

Lab No. 12



Course Code:

CSC141

Submitted By:

Haider Ali

Registration No:

FA21-BEE-053

Submitted To:

Dr. Muhammad Kaleem

Lab # 12 Structures in C

Objectives:

- Learn the basics of C Structures.
- Learn to declare structures.
- Accessing elements of a structure.
- Develop programs for using C Structures

Reading Task 1: Working with Structures

Chapter 10 Structures (pages 363 to 378) from the book: “Let us C” by Yashavant Kanetkar.

In-Lab Task 1:

Write a C Program that does the following:

1. Declares a C-Structure called ‘**car**’.
2. It should contain the following elements a) A char array of size 20 to hold the **make** of the car e.g. Suzuki.
 - b) A char array of size 20 to hold the **model** of the car e.g. Alto
 - c) An integer **capacity** to store the seating capacity.
 - d) A floating point number to hold the **weight** of the empty vehicle.
3. Then declare 3 variables of this type of structure.
4. Let the user populate the elements of these variables.
5. Print these structures

Coding:

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

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

```

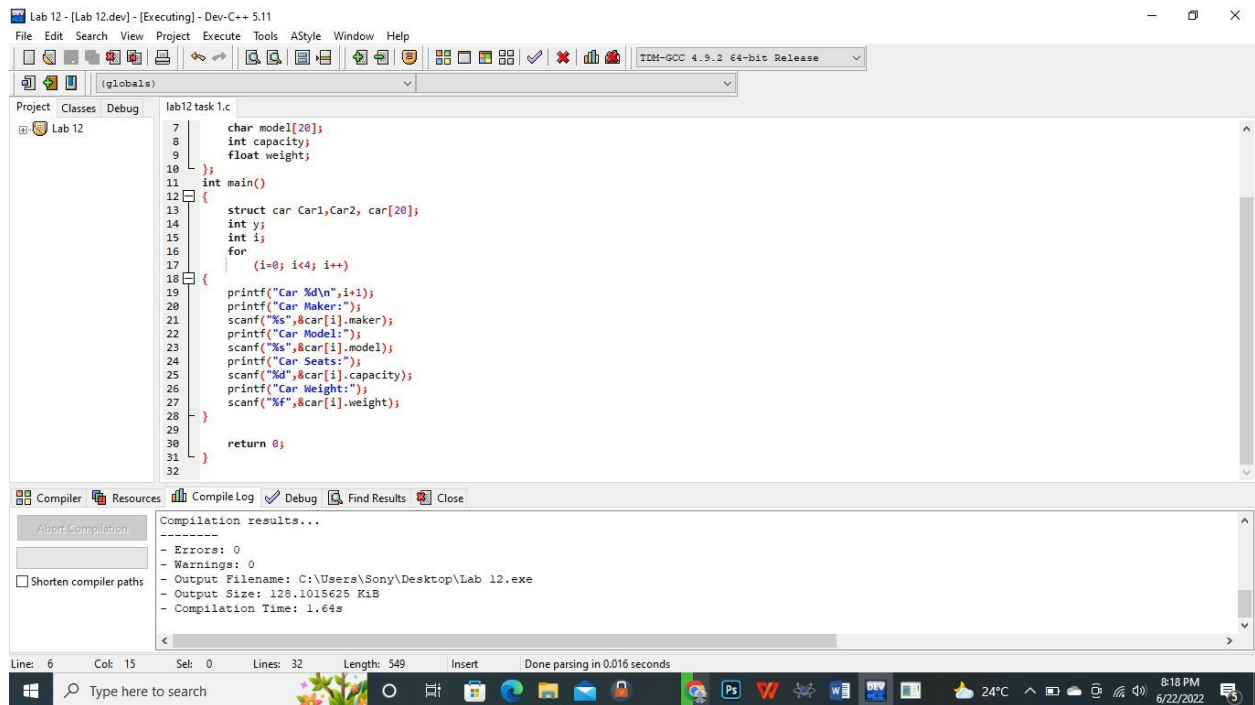
struct car {   char
maker[20];   char
model[20];

    int capacity;
float weight;
}; int

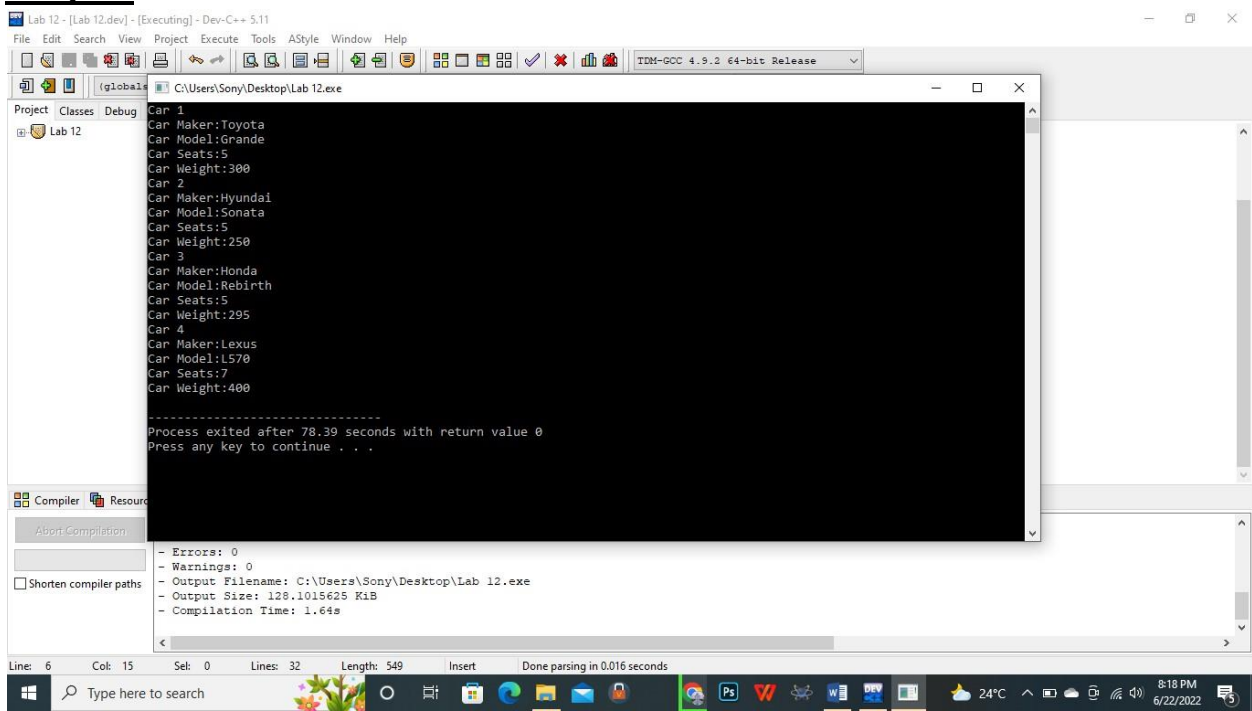
main() {
struct car
Car1,Car
2,
car[20];
    int y;
int    i;
for
    (i=0; i<4; i++)
{   printf("Car %d\n",i+1);
printf("Car Maker:");
scanf("%s",&car[i].maker);
printf("Car Model:");
scanf("%s",&car[i].model);
printf("Car Seats:");
scanf("%d",&car[i].capacity);
printf("Car Weight:");
scanf("%f",&car[i].weight);
}

    return 0;
}

```



Output:



In-Lab Task 2 a:

Write a C program that declares an array of structures of type 'car' from previous example, and asks the user to fill in the elements. Once all the structures have been

initialized, the program should present a menu to the user so that he can print a certain structure, or modify its elements.

Coding:

```
#include <stdio.h> #include
<stdlib.h>
struct car {    char
maker[20];    char
model[20];

    int capacity;
float weight;
}; int main() {    struct car
car1, car2, car[20]; int y; int i;

int a; for
    (i=0;i<2;i++) {        printf("Car
%d\n",i+1);    printf("Enter maker of
car:");    scanf("%s",car[i].maker);
printf("Enter model of car:");
scanf("%s",car[i].model);
printf("Enter no of seats of the car:");
scanf("%d",&car[i].capacity);
printf("Enter weight of car:");
scanf("%f",&car[i].weight);
}    printf("\n\nEnter car Number for which you want
details:\n");    scanf("%d",&a);

    printf("\n\nPress 1 to print Maker of car\n");
printf("Press 2 to print Model of car\n");    printf("Press
3 to print capacity of car\n");    printf("Press 4 to print
weight of car\n\n");    scanf("%d",&y);

    if(a=1){    if(y==1){    printf("The maker of car %d
is %s\n\n",a,car[1].maker);
    }
```

```
    if(y==2){    printf("The model of car %d is
%s\n\n",a,car[1].model);
    }

    if(y==3){    printf("The capacity of car %d is %d
seats\n\n",a,car[1].capacity);
    }

    if(y==4){    printf("The weight of car %d is
%f\n\n",a,car[1].weight);
    }
}

    if(a==2){    if(y==1){    printf("The maker of car %d
is %s\n\n",a,car[2].maker);
    }

    if(y==2){    printf("The model of car %d is
%s\n\n",a,car[2].model);
    }

    if(y==3){    printf("The capacity of car %d is %d
seats\n\n",a,car[2].capacity);
    }

    if(y==4){    printf("The weight of car %d is
%f\n\n",a,car[2].weight);
    }
}

return 0;
}
```

Lab 12 - [Lab 12.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug lab12 task 1.c

Lab 12

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 struct car
4 {
5     char maker[20];
6     char model[20];
7
8     int capacity;
9     float weight;
10 };
11 int main()
12 {
13     struct car car1, car2, car[20];
14     int y;
15     int i;
16     int a;
17     for
18     (i=0;i<2;i++)
19     {
20         printf("Car %d\n",i+1);
21         printf("Enter maker of car:");
22         scanf("%s",car[i].maker);
23         printf("Enter model of car:");
24         scanf("%s",car[i].model);
25         printf("Enter no of seats of the car:");
26         scanf("%d",&car[i].capacity);
```

Compiler Resources Compile Log Debug Find Results Close

Compilation results...

Errors: 0
Warnings: 0
Output Filename: C:\Users\Sony\Desktop\Lab 12.exe
Output Size: 129.2705078125 KiB
Compilation Time: 1.03s

Line: 33 Col: 51 Sel: 0 Lines: 71 Length: 1664 Insert Done parsing in 0.015 seconds

Type here to search

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Lab 12 - [Lab 12.dev] - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug lab12 task 1.c

Lab 12

```
26 scanf("%d",&car[i].capacity);
27 printf("Enter weight of car:");
28 scanf("%f",&car[i].weight);
29 }
30 printf("\n\nEnter car Number for which you want details:\n");
31 scanf("%d",&a);
32
33 printf("\n\nPress 1 to print Maker of car\n");
34 printf("Press 2 to print Model of car\n");
35 printf("Press 3 to print capacity of car\n");
36 printf("Press 4 to print weight of car\n");
37 scanf("%d",&y);
38
39 if(a==1){
40     if(y==1){
41         printf("The maker of car %d is %s\n",a,car[1].maker);
42     }
43     if(y==2){
44         printf("The model of car %d is %s\n",a,car[1].model);
45     }
46     if(y==3){
47         printf("The capacity of car %d is %d seats\n",a,car[1].capacity);
48     }
49     if(y==4){
50         printf("The weight of car %d is %f\n",a,car[1].weight);
51     }
```

Compiler Resources Compile Log Debug Find Results Close

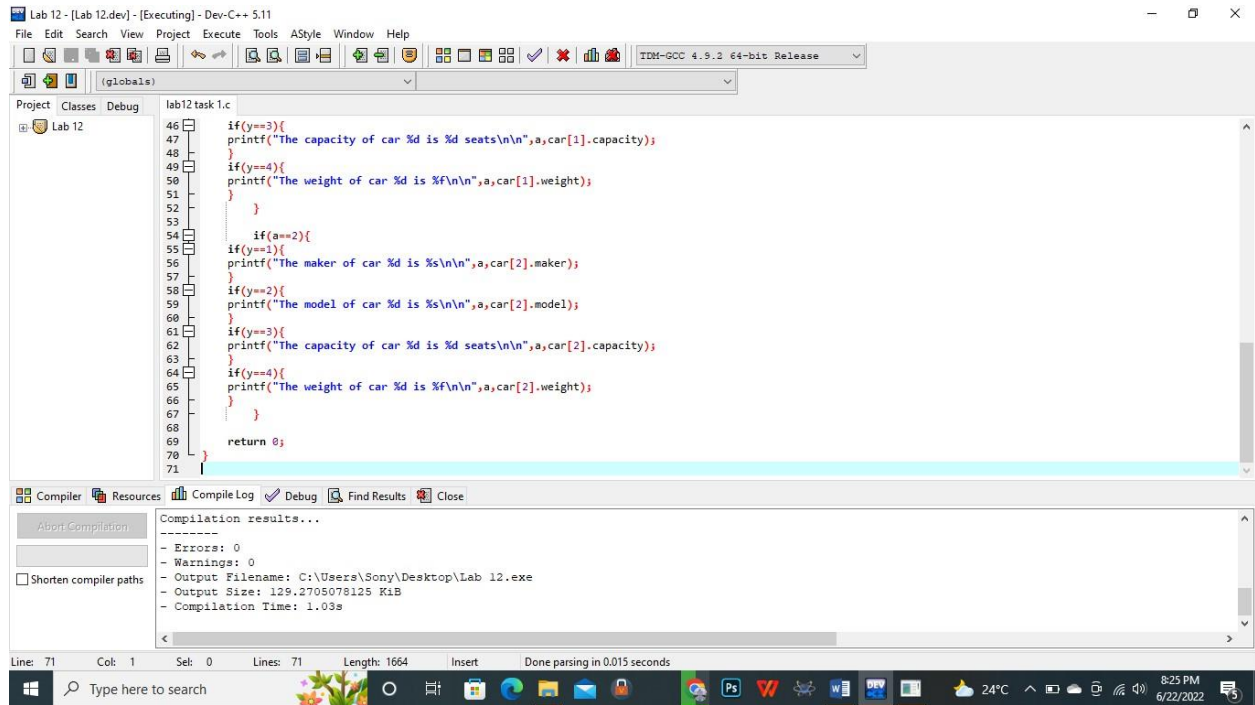
Compilation results...

Errors: 0
Warnings: 0
Output Filename: C:\Users\Sony\Desktop\Lab 12.exe
Output Size: 129.2705078125 KiB
Compilation Time: 1.03s

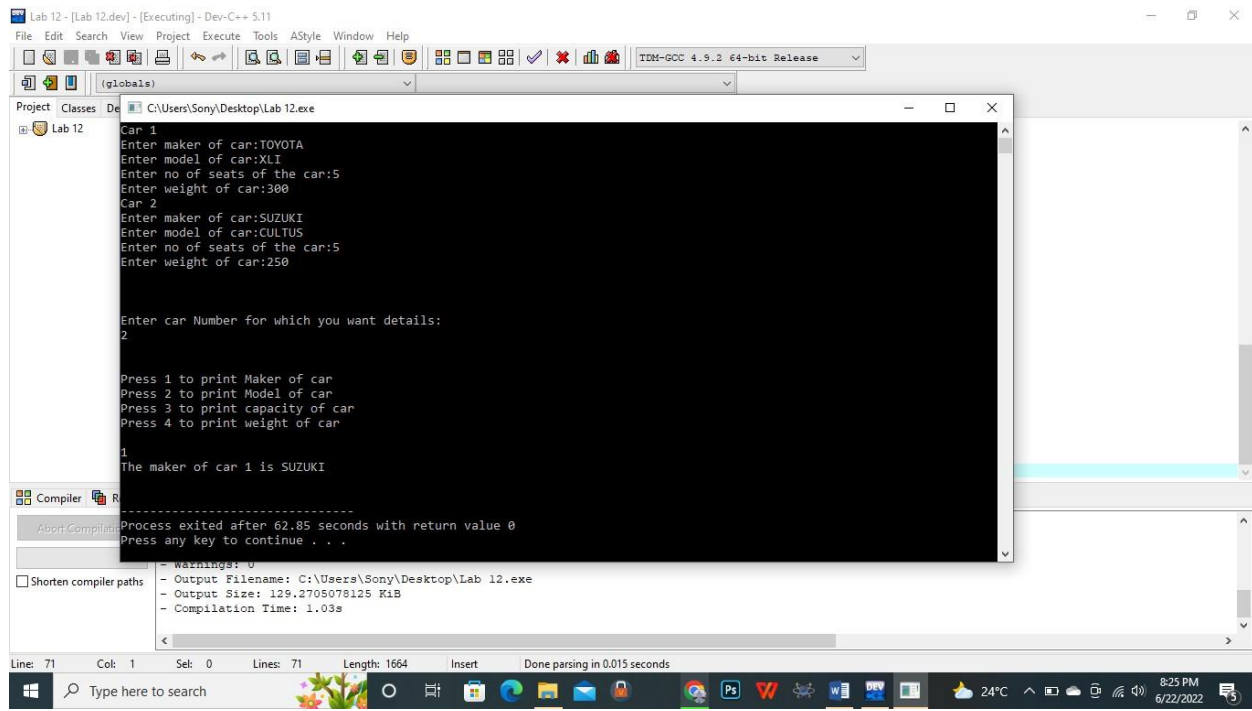
Line: 51 Col: 6 Sel: 0 Lines: 71 Length: 1664 Insert Done parsing in 0.015 seconds

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Output:



In-Lab Task 2 b:

There is a structure called employee that holds information like employee code, name, date of joining. Write a program to create an array of the structure and enter some data into it. Then ask the user to enter current date. Display the names of those employees whose tenure is 3 or more than 3 years according to the given current date.

Coding:

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

```
#include<conio.h>
```

```
struct employee
```

```
{
```

```
int dd,mm,yy; char
```

```
code[10],name[10];
```

```
}emp[10];
```

```
int main() { int
```

```
n,i,dd,mm,yy;
```

```
printf("Enter
```

```
Numbers of
```

```
Employees : ");
```

```
scanf("%d",&n);
```

```
for(i=0;i<n;++i) { printf("\nEnter Emp
```

```
Code : "); scanf("%s",emp[i].code);
```

```
printf("Enter Emp Name : ");
```

```
scanf("%s",emp[i].name); printf("Enter
```

```
Join Date (dd mm yyyy) : ");
```

```
scanf("%d%d%d",&emp[i].dd,&emp[i].mm,&emp[i].yy);
```

```
}
```

```
printf("\nEnter current Date : ");
```

```
scanf("%d%d%d",&dd,&mm,&yy);
```

```
for(i=0;i<n;++i) if((yy - emp[i].yy) >= 3) printf("\nCode : %s
```

```
\nName : %s \nDate of Join : %d/%d/%d",
```

```
emp[i].code,emp[i].name, emp[i].dd,emp[i].mm,emp[i].yy);
```

```
getch(); }
```

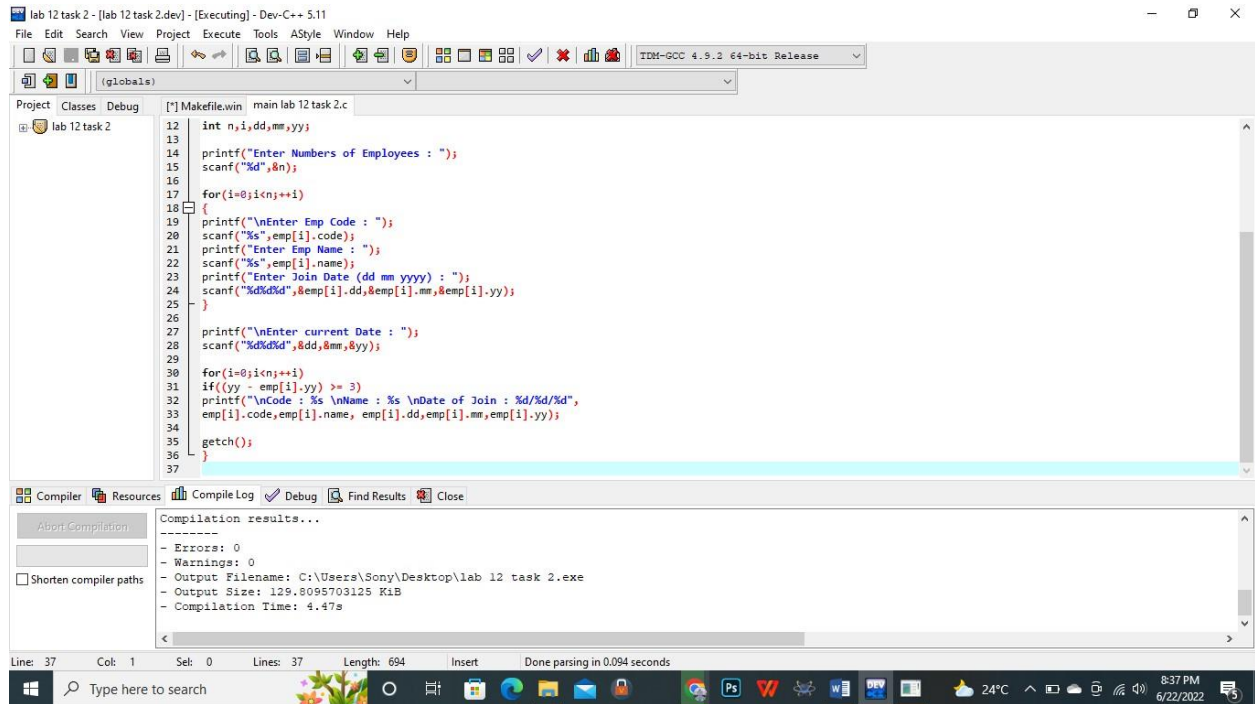
The screenshot shows a C++ IDE window titled "lab 12 task 2 - [lab 12 task 2.dev] - [Executing] - Dev-C++ 5.11". The main editor displays the source code for "main lab 12 task 2.c". The code includes headers for `stdio.h` and `conio.h`, defines an `employee` struct with fields `dd`, `mm`, `yy`, `code`, and `name`, and implements a `main` function. The `main` function prompts the user for the number of employees, then enters a loop to collect employee data (code, name, and join date) and prints it. The bottom panel shows the "Compiler" output, indicating a successful compilation with 0 errors and 0 warnings. The output filename is `C:\Users\Sony\Desktop\lab 12 task 2.exe`, and the compilation time is 4.47s. The status bar at the bottom indicates the current line is 37, column is 1, and the file length is 694 characters.

```
1 #include<stdio.h>
2 #include<conio.h>
3
4 struct employee
5 {
6     int dd,mm,yy;
7     char code[10],name[10];
8 }emp[10];
9
10 int main()
11 {
12     int n,i,dd,mm,yy;
13
14     printf("Enter Numbers of Employees : ");
15     scanf("%d",&n);
16
17     for(i=0;i<n;++i)
18     {
19         printf("\nEnter Emp Code : ");
20         scanf("%s",emp[i].code);
21         printf("Enter Emp Name : ");
22         scanf("%s",emp[i].name);
23         printf("Enter Join Date (dd mm yyyy) : ");
24         scanf("%d%d%d",&emp[i].dd,&emp[i].mm,&emp[i].yy);
25     }
26
27     printf("\nEnter current Date : ");
28     scanf("%d%d%d",&dd,&mm,&yy);
29
30     for(i=0;i<n;++i) if((yy - emp[i].yy) >= 3) printf("\nCode : %s
31 \nName : %s \nDate of Join : %d/%d/%d",
32 emp[i].code,emp[i].name, emp[i].dd,emp[i].mm,emp[i].yy);
33
34     getch(); }
```

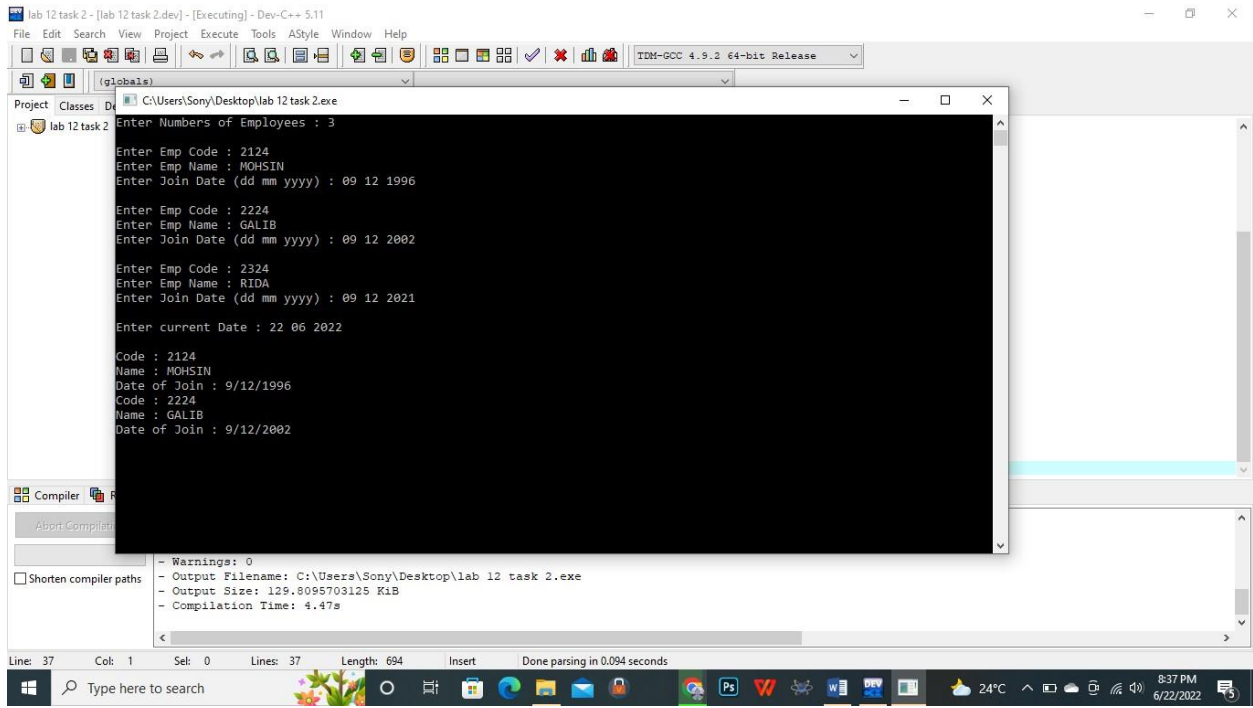
Compilation results...

Errors: 0
Warnings: 0
Output Filename: C:\Users\Sony\Desktop\lab 12 task 2.exe
Output Size: 129.8095703125 KiB
Compilation Time: 4.47s

Line: 37 Col: 1 Sel: 0 Lines: 37 Length: 694 Insert Done parsing in 0.094 seconds



Output:



```
lab 12 task 2 - [lab 12 task 2.dev] - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
(globals)
C:\Users\Sony\Desktop\lab 12 task 2.exe
lab 12 task 2
Enter Numbers of Employees : 3
Enter Emp Code : 2124
Enter Emp Name : MOHSIN
Enter Join Date (dd mm yyyy) : 09 12 1996
Enter Emp Code : 2224
Enter Emp Name : GALIB
Enter Join Date (dd mm yyyy) : 09 12 2002
Enter Emp Code : 2324
Enter Emp Name : RIDA
Enter Join Date (dd mm yyyy) : 09 12 2021
Enter current Date : 22 06 2022
Code : 2124
Name : MOHSIN
Date of Join : 9/12/1996
Code : 2224
Name : GALIB
Date of Join : 9/12/2002
Compiler
About Compiler
Shorten compiler paths
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\lab 12 task 2.exe
- Output Size: 129,809,570,312,5 KiB
- Compilation Time: 4.47s
Line: 37 Col: 1 Sel: 0 Lines: 37 Length: 694 Insert Done parsing in 0.094 seconds
Type here to search 24°C 8:37 PM 6/22/2022
```

Critical Analysis:

The lab 12 was all about the using structures in c language basics of structures and we learned how to declare structures in c accessing elements of a structure for that in in lab task 1 we declared a structure with whom we printed the make, model, no of seats and weight of seats similarly using that program for in lab task 2(a) we determined the details of any car that we declared in the previous program for example we wanted to print the just model of the car 1 by just choosing the correct statement we got that and for in lab task 2(b) we declared arrays and structures for the program that runs and takes the employees codes, names ,doj and after giving the current date it prints out those employees with their names and codes who have the tenured of 3 years or more than 3 years.

Lab Assessment				
Pre Lab			/1	/10
In Lab			/5	
Post Lab	Data Analysis	/4	/4	
	Data Presentation	/4		
	Writing Style	/4		
Instructor Signature and Comments				