CSC1850 Object-oriented Programming (Fall 2025)

Homework Assignment 11

(10 points)

Due Date: Tuesday, Nov. 18 before midnight

Problem

Write a Java program to learn about **abstract class, inheritance, polymorphism, and interface.**

Mathematically, shapes can be as simple as a point, a line, a circle, or some very complex 'shape'.

Please define an abstract class **Shape** that has three data fields: String name and double x, double y for its location. Can you instantiate an object for this class?

Please define a Circle class as a subclass of class Shape. What else data fields are necessary? Maybe a radius is enough.

Please define a Triangle class as a subclass of class Shape. What else data field are necessary? Another two locations, like x1, y1, x2, y2?

Please define an EquiLateralTriangle class as a subclass of class Triangle. Any extra data fields are needed?

For the Circle, Triangle, and other shapes that have an area, there should be a method getArea() inside these classes' definition, how to enforce that? Please define an **interface** for that and implements the interface when defining the classes.

With the inheritance hierarchy, can you show polymorphism?