**Tutorial and Lab Exercises – Week 1**

1.Create a class Rectangle with two private instance variables ***length*** and ***width*** with the default value of 1 for both. The class should have suitable ***set***and ***get*** methods for accessing its instance variables. The ***set***methods should verify that ***length***and ***width***are assigned a value that is larger than 0.0 and is lesser than 20.0. Provide suitable public methods to calculate the rectangle’s perimeter and area. Write a suitable class RectangleTest to test the Rectangle class.

**Note:** Area of Rectangle = Length X Width

Perimeter of Rectangle = 2(Length + Width)

**// You need to complete the missing lines of code**

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public class Rectangle

{

private double length; // the length of the rectangle

private double width; // the width of the rectangle

// constructor without parameters

public Rectangle()

{

this( 1.0, 1.0 );

} // end Rectangle no-argument constructor

// constructor with length and width supplied

public Rectangle( double theLength, double theWidth )

{

setLength( theLength );

setWidth( theWidth );

} // end Rectangle two-argument constructor

**// validate and set length**

**public void setLength( double theLength )**

**{**

**} // end method setLength**

**// validate and set width**

**public void setWidth( double theWidth )**

**{**

**} // end method setWidth**

**// get value of length**

**public double getLength()**

**{**

**} // end method getLength**

**// get value of width**

**public double getWidth()**

**{**

**} // end method getWidth**

**// calculate rectangle's perimeter**

**public double getPerimeter()**

**{**

**} // end method perimeter**

**// calculate rectangle's area**

**public double getArea()**

**{**

**} // end method area**

// convert to String

public String toString()

{

return String.format( "%s: %.2f\n%s: %.2f\n%s: %.2f\n%s: %.2f",

"Length", getLength(), "Width", getWidth(),

"Perimeter", getPerimeter(), "Area", getArea() );

} // end method toString

} // end class Rectangle

// Program tests class Rectangle.

import java.util.Scanner;

public class RectangleTest

{

public static void main( String[] args )

{

Scanner input = new Scanner( System.in );

Rectangle rectangle = new Rectangle();

//Printing details of default valued rectangle

System.out.println( rectangle.toString() );

//Changing length and width of the new rectangle

System.out.println("Enter Length of the new rectangle :" );

double tempLength = input.nextDouble();

if (tempLength > 0)

rectangle.setLength(tempLength);

System.out.println("Enter Width of the new rectangle :" );

double tempWidth = input.nextDouble();

if (tempWidth > 0)

rectangle.setWidth(tempWidth);

//Printing the details of the new rectangle

System.out.println ( rectangle.toString() );

} // end main

} // end class RectangleTest

2. Create a class FixedDeposit with the following requirements:

|  |  |  |  |
| --- | --- | --- | --- |
| **Field name** | **Access specifier** | **Static/ instance** | **Remarks** |
| accountNumber | private | instance | Unique starting from 1001 |
| periodInYears | private | instance | Not negative |
| initialAmount | private | instance | Not negative |
| accountId | private | static | Useful for providing value for the accountNumber |

The FixedDeposit class should contain appropriate constuctors; ***get*** and ***set*** methods; ***toString***() method to print the details of the fixed deposit objects.

Create FDTest class to create the following fixed deposits and print their details on the screen:

|  |  |  |
| --- | --- | --- |
| **Account Number** | **Initial amount** | **Period in years** |
| 1001 | $2500 | 2 |
| 1002 | $3000 | 1 |
| 1003 | $1500 | 2 |