Introduction to Java Programming

Sheet # 5: Inheritance and Polymorphism

▶ **Textbook: Introduction to Java Programming and Data Structures, Comprehensive Version (12th Edition)**

▶ **This sheet covers chapter 11** "Inheritance and Polymorphism"

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➤ Check Point Questions:

Review the questions at the following URL:
https://liveexample.pearsoncmg.com/checkpoint12/Chapter11.html

➤ Solve the following Programming Exercises from the textbook (pages 447-451)

11.2	11.3	11.5	11.6	11.11	11.13
11.14	11.15	11.19			

➤ Mini Project: The Triangle Class

Design a class named `Triangle` that extends `GeometricObject`. The class contains:

- Three `double` data fields named `side1`, `side2`, and `side3` with default values `1.0` to denote three sides of the triangle.
- A no-arg constructor that creates a default triangle.
- A constructor that creates a triangle with the specified `side1`, `side2`, and `side3`.
- The accessor methods for all three data fields.
- A method named `getArea()` that returns the area of this triangle.
- A method named `getPerimeter()` that returns the perimeter of this triangle.
- A method named `toString()` that returns a string description for the triangle.

For the formula to compute the area of a triangle, see Exercise 5.19. The `toString()` method is implemented as follows:

```java
return "Triangle: side1 = " + side1 + " side2 = " + side2 + " side3 = " + side3;
```

Draw the UML diagram that involves the classes Triangle and GeometricObject. Implement the class. Write a test program that creates a Triangle object with sides 1, 1.5, 1, color yellow and filled true, and displays the area, perimeter, color, and whether filled or not.

With our best wishes;