

Student name..... ID..... Sec.....

Lab 6 Encapsulation

1. Working code in "week4" package.
2. Create the class Circle.java and TestCircle.java following the example.

Circle.java

```
1  package week4;
2
3  public class Circle {
4      private double radius = 1;
5
6      private static int numberOfObjects = 0;
7
8      public Circle() {
9          numberOfObjects++;
10     }
11
12     public Circle(double newRadius) {
13         radius = newRadius;
14         numberOfObjects++;
15     }
16
17     public double getRadius() {
18         return radius;
19     }
20
21     public void setRadius(double newRadius) {
22         radius = (newRadius >= 0) ? newRadius : 0;
23     }
24
25
26     public static int getNumberOfObjects() {
27         return numberOfObjects;
28     }
29
30     public static void setNumberOfObject(int number) {
31         numberOfObjects = number;
32     }
33
34     public double getArea() {
35         return radius * radius * Math.PI;
36     }
37 }
38
```

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TestCircle.java

```

1  package week4;
2
3  public class TestCircle {
    Run | Debug
4      public static void main(String[] args) {
5          Circle myCircle = new Circle(5.0);
6
7          System.out.println("The area of the circle of raidius "
8              + myCircle.getRadius() + " is " + myCircle.getArea());
9          myCircle.setRadius(myCircle.getRadius() * 1.1);
10         System.out.println("The area of the circle of raidius "
11             + myCircle.getRadius() + " is " + myCircle.getArea());
12         // test#1
13         // System.out.println(myCircle.radius);
14         // test#2
15         // System.out.println(myCircle.numberOfObjects);
16         // test#3
17         // System.out.println("The number of object is " +
18             myCircle.getNumberOfObjects());
19         // test#4
20         // myCircle.setNumberOfObject(10);
21         // System.out.println("The number of object is " +
22             myCircle.getNumberOfObjects());
23     }
24
25 }

```

3. Compile and run the program. **Checkpoint 1**
4. In the TestCircle class test the data encapsulation following the script. Run and record the output.
 - 4.1 Show the statement #test1 in the program. Then hide it.
 - 4.2 Show the statement #test2 in the program. Then hide it.
 - 4.3 Show the statement #test3 #test4 in the program.
 - 4.4 Fix the code to make all cases able to run. **Checkpoint 3**
5. Add the attribute "color" in to the Circle class by following statement.

```
String color;
```

- 5.1 Answer the question.
6. Create a new package "week41" and add TestCircle2.java.

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```
week41 > TestCircle2.java > ...
1  package week41;
2
3  import week4.Circle;
4
5  public class TestCircle2 {
6      // all program are same TestCircle.java
7  }
8
9  |
```

6.1 Answer the question.

----- End of lab -----