Mehran University of Engineering and Technology Jamshoro


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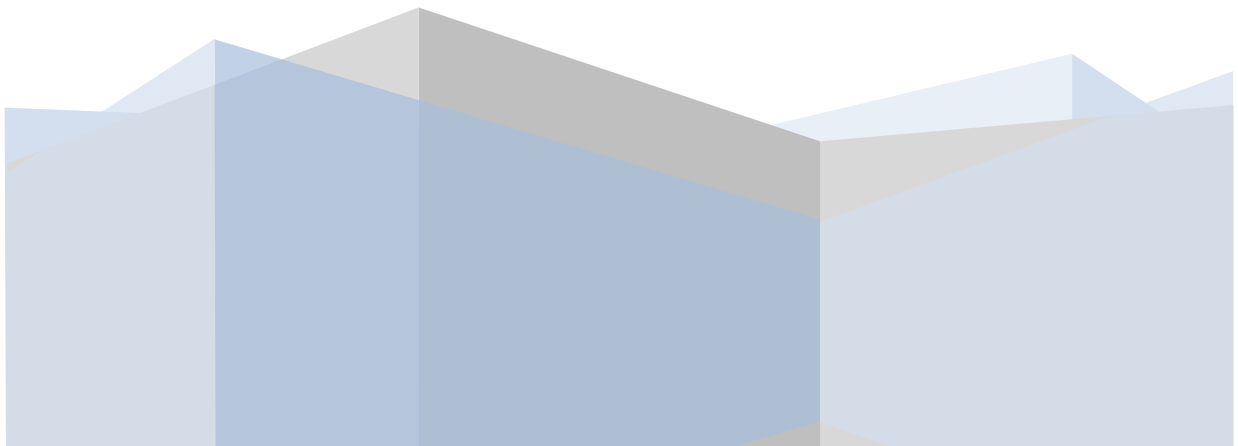
| **ASSIGNMENT** | **:LAB 010** |
| **SUBJECT** | **:PROGRAMMING FUNDAMENTALS** |
| **ROLL NO** | **:24BSAI29** |
| **SUBMITTED BY** | **: SYED MUHAMMAD QASIM** |
| **SUBMITTED TO** | **:MA'AM FAHAMA BARKZAI** |



**Department of Software Engineering**
**Mehran University of Engineering and Technology, Jamshoro**

| Course: AI-112 – Programming Fundamentals | | | |
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| **Instructor** | Engr. Fahama Barakzai | **Practical/Lab No.** | 10 – 12 |
| **Date** | | **CLOs** | 3 |
| **Signature** | | **Assessment Score** | 03 Marks |

| **Topic** | **Object Oriented Programming in C++** |
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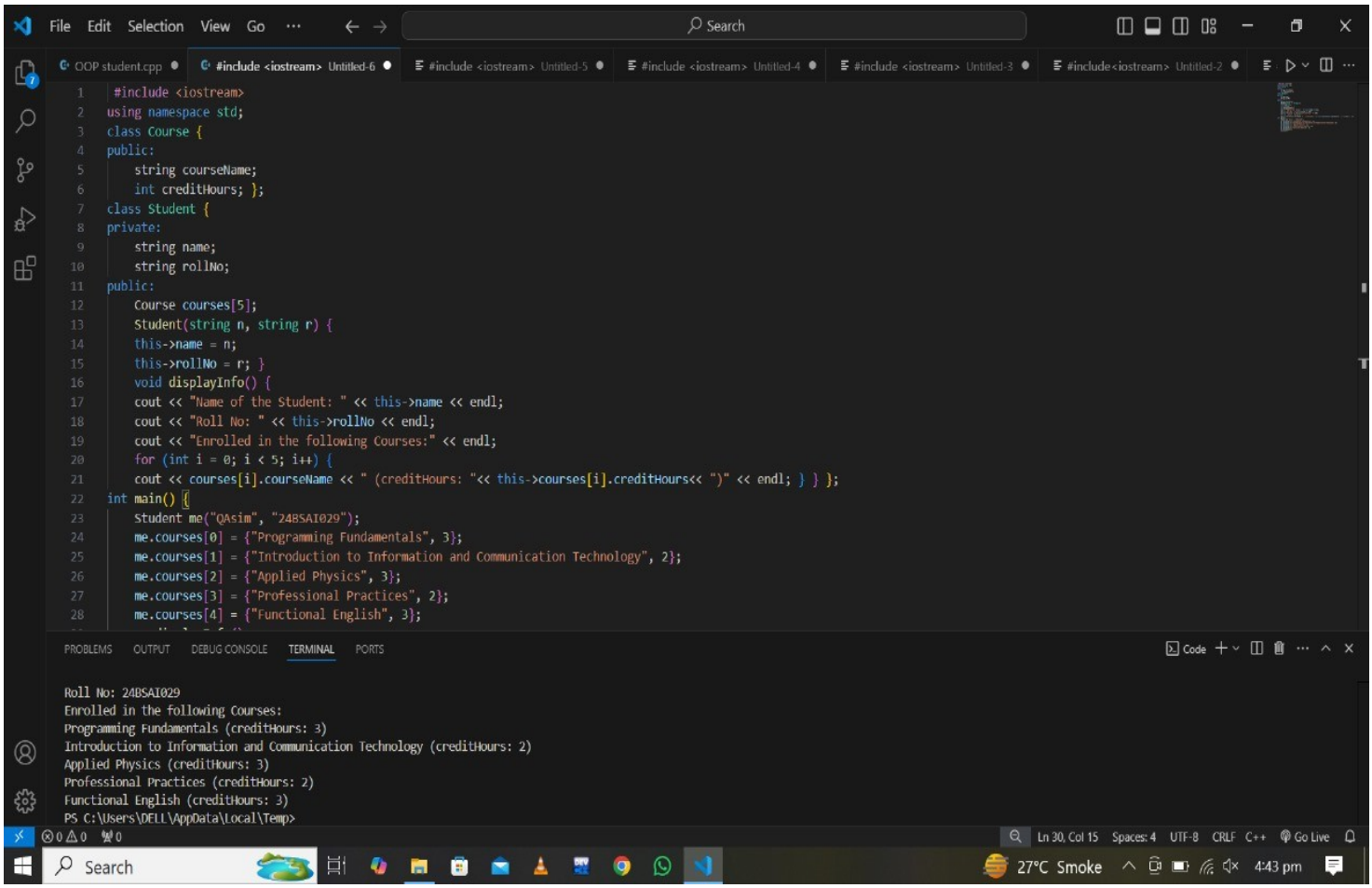
| **Objectives** | - To become familiar with OOP in C++.<br>- To work with concepts like Classes, Constructors and Destructors.<br>- To become familiar with Inheritance and Polymorphism in C++. |

## Lab Discussion: Theoretical concepts and Procedural steps

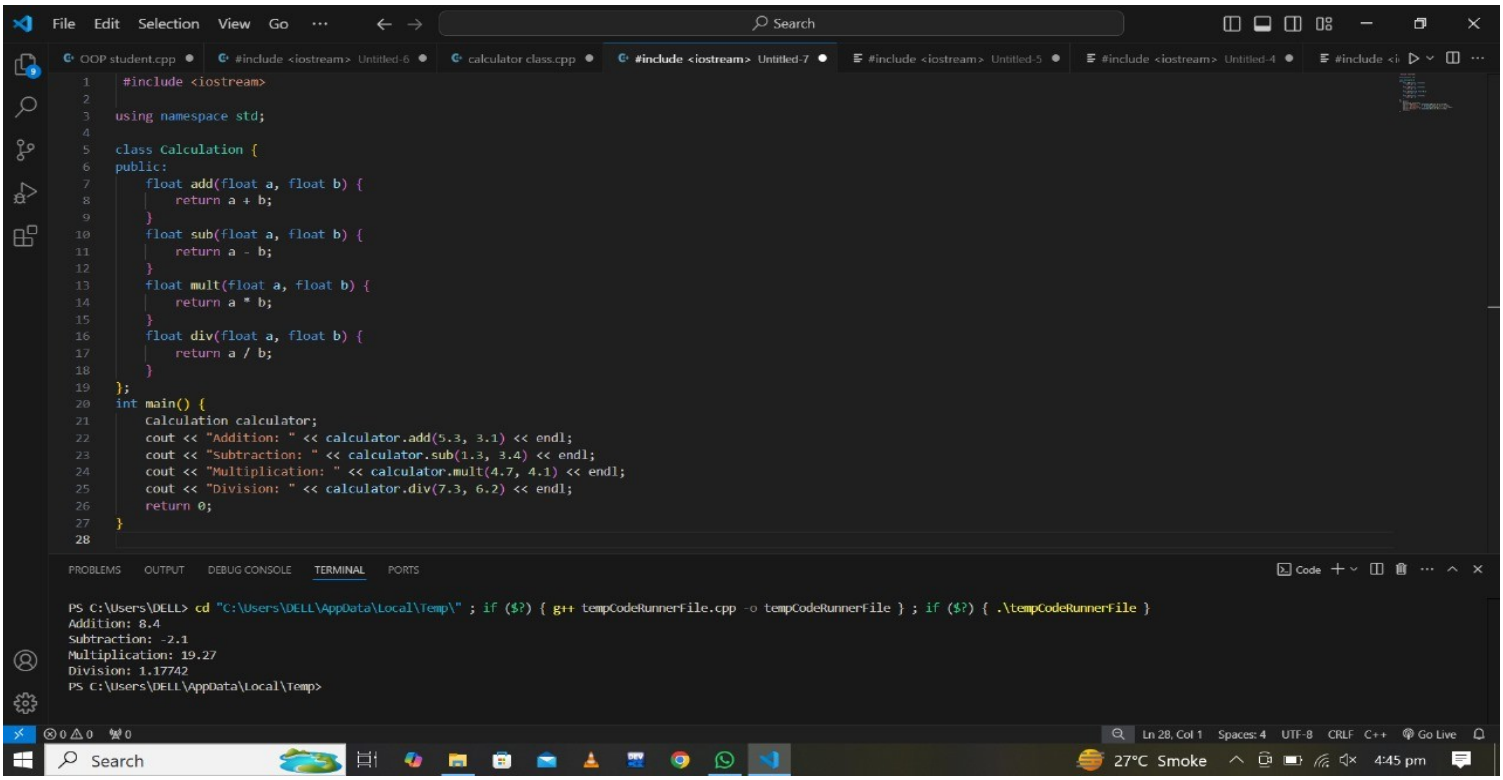
**TOOLS: TURBOO C++/ DEV C++/ VS-CODE/ CODE BLOCKS**

## Lab Tasks

1. To develop the Student Registration System by object-oriented scenarios. It should consist of two classes, namely Student and Course.



2). Try to create a class having four functions, add, sub, mult and div. Each function accepts 2 parameters and returns the sum, difference, multiplication and division of these numbers. Create a main class having a main function that uses the above class.



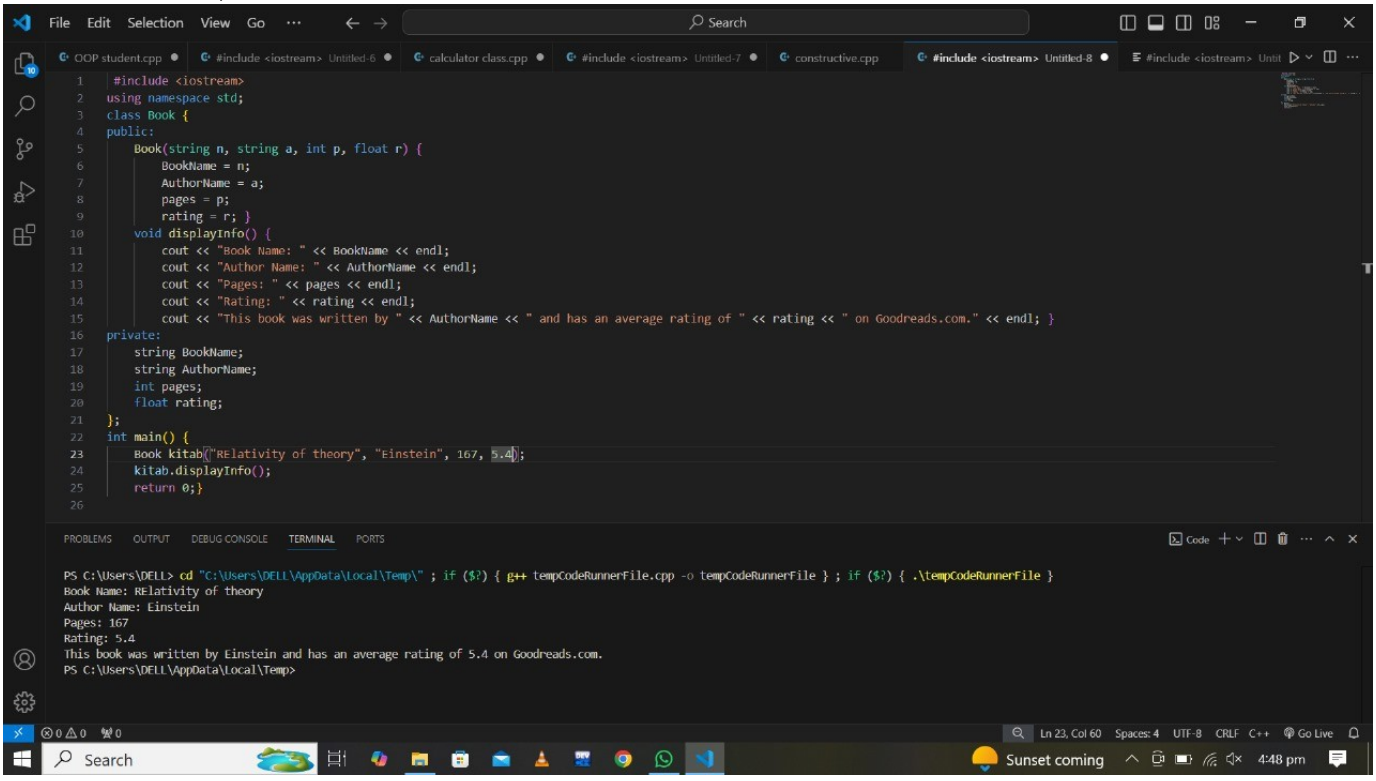
```cpp
#include <iostream>

using namespace std;

class Calculation {
public:
    float add(float a, float b) {
        return a + b;
    }
    float sub(float a, float b) {
        return a - b;
    }
    float mult(float a, float b) {
        return a * b;
    }
    float div(float a, float b) {
        return a / b;
    }
};
int main() {
    Calculation calculator;
    cout << "Addition: " << calculator.add(5.3, 3.1) << endl;
    cout << "Subtraction: " << calculator.sub(1.3, 3.4) << endl;
    cout << "Multiplication: " << calculator.mult(4.7, 4.1) << endl;
    cout << "Division: " << calculator.div(7.3, 6.2) << endl;
    return 0;
}
```

```
PS C:\Users\DELL> cd "C:\Users\DELL\AppData\Local\Temp\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Addition: 8.4
Subtraction: -2.1
Multiplication: 19.27
Division: 1.17742
PS C:\Users\DELL\AppData\Local\Temp>
```

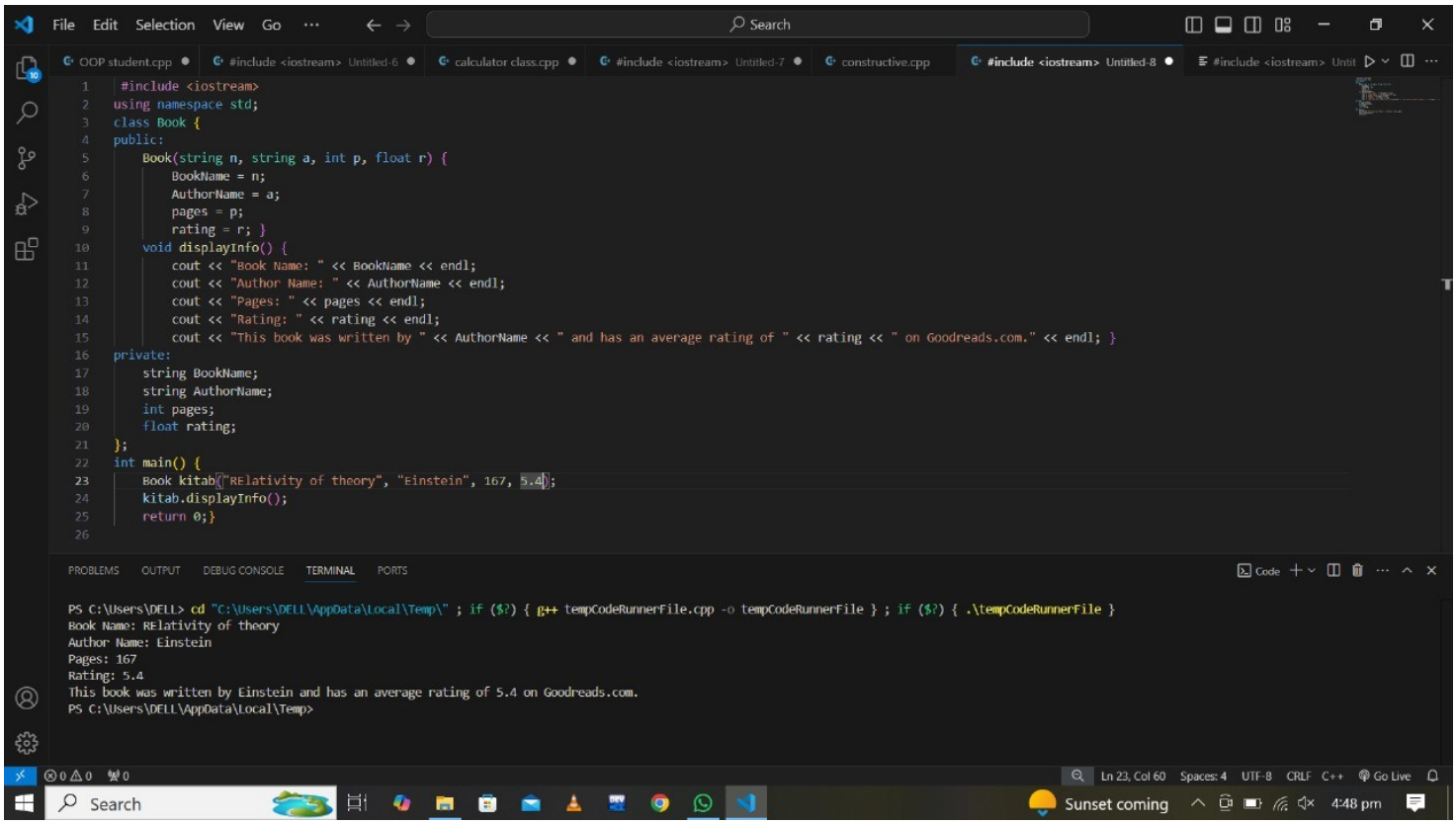
3) Demonstrate the use of the following:
Constructor, Public and Private class members.



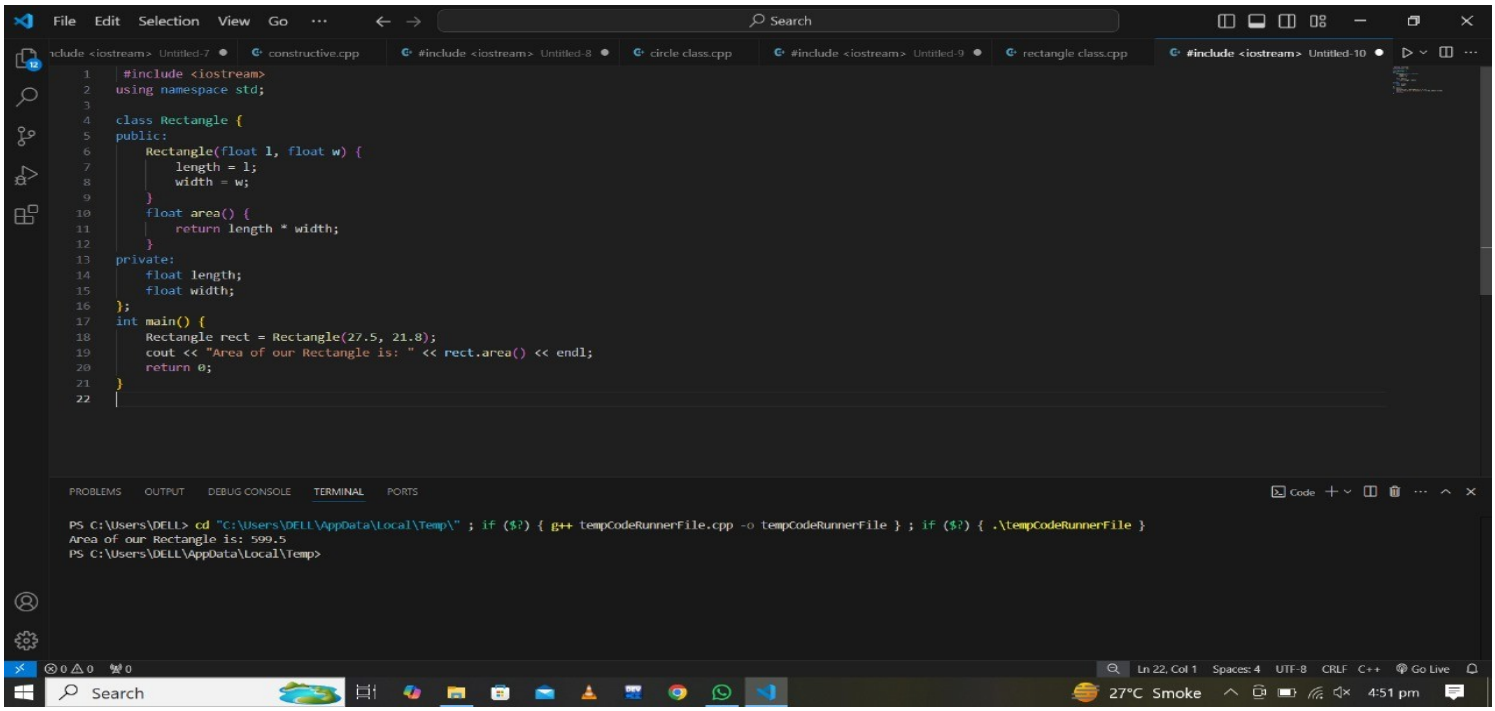
```cpp
#include <iostream>
using namespace std;
class Book {
public:
    Book(string n, string a, int p, float r) {
        BookName = n;
        AuthorName = a;
        pages = p;
        rating = r; }
    void displayInfo() {
        cout << "Book Name: " << BookName << endl;
        cout << "Author Name: " << AuthorName << endl;
        cout << "Pages: " << pages << endl;
        cout << "Rating: " << rating << endl;
        cout << "This book was written by " << AuthorName << " and has an average rating of " << rating << " on Goodreads.com." << endl; }
private:
    string BookName;
    string AuthorName;
    int pages;
    float rating;
};
int main() {
    Book kitab("RElativity of theory", "Einstein", 167, 5.4);
    kitab.displayInfo();
    return 0;}
```

```
PS C:\Users\DELL> cd "C:\Users\DELL\AppData\Local\Temp\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Book Name: RElativity of theory
Author Name: Einstein
Pages: 167
Rating: 5.4
This book was written by Einstein and has an average rating of 5.4 on Goodreads.com.
PS C:\Users\DELL\AppData\Local\Temp>
```

4) Create a class Circle with a single member variable Radius and 2 member functions: a default constructor, which sets the radius to 0, and a parameterized constructor, which sets the radius to a given value. Define a member function Area which calculates and returns the area of the circle.




5) Create a class Rectangle that has two private data members length and width, and one public member function area() that calculates the area of rectangle.


File Edit Selection View Go
Search
constructive.cpp
circle class.cpp
rectangle class.cpp
#include <iostream>
using namespace std;
class Rectangle {
public:
Rectangle(float l, float w) {
length = l;
width = w;
}
float area() {
return length * width;
}
private:
float length;
float width;
};
int main() {
Rectangle rect = Rectangle(27.5, 21.8);
cout << "Area of our Rectangle is: " << rect.area() << endl;
return 0;
}
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\DELL> cd "C:\Users\DELL\AppData\Local\Temp\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Area of our Rectangle is: 599.5
PS C:\Users\DELL\AppData\Local\Temp>
Ln 22, Col 1 Spaces: 4 UTF-8 CRLF C++ Go Live
Search
27°C Smoke
4:51 pm