CSCI-UA.0102-006/008 Data Structures - Recitation

Problem 1 of Lab 1 (Java Review)

By: Qi Feng

1. What does the following program print? (think about references to objects)

```
1  public class Circle {
2      int radius;
3      public Circle(int r) {
4          radius = r;
5      }
6      public int getRadius() {
7          return radius;
8      }
9      public void setRadius(int r) {
10         radius = r;
11     }
12     public static void main(String a[]) {
13         Circle c1 = new Circle(5);
14         Circle c2 = new Circle(17);
15         c1 = c2;
16         System.out.printf("The radius of circle c1 is: %d\n",
17                 c1.getRadius() );
18         System.out.printf("The radius of circle c2 is: %d\n",
19                 c2.getRadius() );
20         c1.setRadius(25);
21         System.out.printf("The radius of circle c1 is: %d\n",
22                 c1.getRadius() );
23         System.out.printf("The radius of circle c2 is: %s\n",
24                 c2.getRadius() );
25     }
26 }
```

2. What does the following program print? (think about overloading and dynamic dispatch)

```
1  public class Diabolical {
2      public static void f(A x) {
3          A y = x;
4          y.key = x.key + 1;
5      }
6      public static void f(B x) {
7          B y = new B();
8          y.key = x.key + 2;
9      }
10     public static void main(String[] args) {
11         A p = new A( );
12         p.key = 3;
13         B q = new B( );
14         q.key = 10;
15         f(p);
16         System.out.println(p.key);
17         f(q);
18         System.out.println(q.key);
19         p = q;
20         f(p);
21         System.out.println(p.key);
22     }
23 }
24 class A {
25     public int key;
26 }
27 class B extends A {
28 }
```

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Problem 2 of Lab 1 (Eclipse IDE)

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1. Create an Eclipse Project.
2. Create a Package and call it Lab1
3. Add a class to the package and call it Rectangle.
4. Add private integer variables length and width.
5. Add a default constructor that sets the values for length and width to 1.
6. Add a constructor that takes two integer parameters, and set length and width to the parameter values.
7. Add two get methods to get the values of length and width.
8. Add two set methods to set the values of length and width.
9. Add a method that calculates and returns the area of the rectangle.

   Follow up: Print the result out ten times.
10. Add a method that calculates and returns whether the rectangle is a square.
11. Add another class to the package and call it IOTestOut.
12. Add a main method. You can use the piece of code below to get started.

```
1  import java.io.BufferedReader;
2  import java.io.IOException;
3  import java.io.InputStreamReader;
4
5  public class IO {
6      public static void main(String[] agrs) throws IOException {
7          BufferedReader in = new BufferedReader(
8              new InputStreamReader(System.in));
9          // add code here
10     }
11 }
```

13. Request the length and width from user (use System.out)
14. save these values in local variables l and w.

15. input will be in String format. You will need to convert it to an integer. (use Integer.parseInt(stringValue))

16. create a Rectangle object with these values.

17. Output the rectangle area.