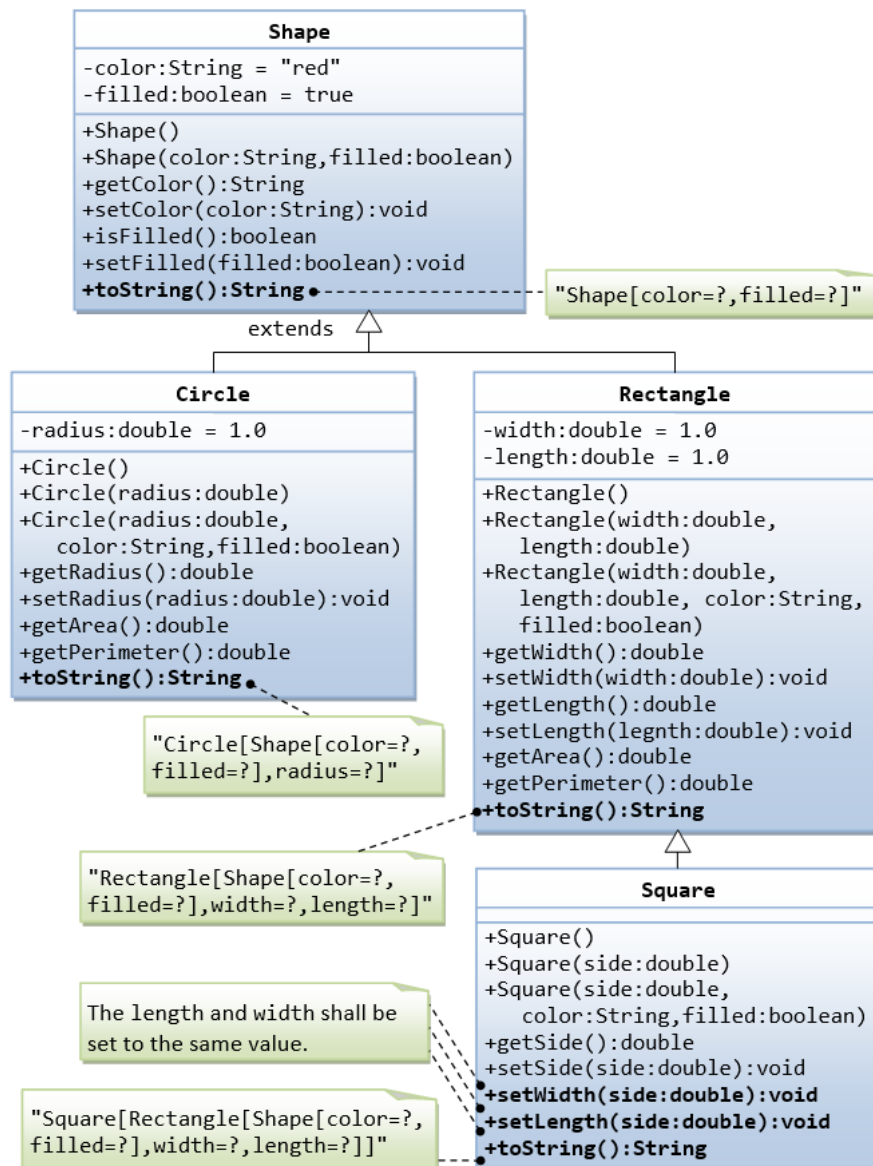


Implement the following class diagram:



1) Write a superclass called Shape (as shown in the class diagram), which contains:

- Two instance variables color (String) and filled (boolean).
- Two constructors: a no-arg (no-argument) constructor that initializes the color to "green" and filled to true, and a constructor that initializes the color and filled to the given values.
- Getter and setter for all the instance variables. By convention, the getter for a boolean variable xxx is called isXXX() (instead of getXxx() for all the other types).
- A toString() method that returns "A Shape with color of xxx and filled/Not filled".

2) Write a test program to test all the methods defined in Shape.

3) Write two subclasses of Shape called Circle and Rectangle, as shown in the class diagram.

• **The Circle class contains:**

- An instance variable radius (double).
- Three constructors as shown. The no-arg constructor initializes the radius to 1.0.
- Getter and setter for the instance variable radius.
- Methods getArea() and getPerimeter().
- Override the toString() method inherited, to return "A Circle with radius=xxx, which is a subclass of yyy", where yyy is the output of the toString() method from the superclass.

• **The Rectangle class contains:**

- Two instance variables width (double) and length (double).
- Three constructors as shown. The no-arg constructor initializes the width and length to 1.0.
- Getter and setter for all the instance variables.
- Methods getArea() and getPerimeter().
- Override the toString() method inherited, to return "A Rectangle with width=xxx and length=zzz, which is a subclass of yyy", where yyy is the output of the toString() method from the superclass.

4) Write a class called Square, as a subclass of Rectangle.

- Provide the appropriate constructors (as shown in the class diagram).
- Override the toString() method to return "A Square with side=xxx, which is a subclass of yyy", where yyy is the output of the toString() method from the superclass.
- Override the setLength() and setWidth() to change both the width and length, so as to maintain the square geometry.