Object Oriented Programming

Lab Report

Lab05

Group Members Name & Reg #:	**Muhammad Haris Irfan** **(FA18-BCE-090)**
Class	Object Oriented Programming CSC241 (**BCE-4B**)
Instructor's Name	Maam Amber Madeeha Zeb

In Lab Tasks

5.1 Task 1:

Area of a circle is π × r2 where r = radius
Area of a triangle is ½ × b × h where b = base, h = height

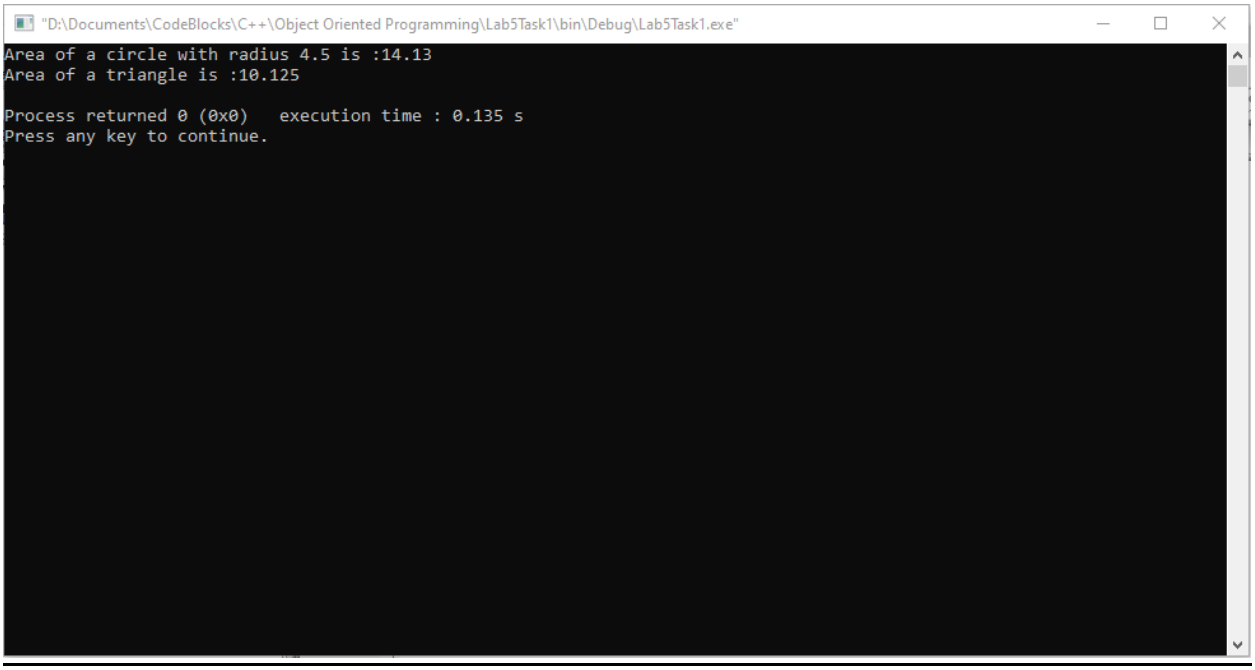
Write two different functions with same name that is Area to calculate the area of circle, triangle, rectangle and square

Solution:

The code is given below,

```
#include <iostream>

using namespace std;
class area
{
private:
    int x;
    int y;

public:

area()
{

}
void areaa(float x)
{
    cout<<"Area of a circle with radius "<<x<<" is :" <<(3.14*x)<<endl;
}
void areaa(float a, float b)
{
cout<<"Area of a triangle is :" <<(0.5*a*b)<<endl;
}
};
int main()
{
    area a;
    a.areaa(4.5);
    a.areaa(4.5,4.5);

    return 0;
}
```

Console Output is shown below.



5.2 Task:2

Write a definition of a Counter class having one private data member count of integer type. This class has following functions

- **void inc_count( ); // will increment the value of count by 1**
- **int get_count ( ); // will return the value of count**

this class has two contructor

- **Counter( ); // that initialize count by 0**
- **Counter (int i); // that initialize the count by i**

Create two objects of Counter class. Write a cout statement in constructor and then check whether that statement appear when two object are created. Then increment object 1 3 times and increment object 2 4 times and display their count values.

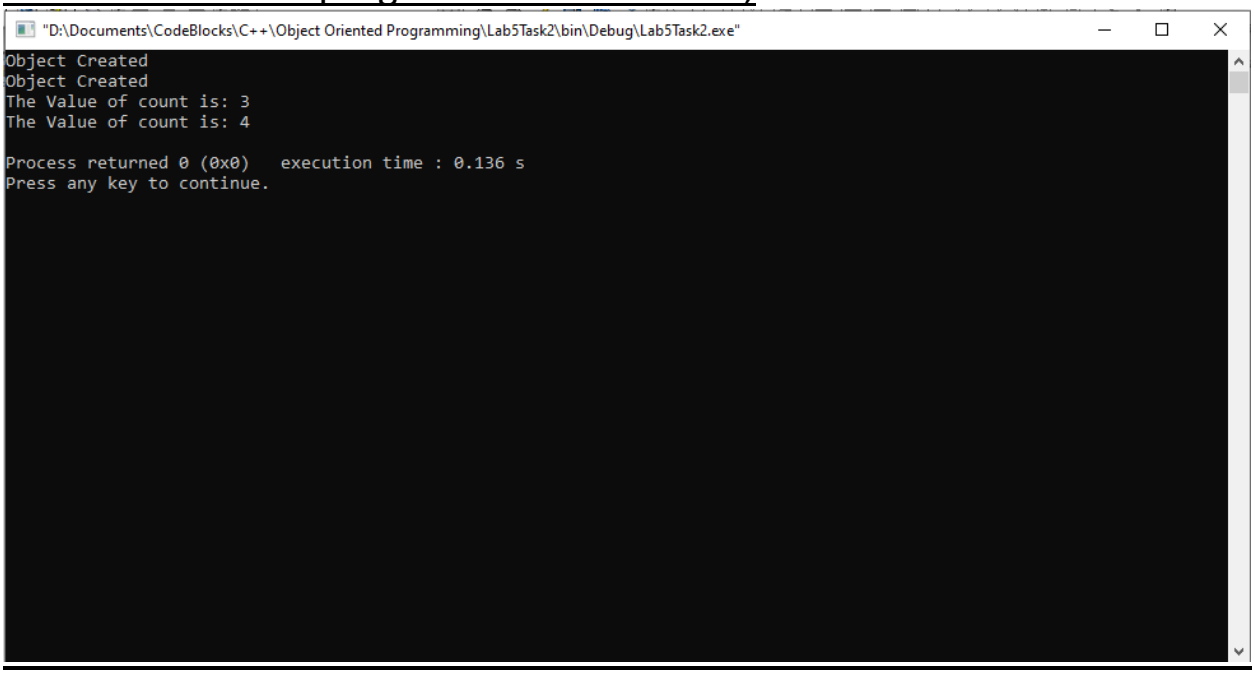
Solution:

I am attaching my code below,

```
#include <iostream>

using namespace std;

class counterClass
{
private:
    int x;

public:

    counterClass()
    {
     x=0;
     cout<<"Object Created"<<endl;
    }
    counterClass(int i)
    {
     x=i;
    }

    void inc_count()
    {
     x=x+1;
```

```
25      }
26
27      int get_count()
28      {
29      cout<<"The Value of count is: "<<x<<endl;
30      }
31  };
32  int main()
33  {
34  counterClass a,b;
35  a.inc_count();
36  a.inc_count();
37  a.inc_count();
38
39  b.inc_count();
40  b.inc_count();
41  b.inc_count();
42  b.inc_count();
43
44  a.get_count();
45  b.get_count();
46
47      return 0;
48  }
```

The result for this program is shown below,



5.3 Task:3

Write a definition of class named Race. It has following private data member

- **carNo (int)**
- **driverID (int)**
- **carModel (int)**

The class has one constructor Race (int, int, int) that initializes the values of carNo, driverID and carModel. Race class has following member functions

- **void InputValues( ) // this will be used to input values of data member of Book object from user**
- **void setValues(int cn, int di, int cm); // it will assign values of cn, di and cm to carNo, driverID and carModel respectively**
- **void display( ); // it displays the value of private**

Create two object of Race class. Assign values using InputValues and setValues function and display them using display function.

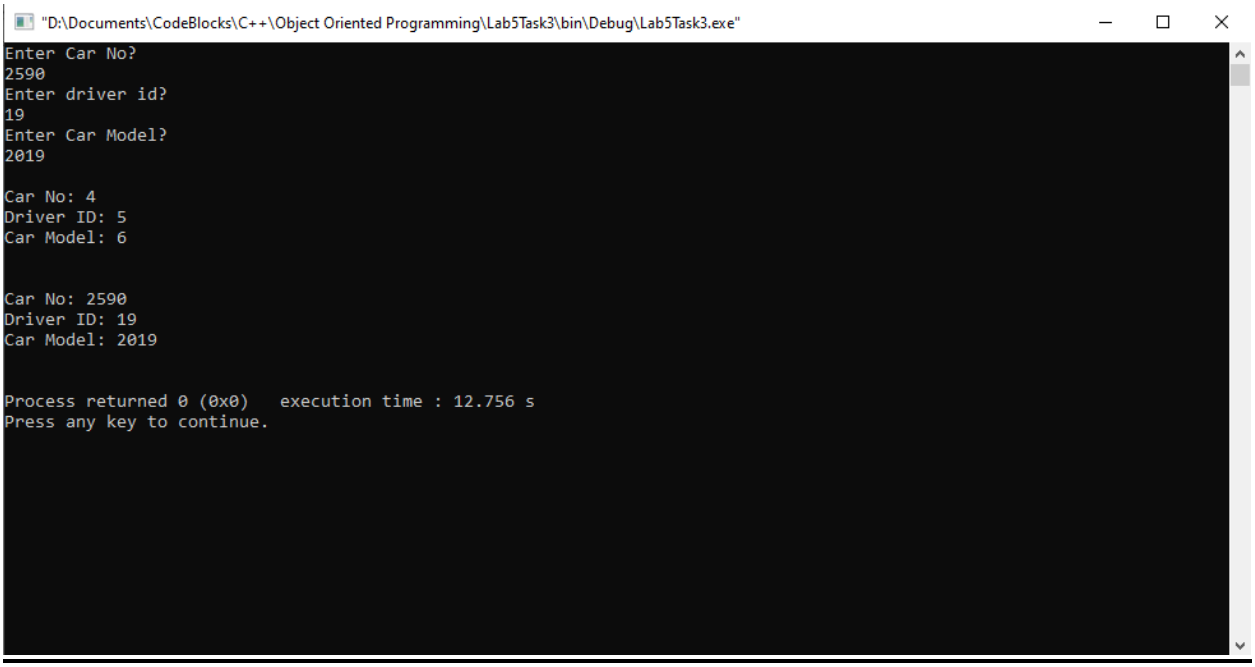
Solution:

I am attaching my code below,

```
#include <iostream>

using namespace std;


class Race
{
private:
    int carNO;
    int driverID;
    int carModel;



public:
    Race()
    {

    }

    Race(int x, int y, int z)
    {
        carNO=x;
        driverID=y;
        carModel=z;
```

```
26      }
27
28      void inputvalues()
29      {
30          cout<<"Enter Car No?"<<endl;
31          cin>>carNO;
32          cout<<"Enter driver id?"<<endl;
33          cin>>driverID;
34          cout<<"Enter Car Model?"<<endl;
35          cin>>carModel;
36
37      }
38
39      void setvalues(int a, int b, int c)
40      {
41          carNO=a;
42          driverID=b;
43          carModel=c;
44      }
45
46      void display()
47      {
48          cout<<endl<<"Car No: "<<carNO<<endl;
49          cout<<"Driver ID: "<<driverID<<endl;
50          cout<<"Car Model: "<<carModel<<endl<<endl;
51
52      }
53  };
54
55
56
57  int main()
58  {
59     Race a,b;
60     a.setvalues(4,5,6);
61     b.inputvalues();
62     a.display();
63     b.display();
64      return 0;
65  }
```

the result for this program is shown below,


"D:\Documents\CodeBlocks\C++\Object Oriented Programming\Lab5Task3\bin\Debug\Lab5Task3.exe"
Enter Car No?
2590
Enter driver id?
19
Enter Car Model?
2019
Car No: 4
Driver ID: 5
Car Model: 6
Car No: 2590
Driver ID: 19
Car Model: 2019
Process returned 0 (0x0) execution time : 12.756 s
Press any key to continue.

5.4 Task:4

Write a definition of a distance class as shown in the example 4.2 above. Make all the appropriate function constant. Include a constant data member called id of integer type.
Create two object constant and non-constant. Assign values and display them. Also check what happens

- **If you try to modify private data member of an object from the definition of const function**
- **If you try to modify the private data member of const object from the definition of non-constant function.**

Solution:

I am attaching my code below,

```
#include <iostream>
using namespace std;
class Distance //English Distance class
{
private:
int feet;
float inches;
public:
Distance(){
cout<<"default constructor"<<endl;
feet = 0; inches = 0;
}
Distance(float mtrs){
// this constructor convert meters to feet and inches
cout<<"one argument constructor"<<endl;
float ft = mtrs * 3.28084; // convertinf meters to feet
feet = (int) ft; // extracting int part from ft
inches = (ft - feet)*12; // converting decimal part of ft into inches
}
Distance (int f, float i){
cout<<"two argument constructor"<<endl;
feet = f; inches = i;
}
void setdist(int ft, float in) const{ //set Distance to args
feet = ft;
inches = in;
}
void getdist()const { //get length from user
cout << "\nEnter feet: "; cin >> feet;
cout << "Enter inches: "; cin >> inches;
}
void initialize( ) const{
feet = 0;
inches = 0;
```

```
35  }
36  void showdist( ) const{ //display distance
37  cout << "feet = "<< feet <<"\t inches = "<<inches<<endl;
38  }
39  };
40  main()
41  {
42  /*two objects are created so default constructor is called two times*/
43  Distance dist1, dist2; // objects data member are initialize by default constructor
44  const Distance  dist6;
45  /* if default constructor is not present then
46  we have to call initialize function with each
47  object to initialize its private data member */
48  //dist1.initialize(); // in comments because we have
49  //dist2.initialize(); // default constructor
50  dist1.setdist(11, 6.25); //set dist1 values using setdist function
51  Distance dist3(3, 5.75); // here 2 argument constructor will be called
52  // that initialize dist3 data member with 3 and 5.75 values
53  Distance dist4(1); // here 1 argument construct will be called
54  dist6(11,76.8)
55  cout << "dist1 : "; dist1.showdist();
56  cout << "dist2 : "; dist2.showdist();
57  cout << "dist3 : "; dist3.showdist();
58  cout << "dist4 : "; dist4.showdist();
59  cout << "dist6 : "; dist6.showdist();
60
61  }
```

In both the cases the compiler will give us an error as we cannot change or update a constant variable.

POST LAB

6.1 Question 1:

Write a definition of class named Date that contains three elements the month, the day of the month, and the year, all of type int.

- **Write two constructors, a default constructor (that initialize each data element of object with zero) and a constructor that takes three parameters (the month, the day of the month, and the year) and initialize the data member of the object with these parameters.**
- **Write a function void printDate() that displays the data elements of the object.**
- **Write a function void setDate(int, int, int) that takes three parameters (he month, the day of the month, and the year) and initialize the data member of the object with these parameters.**

Write a main function create two object of class Date, the data member of one object is initialized with zero through default constructor. The data member of second object is initialized with some values using a constructor that takes three parameters. Page 24 of 80

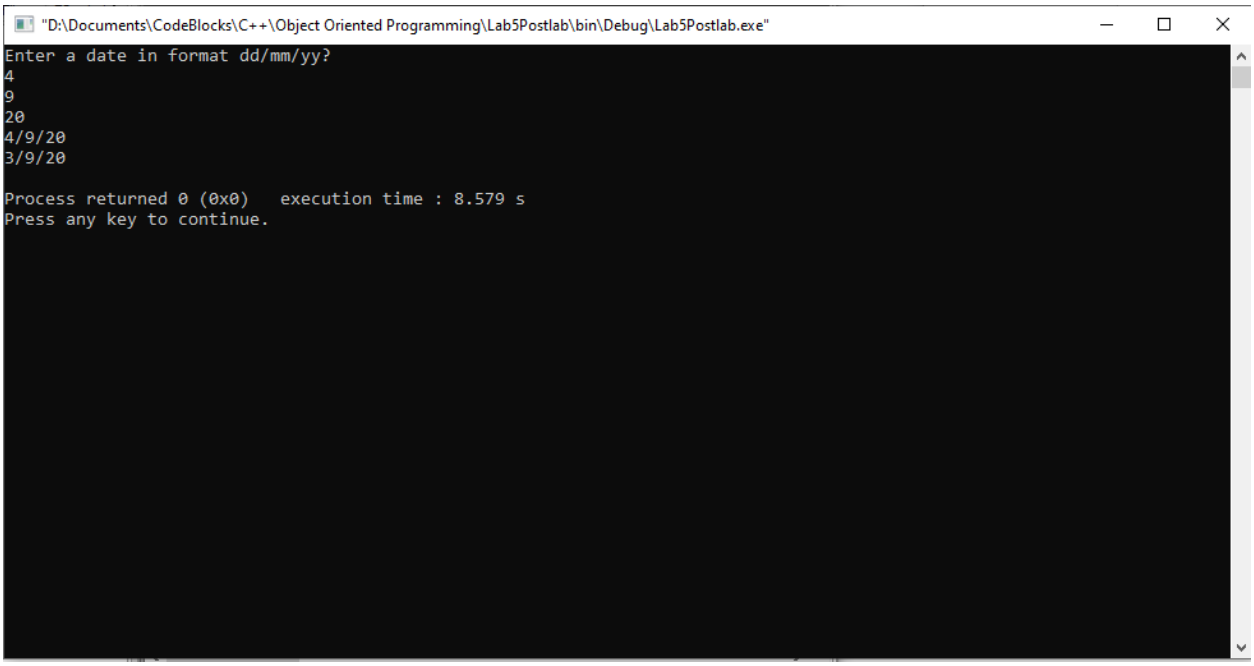
Prompt the user to input date (the month, the day of the month, and the year) in a main function, assign these values to the first object (using function setDate) and then display the value of the data members of two objects using function printDate().

Solution:

I am attaching my code below,

```cpp
#include <iostream>

using namespace std;

class Date
{
private:
    int day;
    int month;
    int year;

public:

    Date()
    {
        day=0;
        month=0;
        year=0;
    }
    Date(int x, int y, int z)
    {
        day=x;
        month=y;
        year=z;
    }

    void printDate()
    {
        cout<<day<<"/"<<month<<"/"<<year<<endl;

    }
    void setDate(int a, int b ,int c)
    {
        day=a;
        month=b;
        year=c;
    }

};

int main()
{
    int x,y,z;
    Date one;
    Date two(3,9,20);

    cout<<"Enter a date in format dd/mm/yy?"<<endl;
    cin>>x;
    cin>>y;
    cin>>z;
    one.setDate(x,y,z);
    one.printDate();
    two.printDate();

    return 0;
}
```

The result for this program is shown below,


"D:\Documents\CodeBlocks\C++\Object Oriented Programming\Lab5Postlab\bin\Debug\Lab5Postlab.exe"
Enter a date in format dd/mm/yy?
4
9
20
4/9/20
3/9/20
Process returned 0 (0x0)   execution time : 8.579 s
Press any key to continue.

_____THE END_____