

Lab Task on Encapsulation

Task # 1

```
class Rectangle {  
private: int width, height;  
public:  
    void setWidth(int w);  
    void setHeight(int h);  
    int getWidth();  
    int getHeight();  
    void showArea();  
};
```

- Define all the member functions of the **Rectangle** class.
- After defining the member functions, use the Rectangle class by creating multiple objects of this type.
- Set the dimension of each of the rectangle objects.
- Output the area of each rectangle using the function **void showArea()**.
- Without using set get method use constructor to initialize width and height then Call showArea() and prints result.

Task # 2

Write a class named Calculator. The class should have the following functions and variable(s)–

```
class Calculator{  
    double myValue;  
public:  
    void setValue(double);  
    void square();  
    void qube();  
}
```

- At first assign a value into the variable myValue and call all the other functions so that relevant results will be output.
- Without calling the setValue(), use constructor for myValue initialization after that call square() or qube().

Task # 3:

Write a class named **Student**. A **Student** has name, id and CGPA. Create two objects of the above mentioned class. Show the average CGPA of all of them.

Encapsulation should be maintained.

Task # 4

Write a class called Circle, that will have only one variable named radius. A function named setRadius will set the radius of the circle. The class should have two other functions, one should output the circumference and the another should output the area of that circle.

Hints :

$$\text{Area} = \text{PI} * r^2$$

$$\text{Circumference} = 2 * \text{PI} * r$$

Task # 5

Write a class called **Box** which contains three member variables; **length**, **width** and **height**. This class also contains two constructors, one **empty** and another one is **with parameter**. You also have to write a function named **getArea()** that calculates and returns the area of a box object. Write necessary code inside the main function to test the class by creating an object.

Task # 6

Write a class called **Account** which consist of the below mentioned members.

Member Variables:

- ***accountID***
- ***accountBalance***
- ***count(static variable)***

Member Functions:

- Two constructor, one is empty and another one is with parameter to initialize member variables
- ***showInformation()*** method to show the information
- ***deposit(double amount)*** method for deposit money
- ***withdraw(double amount)*** method for withdraw money
- ***showAccountInfo()*** outputs detailed account information
- ***transferMoney(Bank acc, double amount)*** method for transfer money from one account to another account

Build a mechanism to show how many accounts are created so far. For this you have to use the static variable **count**.