

Structures and Classes

LAB # 10&11



Spring 2022

CSE-102L COMPUTER PROGRAMMING LAB

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"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

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Submitted to:

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Lab 10 & 11: Structures and Classes

Objectives:

To learn about data structures and classes in C++

Tasks:

1. A phone number such is (091) 767-8900 can be thought of as having three parts: the area code (091), exchange (767) and number 8900. Write a program that uses structure to store these 3 parts of a phone number separately. Assume name of the structure is 'phone'. Create two objects of type 'phone', initialize one object and take the other one from the user. Display both numbers.

Sample Run:

Enter you Area code, exchange, and number: 091 767 8900

My number is (042) 867-4982

Your number is (091) 767-8900

2. Write a C++ Program where you create a movie database using structures. i.e the struct must have two members "title" and "year". For test run add 3 movies into the database and then display the movie title and names.
3. A point on a two-dimensional space has two numbers: an 'X' coordinate and a 'Y' coordinate such as (4, 5). Write a program that uses a structure called 'point' to model a point and draw a rectangle of '*' based on the entered height and width of the rectangle.

Sample Run:

Enter the point coordinates: (x, y)

3 2

Enter width of the rectangle: 3

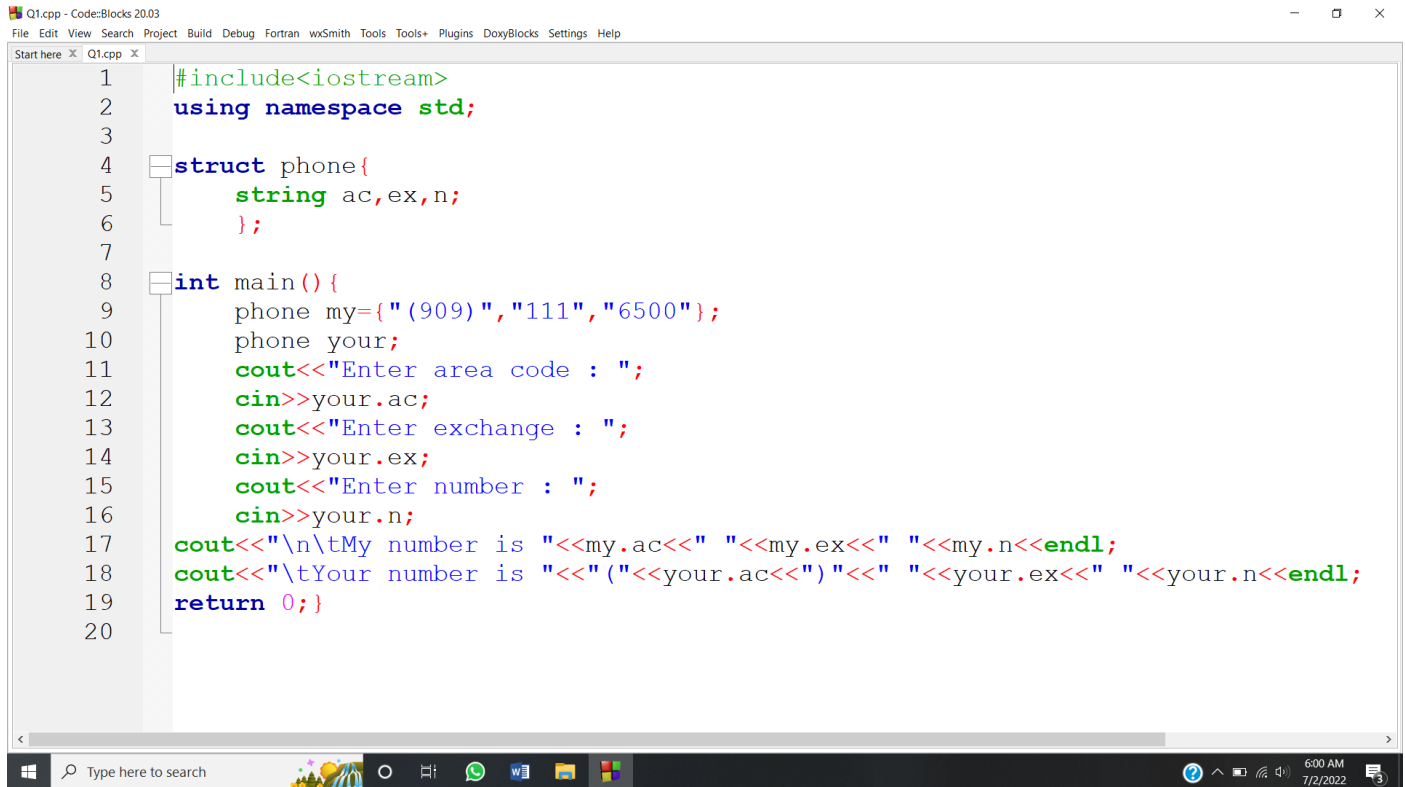
Enter Height of the rectangle: 2

```
*   *   *  
*   *   *
```

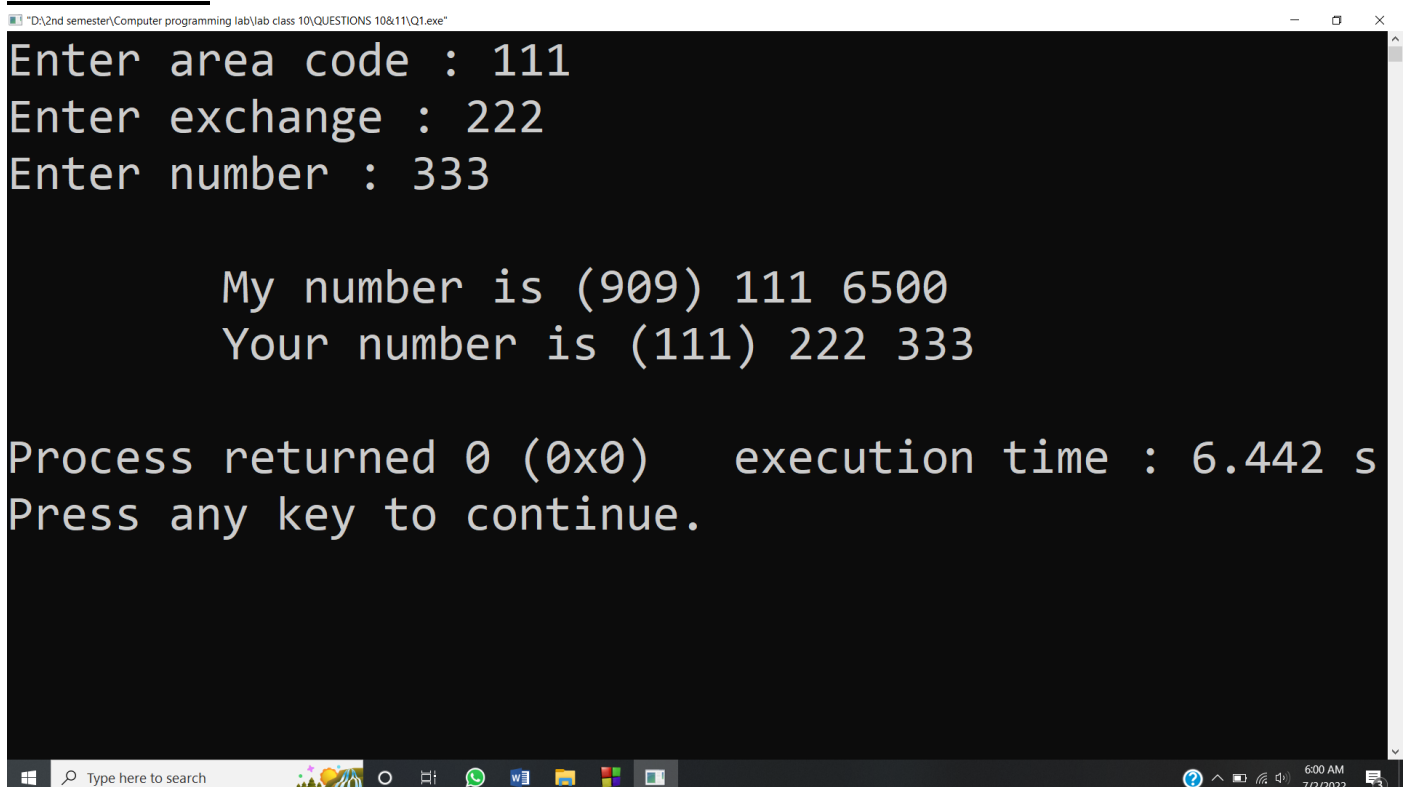
4. Write a program to develop student information system. This system should be able to take the student's credentials, like name, reg no and semester no, as input and store them in a structure object Student_t. The system should be capable of storing the information of multiple students. And it should be capable of displaying the student's information, when asked to do so, via reg no.

5. Make a C++ Program that will have a Class of your choosing. You can pick your own concept it doesn't need to be a specific Class (for example we in lab we made a class about rectangle choose anything like that). Your class must contain the following:

- Constructor
- Member functions
- Data members
- Destructor

COMPUTER PROGRAMMING LAB # 10**Answer #1****CODE:**

```
1 #include<iostream>
2 using namespace std;
3
4 struct phone{
5     string ac,ex,n;
6 };
7
8 int main() {
9     phone my={"(909)","111","6500"};
10    phone your;
11    cout<<"Enter area code : ";
12    cin>>your.ac;
13    cout<<"Enter exchange : ";
14    cin>>your.ex;
15    cout<<"Enter number : ";
16    cin>>your.n;
17    cout<<"\n\tMy number is "<<my.ac<<" "<<my.ex<<" "<<my.n<<endl;
18    cout<<"\tYour number is "<<"("<<your.ac<<" "<<" "<<your.ex<<" "<<your.n<<endl;
19    return 0;}
20
```

OUTPUT:

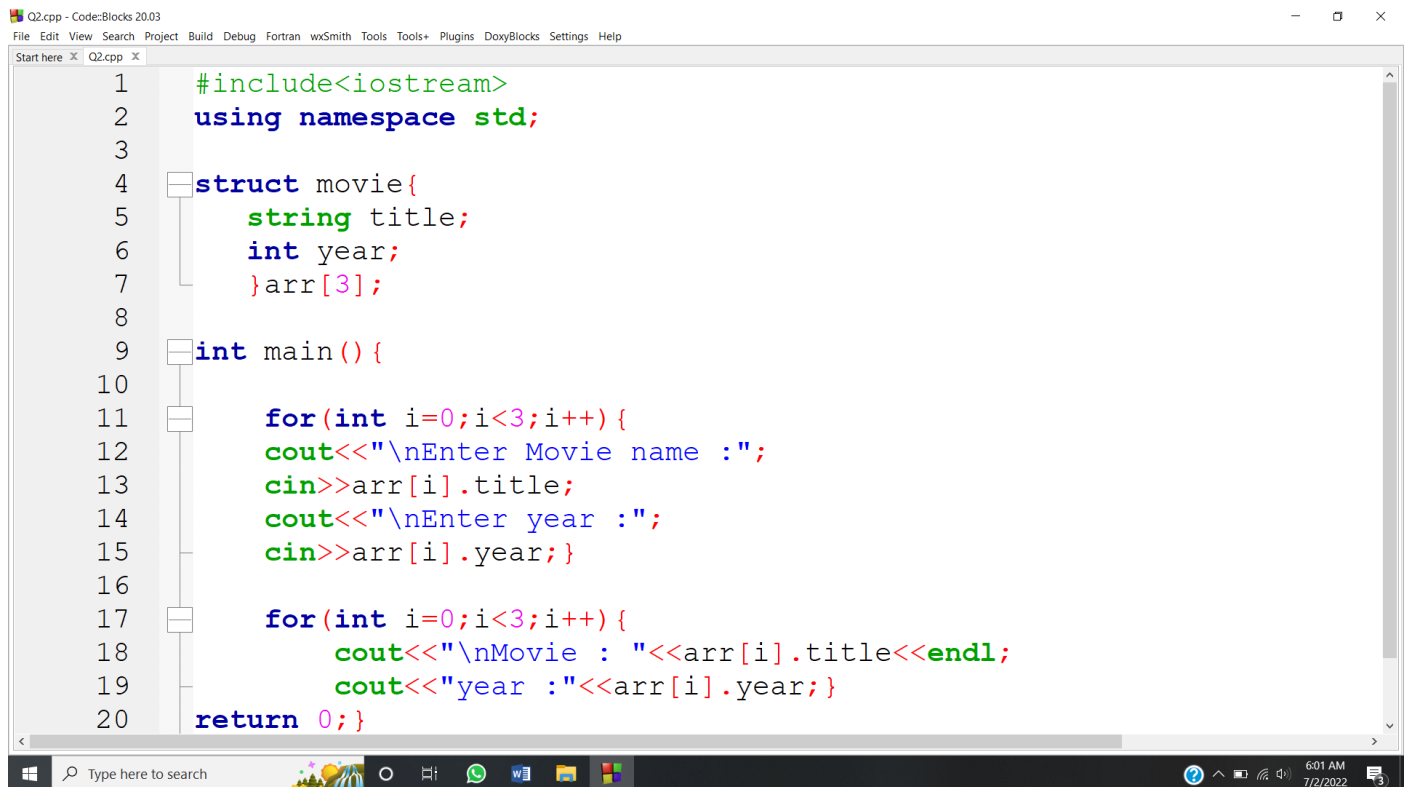
```
Enter area code : 111
Enter exchange : 222
Enter number : 333

My number is (909) 111 6500
Your number is (111) 222 333

Process returned 0 (0x0)    execution time : 6.442 s
Press any key to continue.
```

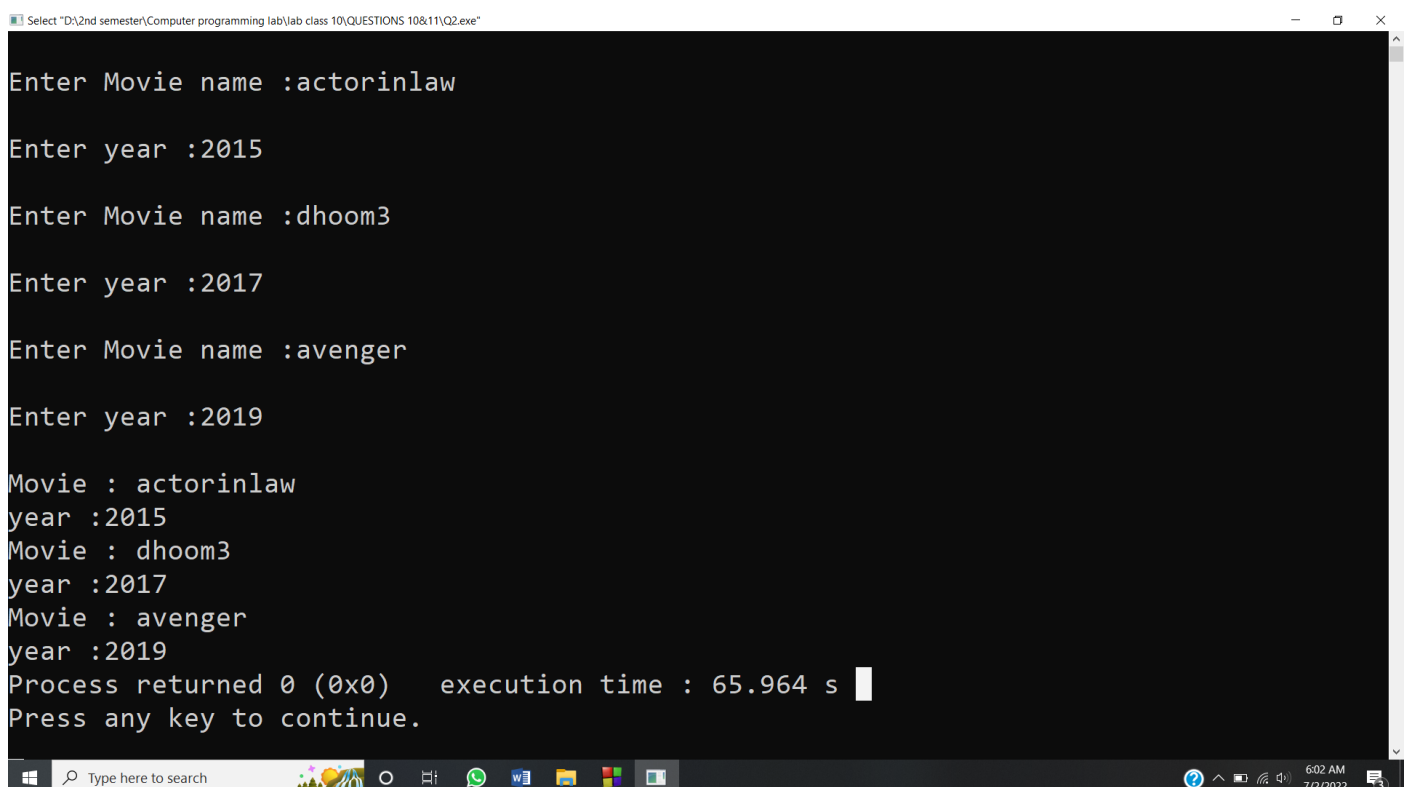
Answer #2

CODE:



```
1  #include<iostream>
2  using namespace std;
3
4  struct movie{
5      string title;
6      int year;
7  }arr[3];
8
9  int main() {
10
11      for(int i=0;i<3;i++){
12          cout<<"\nEnter Movie name :";
13          cin>>arr[i].title;
14          cout<<"\nEnter year :";
15          cin>>arr[i].year;}
16
17      for(int i=0;i<3;i++){
18          cout<<"\nMovie : "<<arr[i].title<<endl;
19          cout<<"year : "<<arr[i].year;}
20      return 0;}
```

OUTPUT:



```
Select "D:\2nd semester\Computer programming lab\lab class 10\QUESTIONS 10&11\Q2.exe"

Enter Movie name :actorinlaw
Enter year :2015
Enter Movie name :dhoom3
Enter year :2017
Enter Movie name :avenger
Enter year :2019

Movie : actorinlaw
year :2015
Movie : dhoom3
year :2017
Movie : avenger
year :2019
Process returned 0 (0x0)   execution time : 65.964 s
Press any key to continue.
```

Answer #3

CODE:

```
*Q3.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x Q2.cpp x *Q3.cpp x
1  #include<iostream>
2  using namespace std;
3
4  struct point{
5      int x,y;
6  }rec;
7
8  int main(){
9      cout << "\nPlease Enter the Total Number of Rectangle x    =  ";
10     cin >> rec.x;
11
12     cout << "\nPlease Enter the Total Number of Rectangle y =  ";
13     cin >> rec.y;
14
15     cout << "\n-----Rectangle Pattern-----\n";
16     for(int i = 1; i <= rec.x; i++){
17         for(int j = 1; j <= rec.y; j++){
18             if(i == 1 || i == rec.x || j == 1 || j == rec.y){
19                 cout << "*";
20             }
21             else{
22                 cout << " ";
23             }
24         }
25         cout << "\n";
26     }
27     return 0;
}
```

OUTPUT:

```
Select "D:\2nd semester\Computer programming lab\lab class 10\QUESTIONS 10&11\Q3.exe"
Please Enter the Total Number of Rectangle x    =  3
Please Enter the Total Number of Rectangle y =  6
-----Rectangle Pattern-----
*****
*      *
*****
Process returned 0 (0x0)   execution time : 3.266 s
Press any key to continue.
```

Answer #4

CODE:

```
*Q4.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x *Q4.cpp x
1  #include<iostream>
2
3  using namespace std;
4
5  int main(){
6      int total,no;
7      cout<<"Enter total students : ";
8      cin>>total;
9
10     struct data{
11         string name;
12         int s,regno;
13     }Student_t[total];
14
15     for(int i=0;i<total;i++){
16         cout<<"Enter student name : ";
17         cin>>Student_t[i].name;
18         cout<<"Enter student Reg No : ";
19         cin>>Student_t[i].regno;
20         cout<<"Enter semester No : ";
21         cin>>Student_t[i].s;}
```

```
*Q4.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x *Q4.cpp x
13     }Student_t[total];
14
15     for(int i=0;i<total;i++){
16         cout<<"Enter student name : ";
17         cin>>Student_t[i].name;
18         cout<<"Enter student Reg No : ";
19         cin>>Student_t[i].regno;
20         cout<<"Enter semester No : ";
21         cin>>Student_t[i].s;}
22
23     cout<<"\nEnter Reg No to search student data : ";
24     cin>>no;
25     for(int i=0;i<total;i++){
26         if(no==Student_t[i].regno){
27             cout<<"*****"<<endl;
28             cout<<"Name : "<<Student_t[i].name<<endl;
29             cout<<"Reg No : "<<Student_t[i].regno<<endl;
30             cout<<"Semester : "<<Student_t[i].s<<endl;
31             cout<<"\n*****";}}
32     return 0;}
```

OUTPUT:

```

Select "D:\2nd semester\Computer programming lab\lab class 10\QUESTIONS 10&11\Q4.exe"
Enter total students : 2
Enter student name : SADEEQ
Enter student Reg No : 12
Enter semester No : 2
Enter student name : WASEEM
Enter student Reg No : 11
Enter semester No : 2

Enter Reg No to search student data : 12
*****
Name : SADEEQ
Reg No : 12
Semester : 2

*****
Process returned 0 (0x0)   execution time : 25.027 s

```

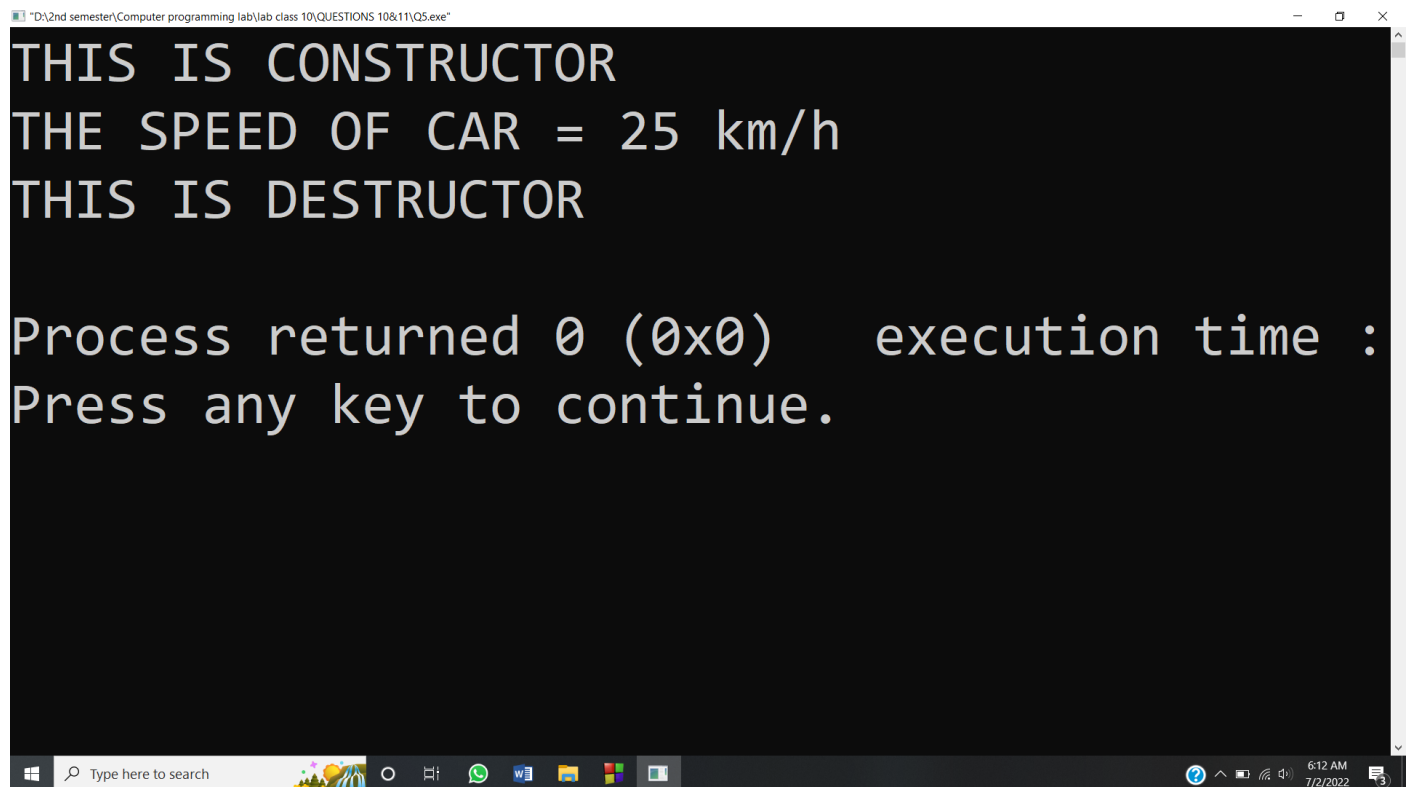
Answer #5

CODE:

```

*Q5.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Start here x *Q5.cpp x
1  #include<iostream>
2
3  using namespace std;
4
5  class meter{
6  private:
7      int time;
8      int distance_cover;
9
10 public:
11     meter(int t,int d){
12         cout<<"THIS IS CONSTRUCTOR "<<endl;
13         time=t;
14         distance_cover=d;
15         cout<<"THE SPEED OF CAR = "<<speed()<<" km/h"<<endl;}
16
17     int speed(){
18         return distance_cover/time;}
19
20     ~meter(){
21         cout<<"THIS IS DESTRUCTOR "<<endl;}
22     };
23
24 int main(){
25     meter car(20,500);
26     return 0;}

```


OUTPUT:

A screenshot of a Windows command prompt window. The title bar at the top reads "D:\2nd semester\Computer programming lab\lab class 10\QUESTIONS 10&11\Q5.exe". The window has a black background with white text. The text displayed is: "THIS IS CONSTRUCTOR", "THE SPEED OF CAR = 25 km/h", "THIS IS DESTRUCTOR", "Process returned 0 (0x0) execution time :", and "Press any key to continue.". The Windows taskbar is visible at the bottom, showing the search bar, taskbar icons, and system tray with the time 6:12 AM on 7/2/2022.

```
"D:\2nd semester\Computer programming lab\lab class 10\QUESTIONS 10&11\Q5.exe"
THIS IS CONSTRUCTOR
THE SPEED OF CAR = 25 km/h
THIS IS DESTRUCTOR

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