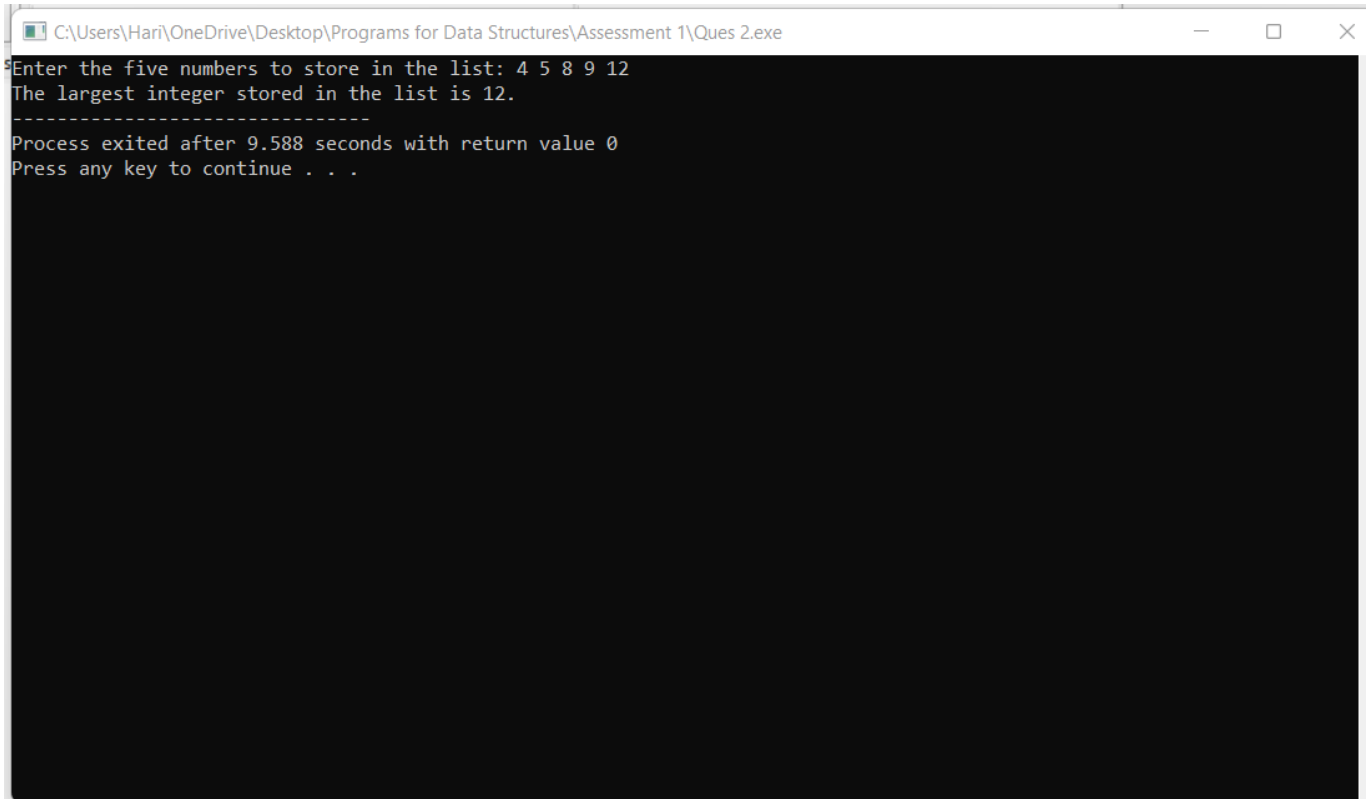
Ques 2. Write a program to store an input list of five numbers in an array named list and display the largest element in the array using a function named get_max. The function get_max will use the array and its size as input parameters and then returns the largest element in the array.

Answer:

```
//Hari Krishna Shah
//VIT ID: 21BCS0167
#include <stdio.h>
int get_max(int list[5], int size){
	int max = list[0];

	for(int i = 0; i<size; i++){
		if(max<list[i]){
			max = list[i];
		}
	}
	return max;

}
int main(){
	int list[5], size = 5;
	printf("Enter the five numbers to store in the list: ");

	for(int i = 0; i<size; i++){
		scanf("%d", &list[i]);
	}
```

```
    printf("The largest integer stored in the list is %d.", get_max(list, size));

    return 0;
}
```

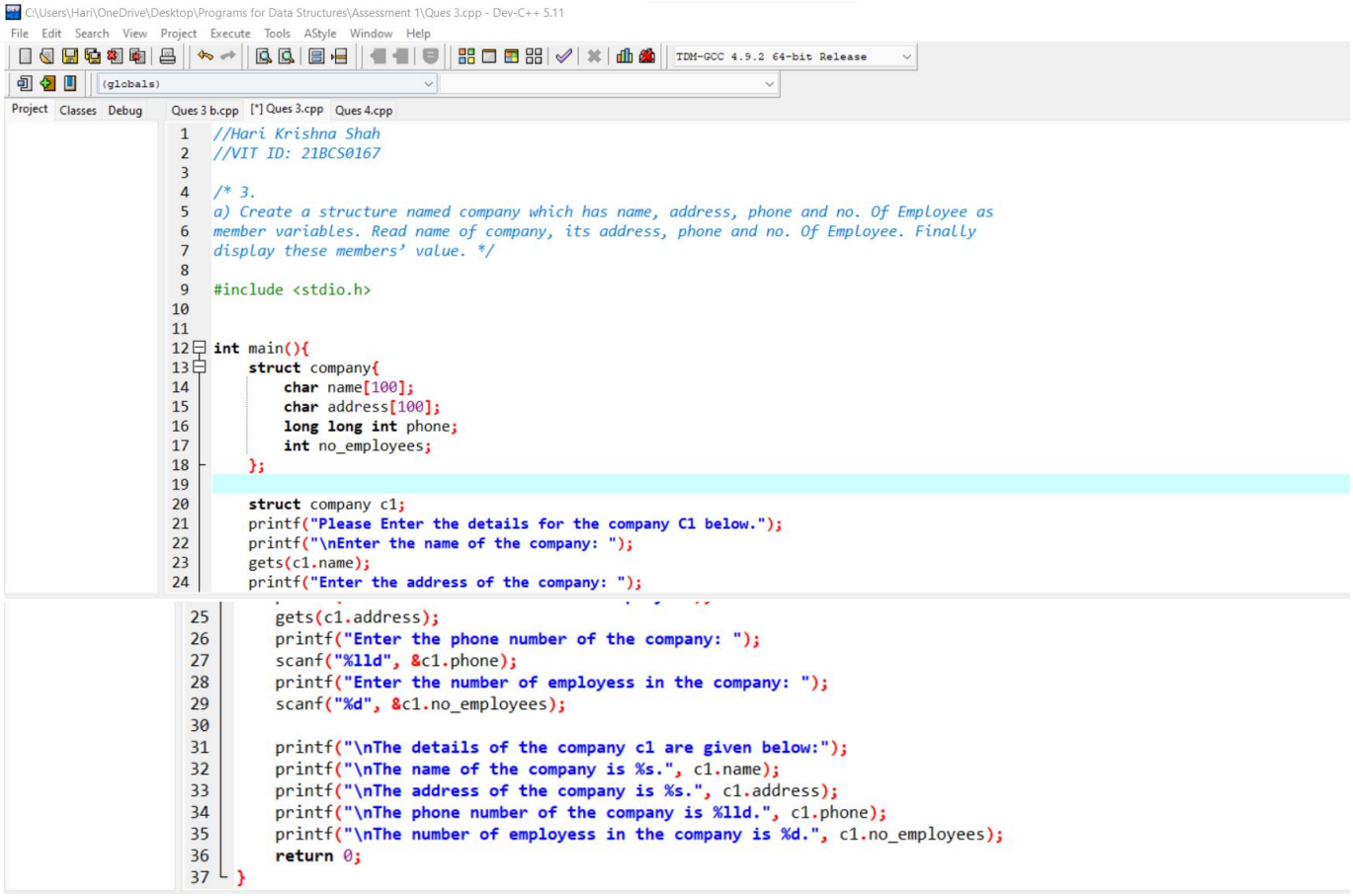


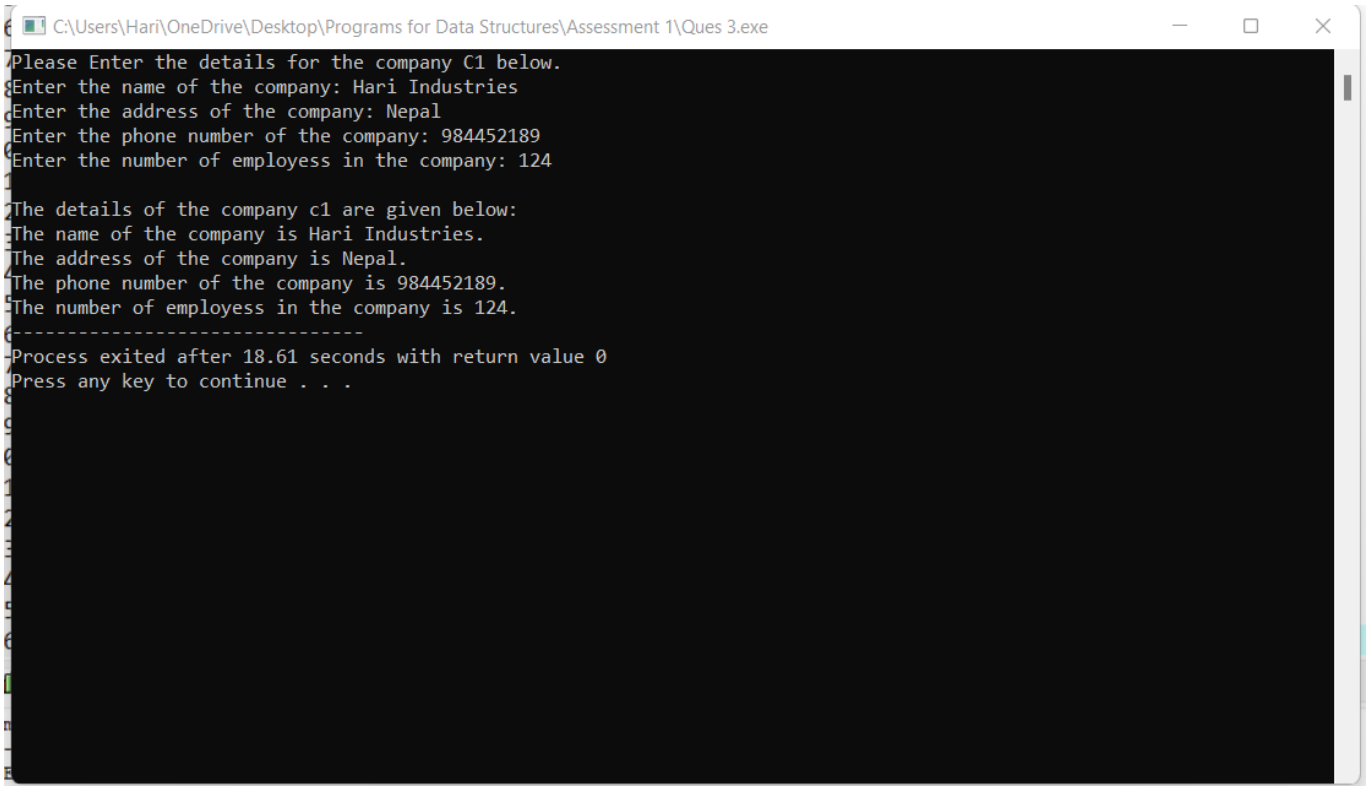


Ques 3. a. Create a structure named company which has name, address, phone and no. Of Employee as member variables. Read name of company, its address, phone and no. Of Employee. Finally display these members' value.

```
//Hari Krishna Shah
//VIT ID: 21BCS0167
#include <stdio.h>
int main(){
    struct company{
        char name[100];
        char address[100];
        long long int phone;
        int no_employees;
    };

    struct company c1;
```

```
	printf("Please Enter the details for the company C1 below.");
	printf("\nEnter the name of the company: ");
	gets(c1.name);
	printf("Enter the address of the company: ");
	gets(c1.address);
	printf("Enter the phone number of the company: ");
	scanf("%lld", &c1.phone);
	printf("Enter the number of employess in the company: ");
	scanf("%d", &c1.no_employees);

	printf("\nThe details of the company c1 are given below:");
	printf("\nThe name of the company is %s.", c1.name);
	printf("\nThe address of the company is %s.", c1.address);
	printf("\nThe phone number of the company is %lld.", c1.phone);
	printf("\nThe number of employess in the company is %d.",
c1.no_employees);
	return 0;
}
```


C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Assessment 1\Ques 3.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
Ques 3 b.cpp
[*] Ques 3.cpp
Ques 4.cpp
//Hari Krishna Shah
//VIT ID: 21BCS0167
/* 3.
a) Create a structure named company which has name, address, phone and no. Of Employee as
member variables. Read name of company, its address, phone and no. Of Employee. Finally
display these members' value. */
#include <stdio.h>
int main(){
struct company{
char name[100];
char address[100];
long long int phone;
int no_employees;
};
struct company c1;
printf("Please Enter the details for the company C1 below.");
printf("\nEnter the name of the company: ");
gets(c1.name);
printf("Enter the address of the company: ");
gets(c1.address);
printf("Enter the phone number of the company: ");
scanf("%lld", &c1.phone);
printf("Enter the number of employess in the company: ");
scanf("%d", &c1.no_employees);
printf("\nThe details of the company c1 are given below:");
printf("\nThe name of the company is %s.", c1.name);
printf("\nThe address of the company is %s.", c1.address);
printf("\nThe phone number of the company is %lld.", c1.phone);
printf("\nThe number of employess in the company is %d.", c1.no_employees);
return 0;
}


C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Assessment 1\Ques 3.exe
Please Enter the details for the company C1 below.
Enter the name of the company: Hari Industries
Enter the address of the company: Nepal
Enter the phone number of the company: 984452189
Enter the number of employess in the company: 124
The details of the company c1 are given below:
The name of the company is Hari Industries.
The address of the company is Nepal.
The phone number of the company is 984452189.
The number of employess in the company is 124.

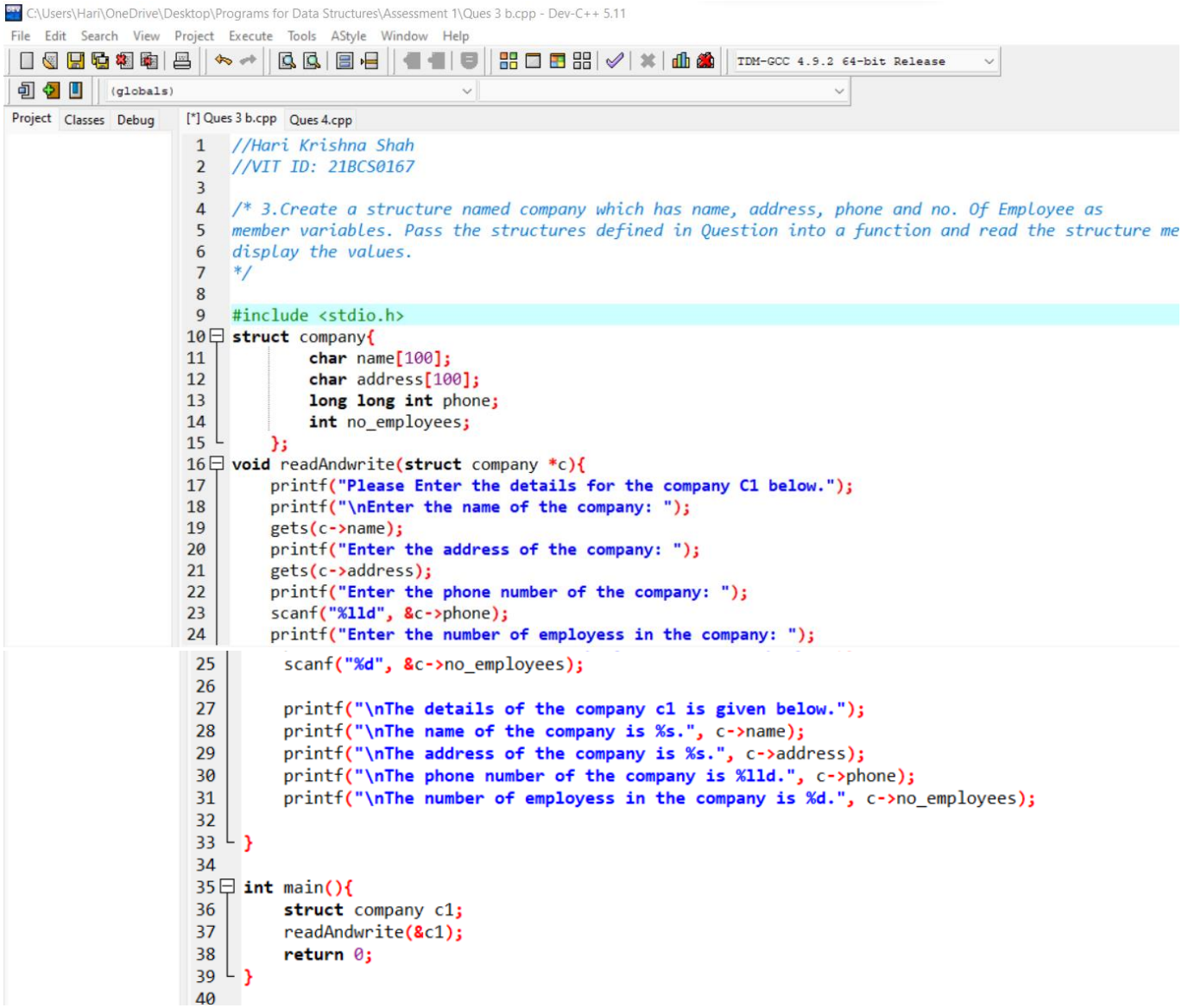
Process exited after 18.61 seconds with return value 0
Press any key to continue . . .

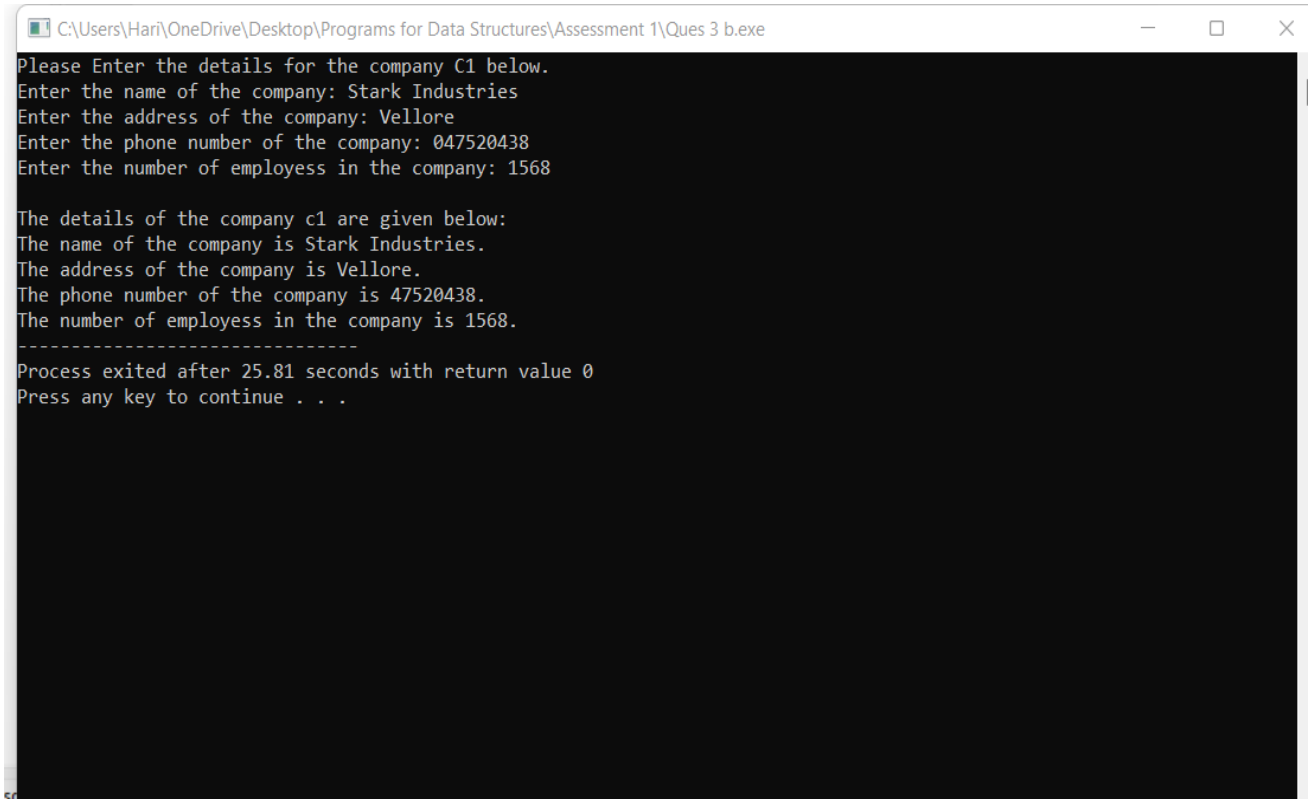
Ques 3. b. Create a structure named company which has name, address, phone and no. Of Employee as member variables. Pass the structures defined in Question into a function and read the structure member and display the values.

Answer:

```
//Hari Krishna Shah
//VIT ID: 21BCS0167
#include <stdio.h>
struct company{
        char name[100];
        char address[100];
        long long int phone;
        int no_employees;
    };
void readAndwrite(struct company *c){
    printf("Please Enter the details for the company C1 below.");
    printf("\nEnter the name of the company: ");
    gets(c->name);
    printf("Enter the address of the company: ");
    gets(c->address);
    printf("Enter the phone number of the company: ");
    scanf("%lld", &c->phone);
    printf("Enter the number of employess in the company: ");
    scanf("%d", &c->no_employees);

    printf("\nThe details of the company c1 is given below.");
    printf("\nThe name of the company is %s.", c->name);
```

```
        printf("\nThe address of the company is %s.", c->address);
        printf("\nThe phone number of the company is %lld.", c->phone);
        printf("\nThe number of employess in the company is %d.", c->no_employees);

}

int main(){
        struct company c1;
        readAndwrite(&c1);
        return 0;
}
```


C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Assessment 1\Ques 3 b.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
[*] Ques 3 b.cpp
Ques 4.cpp
//Hari Krishna Shah
//VIT ID: 21BCS0167
/* 3.Create a structure named company which has name, address, phone and no. Of Employee as
member variables. Pass the structures defined in Question into a function and read the structure me
display the values.
*/
#include <stdio.h>
struct company{
char name[100];
char address[100];
long long int phone;
int no_employees;
};
void readAndwrite(struct company *c){
printf("Please Enter the details for the company C1 below.");
printf("\nEnter the name of the company: ");
gets(c->name);
printf("Enter the address of the company: ");
gets(c->address);
printf("Enter the phone number of the company: ");
scanf("%lld", &c->phone);
printf("Enter the number of employess in the company: ");
scanf("%d", &c->no_employees);
printf("\nThe details of the company c1 is given below.");
printf("\nThe name of the company is %s.", c->name);
printf("\nThe address of the company is %s.", c->address);
printf("\nThe phone number of the company is %lld.", c->phone);
printf("\nThe number of employess in the company is %d.", c->no_employees);
}
int main(){
struct company c1;
readAndwrite(&c1);
return 0;
}


C:\Users\Hari\OneDrive\Desktop\Programs for Data Structures\Assessment 1\Ques 3 b.exe
Please Enter the details for the company C1 below.
Enter the name of the company: Stark Industries
Enter the address of the company: Vellore
Enter the phone number of the company: 047520438
Enter the number of employess in the company: 1568
The details of the company c1 are given below:
The name of the company is Stark Industries.
The address of the company is Vellore.
The phone number of the company is 47520438.
The number of employess in the company is 1568.

Process exited after 25.81 seconds with return value 0
Press any key to continue . . .

Ques 4. Define a structure “complex” to read two complex numbers and perform addition, subtraction of these two complex numbers and display the result (implement using pointers with structures).

Answer.

```
//Hari Krishna Shah
//VIT ID: 21BCS0167
#include <stdio.h>
#include <math.h>
int main(){
	struct complex
	{
	float real;
	float imaginary;
	};

	struct complex c1, c2;
	printf("Enter the real part of the first number: ");
	scanf("%f", &c1.real);
	printf("Enter the imaginary part of the first number: ");
	scanf("%f", &c1.imaginary);
	printf("The first complex number is %.2f + %.2fi.", c1.real, c1.imaginary);
	printf("\n\nEnter the real part of the second number: ");
	scanf("%f", &c2.real);
	printf("Enter the imaginary part of the second number: ");
	scanf("%f", &c2.imaginary);
	printf("The second complex number is %.2f + %.2fi.", c2.real,
c2.imaginary);
```

printf("\n\nThe sum of the two complex number is given by: \nSum = %.2f + %.2fi", c1.real + c2.real, c1.imaginary + c2. imaginary);

return 0;

}