**Java CP2560**

**Due: Tues July 5th**

**Assignment 1: Review**

**Create a class hierarchy for shapes and a container.**

*Submission: Assignment #1 Dropbox*

**Review Tutorial’s Point**

Run through the basic and Object Oriented Tutorials: <https://www.tutorialspoint.com/java/index.htm>**Coding**

Create the following:

# Abstract Class ‘Shape’

1. Define an abstract function Double area();
2. Define an abstract method String getDescription();

# Create a child class ‘Circle’

1. Add appropriate attributes for a circle and get/set functions (radius)
2. Implement the area() method. Area of a circle is PI\*r^2
3. Implement the getDescription() method return a string stating it’s a circle, it’s radius and area. (Hint: return a description “Circle with radius 1 and area: 3.1459…”)

# Create a child class ‘Rectangle’

1. Add appropriate attributes for a rectangle and get/set functions (length and width)
2. Implement the area() method. Area of a rectangle is length\*width.
3. Implement the getDescription() method return a string stating it’s a rectangle, it’s length, width and area. (Hint: return a description “Rectangle with width 3 and length 4 and area 12”)

# Create a ‘ShapeGenerator’ object which randomly created a shape object and returns it

a. Hint: use a random number generator to flip a coin (even or odd number) and return a circle if it’s even and a rectangle otherwise. But make the return type a shape so the user doesn’t know the type until they get the description.

1. Create main class, which generates a few shapes and puts them in an array.

a. Print out the description for each shape.

1. Create Tester classes for Circle and Rectangle to make sure the area calculations work.