

COM 102 – OBJECT ORIENTED PROGRAMMING DURING LAB Assignment#7

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1- General Exercise:

Write a Java application to demonstrate polymorphism. You can use Animal, Cat, Dog, and Lion types by mimicking their makeNoise() ability .

2- Area and Perimeter Calculator for Some Geometric Shapes

In this application, our customer is a Mathematic teacher that teaches geometry class for fourth year students of a primary school. She needs a software for calculating **area** and **circumference** of **geometric shapes** for her students usage. We need to keep a name for the shape and calculate circumference and area for each shape. Your program should be able to calculate area and circumference for a rectangle, square, right triangle, equilateral triangle and scalene triangle. (Note that you already coded Rectangle and Square in the last lab, you can use them with small modifications.)

In your implementation, use good software engineering and object-oriented programming practices and use a UML Class Hierarchy diagram reflecting your design before your implementation. Furthermore, do not forget to do validity checking for parameters for each classes for example, use triangle check rules $a + b > c$; $a + c > b$ and $b + c > a$ based on the edge values a, b and c.

NOTE:In your test class implementation, create some number of different shape objects which are kept in a collection. Using the array/arraylist, exemplify a good use of polymorphism capability of the JVM by calling calculate area and calculate circumference methods of the corresponding class objects.