OOP

Practical 8, Week 8

Submission

1. Your submission should contain two files. One of these files is **PDF** document with screenshots of the implementation (Java code) and testing only. Another file is **ZIP** file with the Java project.
2. You must save the files with name

   {YourStudentNumber}-Practical8.pdf;

   {YourStudentNumber}-Practical8.zip;

   For example: 202107081314-Practical8.pdf, 202107081314-Practical8.zip
3. You must upload from the student website: student.zy.cdut.edu.cn

Marking scheme

You will gain up to 5 marks for the completion of the exercise.

The markers will use the following marking scheme for each exercise.

Rubric	marks
No attempt has been made to answer the question. No implementation at all, or completely inappropriate considerations	0
Some attempt has been made to design the algorithm, and some considerations shown. No effort to implement a working solution and test it.	1
Incomplete design/programming, but significant effort has gone into it. Some consideration and implementation of the result, but very limited, some of the rules have not been properly implemented, no testing.	2
Mostly complete design but the implementation does not match the design or does not follow a correct standard. The program works but does not use loops and string methods properly.	3
Complete design with fair to good implementation, and some testing shown.	4
Excellent design and implementation of the whole problem, including testing and implementation.	5

OOP

Week 8, Assessed exercise

(Details see the file "OOP Week 8 Textfiles Exercises.docx")

Modify the code given (OOP Week 8 Textfiles Exercises - Solution.zip) so that if the velocity of a shape has been specified, you can optionally set the colour by adding an extra three integers ***red green blue*** (all of which should be in the range 0-255). In other words, a **circle** can be specified as

Circle *x y r*

or

Circle *x y r vx vy*

or

Circle *x y r vx vy red green blue*

With **squares** being specified in a similar manner.

Note that you cannot specify the **colour** without also specifying the **velocity**. If the colour is not specified then the shape should be **black**.

Finish this exercise in Main class. More operations must include in Main class:

- Calculate the number of squares and circles in file "practical8.txt". Program needs to confirm that the first token of each line from the file is "Circle" or "Square" only while parsing the file. Ignore that line if it is not match the requirement. Print the parse result to the console.
- Calculate the total area of all the shapes. Print the result to the console.

Testing Case and Result (The textfile is practical8.txt)

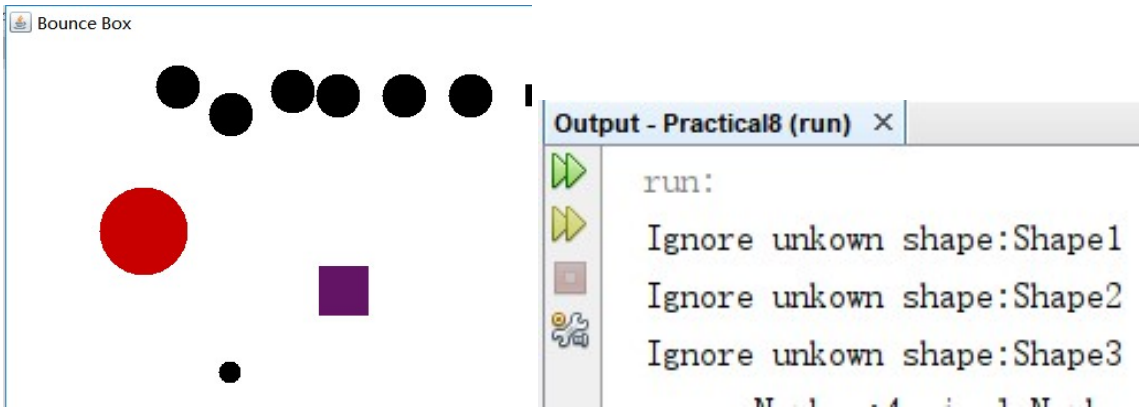
Textfile practical8.txt:

practical8.txt - Notepad

File Edit Format View Help

```
Circle  50 60 40 50 50 20(
Circle  150 160 10 30 50
Square 250 260 45  -50 -5(
Shape1 50 70 40 50 50 200

Shape2 60 50 20
Circle 120 50 20
Circle 180 50 20
Circle 240 50 20
Circle 300 50 20
Circle 360 50 20
Circle 420 50 20
Square 480 50 20
Square 540 50 20
Square 400 440 40

Shape3 10 460 5
```

BounceBox and Output:



Complete the implementation and testing.

（1） Implementation

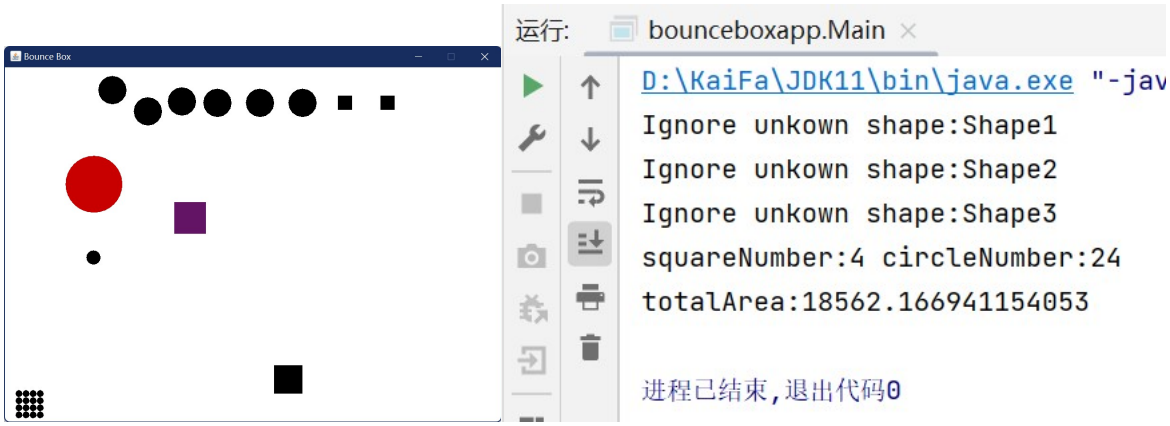
Please show your design with some comments in your program and paste the source code in file Main.java you changed here with screenshots.

```java
/.../
package bounceboxapp;

import ...

/**...*/
public class Main {

    /**
     * @param args the command line arguments
     */
    0 个用法
    public static void main(String[] args) throws FileNotFoundException {

//        setUpDemo1();
        //For practical exercises, comment out the line above, and uncomment the one
        //below
//        simpleDemo();
        addShapes();

    }

    0 个用法
    public static void setUpDemo1() {...}

    //Exercise 2
    0 个用法
    public static void simpleDemo() {...}

    //...


    // Exercise 5 to Practical 8
    1 个用法
    private static void addShapes() throws FileNotFoundException {

        // To count the number of squares and circles and their total area, 3 variables are declared and declared.
        double totalArea = 0;
        int squareNumber = 0;
        int circleNumber = 0;

        BounceBox box = new BounceBox( width: 700,  height: 500);

        FileInputStream fileIn =new FileInputStream( name: "D:\\KaiFa\\Java.code\\OPP\\OOP.Practical_8\\practical8.txt");
        Scanner scan = new Scanner(fileIn);

```

```
        /*
         * Program needs to confirm that the first token of each line from the file is "Circle" or "Square" only while
         * parsing the file. Ignore that line if it is not match the requirement. Print the parse result to the console.
         */
        while (scan.hasNext()) {
            Shape shape; //You should import Shape
            String shapeName = scan.next(); //get the first token
            int x = scan.nextInt();
            int y = scan.nextInt();
            int dimension = scan.nextInt();

            if (shapeName.equals("Circle")) {
                shape = new Circle(x, y, dimension); //Create the instance of Circle
                circleNumber++; // The counter (number of circles) is incremented by one
                totalArea += shape.getMass(); // Increase the area of this circle
                if (scan.hasNextInt()) { // Set the velocity if it has
                    int vx = scan.nextInt();
                    int vy = scan.nextInt();
                    shape.setVelocity(vx, vy);
                }
                if (scan.hasNextInt()) { // Set the colour if it has
                    int red = scan.nextInt();
                    int green = scan.nextInt();
                    int blue = scan.nextInt();
                    Color color = new Color(red,green,blue);
                    shape.setColor(color);
                }
                box.addShape(shape);
            } else if (shapeName.equals("Square")) {
                shape = new Square(x, y, dimension); //Create the instance of Square
                squareNumber++; // The counter (number of squares) is incremented by one
                totalArea += shape.getMass(); // Increase the area of this square
                if (scan.hasNextInt()) { // Set the velocity if it has
                    int vx = scan.nextInt();
                    int vy = scan.nextInt();
                    shape.setVelocity(vx, vy);
                }
                if (scan.hasNextInt()) { // Set the colour if it has
                    int red = scan.nextInt();
                    int green = scan.nextInt();
                    int blue = scan.nextInt();
                    Color color = new Color(red,green,blue);
                    shape.setColor(color);
                }
                box.addShape(shape);
            } else { // Ignore lines that don't meet the requirements and print them to the console.
                System.out.println("Ignore unkown shape:"+shapeName);
                if (scan.hasNextInt()) { // Set the velocity if it has
                    int vx = scan.nextInt();
                    int vy = scan.nextInt();
                }
                if (scan.hasNextInt()) { // Set the colour if it has
                    int red = scan.nextInt();
                    int green = scan.nextInt();
                    int blue = scan.nextInt();
                }
            }
        }

        // Print the number of squares and circles.
        System.out.println("squareNumber:"+squareNumber+" circleNumber:"+circleNumber);

        // Print the total area of all squares and circles.
        System.out.println("totalArea:"+totalArea);

        // Start bouncing
        box.start();
    }
}

```

（2） Testing

Testing 1 (Same test case with textfile practical8.txt)



Testing 2 (Your own test case with different data in textfile)