

Inheritance Terminology

CS 272 Software Development

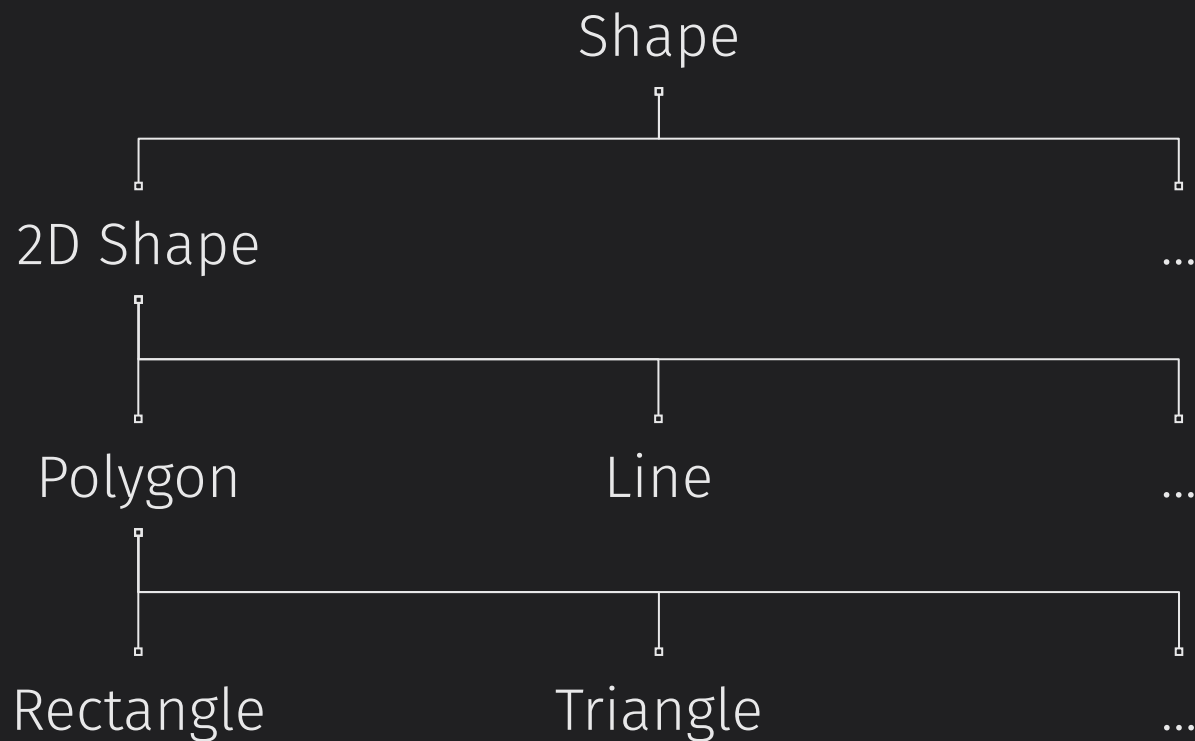
Relationship Types

- Composition
 - "**has-a**" relationship
 - *e.g.* X **has a** Y *e.g.* Tomatoes **have** seeds
- Inheritance
 - "**is-a**" relationship
 - *e.g.* X **is a** Y *e.g.* Tomatoes **are** fruit

Relationship Examples

- A rectangle **has-a** width and height
- A rectangle **has-a** area
- A square **is-a** rectangle
- A rectangle **is-a** polygon
- A polygon **is-a** 2D shape





Terminology

Rectangle is-a Polygon is-a 2D Shape

- Polygon is a **direct superclass** of Rectangle
- 2D shape is a **indirect superclass** of Rectangle
- Rectangle is a **direct subclass** of Polygon
- Rectangle is a **indirect subclass** of 2D Shape



Terminology

Rectangle is-a Polygon is-a 2D Shape

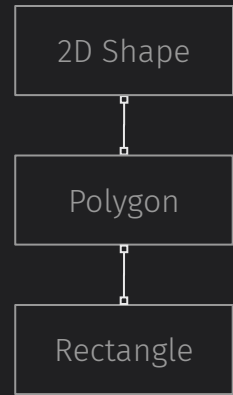
- Rectangle **inherits** from Polygon
- Polygon **inherits** from 2D Shape
- Rectangle **extends** Polygon
- Polygon **extends** 2D Shape



Access

Rectangle **extends** Polygon **extends** 2D Shape

- Rectangle may not access **private** methods or members in Polygon or 2D Shape
- Rectangle may access **public** or **protected** methods or members in Polygon and 2D Shape



Behavior

Rectangle **extends** Polygon **extends** 2D Shape



- Rectangle may **override** methods in Polygon
- Rectangle may add **additional** methods not already defined in Polygon

Behavior

Rectangle **extends** Polygon **extends** 2D Shape

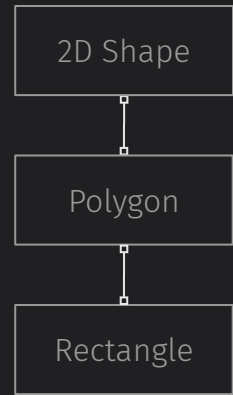
- Rectangle may explicitly call the constructor for Polygon using the **super()** method
- Chain constructors so Rectangle calls Polygon constructor, which calls the 2D Shape constructor



Behavior

Rectangle **extends** Polygon **extends** 2D Shape

- Rectangle eventually inherits from the Object class (explicitly or implicitly)
- Rectangle inherits default **toString()** and other methods from the Object class



Questions?

