Course: Object Oriented Programming
Lab 04
Encapsulation, Constructors

Task 1: Make a Rectangle class that has color, width and height attribute. Color is of String type, while other two are int type attribute. All the attributes should be private and exposed via setter/getter methods. Value of width and height should be greater than zero.

Define a method inside Rectangle class: int *calculateArea()* that returns area of Rectangle. Define another method in Rectangle class: *int calculatePerimeter()* that returns perimeter of rectangle. Make a RectangleTest class, in main method, instantiate a rectangle object. Ask user to input value of width and height, and prints its area and perimeter.

Task 2: Write a class BankAccount, which have following attributes:

1. Attributes

    - accountNumber
    - accountTitle
    - balance (should be greater than zero)

    All attributes are private.

    Create a test class named BankAccountTest. In main method, instantiate BankAccount object and display information of account.

    Note: Ask user to input value of accountNumber, accountTitle and balance.

Task 3: Design a class Cylinder, which has following members:

- Data:
    - radius
    - height
- Constructor
    - A default constructor. This constructor print this statement “A no argument constructor”.
    - A one-argument constructor receiving height and setting radius to default value 1

        - A two-argument constructor receiving height and radius (demonstrate the use of this reference by using same names for parameters and instance variables)
    - Methods:
        - Setter functions (total 2)
        - Getter functions (total 2)
        - computeArea
        - computeVolume
            - look for the relevant formulae over internet
        - displayInfo
            - Showing cylinder height, radius, area and volume
- Test class to test Cylinder
    - Demonstrate all the above constructors/methods by creating different objects and calling each constructor/method at least once

Task 4: Write a date class to model a date object.

- Date
    - year
    - month
    - day

    Value of day should not be greater than 30, if day value is greater than 30 reset it one.

    Value of month should not be greater than 12, if month value is greater than 12 than reset it to one.
- Constructors
    - No argument constructor. In this constructor set Day value to 7, month value to 10 and year to 2020.
    - One parameterized constructor for setting all three fields

- Methods
    - A method to print date in “dd/mm/yy” format
    - Implement the setter and getter methods for day and month.

- Write DateTest class for the Date class
    - Create two date objects **d1** and **d2** by calling constructors with appropriate values
    - Input date, month and year from user using Scanner object
    - Create two reference variables (**d3** and **d4**) of type date.
    - Print date for **d1, d2** by calling print method of date.
    - Assign **d2** to a new object **d3** and **d3** to **d4**
    - Change **d3** month through the setter methods
    - Print **d1, d2, d3 and d4** by calling print method of date and observe the effect of reference types