

**King Saud University**  
**College of Computer & Information Science**  
**CSC111 - Lab07**  
**Object - I -**  
**All Sections**

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## **Instructions**

Web-CAT submission URL:

<http://10.131.240.28:8080/Web-CAT/WebObjects/Web-CAT.woa/wa/assignments/eclipse>

## **Objectives:**

Student should learn how to:

- 1- Follow the loop design strategy to develop loops.
- 2- Control a loop with a sentinel value.
- 3- Write loops using for statements
- 4- Write nested loops
- 5- Combine loops and control statements to solve problems with complex logic

## Lab Exercise 1

Design a class named **MyRectangle** to represent a rectangle. The class contains:

- Two double data fields named **width** and **height** that specify the width and height of the rectangle. The default values are 1 for both width and height.
- A no-arg constructor that creates a default rectangle.
- A constructor that creates a rectangle with the specified width and height.
- A method named **getArea()** that returns the area of this rectangle.
- A method named **getPerimeter()** that returns the perimeter.

Draw the UML diagram for the class and then implement the class. Write a test program (class with main method) that creates two **MyRectangle** objects—one with width 4 and height 40 and the other with width 3.5 and height 35.9. Display the width, height, area, and perimeter of each rectangle in this order. Name rectangle class **MyRectangle**. Name class with main method **TestRectangle**.

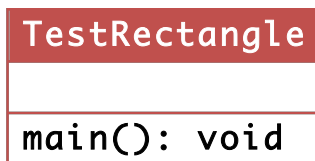
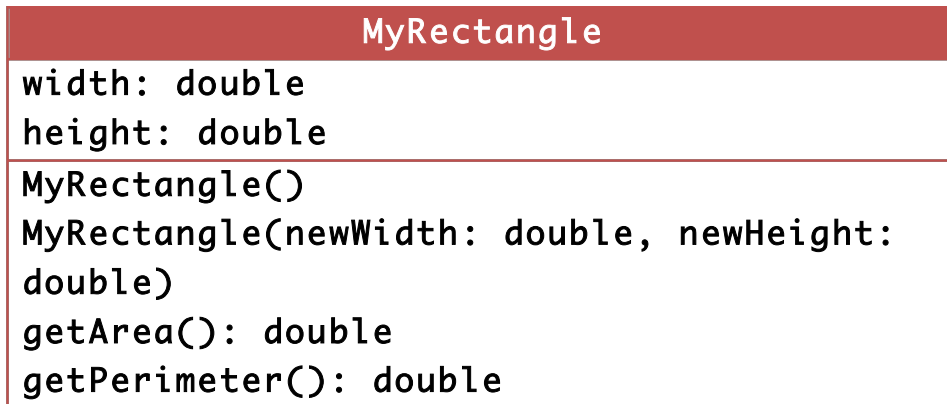
### Sample Run

```
The area of a rectangle with width 4.0 and height 40.0 is 160.0
The perimeter of a rectangle is 88.0
The area of a rectangle with width 3.5 and height 35.9 is
125.64999999999999
```

The perimeter of a rectangle is 78.8

## Solution

- 1- First phase is to design your program as an OOP program. Draw UML diagrams for the two classes, `MyRectangle` and `TestRectangle`.



- 2- Create a new eclipse project and name it **lab07**
- 3- Create a new class and name it **TestRectangle**. Make sure you choose the `public static void main` option. We will write both classes into this file, which means **MyRectangle** class, will not be public. Another option is to create two files one for each class.
- 4- Write the program as shown in next page (you can ignore comments)
- 5- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 6- Submit your program to WebCAT through. Ask your TA for help.

```

public class TestRectangle {
    public static void main(String[] args) {
        MyRectangle myRectangle = new MyRectangle(4, 40);
        System.out.println("The area of a rectangle with width " +
            myRectangle.width + " and height " +
            myRectangle.height + " is " +
            myRectangle.getArea());
        System.out.println("The perimeter of a rectangle is " +
            myRectangle.getPerimeter());

        MyRectangle yourRectangle = new MyRectangle(3.5, 35.9);
        System.out.println("The area of a rectangle with width " +
            yourRectangle.width + " and height " +
            yourRectangle.height + " is " +
            yourRectangle.getArea());
        System.out.println("The perimeter of a rectangle is " +
            yourRectangle.getPerimeter());
    }
}

```

```

class MyRectangle {
    // Data members
    double width = 1;
    double height = 1;

    // Constructor
    public MyRectangle() {
    }

    // Constructor
    public MyRectangle(double newWidth, double newHeight) {
        width = newWidth;
        height = newHeight;
    }

    public double getArea() {
        return width * height;
    }

    public double getPerimeter() {
        return 2 * (width + height);
    }
}

```

## Lab Exercise 2

Design a class named **Stock** that contains:

- A string data field named **symbol** for the stock's symbol.
- A string data field named **name** for the stock's name.
- A double data field named **previousClosingPrice** that stores the stock price for the previous day.
- A double data field named **currentPrice** that stores the stock price for the current time.
- A constructor that creates a stock with the specified symbol and name.
- A method named **getChangePercent()** that returns the percentage changed from **previousClosingPrice** to **z**.

Draw the UML diagram for the class and then implement the class. Write a test program that creates a **Stock** object with the stock symbol, the company name, and the previous closing price read from user. Read a new current price from user and display the price-change percentage. Name your classes **Stock** and **TestStock**. Use two separate files for each of the two classes.

### Sample Run

```
Enter symbol of stock:ORCL ↵
Enter company name:Oracle ↵
Enter previous closing price:34.5 ↵
Enter curret price:34.35 ↵
Previous Closing Price: 34.5
Current Price: 34.35
Price Change: -0.434782608695648%
```

## Solution

- 1- First phase is to design your program as an OOP program. Draw UML diagrams for the two classes, Stock and TestStock.

Stock
<code>symbol: String</code> <code>name: String</code> <code>previousClosingPrice: double</code> <code>currentPrice: double</code>
<code>Stock()</code> <code>Stock(newSymbol: String, newName: String)</code> <code>getChangePercent(): double</code> <code>getPreviousClosingPrice(): double</code> <code>getCurrentPrice(): double</code> <code>setCurrentPrice(newCurrentPrice: double): void</code> <code>setPreviousClosingPrice(newPreviousClosingPrice: double): void</code>

TestStock
<code>main(): void</code>

- 2- Create a new eclipse project and name it **lab07**
- 3- Unlike in previous exercise, we will create two separate files for the two classes. Create a new class and name it **Stock**.
- 4- Create a new class and name it **TestStock**. Make sure you choose the `public static void main` option.
- 5- Write the two program classes as shown in next pages (you can ignore comments)
- 6- When you are done, save your program and run it. Make sure it prints the output as shown above.
- 7- Submit your program to WebCAT through. Ask your TA for help.

```
public class Stock {
    String symbol;
    String name;
    double previousClosingPrice;
    double currentPrice;
    public Stock() {
    }
    public Stock(String newSymbol, String newName) {
        symbol = newSymbol;
        name = newName;
    }
    public double getChangePercent() {
        return (currentPrice - previousClosingPrice) / previousClosingPrice;
    }
    public double getPreviousClosingPrice() {
        return previousClosingPrice;
    }
    public double getCurrentPrice() {
        return currentPrice;
    }
    public void setCurrentPrice(double newCurrentPrice) {
        currentPrice = newCurrentPrice;
    }
    public void setPreviousClosingPrice(double newPreviousClosingPrice) {
        previousClosingPrice = newPreviousClosingPrice;
    }
}
```

```
import java.util.Scanner;
public class TestStock {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter symbol of stock:");
        String symbol = input.next();
        System.out.print("Enter company name:");
        String name = input.next();
        Stock stock = new Stock(symbol, name);
        System.out.print("Enter previous closing price:");
        double prevPrice = input.nextDouble();
        stock.setPreviousClosingPrice(prevPrice);
        System.out.print("Enter current price:");
        double currentPrice = input.nextDouble();
        // Set current price
        stock.setCurrentPrice(currentPrice);
        // Display stock info
        System.out.println("Previous Closing Price: "
            + stock.getPreviousClosingPrice());
        System.out.println("Current Price: " + stock.getCurrentPrice());
        System.out.println("Price Change: " + stock.getChangePercent() * 100
            + "%");
    }
}
```

**Done...**