Object Oriented Analysis and Design

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Jarno Walgemoed - Sourcelabs

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Object Oriented Design is the process of planning a system of interacting objects for the purpose of solving a software problem. It is one (of many) approaches to software design.

So, we are essentially solving a software problem by modelling its structure and interactions to match the world outside of the software.

UML: A standardized modeling language to express object oriented models.

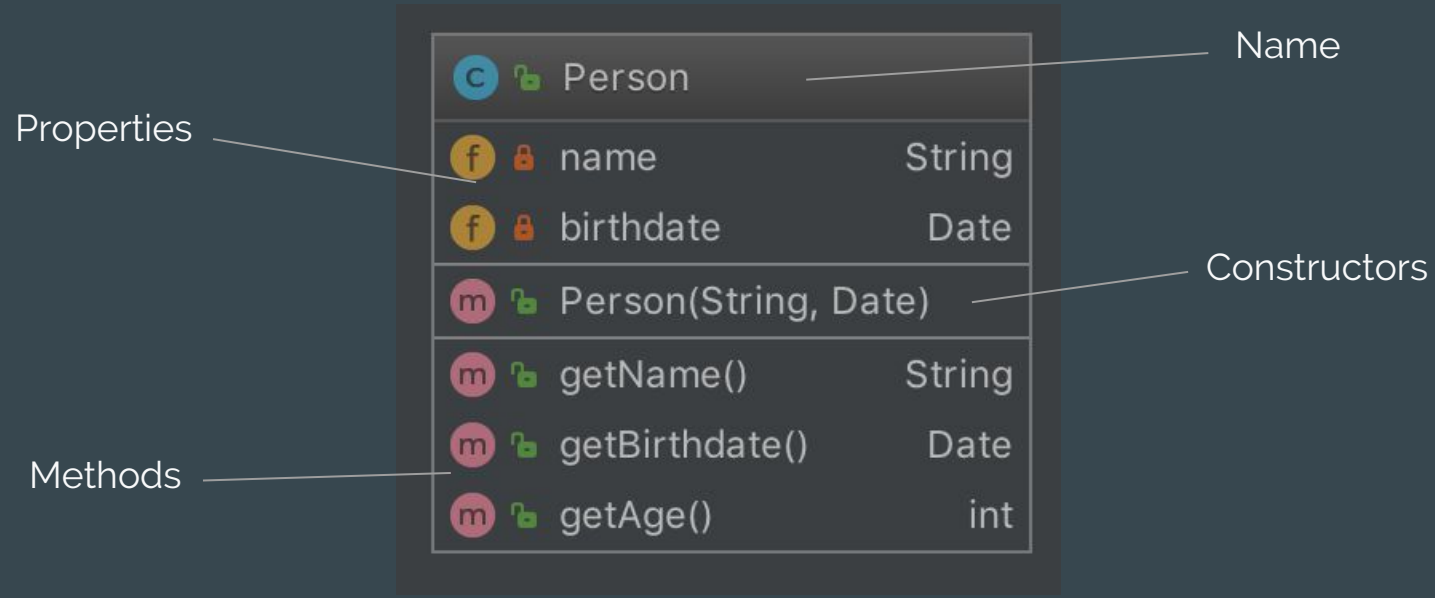
UML Diagrams

- **Class**
  - Shows the class/object model and its relationships
- Package
  - Shows the package structure and dependencies
- Use case
  - Shows use cases and the actors involved
- Activity
  - Shows relationships between use cases in a workflow
- Sequence
  - Shows interactions between objects within a use case and the order in which they occur
- Quite a few more…
  - Different models with different granularity, each with their own uses

UML Class Diagram Contents

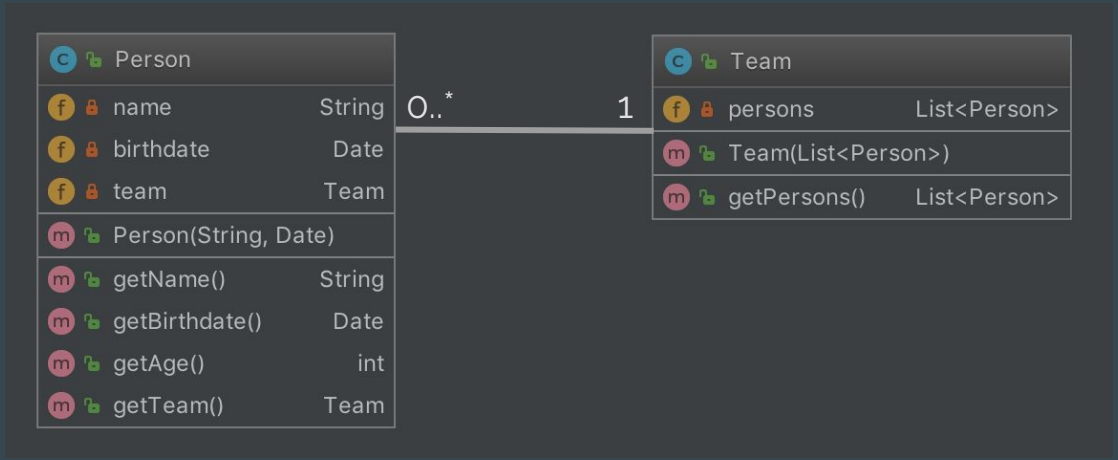
- Objects or classes in your model
  - Constructors
  - Properties
  - Methods
- Associations
  - Cardinality - 0..*, 0..1, 1, *, ...
  - Directionality - unidirectional, bidirectional
- Polymorphism
  - Inheritance
  - Interfaces
- Dependencies
- Aggregations
- Compositions

Classes - Objects

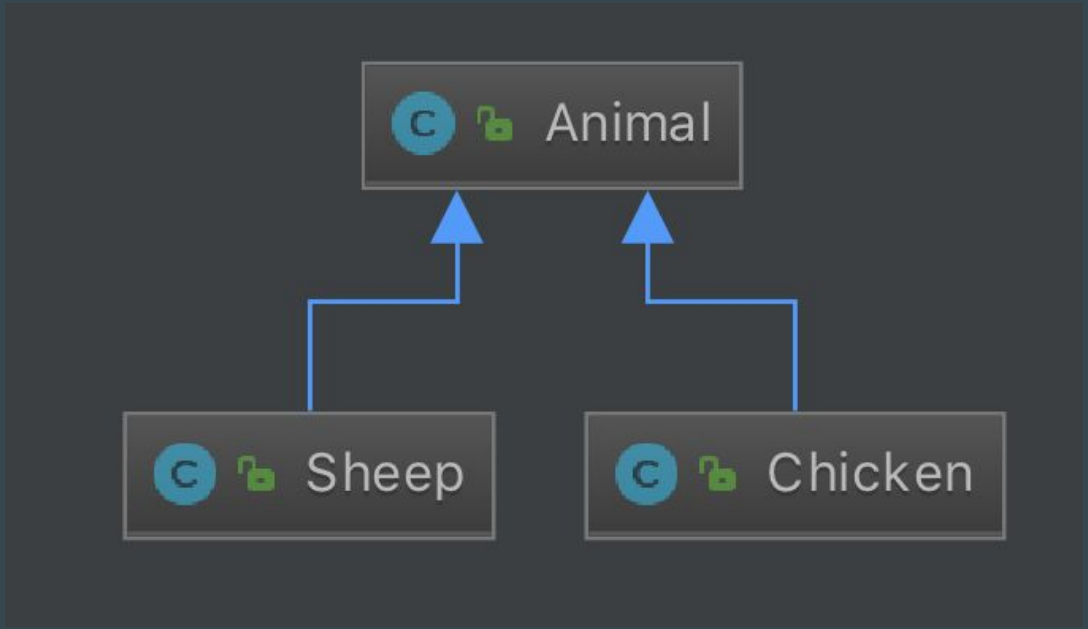


Associations - Unidirectional

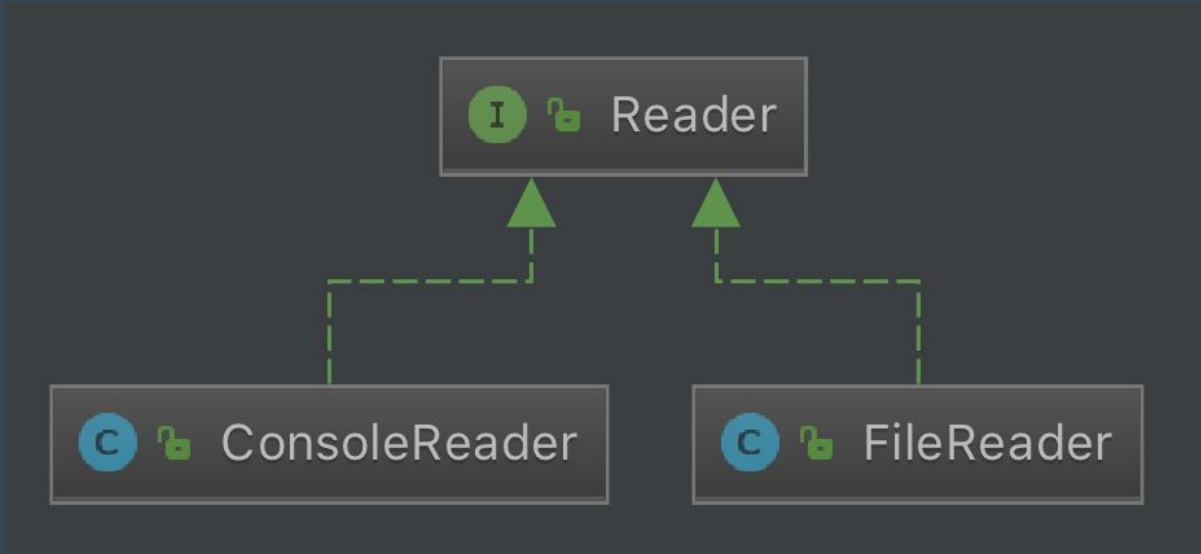
Associations - Bidirectional



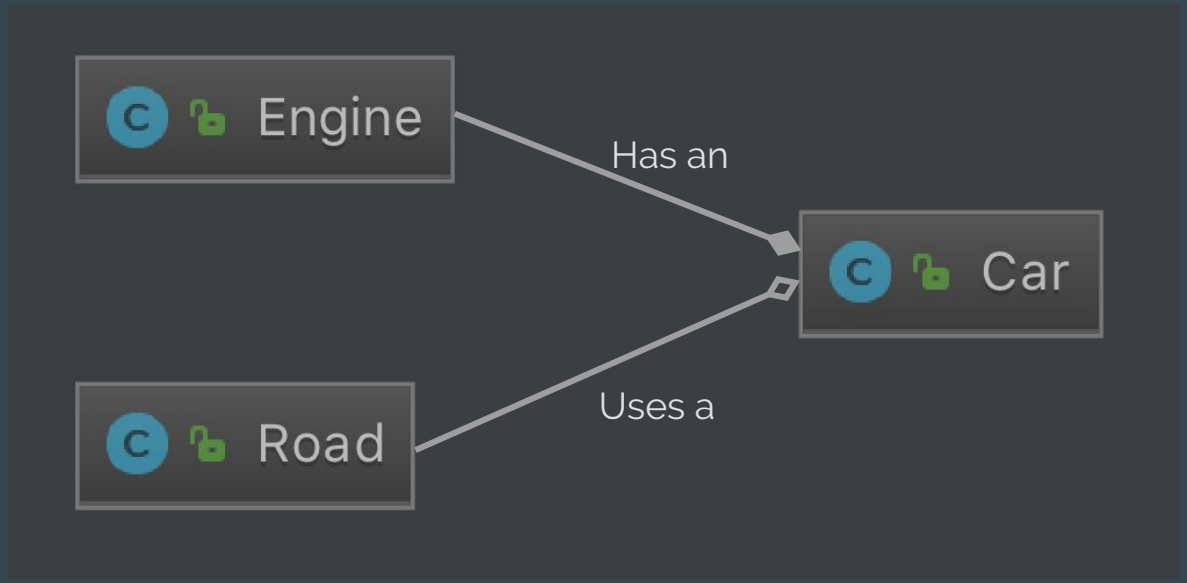
Polymorphism - Inheritance



Polymorphism - Interfaces



Composition & Aggregation



Let's create a whiteboard model of a Soda Vending Machine