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jkgiffor – pExtra

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=                               Print Date: Sun Oct  2 19:57:06 2016                               =
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=                               Source Files                               =
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~~~~~
~                               File: Rectangle.java                               ~
~~~~~

import java.io.*;
import java.util.*;
import java.text.DecimalFormat;

// ~~~~~ 3PIO Comments for Rectangle Class ~~~~~//
//Purpose: create a rectangle object and calculate Area and Perimeter
//Input:  Various. depends on the method/construtor called
//Pre Condition: the code complies and the class is called
//Output:  Various. depends on the method/construtor called
//Post Condition: Varios. depends on the method/construtor called
//Note: n/a
// ~~~~~//

public class Rectangle{
    private double width;
    private double height;
    private String color;
    DecimalFormat df = new DecimalFormat("##.##");

    // ~~~~~ 3PIO Comments for No Args Constructor ~~~~~//
    //Purpose:  create a Rectangle object
    //Input:  n/a
    //Pre Condition: the code complies and the construtor is called
    //Output:  n/a
    //Post Condition: a Rectangle is created with default values
    //Note: n/a
    // ~~~~~//
    public Rectangle(){
        width = 0;
        height = 0;
        color = "";
    }

    // ~~~~~ 3PIO Comments for Three Args Constructor ~~~~~//
    //Purpose:  create a Rectangle object with given values
    //Input:  double, double, string
    //Pre Condition:  the code complies and the construtor is called
    //Output:  n/a
    //Post Condition: A Rectangle is created with the given values
    //Note: n/a
    // ~~~~~//
    public Rectangle(double newWidth, double newHeight, String newColor){
        width = newWidth;
        height = newHeight;
        color = newColor;
    }

    // ~~~~~ 3PIO Comments for setRec method ~~~~~//
    //Purpose: set the values of the Rectangle
    //Input:  double, double, string
    //Pre Condition: A Rectangle object is created and the method is called
    //Output:  n/a

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//Post Condition: The Rectangles values are updated to the new given values
//Note: n/a
// ~~~~~
public void setRec(double inWidth, double inHeight, String inColor){
    width = inWidth;
    height = inHeight;
    color = inColor;
}

// ~~~~~ 3PIO Comments for setWidth method ~~~~~//
//Purpose: set the width for the Rectangle
//Input: double
//Pre Condition: A Rectangle object is created and the method is called
//Output: n/a
//Post Condition: The Rectangles width is updated to the given value
//Note: n/a
// ~~~~~
public void setWidth(double inWidth){
    width = inWidth;
}

// ~~~~~ 3PIO Comments for setHeight method ~~~~~//
//Purpose: set the height of the Rectangle
//Input: double
//Pre Condition: A Rectangle object is created and the method is called
//Output: n/a
//Post Condition: The Rectangles height is updated to the give value
//Note: n/a
// ~~~~~
public void setHeight(double inHeight){
    height = inHeight;
}

// ~~~~~ 3PIO Comments for setColor method ~~~~~//
//Purpose: set the color of the Rectangle
//Input: string
//Pre Condition: A Rectangle object is created and the method is called
//Output: n/a
//Post Condition: The Rectangles color is updated to the given value
//Note: n/a
// ~~~~~
public void setColor(String inColor){
    color = inColor;
}

// ~~~~~ 3PIO Comments for getWidth method ~~~~~//
//Purpose: return the Rectangles width
//Input: n/a
//Pre Condition: A Rectangle object is created and the method is called
//Output: double
//Post Condition: the width of the Rectangle is returned
//Note: n/a
// ~~~~~
public double getWidth(){
    return width;
}

// ~~~~~ 3PIO Comments for getHeight method ~~~~~//
//Purpose: return the Rectangles height
//Input: n/a
//Pre Condition: A Rectangle object is created and the method is called
//Output: double
//Post Condition: the height of the Rectangle is returned
//Note: n/a
// ~~~~~
public double getHeight(){

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        return height;
    }

    // ~~~~~ 3PIO Comments for getColor method ~~~~~//
    //Purpose: return the Rectangles color
    //Input: n/a
    //Pre Condition: A Rectangle object is created and the method is called
    //Output: string
    //Post Condition: the color of the Rectangle is returned
    //Note: n/a
    // ~~~~~//
    public String getColor(){
        return color;
    }

    // ~~~~~ 3PIO Comments for getArea method ~~~~~//
    //Purpose: calculate the Rectangles area
    //Input: n/a
    //Pre Condition: A Rectangle object is created and the method is called
    //Output: double
    //Post Condition: the Rectangles area is returned
    //Note: n/a
    // ~~~~~//
    public double getArea(){
        return Double.valueOf(df.format(width * height));
    }

    // ~~~~~ 3PIO Comments for getPerimeter method ~~~~~//
    //Purpose: calculate the Rectangles perimeter
    //Input: n/a
    //Pre Condition: A Rectangle object is created and the method is called
    //Output: double
    //Post Condition: the Rectangles perimeter is returned
    //Note: n/a
    // ~~~~~//
    public double getPerimeter(){
        return Double.valueOf(df.format((2*width) + (2*height)));
    }

    // ~~~~~ 3PIO Comments for printRec method ~~~~~//
    //Purpose: print the Rectangles details
    //Input: boolean
    //Pre Condition: A Rectangle object is created, the method is called, and the width and height are determined to be valid/invalid
    //Output: n/a
    //Post Condition: The Rectangles details are printout out in the format depending if they are valid or invalid.
    //Note: n/a
    // ~~~~~//
    public void printRec(boolean value){
        if (value)
            System.out.printf("%5s %6s %6s %9s %7s\n", df.format(width), df.format(height), color, df.format(this.getPerimeter()), df.format(this.getArea()));
        else
            System.out.printf("%5s %6s %6s ~~~> Check the data!\n", df.format(width), df.format(height), color);
    }
}

~~~~~
~                               File: pExtra.java                               ~
~~~~~

// pExtra.java
//*****
// YOUR NAME: Jerome Gifford
//
// COURSE TITLE: Computer Programming II
//
// COURSE NUMBER: CS216

```

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```
//
// PROF NAME: Moe Bidgoli
//
// ASSIGNMENT NUMBER: #Extra
//
// DUE DATE: 10-3-16
//
// POSSIBLE POINTS: Extra Points
//
// PURPOSE: generate Rectangles and print out their widths, heights, colors, Areas, and Perimeters.
// Also print out the largest and smallest Areas
//*****

import java.io.*;
import java.util.*;
import java.text.DecimalFormat;

public class pExtra {

    // ~~~~~ 3PIO Comments for Client side code ~~~~~//
    //Purpose: generate Rectangles and print out their details
    //Input: n/a
    //Pre Condition: the code compiles
    //Output: n/a
    //Post Condition: the Rectangles are printed out as needed.
    //Note: n/a
    // ~~~~~//

    public static void main(String[] args) {
        Scanner inFile = new Scanner(System.in);
        int num = inFile.nextInt();
        // run the code multiple times based on a give number of times
        while (num > 0){

            //create array of objects
            Rectangle[] arr = new Rectangle[10];
            int i = 0;
            final double widthMin = 0.0;
            final double widthMax = 10.0;
            final double heightMin = 10.0;
            final double heightMax = 50.0;
            String color = "";
            double sumArea = 0;
            double sumPerimeter = 0;
            double maxArea = Double.MIN_VALUE;
            double minArea = Double.MAX_VALUE;
            String maxColor = "";
            String minColor = "";
            Random r = new Random();
            DecimalFormat decimalFormat = new DecimalFormat("###.##");

            printHeader();

            while (i < 10){
                //get random width, height, and color
                double width = Double.valueOf(decimalFormat.format(widthMin + (widthMax - widthMin) * r.nextDouble()));
                double height = Double.valueOf(decimalFormat.format(heightMin + (heightMax - heightMin) * r.nextDouble()));
                if (r.nextDouble() >= .5)
                    color = "Red";
                else
                    color = "Yellow";

                // fill Rectangle with data
                arr[i] = new Rectangle(width, height, color);

                // print the rectangle
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arr[i].printRec(width < height & width > 0);

if (width < height & width > 0){
    //get sums
    sumArea = sumArea + arr[i].getArea();
    sumPerimeter = sumPerimeter + arr[i].getPerimeter();

    // get min and max
    if (arr[i].getArea() > maxArea){
        maxArea = arr[i].getArea();
        maxColor = arr[i].getColor();
    }
    else if (arr[i].getArea() < minArea){
        minArea = arr[i].getArea();
        minColor = arr[i].getColor();
    }
}

i++;
}
printSummary(sumArea, sumPerimeter, maxArea, minArea, maxColor, minColor);

num --;
}

// ~~~~~ 3PIO Comments for printHeader ~~~~~//
//Purpose: print the header for output
//Input: n/a
//Pre Condition: The code complies and the method is called
//Output: n/a
//Post Condition: The header is printed
//Note: n/a
// ~~~~~//
public static void printHeader(){
    System.out.println("=====\n" + "~~~ Rectangle Report ~~~");
    System.out.printf("%5s %6s %6s %9s %7s\n", "Width", "Height", "Color", "Perimeter", "A r e a");
    System.out.printf("%5s %6s %6s %9s %7s\n", "-----", "-----", "-----", "-----", "-----");
}

// ~~~~~ 3PIO Comments for printSummary ~~~~~//
//Purpose: print the summary for the report
//Input: double, double, double, double, string, string
//Pre Condition: the method is called and all data is valid and calculated
//Output: n/a
//Post Condition: Summary is printed out.
//Note: n/a
// ~~~~~//
public static void printSummary(double sumArea, double sumPerimeter, double maxArea, double minArea, String maxColor, String minColor){
    DecimalFormat df = new DecimalFormat("##.##");
    System.out.printf("%5s %6s %6s %9s %7s\n", "-----", "-----", "-----", "-----", "-----\n");
    System.out.println("\nSum of Area: " + df.format(sumArea) + "\nSum of Perimeter: " + df.format(sumPerimeter));
    System.out.println("\nMax Area: " + maxArea + " " + maxColor + "\nMin Area: " + minArea + " " + minColor);
    System.out.println("~~~ End Report ~~~" + "\n=====");
}
}

```

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=                               =
Data Files
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```

~                               ~
~ File: my.data ~
~                               ~

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-                               Execution                               -
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```

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~~~ Rectangle Report ~~~

| Width | Height | Color  | Perimeter | A r e a |
|-------|--------|--------|-----------|---------|
| 3.82  | 30.81  | Red    | 69.26     | 117.69  |
| 5.27  | 23.02  | Red    | 56.58     | 121.32  |
| 9.93  | 47.43  | Red    | 114.72    | 470.98  |
| 5.37  | 40.48  | Red    | 91.7      | 217.38  |
| 2.32  | 10.88  | Yellow | 26.4      | 25.24   |
| 0.38  | 31.23  | Yellow | 63.22     | 11.87   |
| 3.6   | 36.7   | Red    | 80.6      | 132.12  |
| 3.75  | 13.6   | Yellow | 34.7      | 51      |
| 8.02  | 12.5   | Yellow | 41.04     | 100.25  |
| 1.07  | 37.29  | Red    | 76.72     | 39.9    |

Sum of Area: 1287.75

Sum of Perimeter: 654.94

Max Area: 470.98 Red

Min Area: 11.87 Yellow

~~~ End Report ~~~

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~~~ Rectangle Report ~~~

| Width | Height | Color  | Perimeter | A r e a |
|-------|--------|--------|-----------|---------|
| 3.86  | 39.59  | Red    | 86.9      | 152.82  |
| 8.58  | 30.53  | Yellow | 78.22     | 261.95  |
| 0.29  | 26.27  | Red    | 53.12     | 7.62    |
| 0.12  | 41.57  | Yellow | 83.38     | 4.99    |
| 6.42  | 33     | Yellow | 78.84     | 211.86  |
| 3.69  | 24.04  | Yellow | 55.46     | 88.71   |
| 2.04  | 40.22  | Red    | 84.52     | 82.05   |
| 3.15  | 19.53  | Yellow | 45.36     | 61.52   |
| 9.07  | 20.4   | Yellow | 58.94     | 185.03  |
| 1.55  | 40.16  | Yellow | 83.42     | 62.25   |

Sum of Area: 1118.8

Sum of Perimeter: 708.16

Max Area: 261.95 Yellow

Min Area: 4.99 Yellow

~~~ End Report ~~~

=====

=====

~~~ Rectangle Report ~~~

| Width | Height | Color  | Perimeter | A r e a |
|-------|--------|--------|-----------|---------|
| 1.89  | 46.77  | Red    | 97.32     | 88.4    |
| 8.31  | 12.57  | Yellow | 41.76     | 104.46  |
| 4.58  | 21.03  | Yellow | 51.22     | 96.32   |
| 6.05  | 24.31  | Red    | 60.72     | 147.08  |
| 6.15  | 16.96  | Red    | 46.22     | 104.3   |

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|      |       |        |        |        |
|------|-------|--------|--------|--------|
| 6.67 | 45    | Yellow | 103.34 | 300.15 |
| 4.06 | 30.37 | Yellow | 68.86  | 123.3  |
| 8.45 | 35.86 | Yellow | 88.62  | 303.02 |
| 9.38 | 30.55 | Yellow | 79.86  | 286.56 |
| 7.75 | 31.17 | Red    | 77.84  | 241.57 |

Sum of Area: 1795.16  
Sum of Perimeter: 715.76

Max Area: 303.02 Yellow  
Min Area: 96.32 Yellow  
~~~ End Report ~~~

~~~~~  
~~~ Rectangle Report ~~~

| Width | Height | Color  | Perimeter | A r e a |
|-------|--------|--------|-----------|---------|
| 7.06  | 15.11  | Red    | 44.34     | 106.68  |
| 6.83  | 28.73  | Red    | 71.12     | 196.23  |
| 9.56  | 43.2   | Red    | 105.52    | 412.99  |
| 7.62  | 31.51  | Yellow | 78.26     | 240.11  |
| 7.53  | 20.83  | Yellow | 56.72     | 156.85  |
| 2.46  | 39.93  | Red    | 84.78     | 98.23   |
| 0.52  | 25.75  | Yellow | 52.54     | 13.39   |
| 3.49  | 33.02  | Yellow | 73.02     | 115.24  |
| 4.9   | 44.7   | Yellow | 99.2      | 219.03  |
| 7.89  | 43.27  | Red    | 102.32    | 341.4   |

Sum of Area: 1900.15  
Sum of Perimeter: 767.82

Max Area: 412.99 Red  
Min Area: 13.39 Yellow  
~~~ End Report ~~~

~~~~~  
~~~ Rectangle Report ~~~

| Width | Height | Color  | Perimeter | A r e a |
|-------|--------|--------|-----------|---------|
| 7.36  | 33.12  | Yellow | 80.96     | 243.76  |
| 1.07  | 19.21  | Red    | 40.56     | 20.55   |
| 9.83  | 33.75  | Yellow | 87.16     | 331.76  |
| 2.28  | 41.81  | Yellow | 88.18     | 95.33   |
| 0.7   | 32.25  | Red    | 65.9      | 22.57   |
| 3.89  | 41.98  | Yellow | 91.74     | 163.3   |
| 4.39  | 33.79  | Red    | 76.36     | 148.34  |
| 2.42  | 12.27  | Red    | 29.38     | 29.69   |
| 3.27  | 45.74  | Yellow | 98.02     | 149.57  |
| 1.78  | 18.95  | Yellow | 41.46     | 33.73   |

Sum of Area: 1238.6  
Sum of Perimeter: 699.72

Max Area: 331.76 Yellow  
Min Area: 20.55 Red  
~~~ End Report ~~~

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