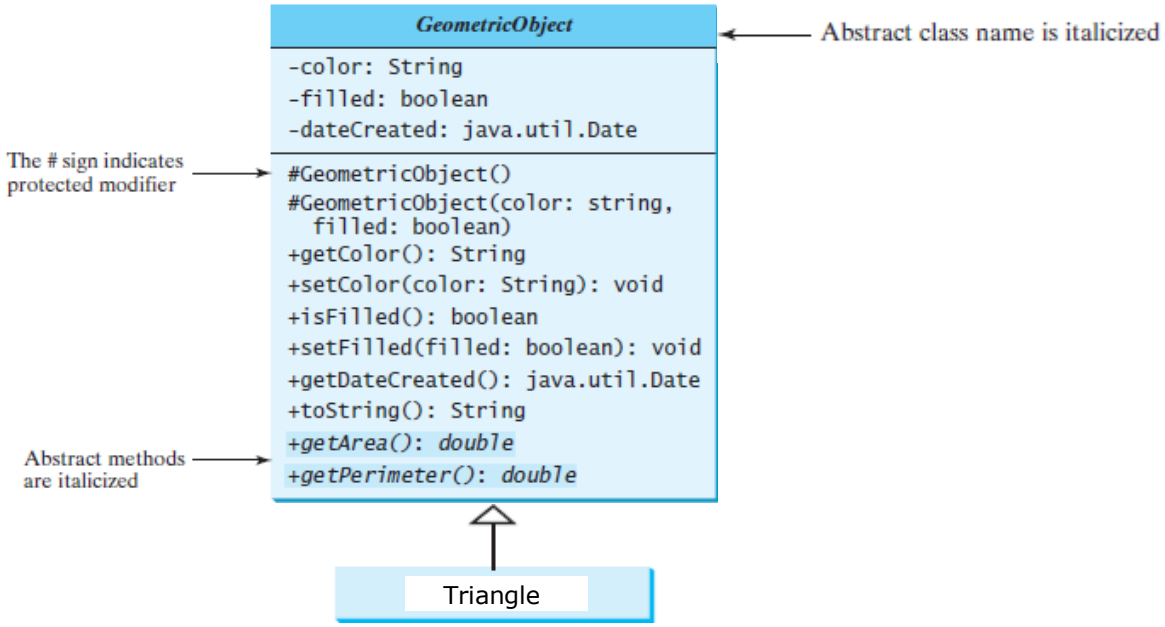
การทดลองที่ 8

Chapter 13 Abstract classes and Interfaces

Program # 1 (Exercise 13.1 p.529 Triangle class)

Design a new Triangle class that extends the abstract GeometricObject class. Draw the UML diagram for the classes Triangle and GeometricObject and then implement the Triangle class. Write a test program that prompts the user to enter three sides of the triangle, a color, and a Boolean value to indicate whether the triangle is filled. The program should create a Triangle object with these sides and set the color and filled properties using the input. The program should display the area, perimeter, color, and true or false to indicate whether it is filled or not.



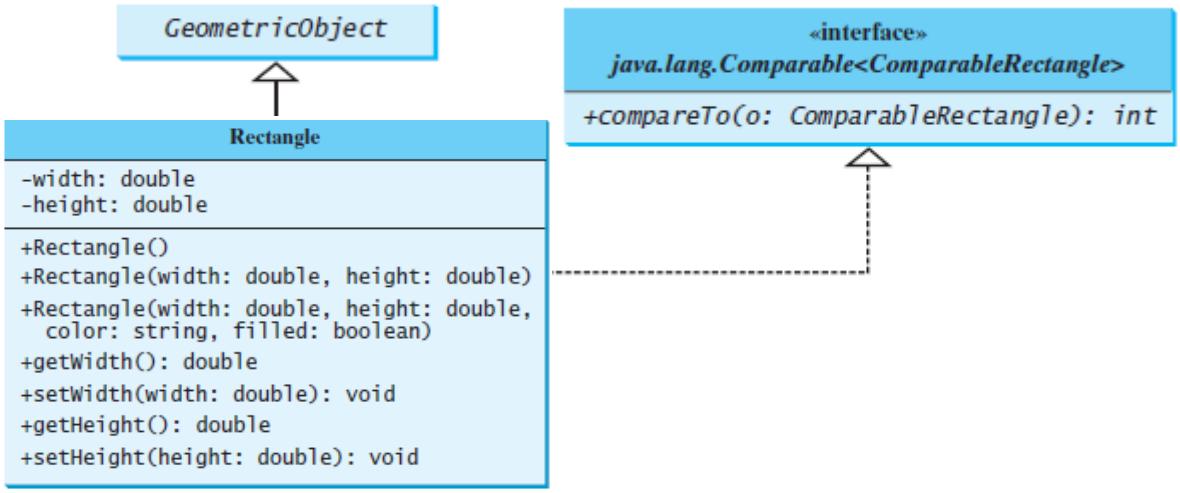
Program # 2 (Exercise 13.7 The Colorable interface)

Design an interface named Colorable with a void method named howToColor(). Every class of a colorable object must implement the Colorable interface.

- Design a class named Square that extends GeometricObject and implements Colorable.
- Implement howToColor to display the message Color all four sides.
- Draw a UML diagram that involves Colorable, Square, and GeometricObject.
- Write a test program that creates an array of five GeometricObjects. For each object in the array, display its area and invoke its howToColor method if it is colorable.

Program # 3 (Exercise 13.10 p.530 Enable Rectangle comparable)

Rewrite the Rectangle class in Listing 13.3 to extend GeometricObject and implement the Comparable interface. Override the equals method in the Object class. Two Rectangle objects are equal if their areas are the same. Draw the UML diagram that involves Rectangle, GeometricObject, and Comparable.



Program # 4 (Exercise 13.11 The Octagon class) Write a class named Octagon that extends GeometricObject and implements the Comparable and Cloneable interfaces. Assume that all eight sides of the octagon are of equal length. The area can be computed using the following formula:

area = (2 + 4/22) * side * side

Draw the UML diagram that involves Octagon, GeometricObject, Comparable, and Cloneable. Write a test program that creates an Octagon object with side value 5 and displays its area and perimeter. Create a new object using the clone method and compare the two objects using the compareTo method.
