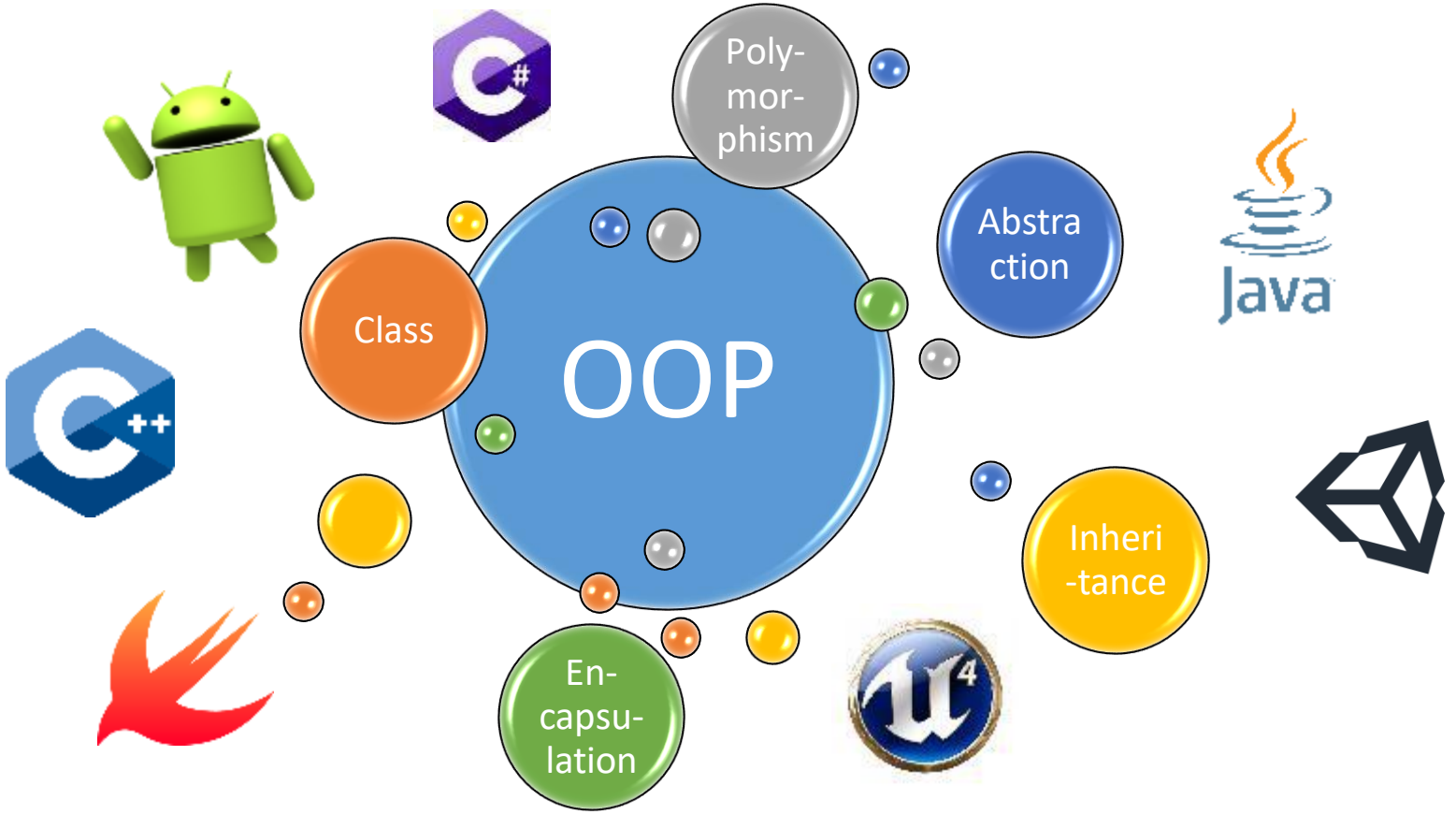


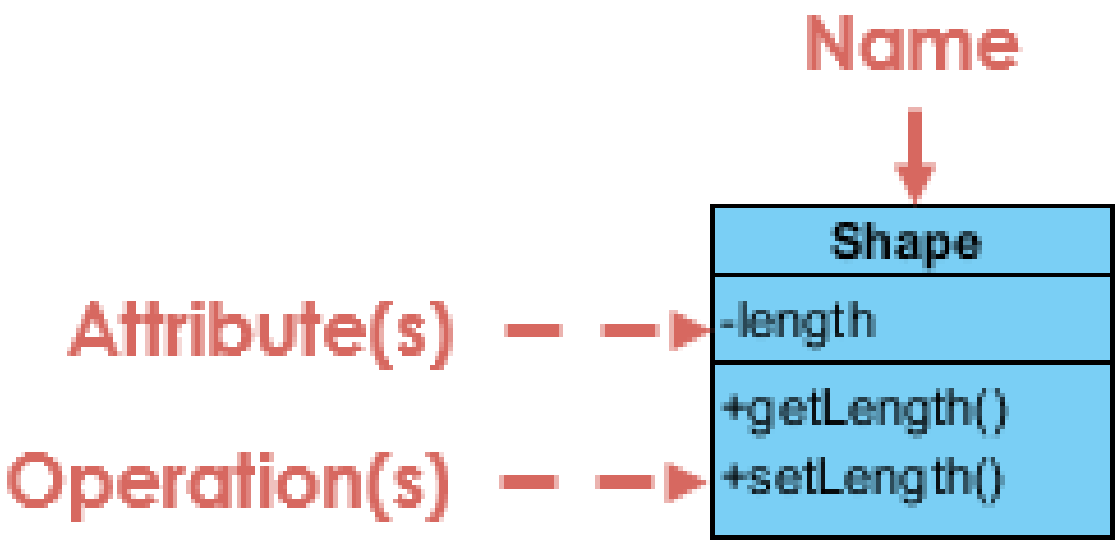
Unified Modeling Language

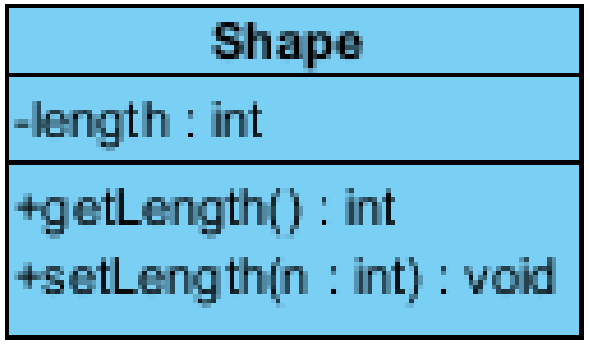
Kuan-Ting Lai

2020/3/2

Unified Modeling Language (UML)

- A graphical notation for OOP
- Example: (All examples are from Visual Paradigm)



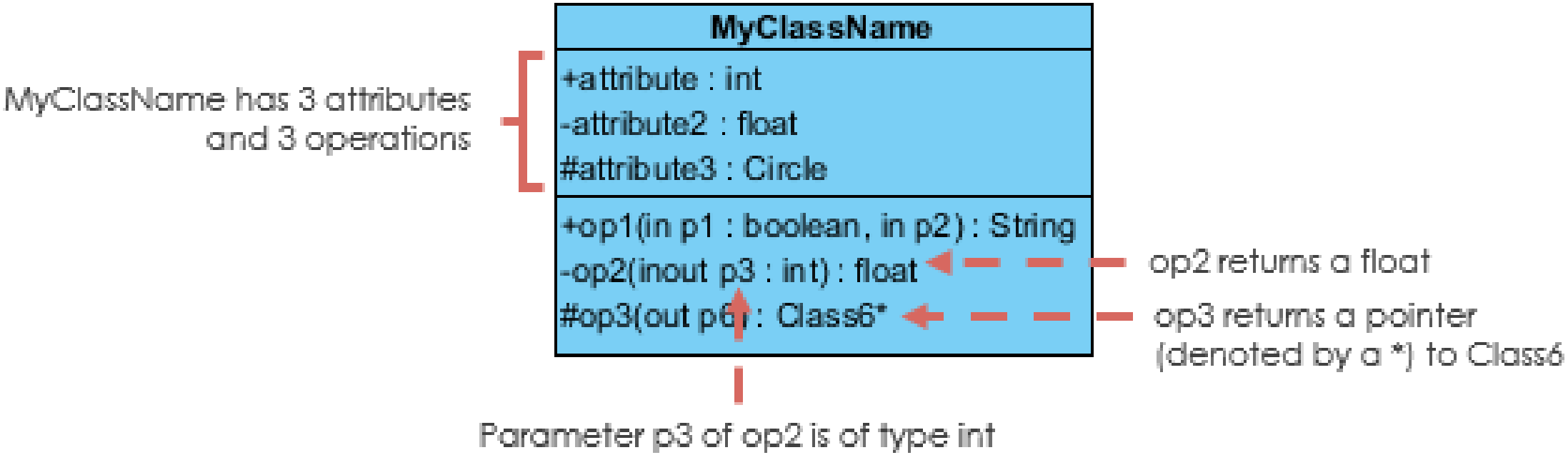


Class without signature

Class with signature

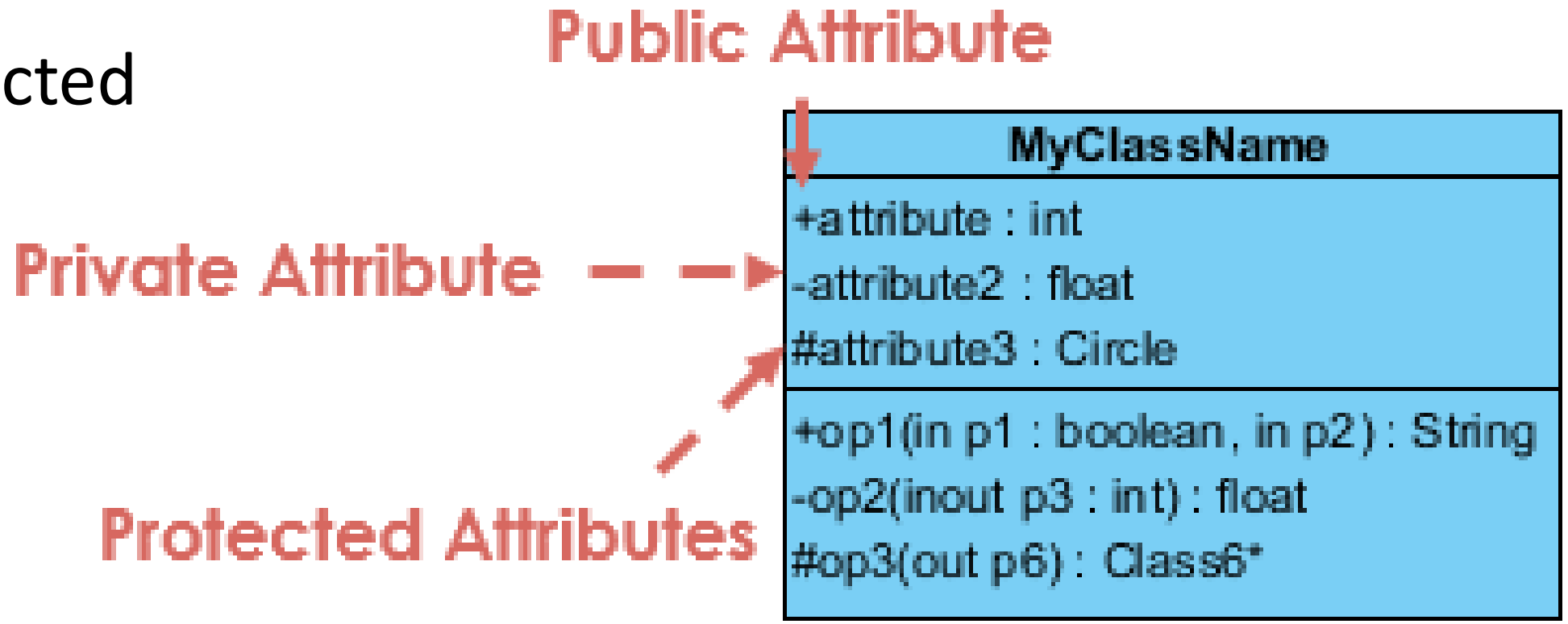
Class Operations (Methods)

- The return type of a method is shown after the colon at the end of the method signature.



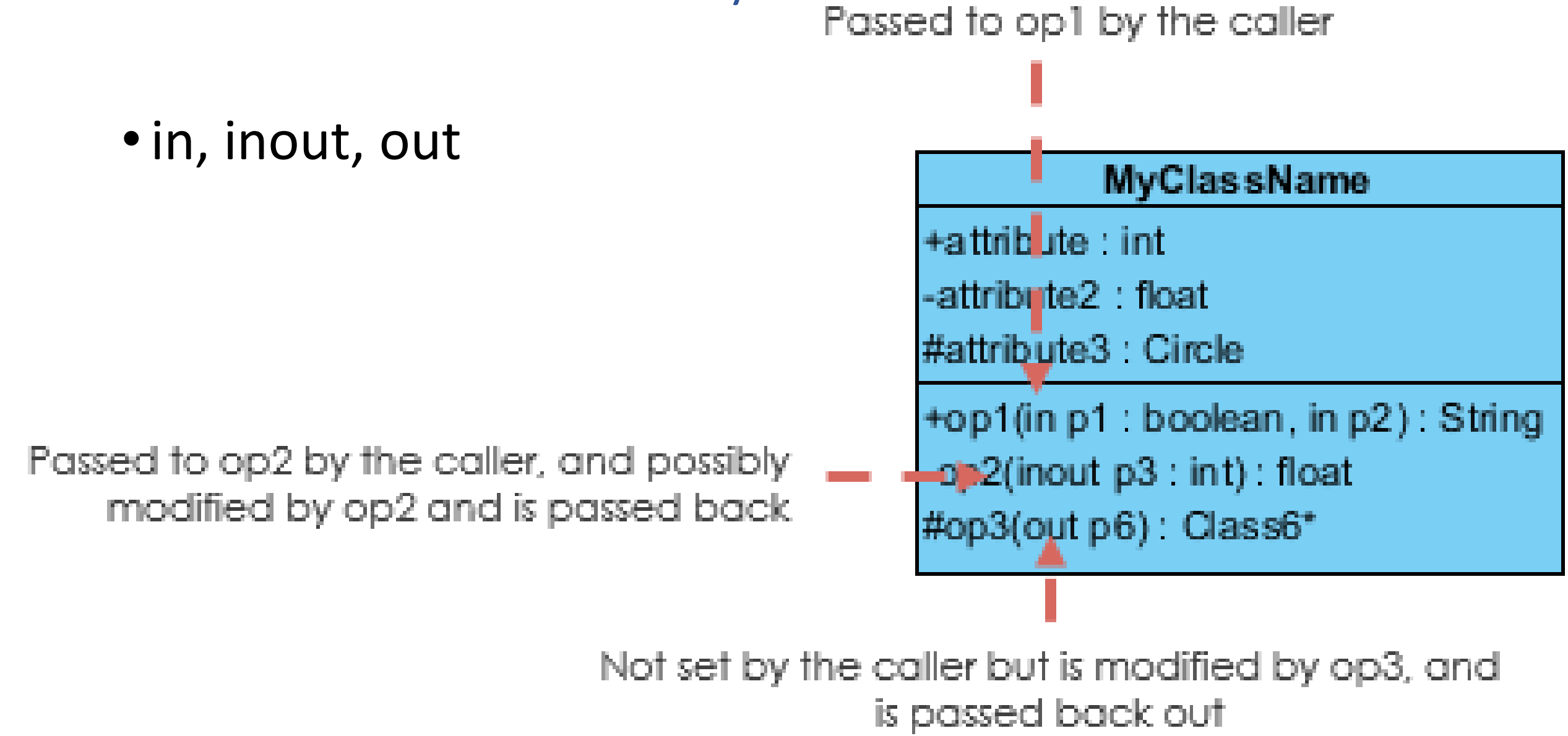
Class Visibility

- + public
- - private
- # protected



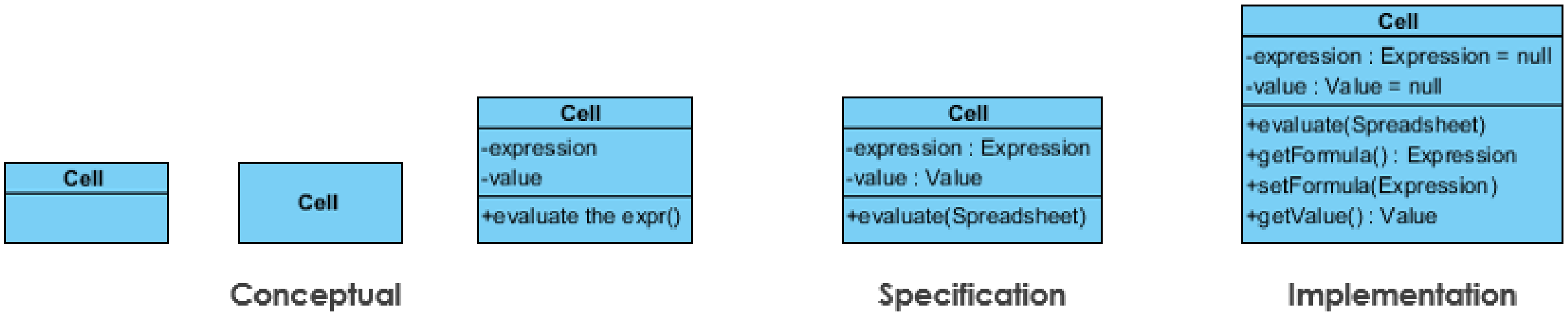
Parameter Directionality

- in, inout, out

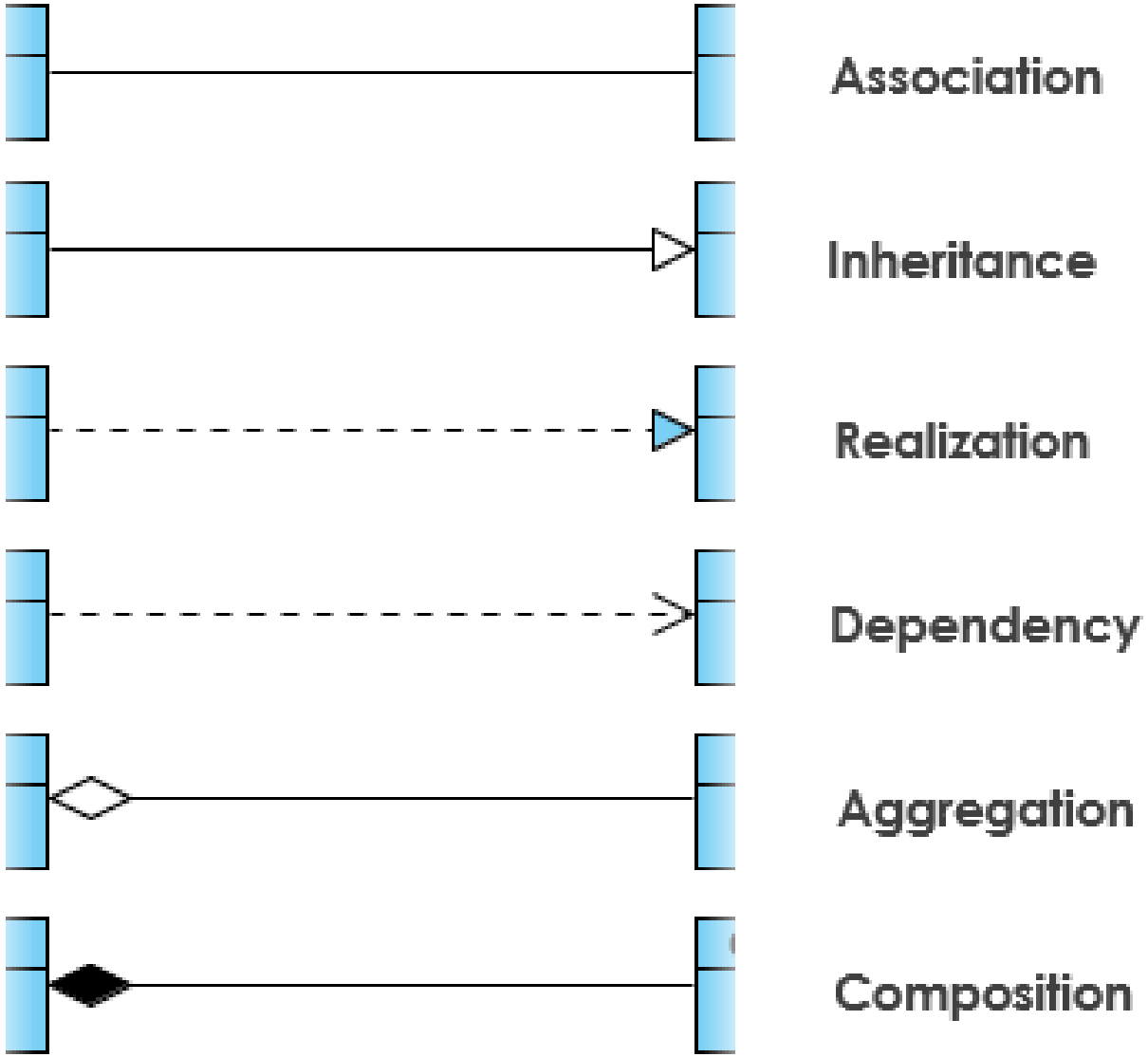


Perspectives of Class Diagram

- Conceptual
- Specification
- Implementation

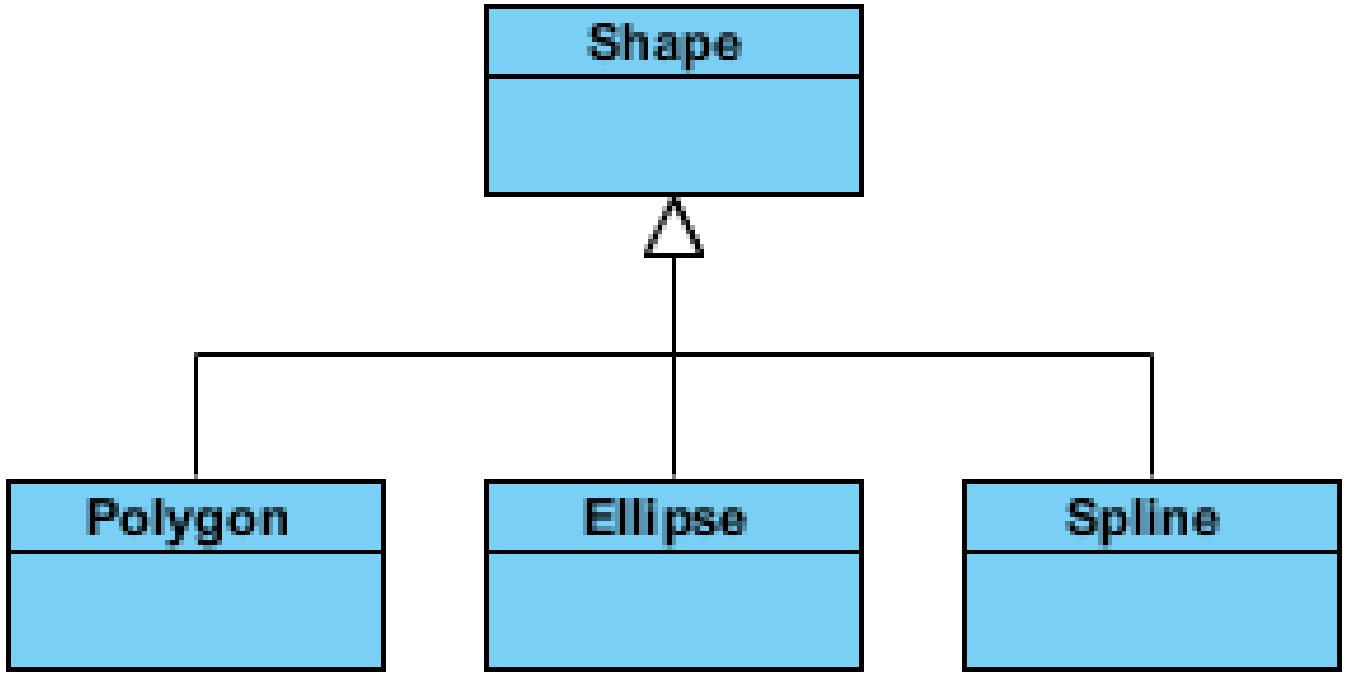


Relationships Between Classes



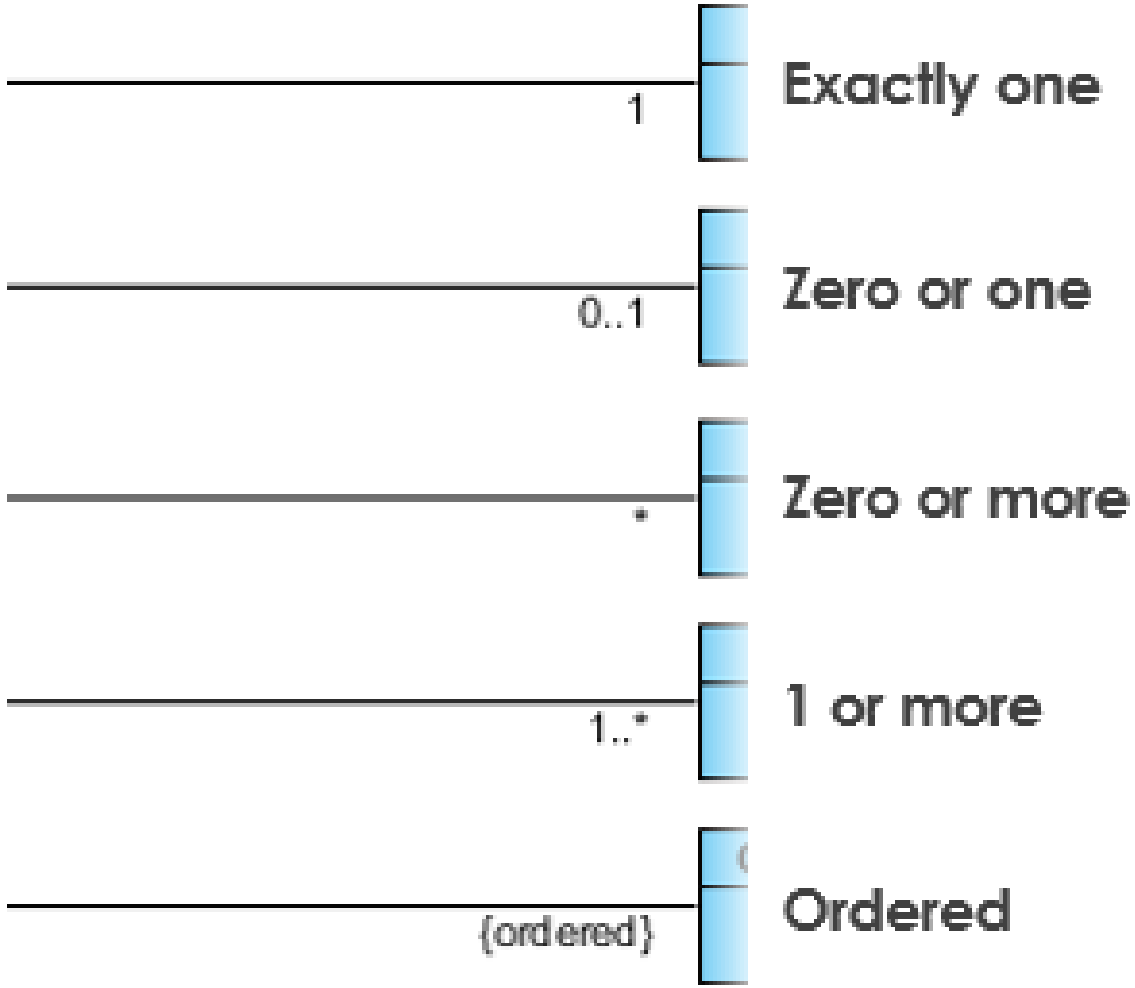
Inheritance

- Represents an "is-a" relationship.
- An abstract class name is shown in italics.



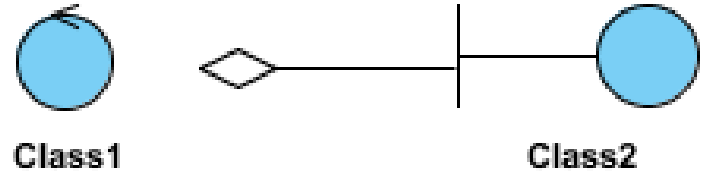
Association

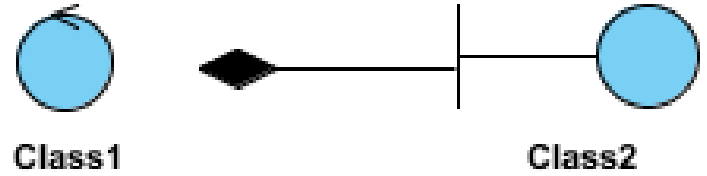
- One-to-one
- One-to-many
- Many-to-many

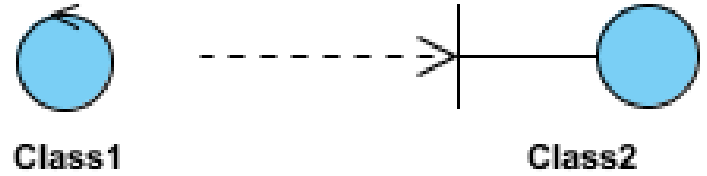


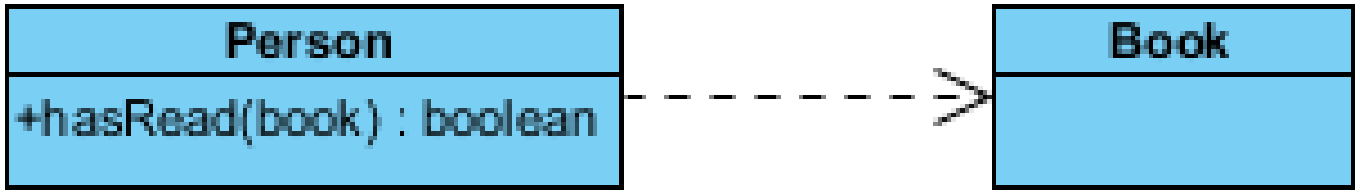
Aggregation, Composition, Dependency

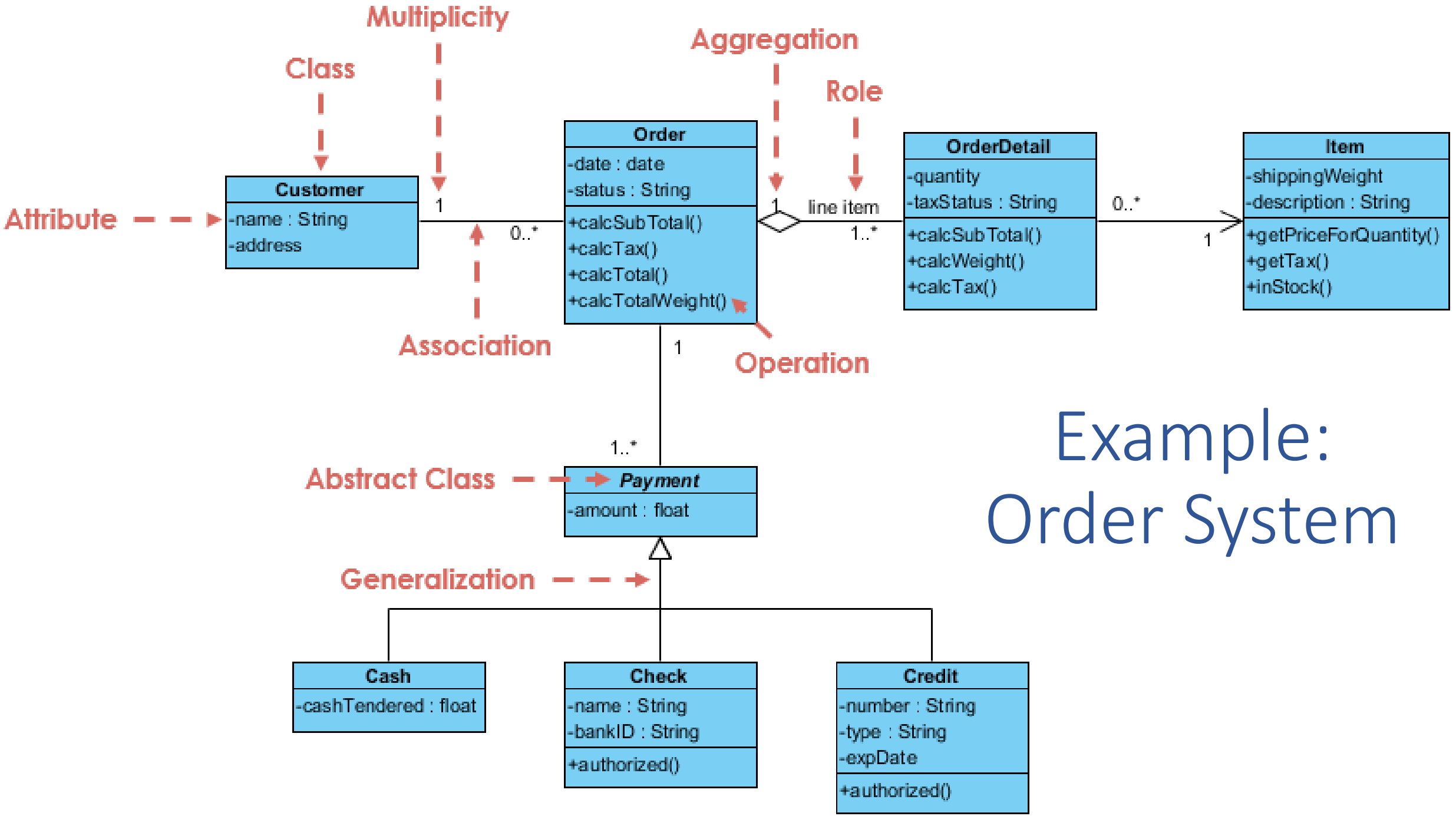
- Aggregation
  - It represents a "part of" relationship.
  - Objects of Class1 and Class2 have separate lifetimes.
- Composition
  - Objects of Class2 live and die with Class1.
- Dependency
  - If changes to Class 2 cause changes to Class 1





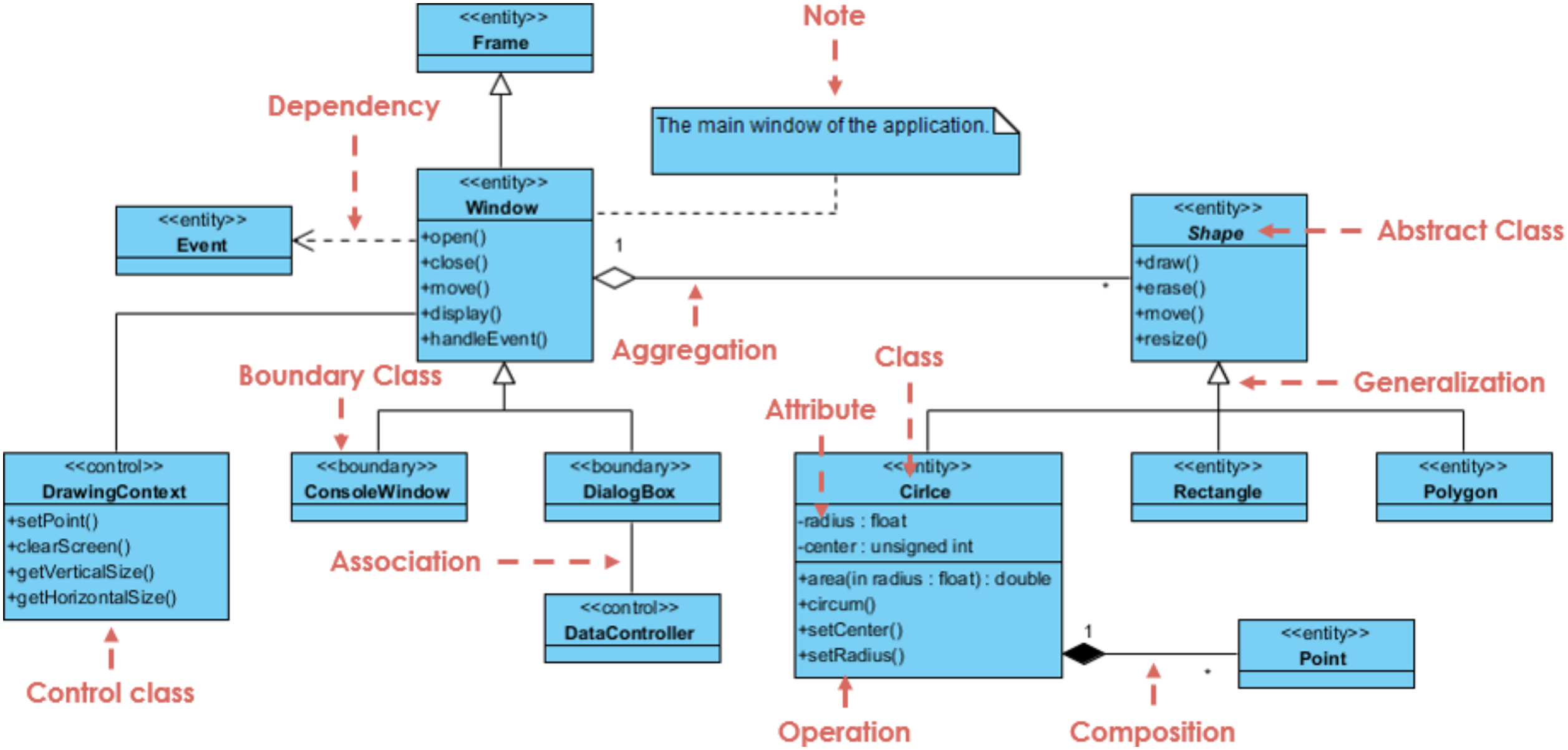






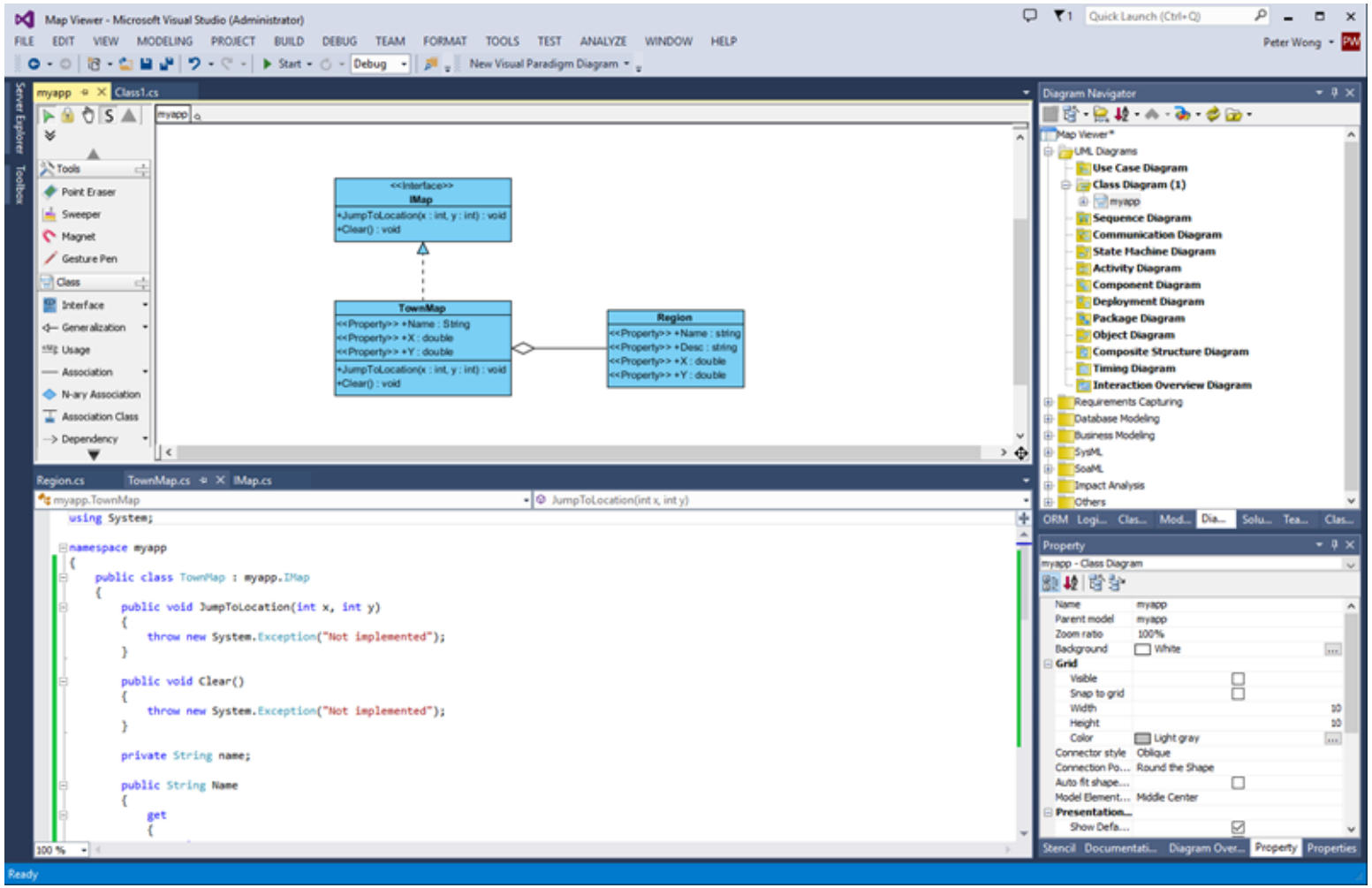
Example: Order System

Example: GUI


<<entity>>
Frame
Note
The main window of the application.
Dependency
<<entity>>
Window
+open()
+close()
+move()
+display()
+handleEvent()
<<entity>>
Event
1
*
<<entity>>
Shape
+draw()
+erase()
+move()
+resize()
Abstract Class
Aggregation
Class
Attribute
Boundary Class
Generalization
<<control>>
DrawingContext
+setPoint()
+clearScreen()
+getVerticalSize()
+getHorizontalSize()
<<boundary>>
ConsoleWindow
<<boundary>>
DialogBox
<<entity>>
Cirlce
-radius : float
-center : unsigned int
+area(in radius : float) : double
+circum()
+setCenter()
+setRadius()
<<entity>>
Rectangle
<<entity>>
Polygon
Association
<<control>>
DataController
1
*
<<entity>>
Point
Control class
Operation
Composition

Generate C# Code using UML in Visual Studio

- https://www.visual-paradigm.com/tw/tutorials/visual-studio-uml-to-csharp-tutorial.jsp



References

- https://www.visual-paradigm.com/guide/uml-unified-modeling-language/uml-class-diagram-tutorial/