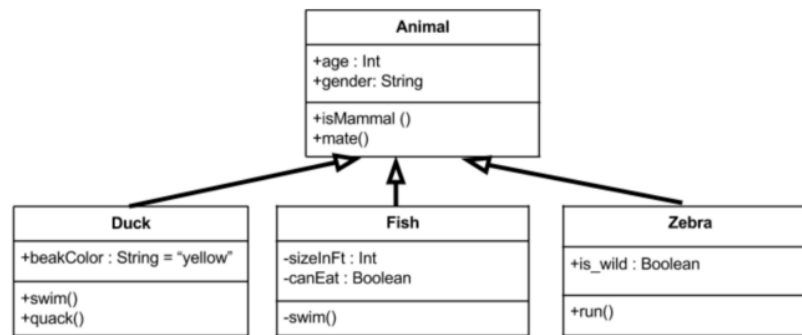
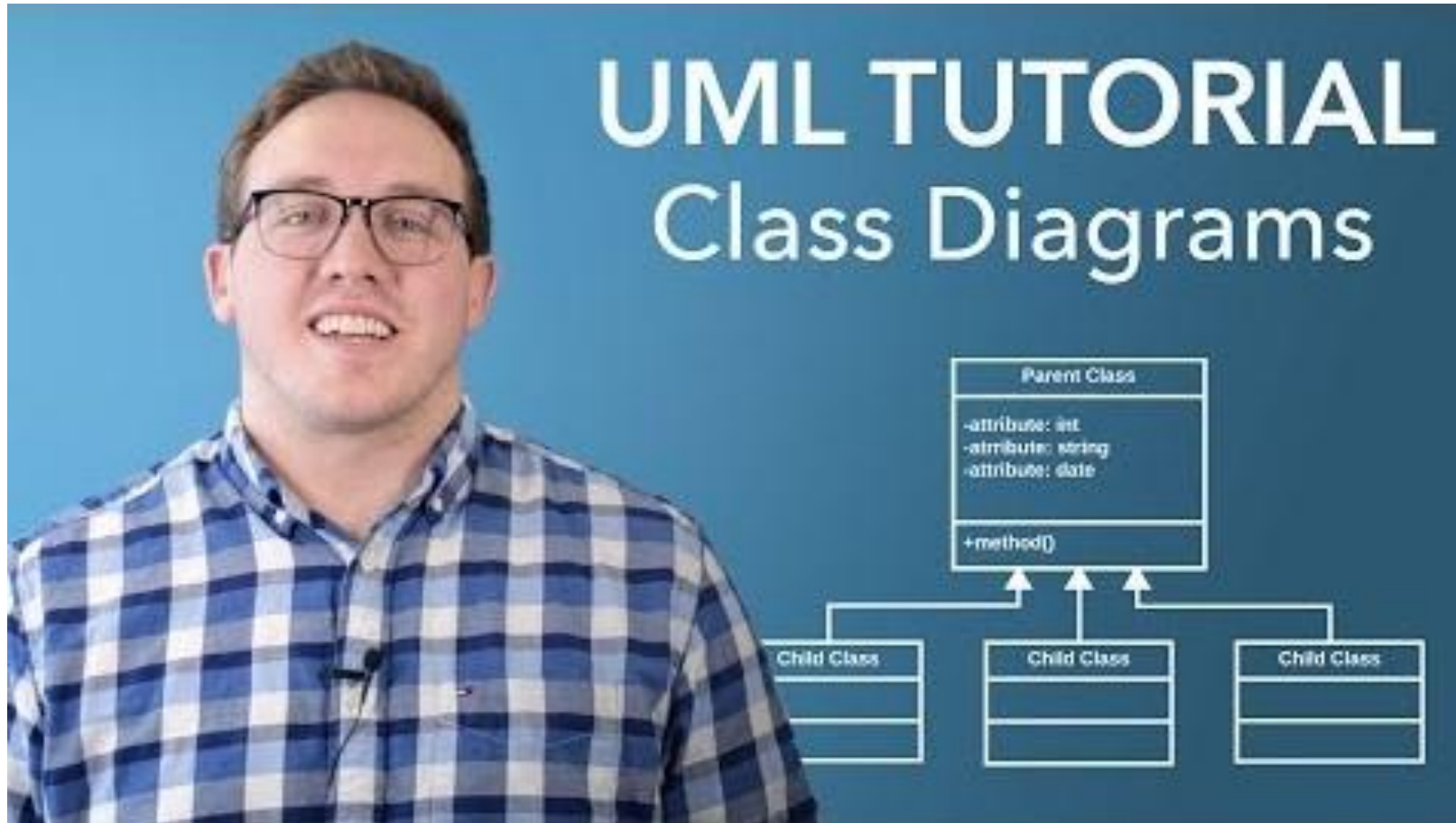


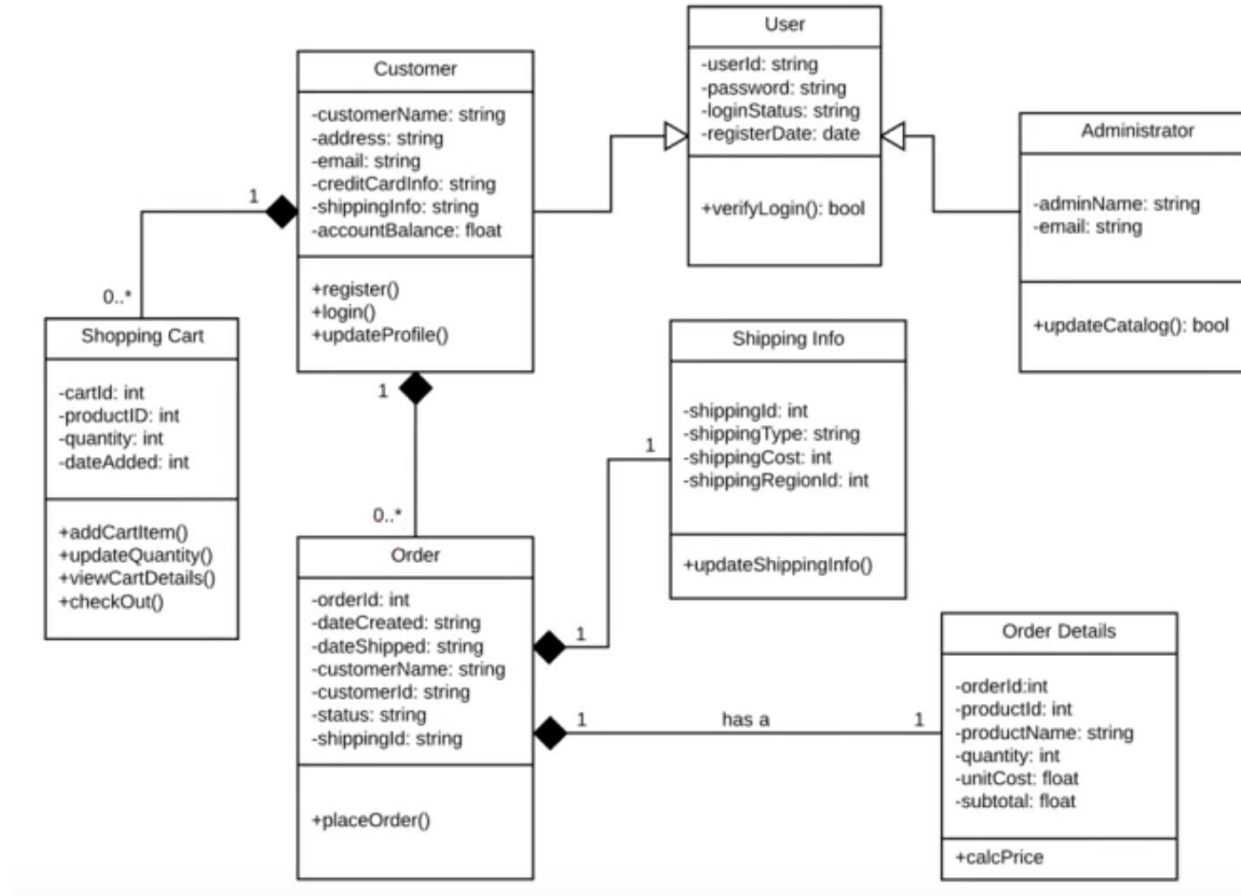
Class Diagrams



Class Diagrams Tutorial



Example for UML Class Diagram



Why do we need class diagrams?

- Planning and modeling makes programming much easier.
- Making changes to class diagrams is easy.
 - Changing code can be expensive /difficult / dangerous (?).
- You don't need much technical / language-specific knowledge to understand it.

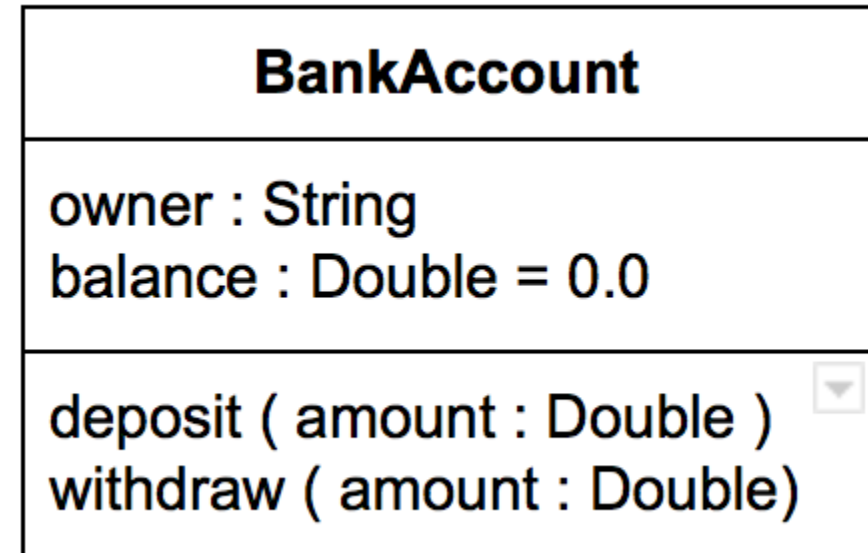
Think of building a house ...

- You wouldn't just grab a hammer and get to work.
- You need to have a design plan.
- So you can ANALYZE & MODIFY the system easily.



Class Representation in UML

- Box with 3 compartments
 - Class name
 - Class attributes
 - Class methods
- Conventions
 - attribute name : type
 - method name(parameter: type)
- You can set a default value
 - balance : Double = 0

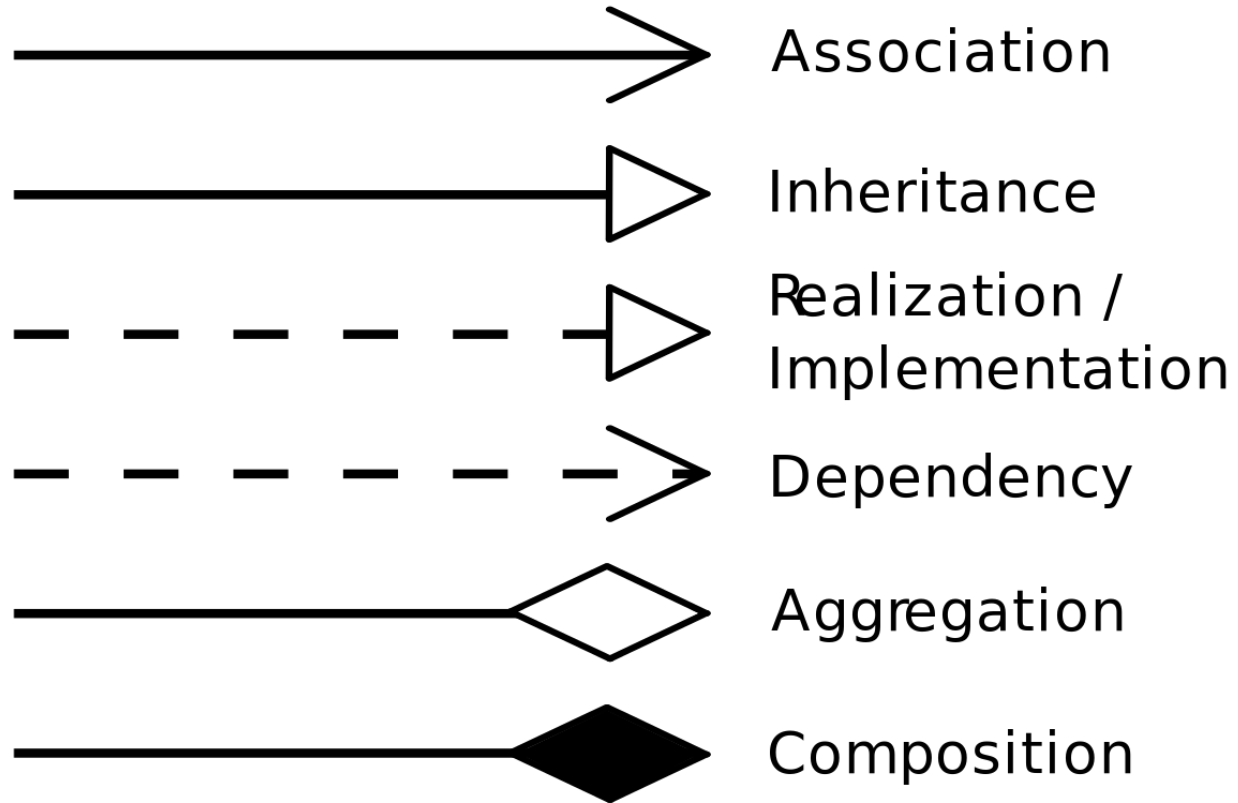


Access level modifiers

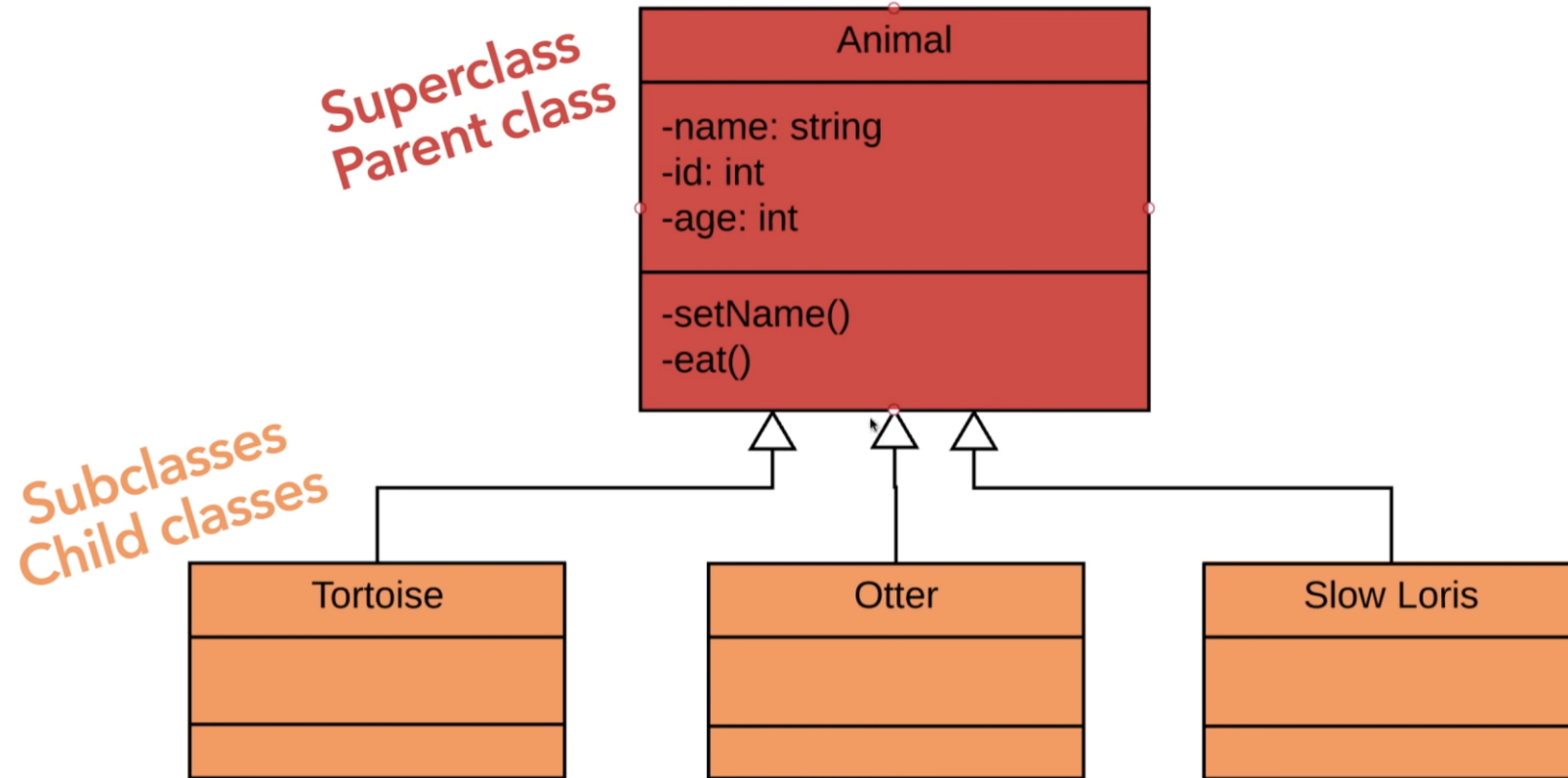
Java Modifier	UML Symbol	Accessible in same class	Accessible in same package	Accessible in subclass	Accessible in every package
public	+	Yes	Yes	Yes	Yes
protected	#	Yes	Yes	Yes	No
no modifier (“package-private”)	~	Yes	Yes	No	No
private	-	Yes	No	No	No

! Protected class members are also accessible in subclasses, which are not part of the same package!

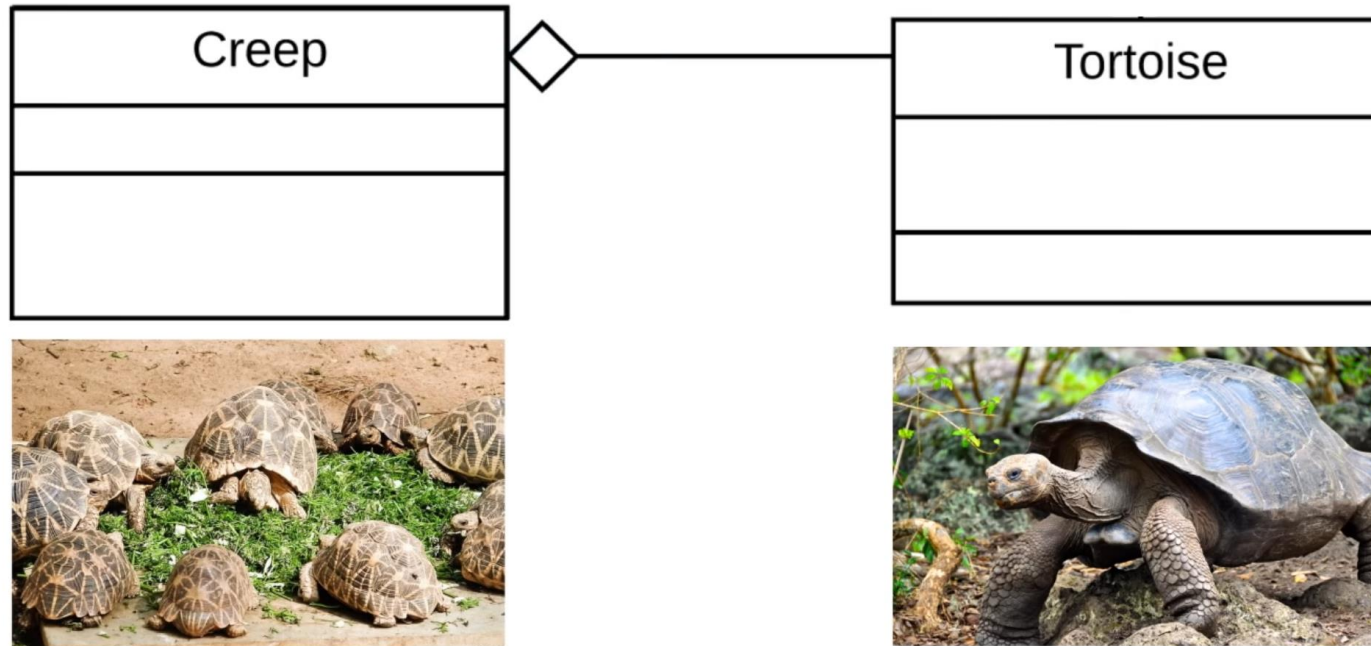
Relationships between Classes



Inheritance

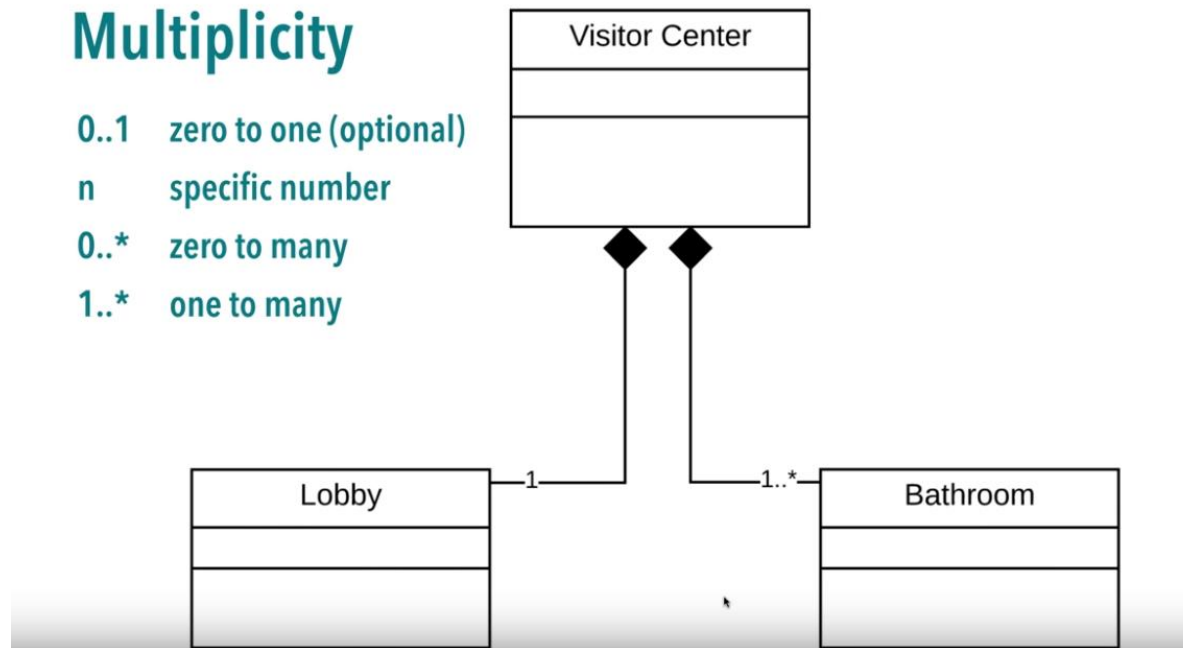


Aggregation



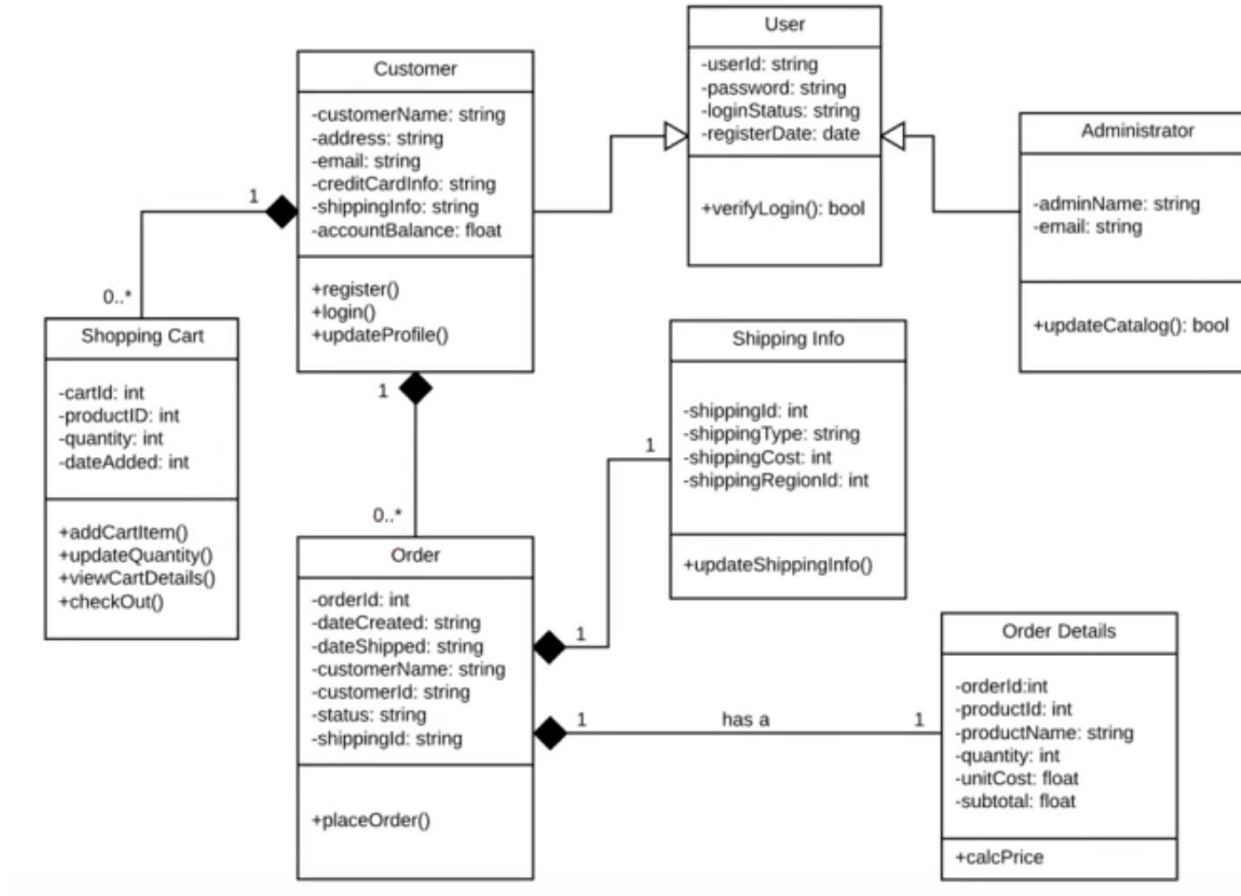
The tortoise can exist without the creep!

Composition (with Multiplicity)

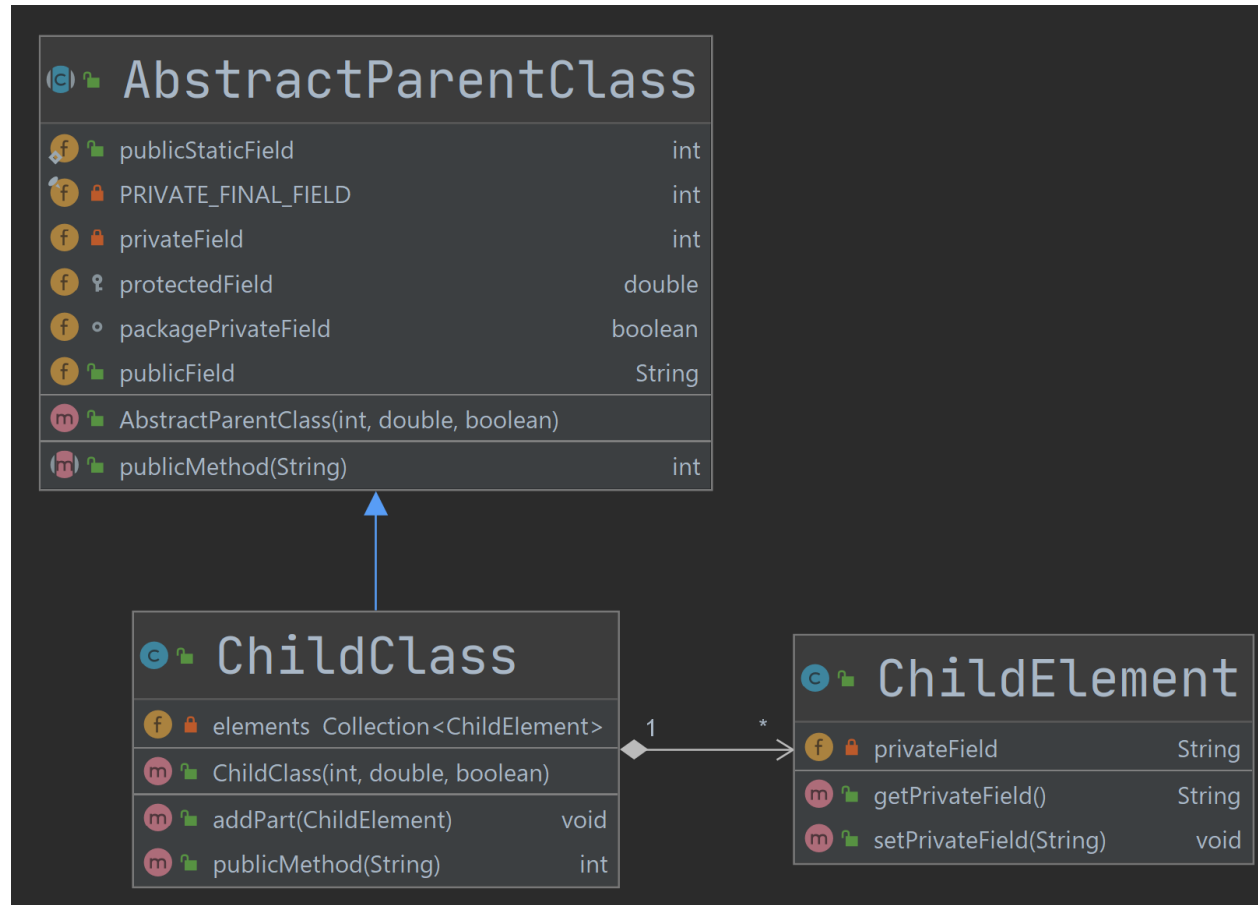


The bathroom can't exist without the visitor center!

Class Diagram for Online Shopping Cart



Class Diagrams in IntelliJ IDEA



- How to create a diagram
 - Right-click a package in *Project* tool window
 - Select *Diagrams* | *Show Diagram*
 - Select *Java Class Diagram*
- Symbols look a little bit different (learn them!!!)
- Associations are always shown as compositions. :-(
 - <https://www.jetbrains.com/help/idea/class-diagram.html>

Resources

- https://medium.com/@smagid_allThings/uml-class-diagrams-tutorial-step-by-step-520fd83b300b
- <https://www.youtube.com/watch?v=UI6lqHOVHic&t=14s>