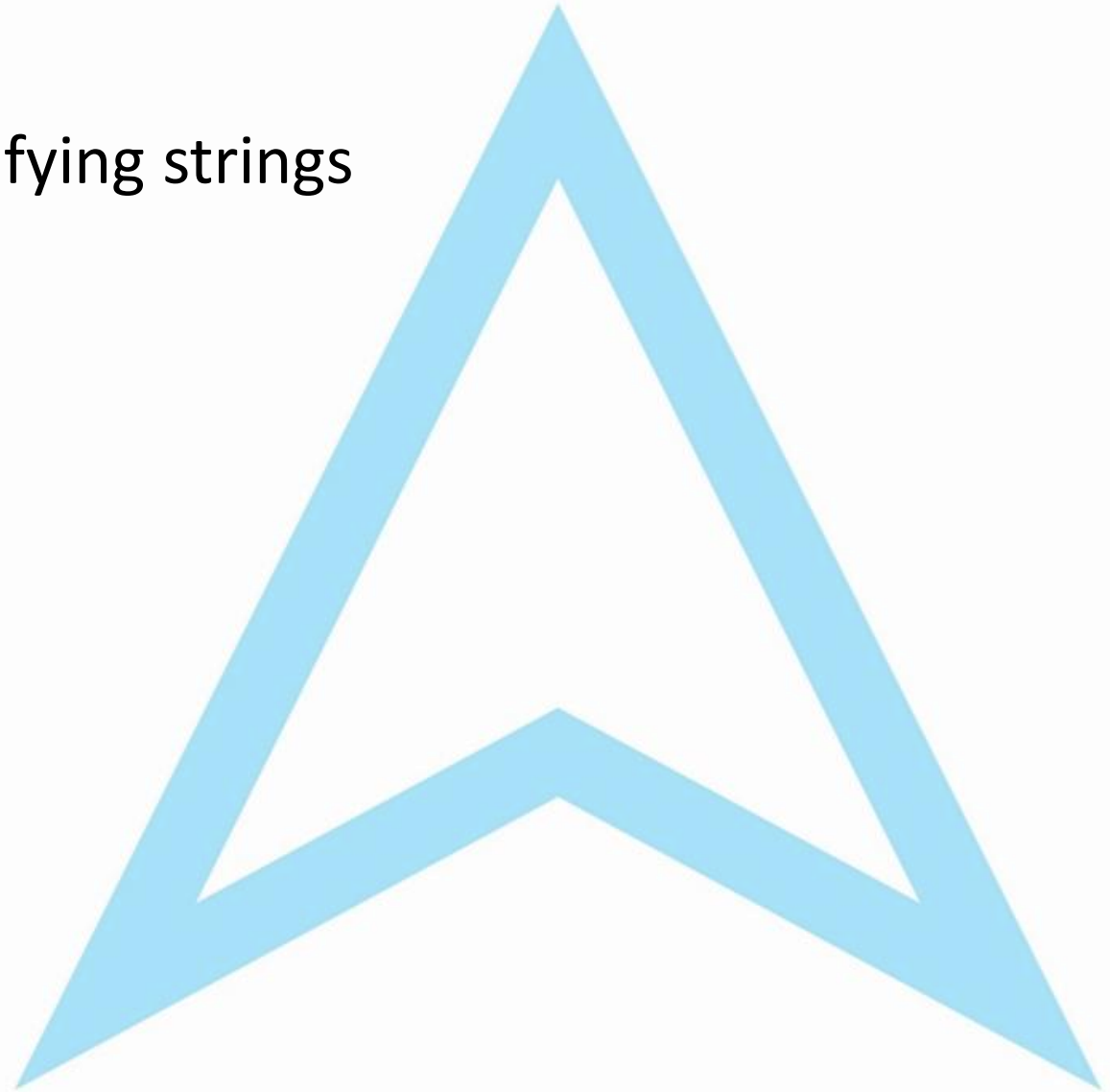
Module 1 Day 13

Abstract Classes

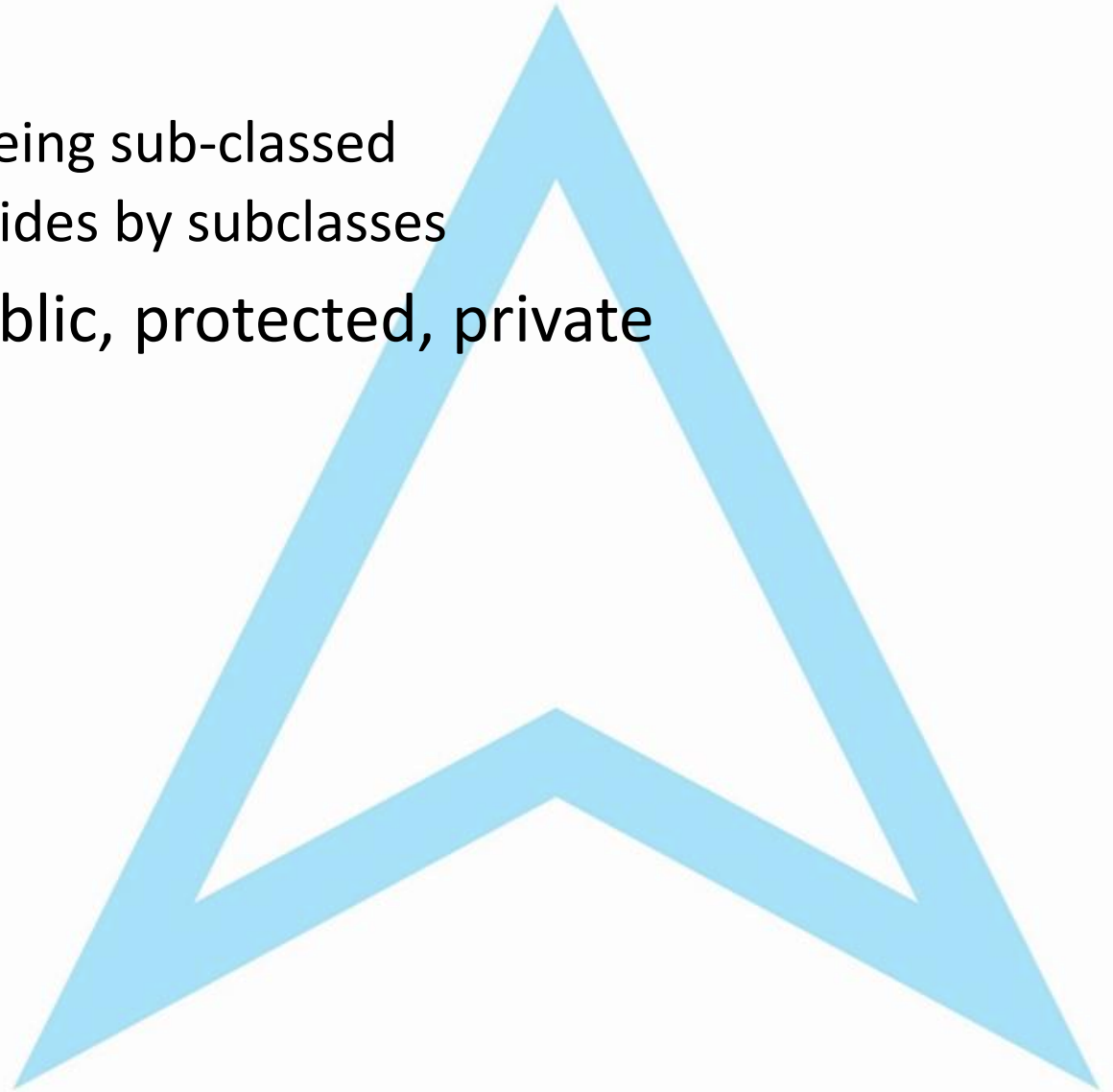
Little bits of Coolness

- Format specifiers in strings
- Padding strings for alignment; justifying strings
- ToString() override



Communicating Design Intent

- Sealed
  - On a class, prevents the class from being sub-classed
  - On a method, prevents further overrides by subclasses
- Access modifiers – when to use public, protected, private
  - Easier to give than to take away



Abstract Methods and Classes

- Abstract Method
  - Superclass provides **no implementation**
  - Subclass **must** implement the method
- Abstract Class
  - A user cannot create an instance of this class
  - **Only subclasses** can be instantiated
    - Should it really be possible to create a new FarmAnimal?
    - What does a FarmAnimal look like?
    - What noises does it make?
    - Can we sell it?
- If a class contains an abstract method, then it **must** be an abstract class

Classes, Abstract Classes, Interfaces, Oh My

Concrete Class	Abstract Class	Interface
Class Inheritance (max 1)	Class Inheritance (max 1)	Interface Inheritance (many)
General → Specialized	General → Specialized	Functionality (can do)
Implementation code	Implementation code	No code, just a contract
May contain public, protected and private members	May contain public, protected and private members	Public members only
Can create an instance	**Cannot** create an instance	**Cannot** create an instance
Use when there is a specialization relationship (a true is-a), and the class represents a real-world thing that can exist (e.g., a Pig)	Use when there is a specialization relationship (a true is-a), but the class represents something that doesn't make sense to exist without being further defined (e.g., a Farm Animal)	Use when there is a need to make a class "behave like" or "can do" some additional functionality; when there is not a true "is-a" relationship.