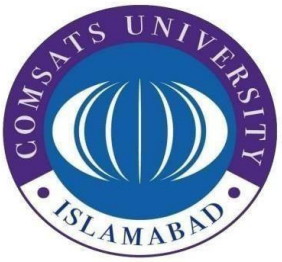
Object Oriented Programming
CSC-241



Lab #02 **Classes and Data Abstraction**

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Class	3B (BEE)
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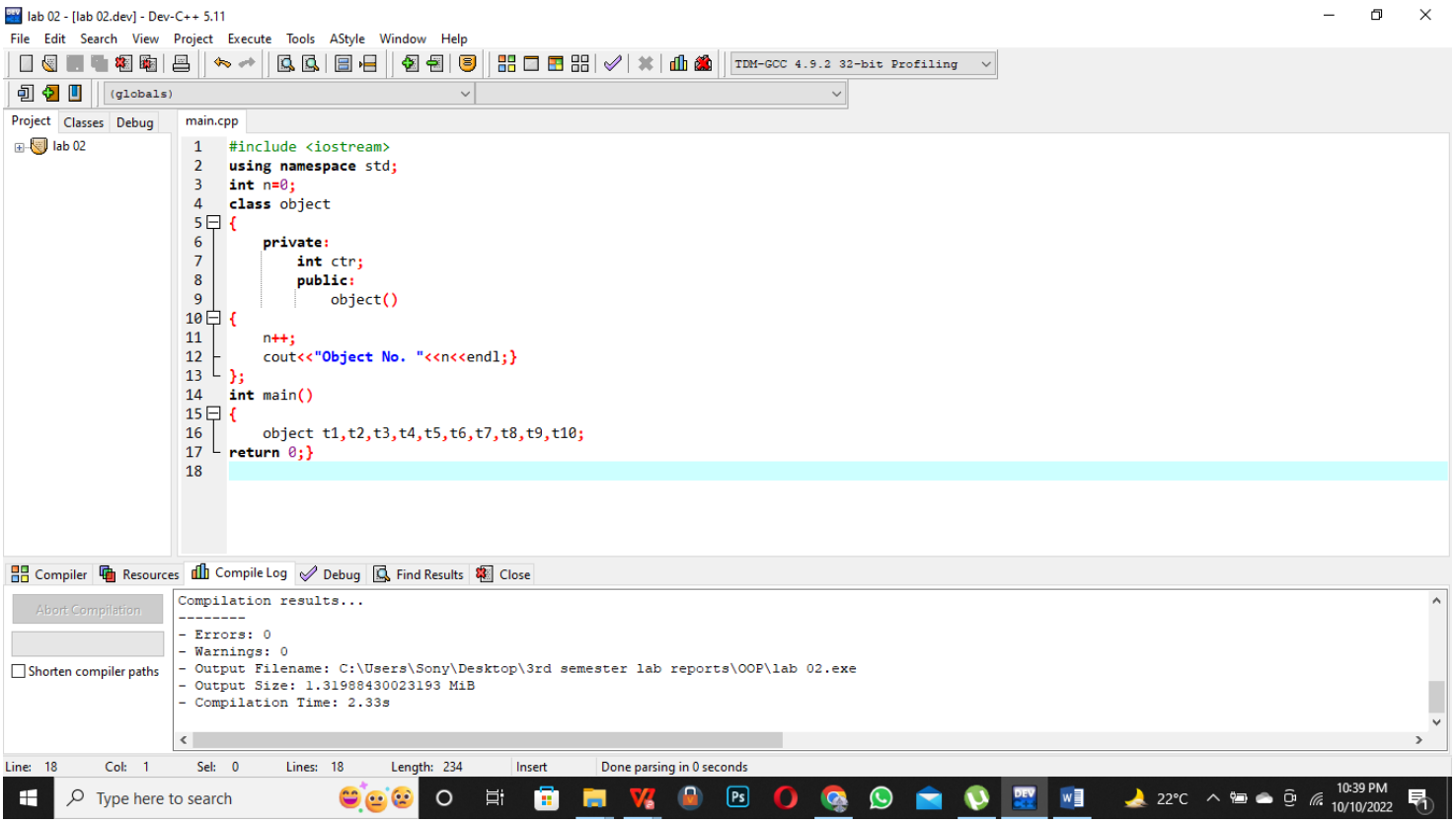
Lab Assessment

Pre-Lab	**In-Lab**	**Post Lab**			**Total**
		Data Presentation	**Data Analysis**	**Writing Style**	

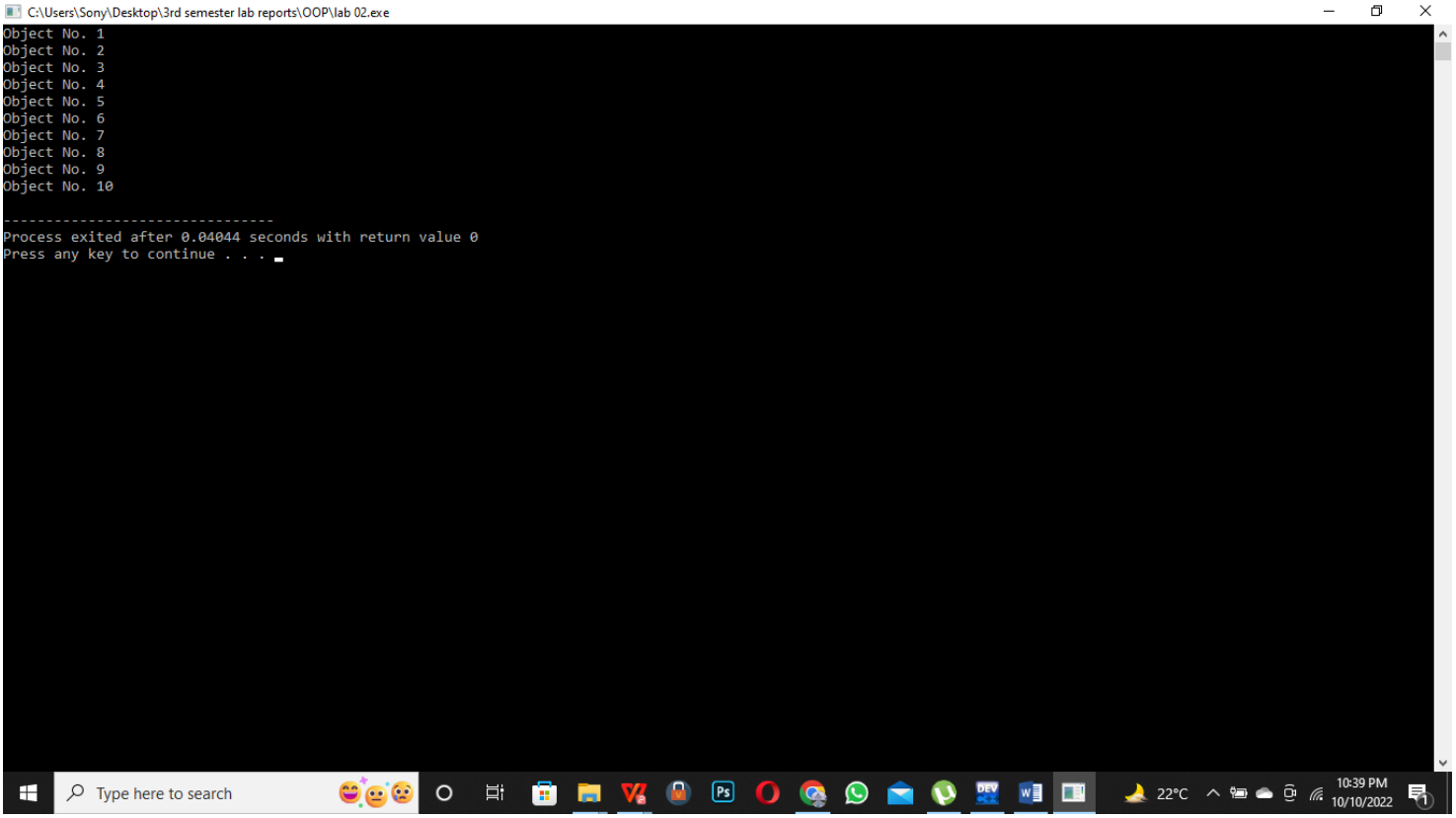
Lab Tasks

5.1 Write a class that displays a simple message “I am object no. __”, on the screen Whenever an object of that class is created.

```
#include <iostream>
using namespace std;
int n=0;
class object
{
	private:
		int ctr;
		public:
			object()
{
	n++;
	cout<<"Object No. "<<n<<endl;}
};
int main()
{
	object t1,t2,t3,t4,t5,t6,t7,t8,t9,t10;
return 0;}
```



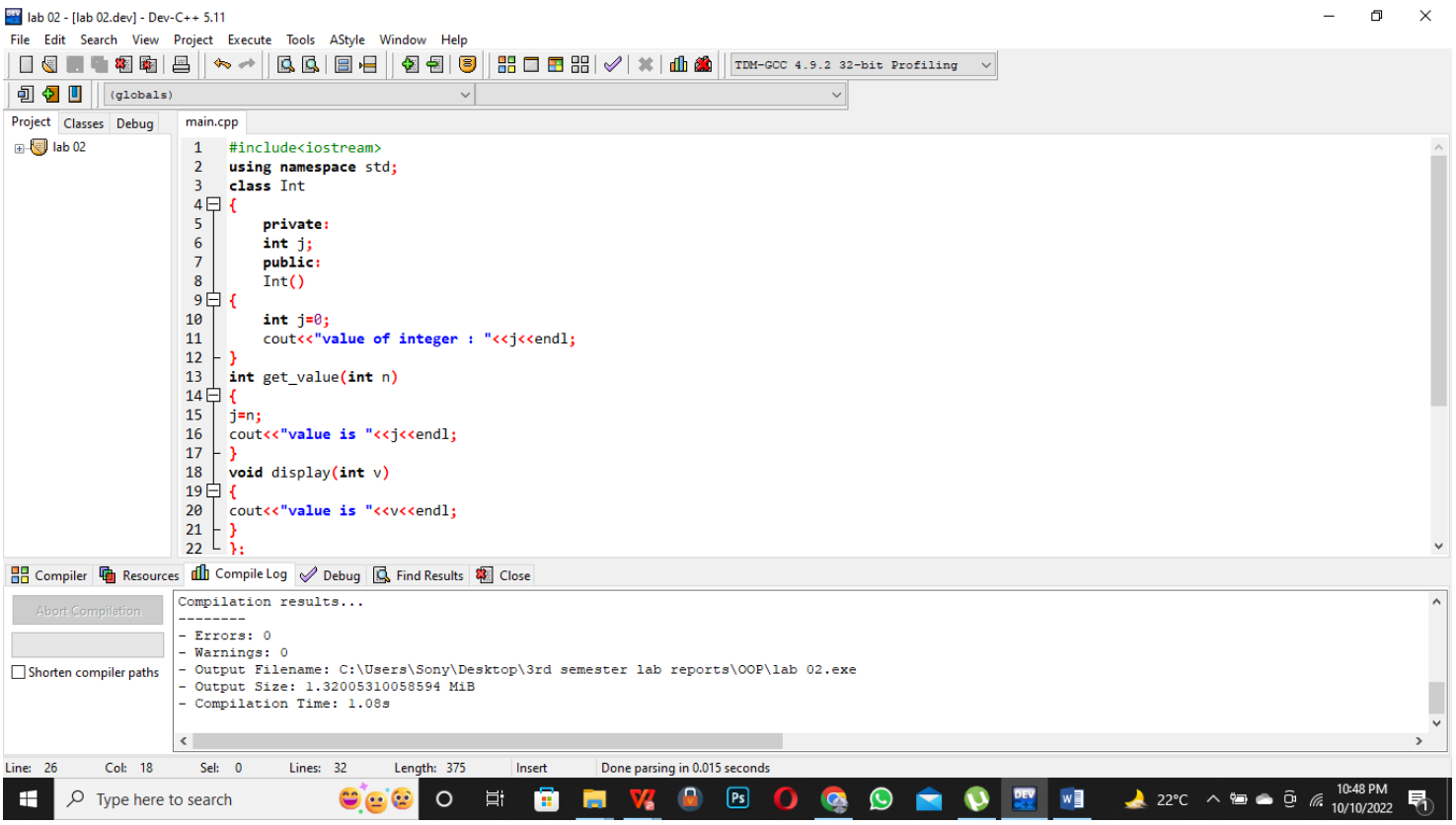
Output:

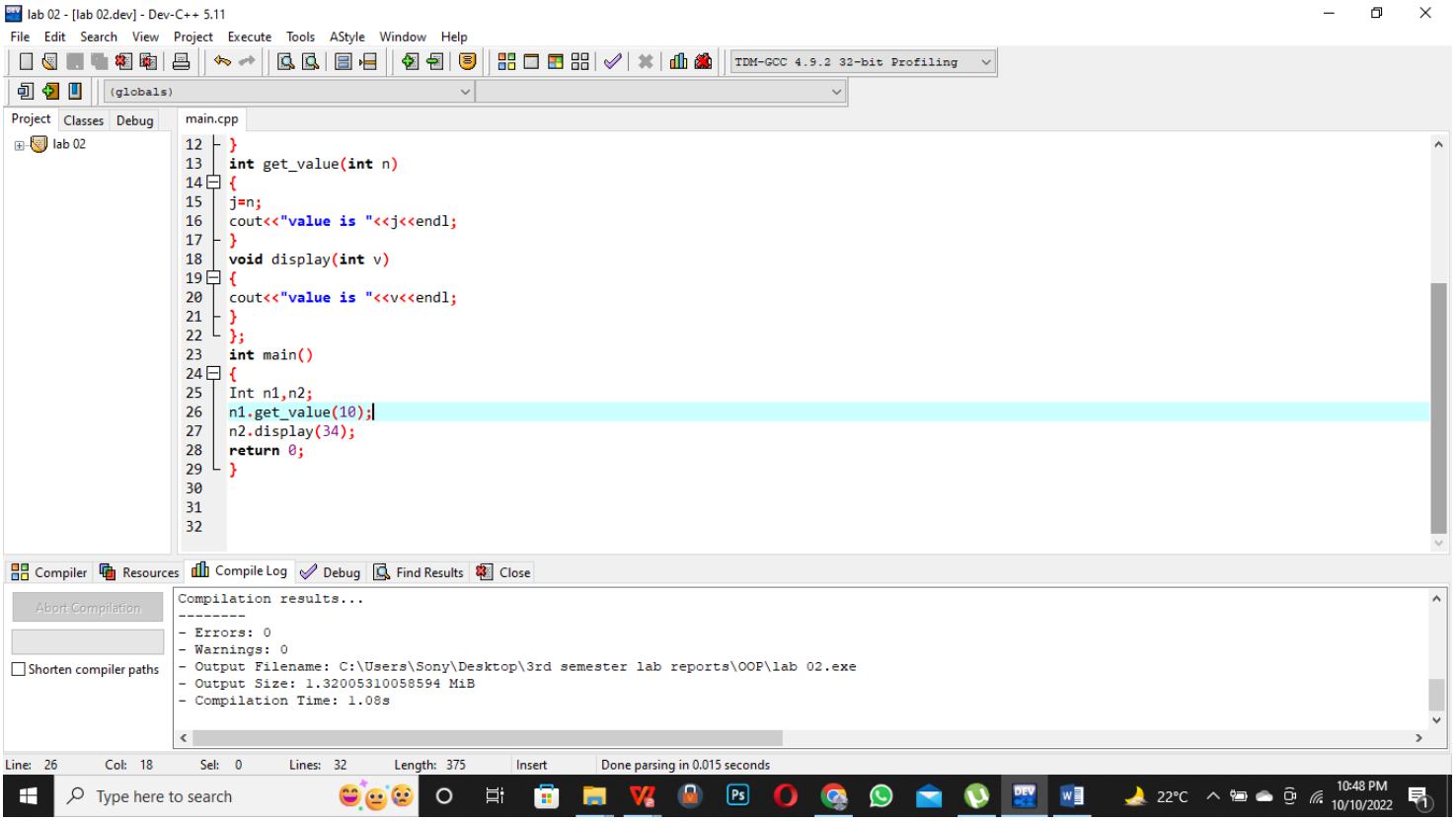


5.2 Create a class that imitates part of the functionality of the basic data type int, call the class Int. The only data in this class is an integer variable. Include member functions to initialize an Int to zero, to initialize it to an integer value and to display it. Write a program that exercises this class by creating an Int variable and calling its member functions.

```
#include<iostream>
using namespace std;
class Int
{
   private:
   int j;
   public:
   Int()
{
   int j=0;
   cout<<"value of integer : "<<j<<endl;
}
int get_value(int n)
{
j=n;
cout<<"value is "<<j<<endl;
}
```

```
void display(int v)
{
cout<<"value is "<<v<<endl;
}
};
int main()
{
Int n1,n2;
n1.get_value(10);
n2.display(34);
return 0;
}
```




lab 02 - [lab 02.dev] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 32-bit Profiling
(globals)
Project Classes Debug
lab 02
main.cpp
12 }
13 int get_value(int n)
14 {
15 j=n;
16 cout<<"value is "<<j<<endl;
17 }
18 void display(int v)
19 {
20 cout<<"value is "<<v<<endl;
21 }
22 };
23 int main()
24 {
25 Int n1,n2;
26 n1.get_value(10);
27 n2.display(34);
28 return 0;
29 }
30
31
32
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
- Output Size: 1.32005310058594 MiB
- Compilation Time: 1.08s
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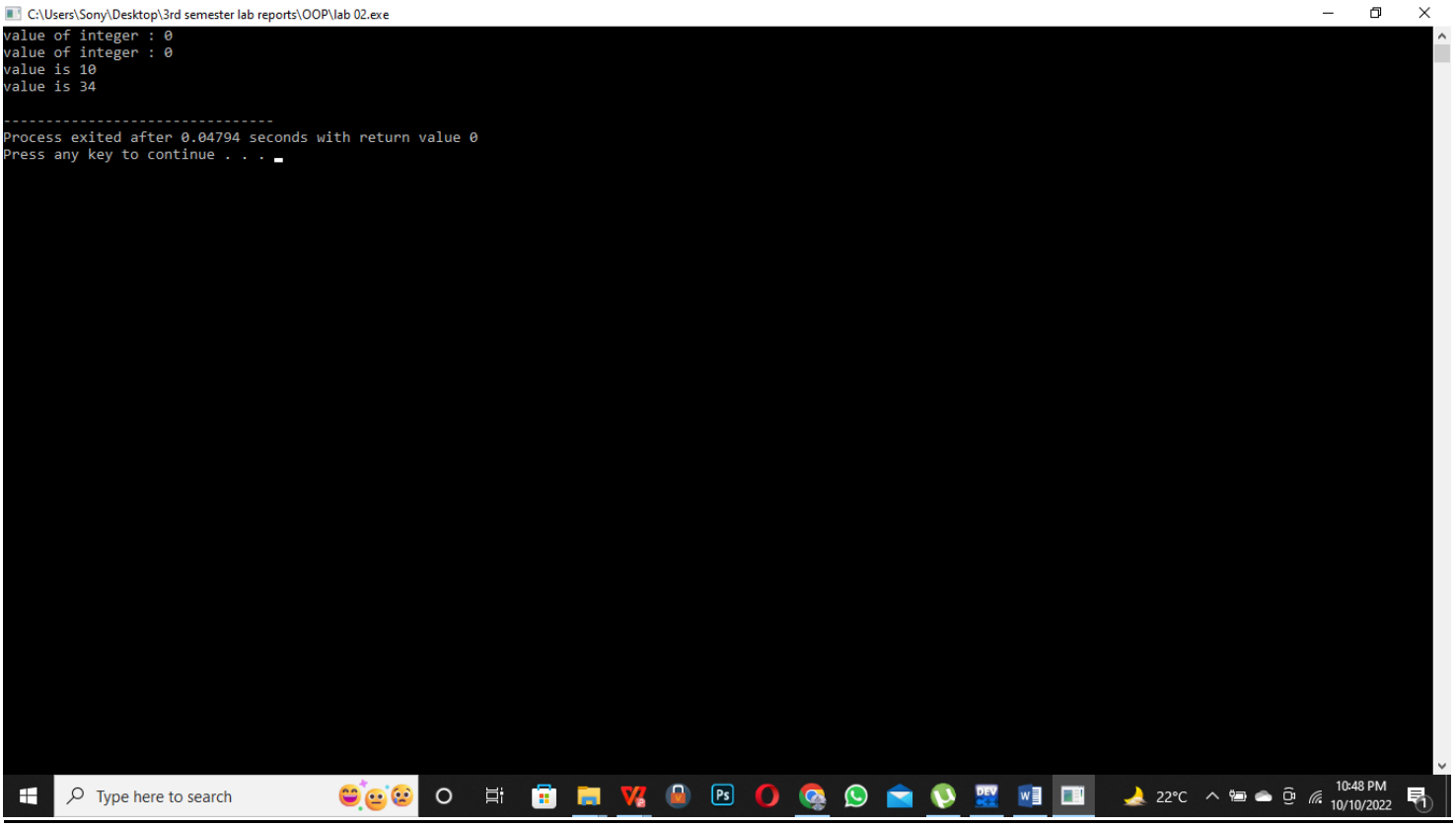
10/10/2022

Output:


C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
value of integer : 0
value of integer : 0
value is 10
value is 34

Process exited after 0.04794 seconds with return value 0
Press any key to continue . . .
Type here to search
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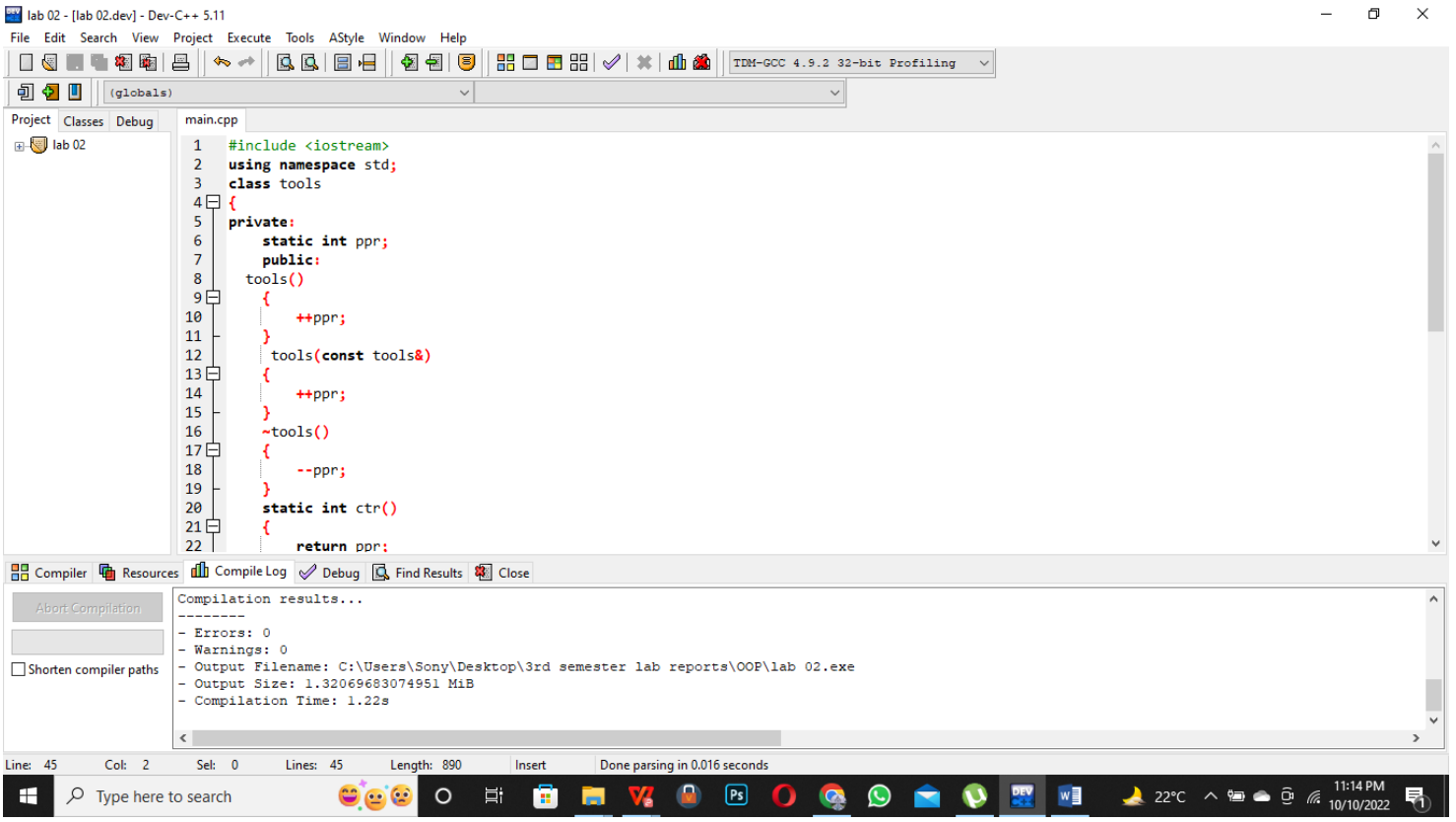
10/10/2022

Home Assignments

6.1 Write a program to calculate the number of objects created and destroyed for the counter class.

```
#include <iostream>
using namespace std;
class tools
{
private:
    static int ppr;
    public:
  tools()
    {
        ++ppr;
    }
     tools(const tools&)
    {
        ++ppr;
    }
    ~tools()
    {
        --ppr;
    }
    static int ctr()
    {
        return ppr;
    }
};
int tools::ppr = 0;
int main()
{
cout << "1: Current object(s): " << tools::ctr()<<endl;
    {
            tools t1;
    cout<<"2: Current object(s): "<<tools::ctr()<<endl;
    }
    cout <<"3: Current object(s): "<<tools::ctr()<<endl;
 tools* ptr1 = new tools();
    cout <<"4: Current object(s): "<<tools::ctr()<<endl;
   delete ptr1;
cout <<"5: Current object(s): "<<tools::ctr()<<endl;
    {
        tools t1;
        tools t2 = t1;
cout<<"6: Current object(s): "<< tools::ctr()<<endl;
    }
    cout <<"7: Current object(s): "<<tools::ctr()<<endl;
    return 0;
}
```


lab 02 - [lab 02.dev] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 32-bit Profiling
(globals)
Project Classes Debug
lab 02
main.cpp
1 #include <iostream>
2 using namespace std;
3 class tools
4 {
5 private:
6 static int ppr;
7 public:
8 tools()
9 {
10 ++ppr;
11 }
12 tools(const tools&)
13 {
14 ++ppr;
15 }
16 ~tools()
17 {
18 --ppr;
19 }
20 static int ctr()
21 {
22 return ppr;
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
- Output Size: 1.32069683074951 MiB
- Compilation Time: 1.22s
Line: 45 Col: 2 Sel: 0 Lines: 45 Length: 890 Insert Done parsing in 0.016 seconds
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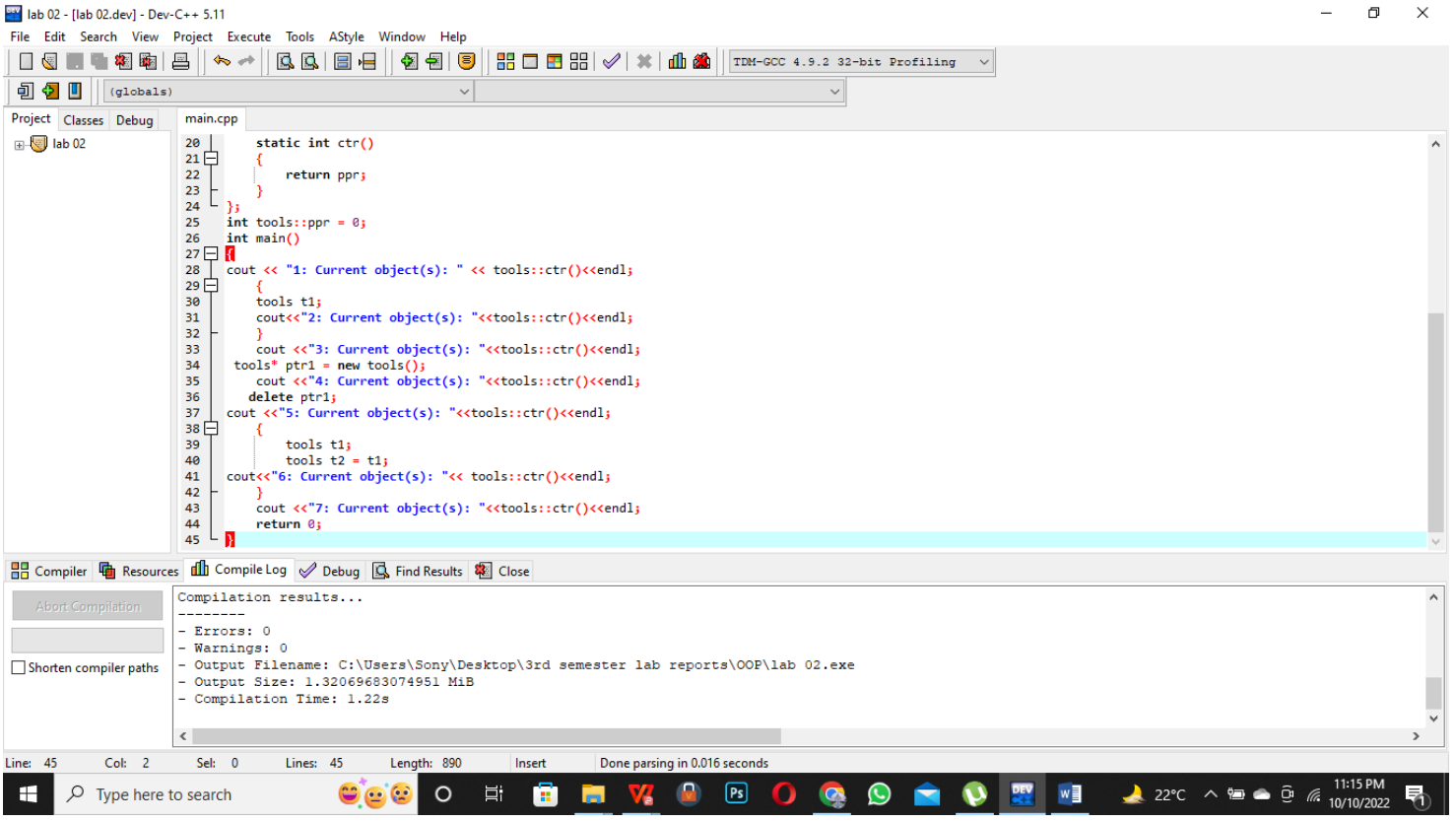
lab 02 - [lab 02.dev] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 32-bit Profiling
(globals)
Project Classes Debug
lab 02
main.cpp
20 static int ctr()
21 {
22 return ppr;
23 }
24 };
25 int tools::ppr = 0;
26 int main()
27 {
28 cout << "1: Current object(s): " << tools::ctr()<<endl;
29 {
30 tools t1;
31 cout<<"2: Current object(s): "<<tools::ctr()<<endl;
32 }
33 cout <<"3: Current object(s): "<<tools::ctr()<<endl;
34 tools* ptr1 = new tools();
35 cout <<"4: Current object(s): "<<tools::ctr()<<endl;
36 delete ptr1;
37 cout <<"5: Current object(s): "<<tools::ctr()<<endl;
38 {
39 tools t1;
40 tools t2 = t1;
41 cout<<"6: Current object(s): "<< tools::ctr()<<endl;
42 }
43 cout <<"7: Current object(s): "<<tools::ctr()<<endl;
44 return 0;
45 }
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
- Output Size: 1.32069683074951 MiB
- Compilation Time: 1.22s
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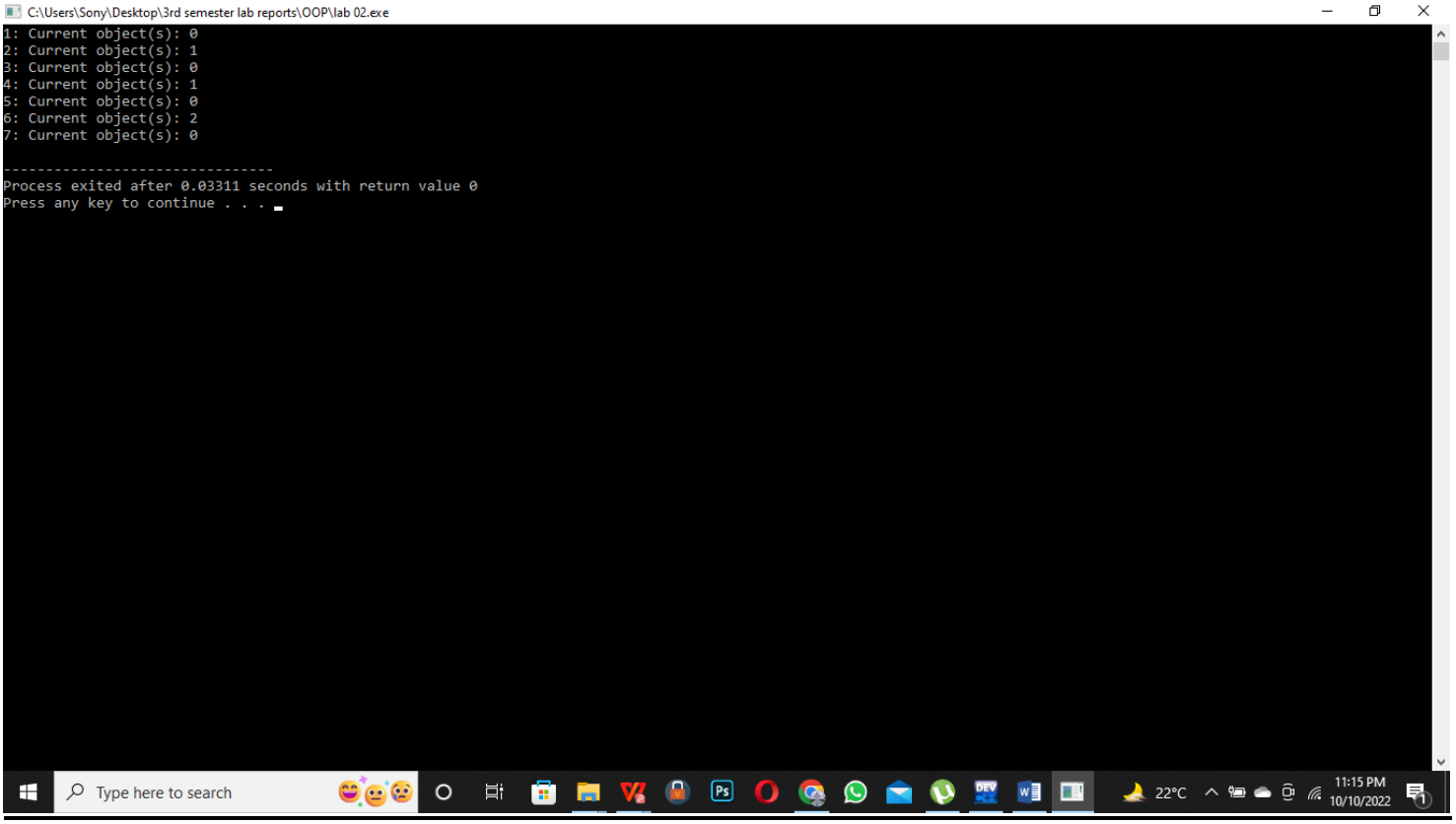
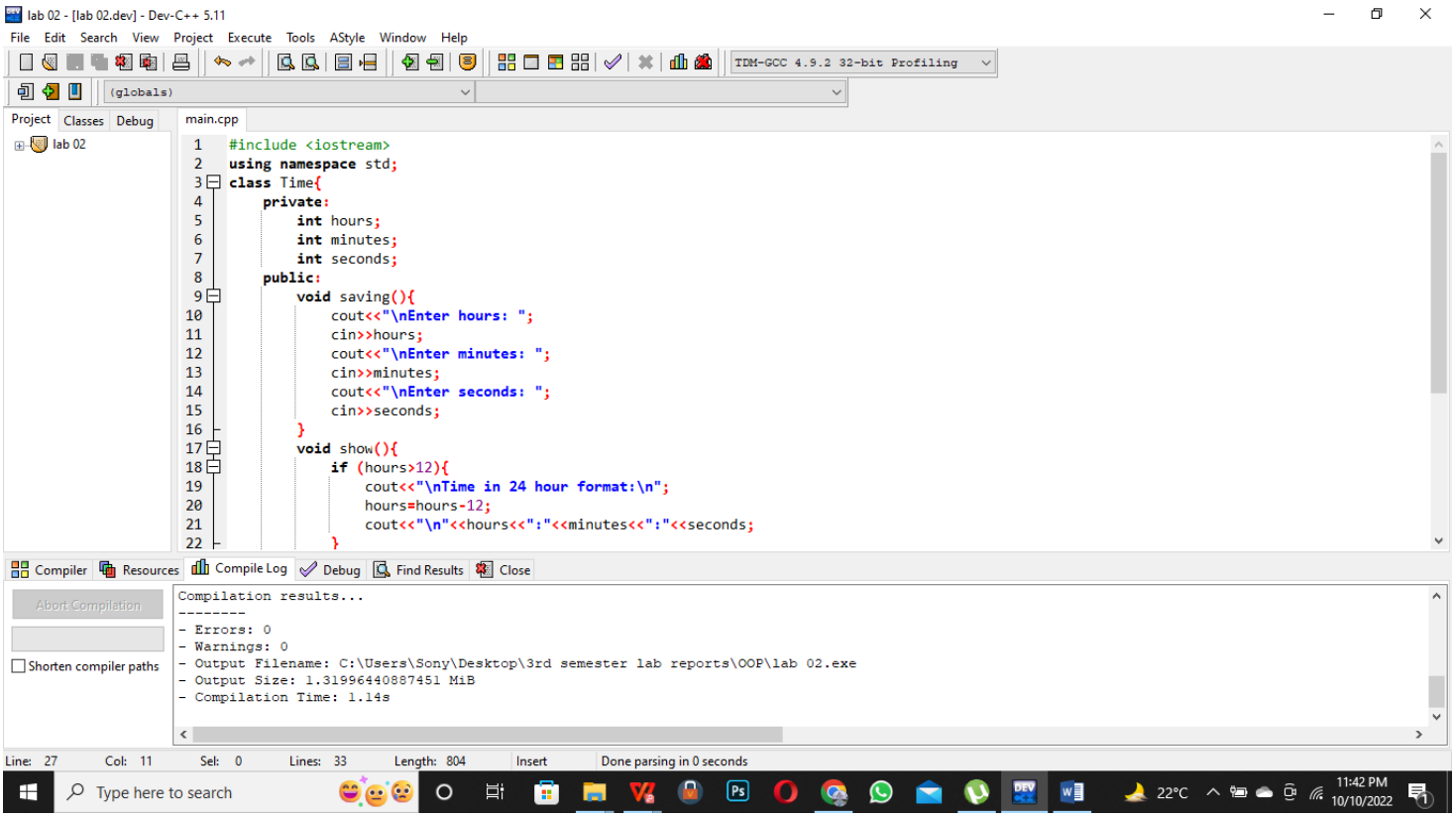
Output:

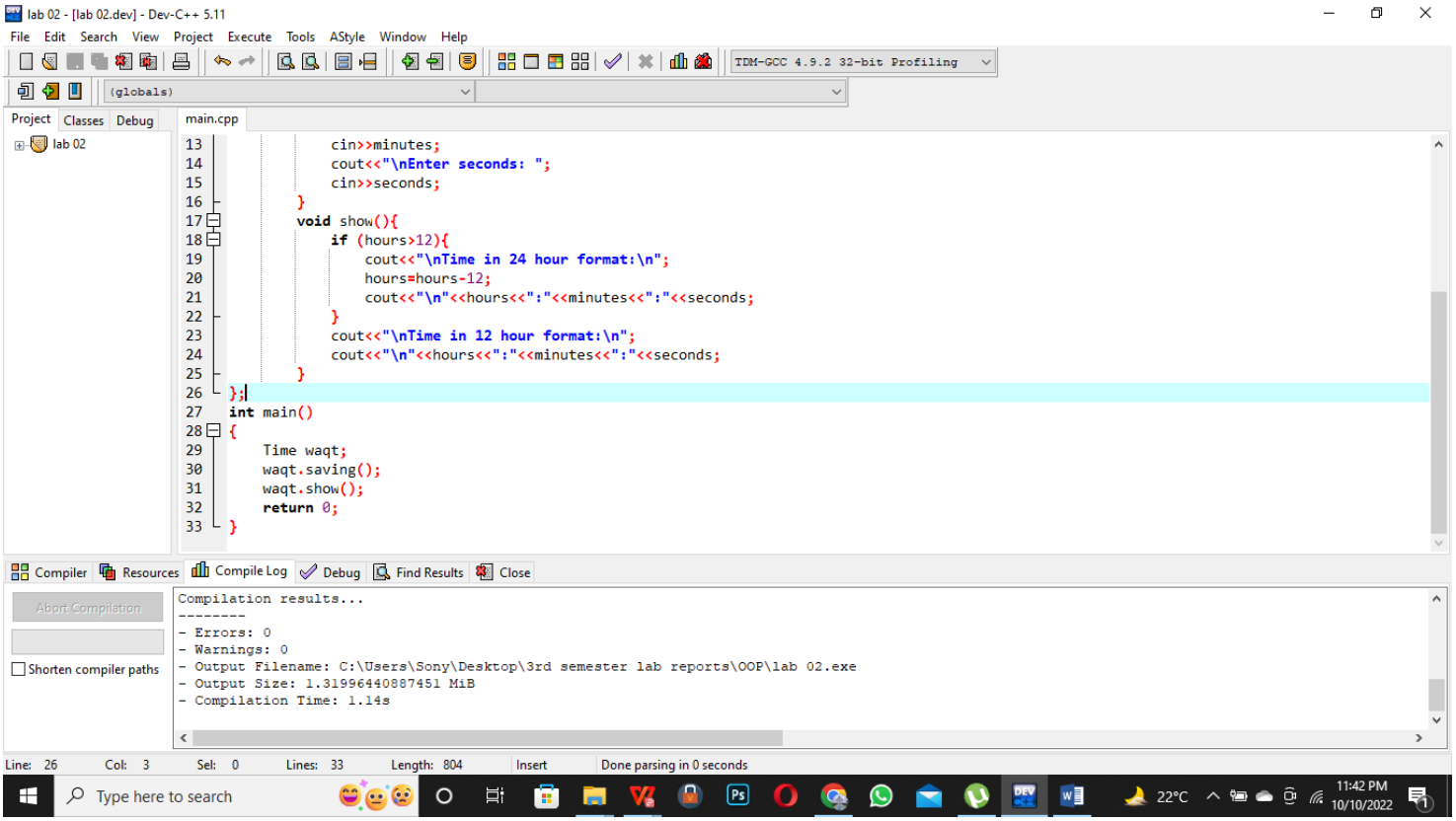


6.2 Create a class named time, the data members are hours, minutes and seconds. Write a Function to read the data members supplied by the user, write a function to display the Data members in standard (24) hour and also in (12) hour format.

```
#include <iostream>
using namespace std;
class Time{
   private:
      int hours;
      int minutes;
      int seconds;
   public:
      void saving(){
         cout<<"\nEnter hours: ";
         cin>>hours;
         cout<<"\nEnter minutes: ";
         cin>>minutes;
         cout<<"\nEnter seconds: ";
         cin>>seconds;
      }
      void show(){
         if (hours>12){
            cout<<"\nTime in 24 hour format:\n";
```

```
            hours=hours-12;
            cout<<"\n"<<hours<<":"<<minutes<<":"<<seconds;
        }
        cout<<"\nTime in 12 hour format:\n";
        cout<<"\n"<<hours<<":"<<minutes<<":"<<seconds;
    }
};
int main()
{
   Time waqt;
   waqt.saving();
   waqt.show();
        return 0;
}
```




lab 02 - [lab 02.dev] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 32-bit Profiling
(globals)
Project Classes Debug
lab 02
main.cpp
cin>>minutes;
cout<<"\nEnter seconds: ";
cin>>seconds;
}
void show(){
if (hours>12){
cout<<"\nTime in 24 hour format:\n";
hours=hours-12;
cout<<"\n"<<hours<<":"<<minutes<<":"<<seconds;
}
cout<<"\nTime in 12 hour format:\n";
cout<<"\n"<<hours<<":"<<minutes<<":"<<seconds;
}
};
int main()
{
Time waqt;
waqt.saving();
waqt.show();
return 0;
}
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
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- Compilation Time: 1.14s
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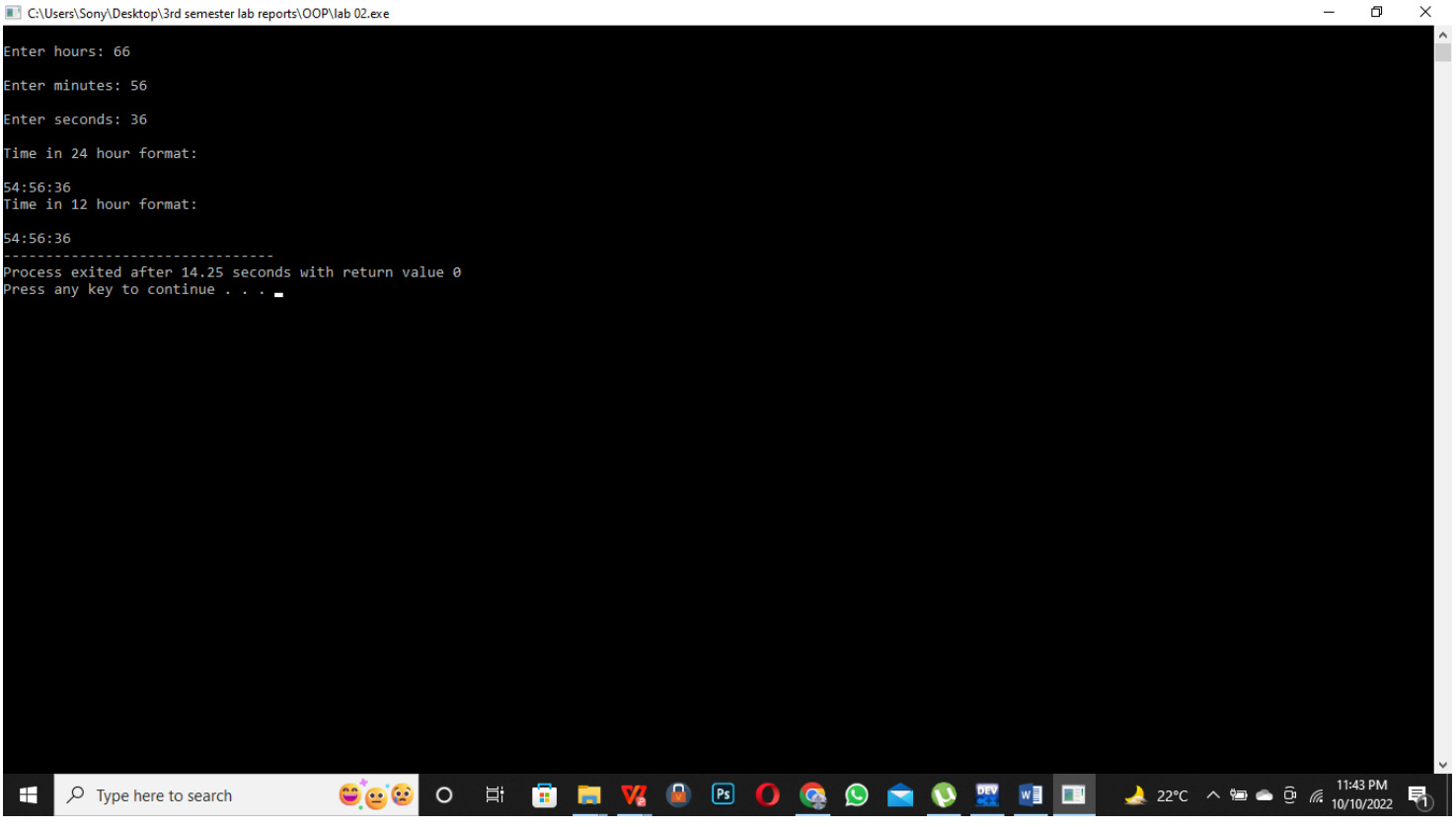
Output:


C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
Enter hours: 66
Enter minutes: 56
Enter seconds: 36
Time in 24 hour format:
54:56:36
Time in 12 hour format:
54:56:36

Process exited after 14.25 seconds with return value 0
Press any key to continue . . .
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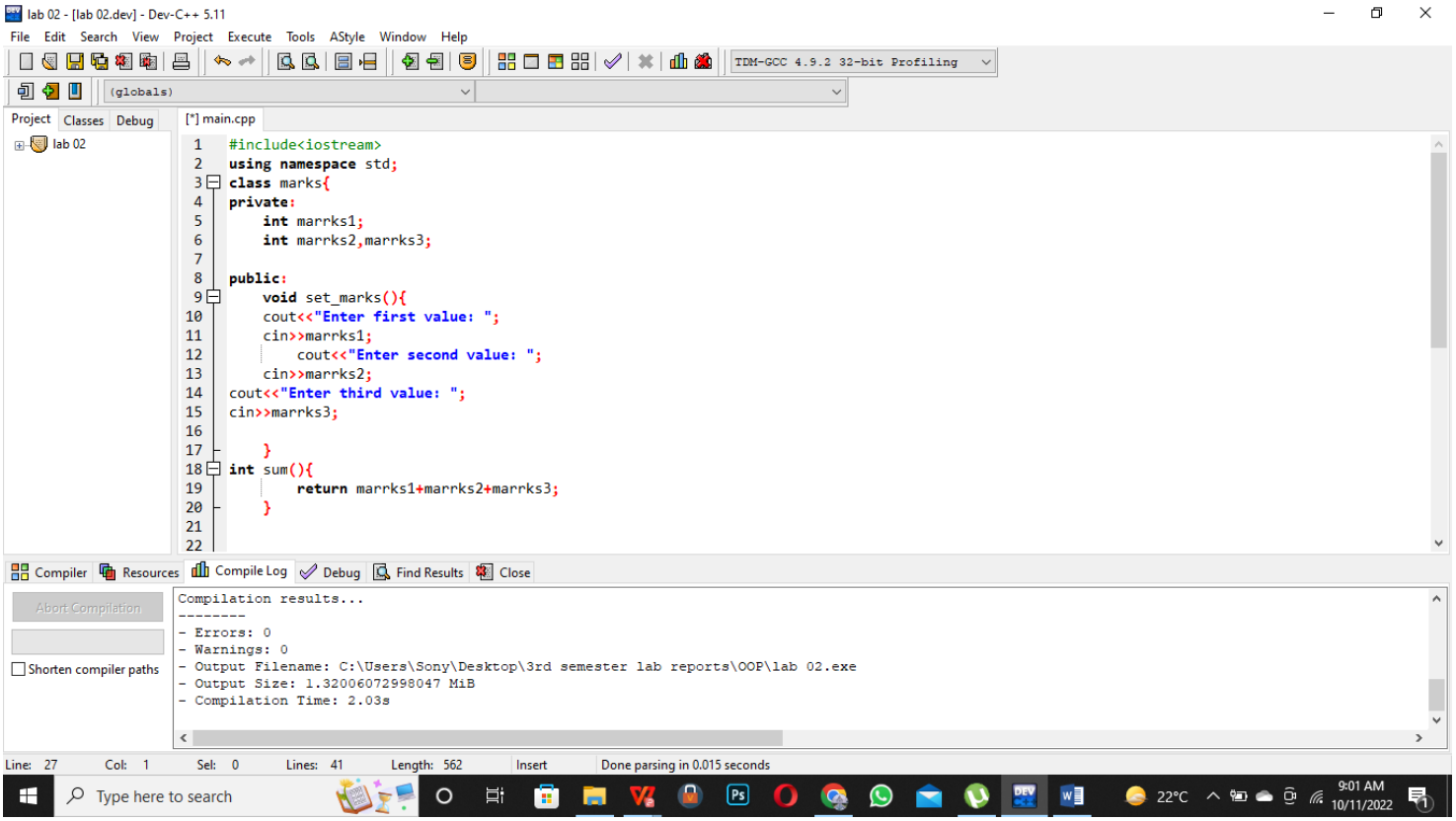
6.3 Write a class marks with three data members to store three marks. Write three Member functions, set_marks() to input marks, sum() to calculate and return the sum And avg() to calculate and return average marks.

```
#include<iostream>
using namespace std;
class marks{
private:
	int marrks1;
	int marrks2,marrks3;

public:
	void set_marks(){
	cout<<"Enter first value: ";
	cin>>marrks1;
	cout<<"Enter second value: ";
	cin>>marrks2;
cout<<"Enter third value: ";
cin>>marrks3;

	}
int sum(){
		return marrks1+marrks2+marrks3;
	}


	float avg(){
		return (float)( sum())/4.0;
	}
};
int main() {
	int num;


	marks mark;
	mark.set_marks();
	cout<<"Sum: "<<mark.sum()<<"\n";
	cout<<"Avg: "<<mark.avg()<<"\n";


	cin>>num;
	return 0;
}
```


lab 02 - [lab 02.dev] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 32-bit Profiling
(globals)
Project Classes Debug
lab 02
[*] main.cpp
#include<iostream>
using namespace std;
class marks{
private:
int marrks1;
int marrks2,marrks3;
public:
void set_marks(){
cout<<"Enter first value: ";
cin>>marrks1;
cout<<"Enter second value: ";
cin>>marrks2;
cout<<"Enter third value: ";
cin>>marrks3;
}
int sum(){
return marrks1+marrks2+marrks3;
}
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
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- Compilation Time: 2.03s
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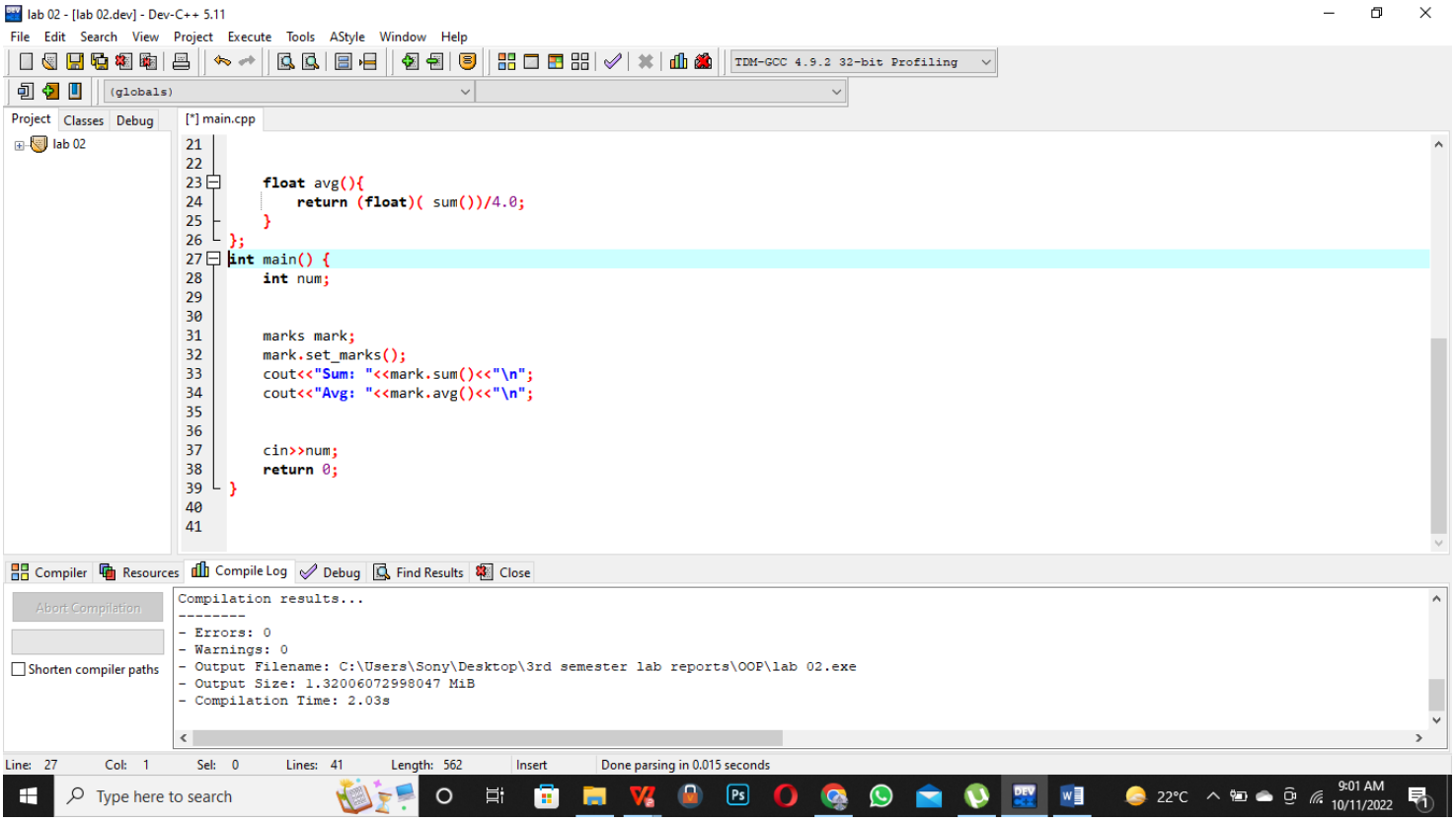
lab 02 - [lab 02.dev] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 32-bit Profiling
(globals)
Project Classes Debug
lab 02
[*] main.cpp
float avg(){
return (float)(sum())/4.0;
}
};
int main() {
int num;
marks mark;
mark.set_marks();
cout<<"Sum: "<<mark.sum()<<"\n";
cout<<"Avg: "<<mark.avg()<<"\n";
cin>>num;
return 0;
}
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
Shorten compiler paths
Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Sony\Desktop\3rd semester lab reports\OOP\lab 02.exe
- Output Size: 1.32006072998047 MiB
- Compilation Time: 2.03s
Line: 27 Col: 1 Sel: 0 Lines: 41 Length: 562 Insert Done parsing in 0.015 seconds
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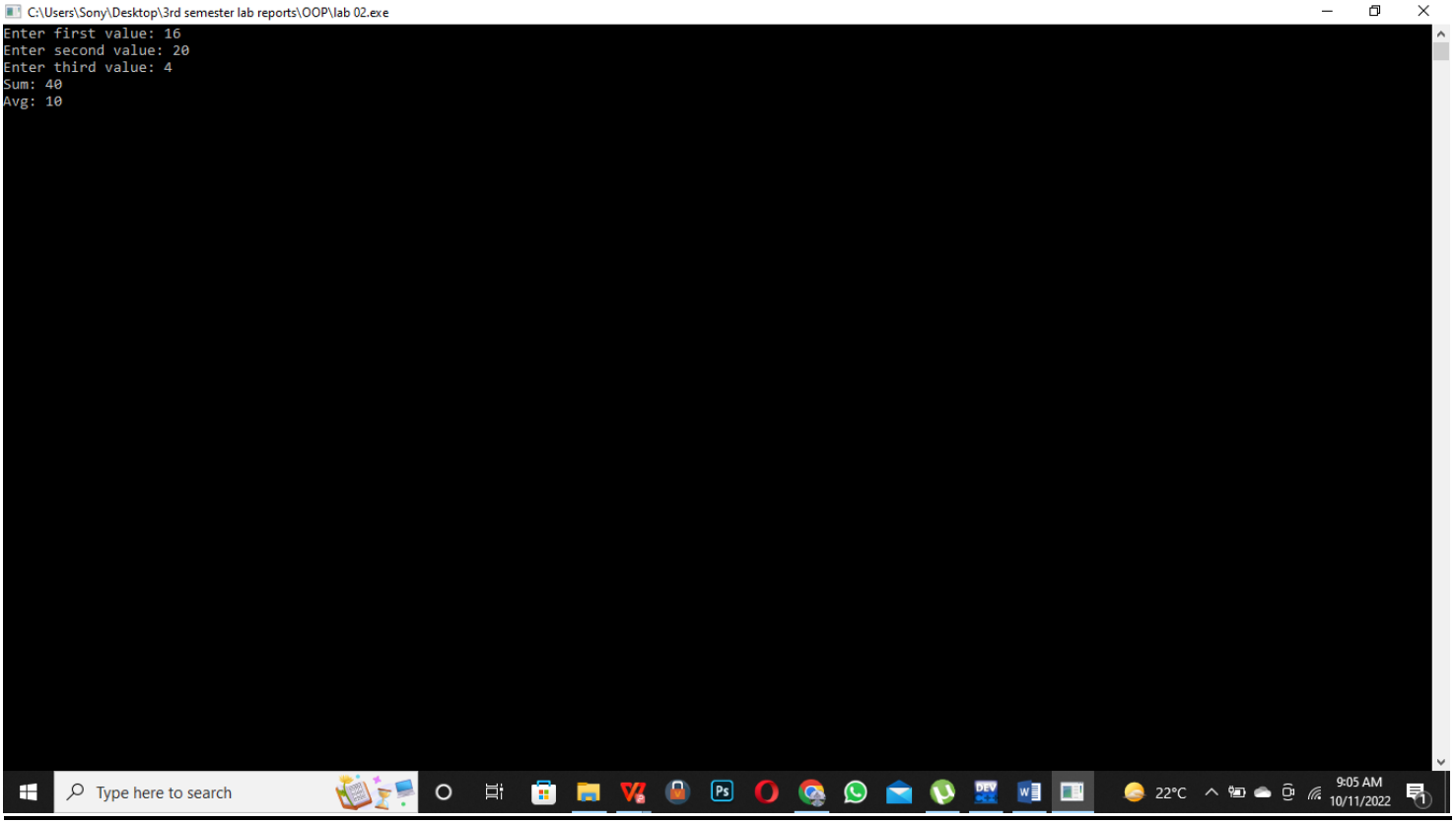
Output:



Critical Analysis/Conclusions:

In this lab we learn the construction of objects using classes along With its member functions and variables of specific data type of a class. We Learn how to Define constructor both inside and outside of class and we learn how to use Destructor in Classes. Moreover this lab helps us to understand the importance of constructor Or destructor in classes while doing construction of objects.