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Conception Orientée Objets

Classes Structurées et Collaborations

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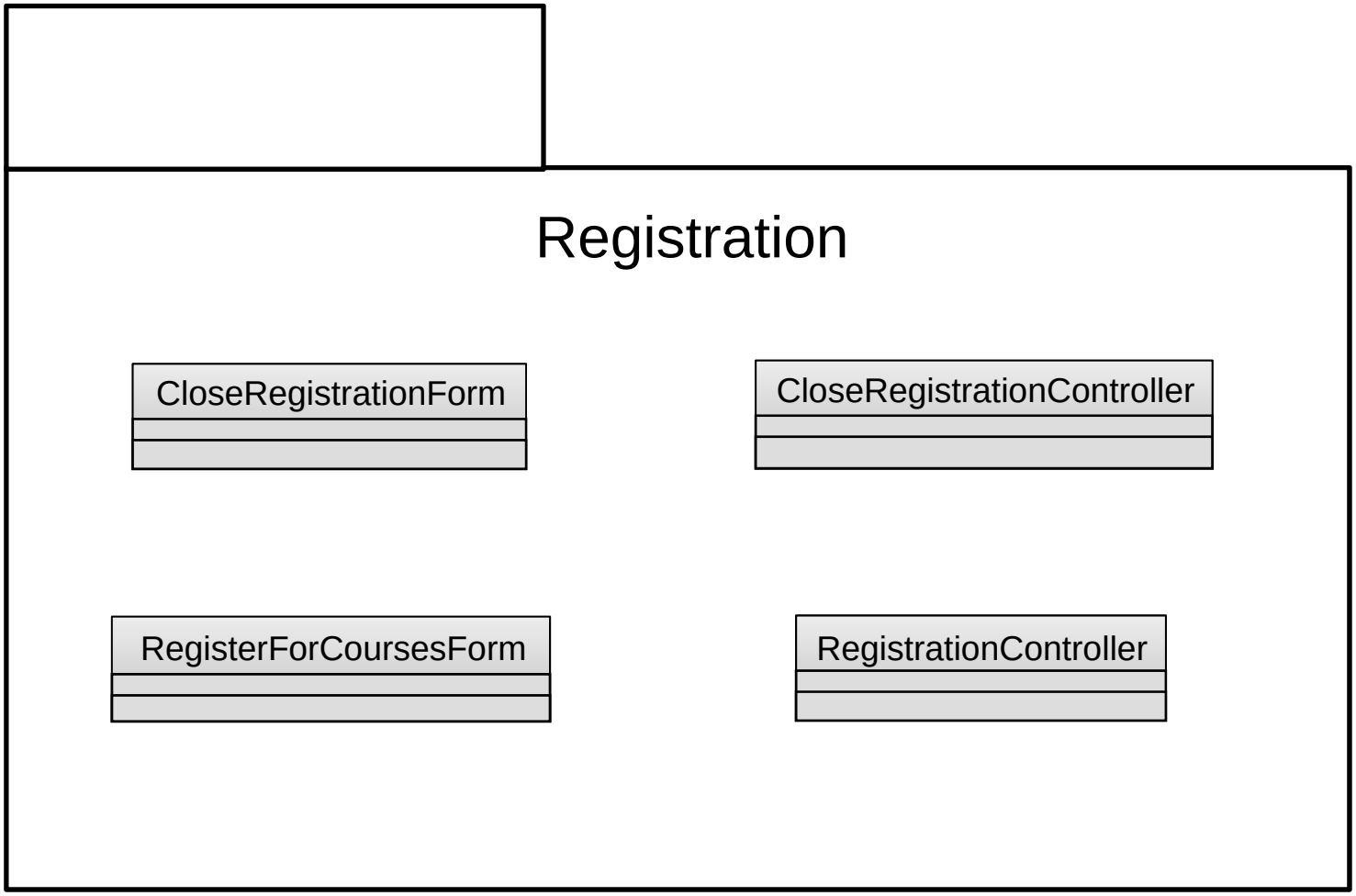
Classes are grouped within Packages



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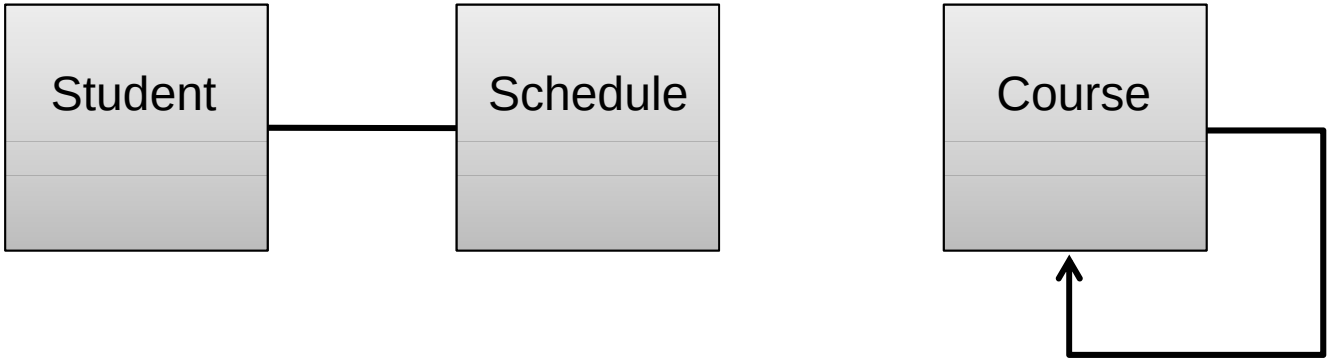
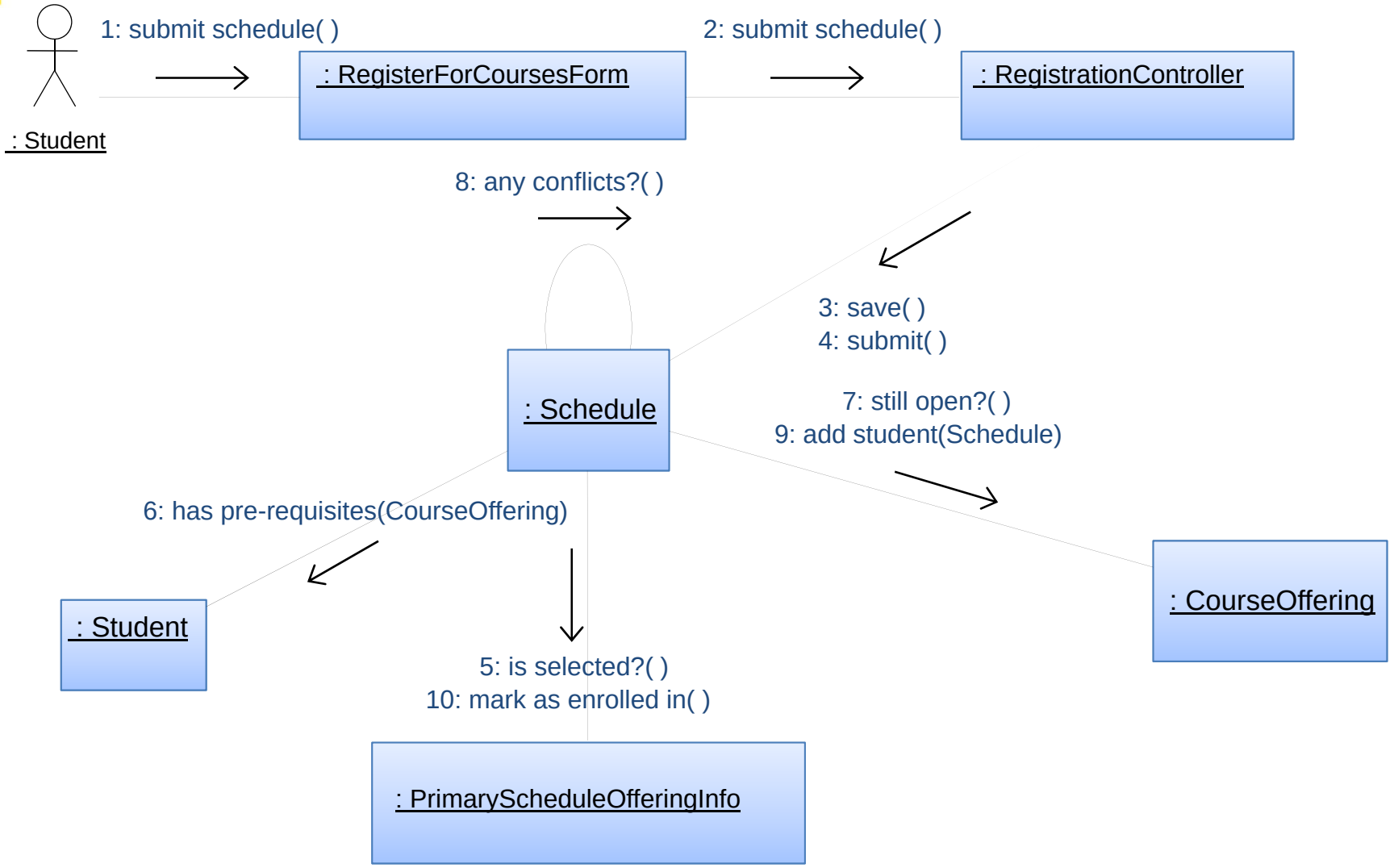
Associations

- The semantic relationship between two or more classifiers that specifies connections among their instances.
- A structural relationship specifying that objects of one thing are connected to objects of another thing.



How to decide which associations? Which methods?

Use interactions to find associations



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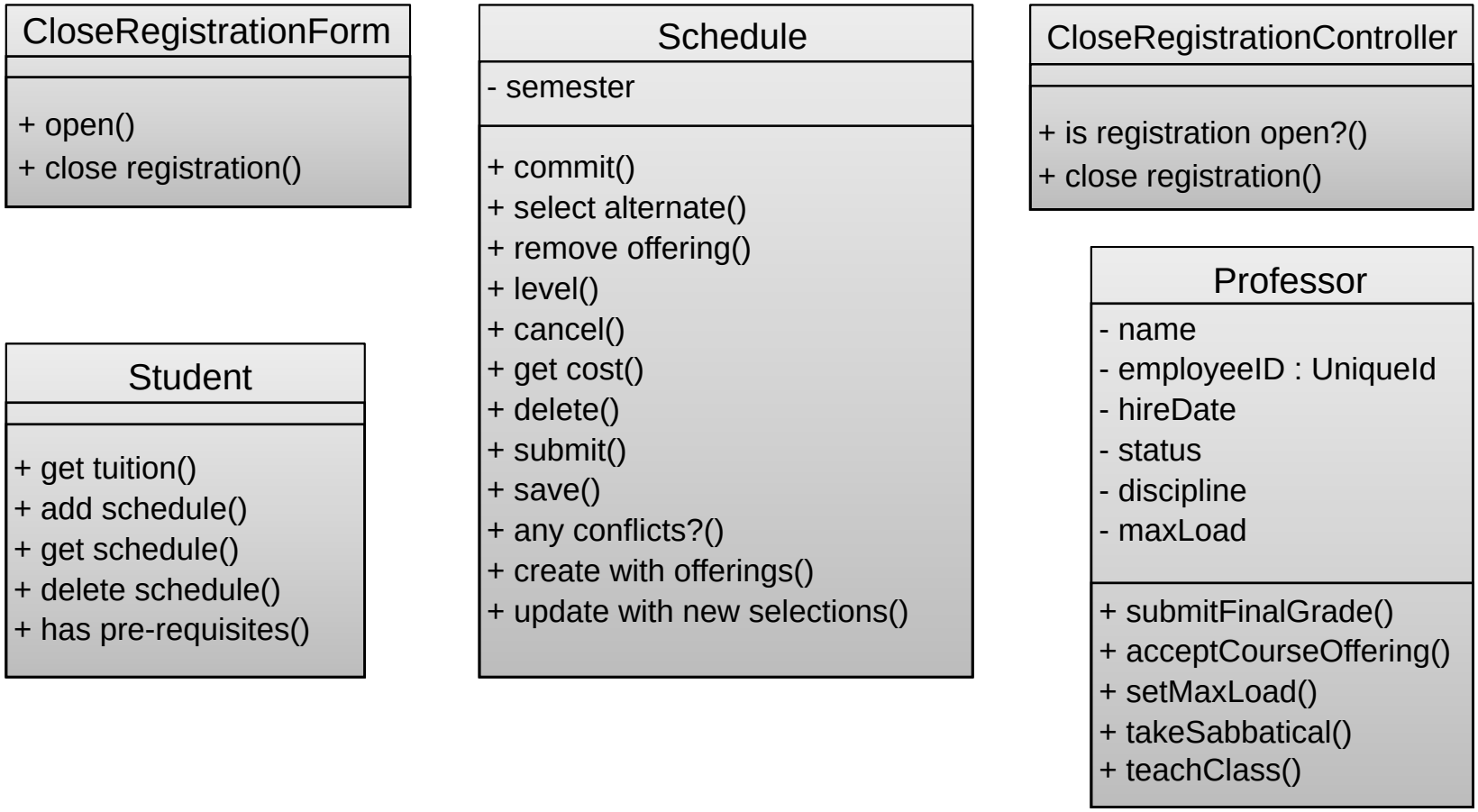
Structural Diagrams

- Static view of a system



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Generalization

- A relationship among classes where one class shares the structure and/or behavior of one or more classes.
- Defines a hierarchy of abstractions where a subclass inherits from one or more super classes.
  - Single inheritance
  - Multiple inheritance
- Is an “is a kind of” relationship.

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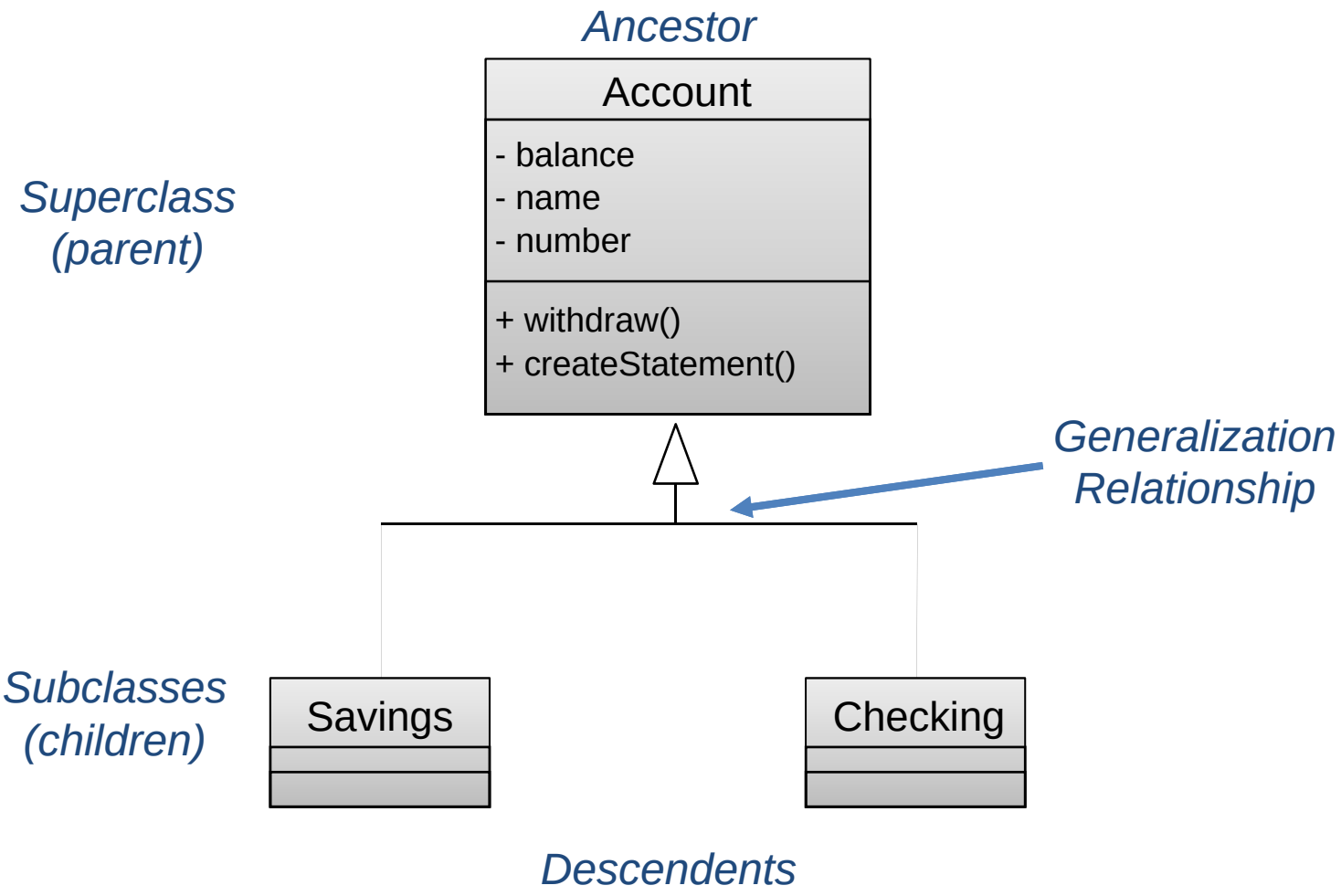
Example: Single Inheritance

- One class inherits from another.



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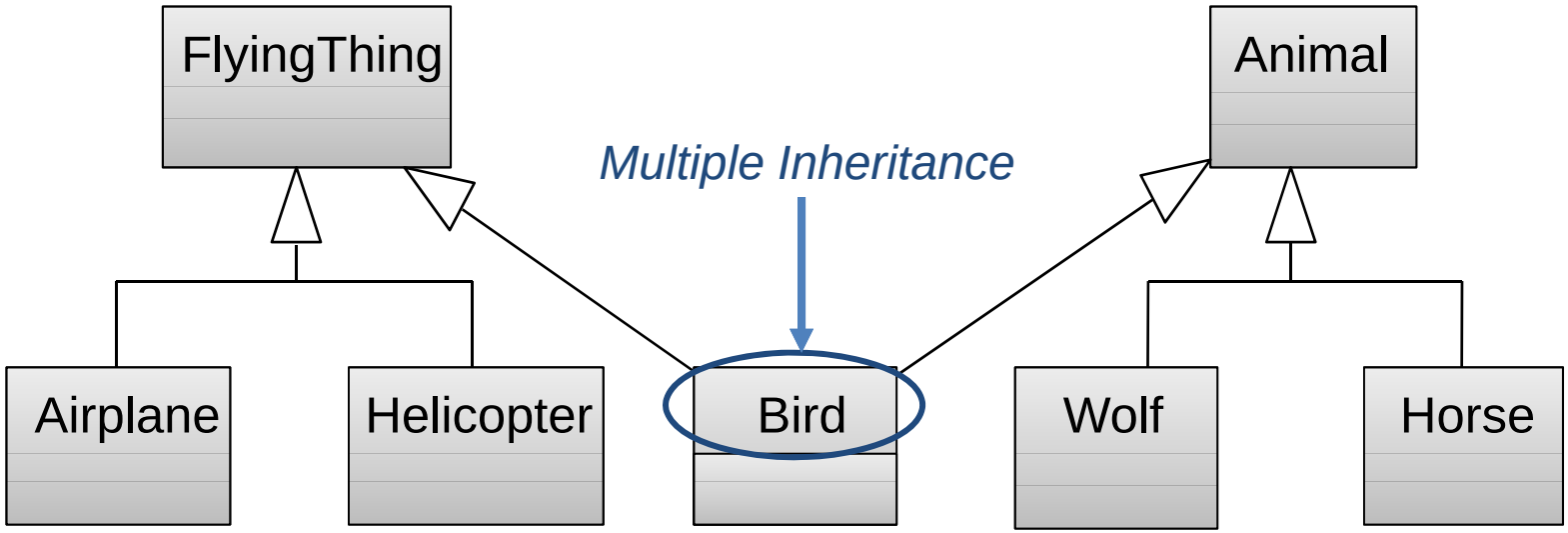
Example: Multiple Inheritance

- A class can inherit from several other classes.



Use multiple inheritance only when needed and always with caution!

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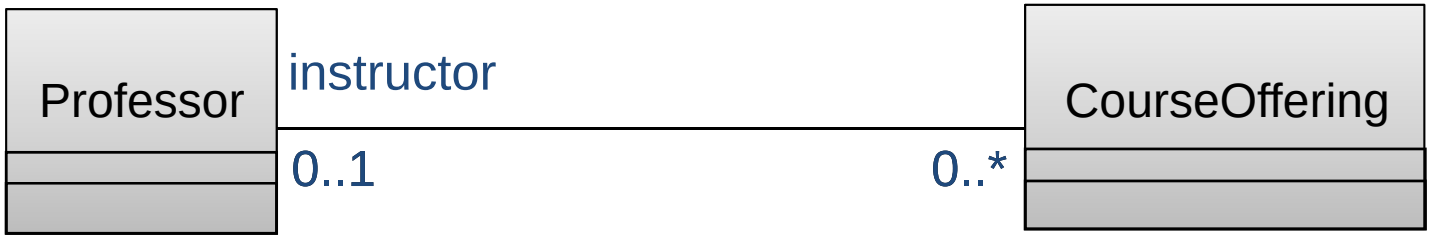
Multiplicity

- Multiplicity is the number of instances one class relates to ONE instance of another class.
- For each association, there are two multiplicity decisions to make, one for each end of the association.
  - For each instance of Professor, many Course Offerings may be taught.
  - For each instance of Course Offering, there may be either one or zero Professor as the instructor.



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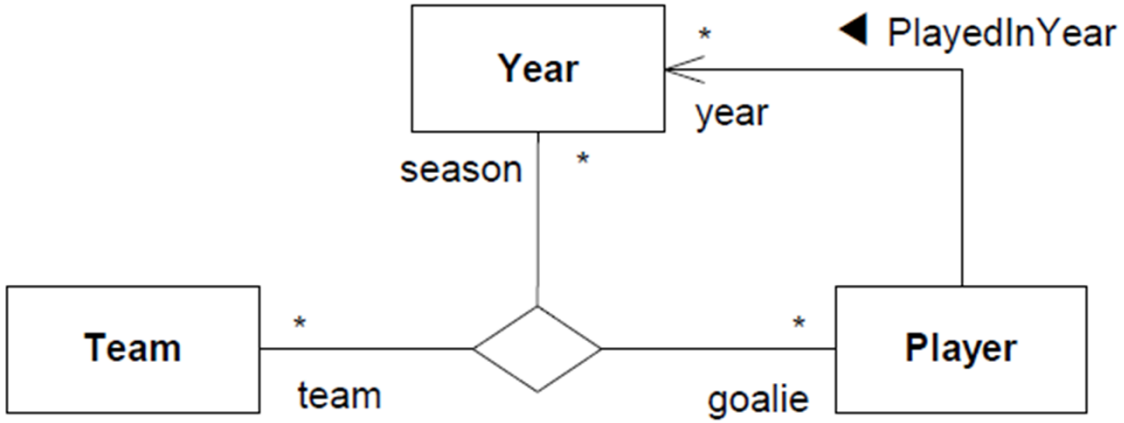
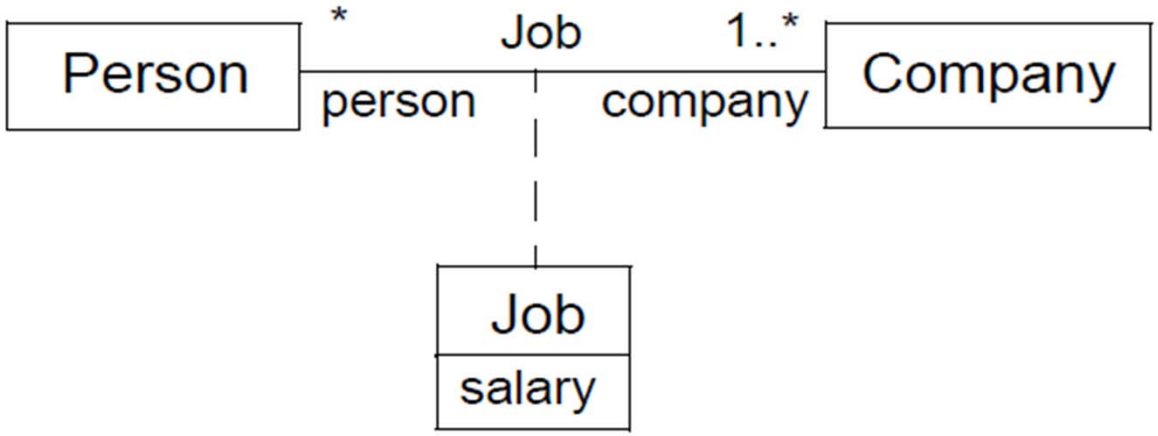
Complex Associations

- Ternary association



- Association Classes



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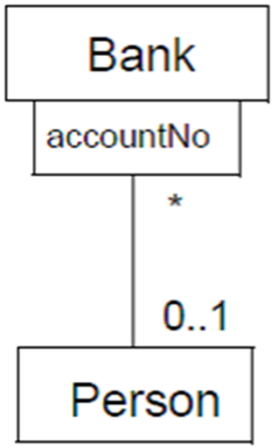
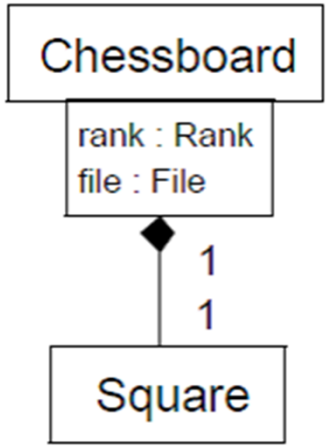
Complex Associations

- Qualified Associations





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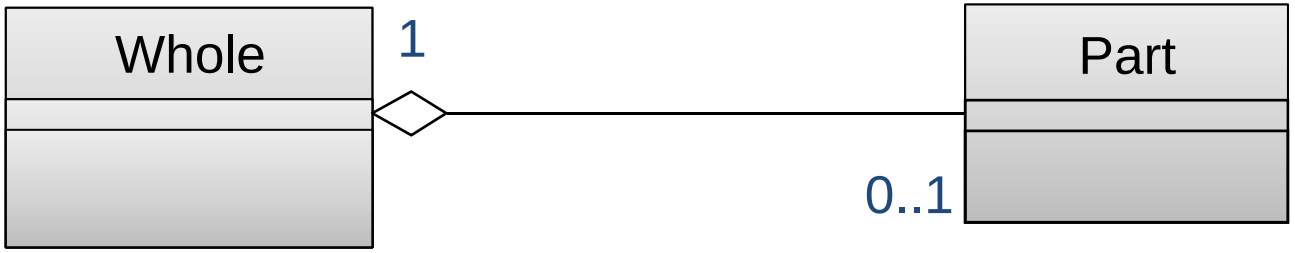
Aggregation

- A special form of association that models a whole-part relationship between the aggregate (the whole) and its parts.
  - An aggregation is an “is a part-of” relationship.
- Multiplicity is represented like other associations.



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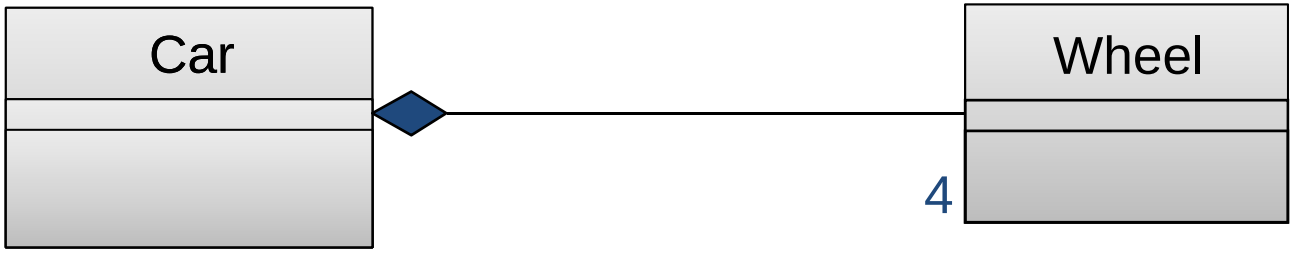
Composition

- A special form of aggregation where the composite (the whole) is responsible for the existence of the parts
  - An aggregation is an “owns” relationship
- Composition is more restricting than aggregation
  - Parts (instances) are not shared
  - E.g., A wheel is not shared between two cars



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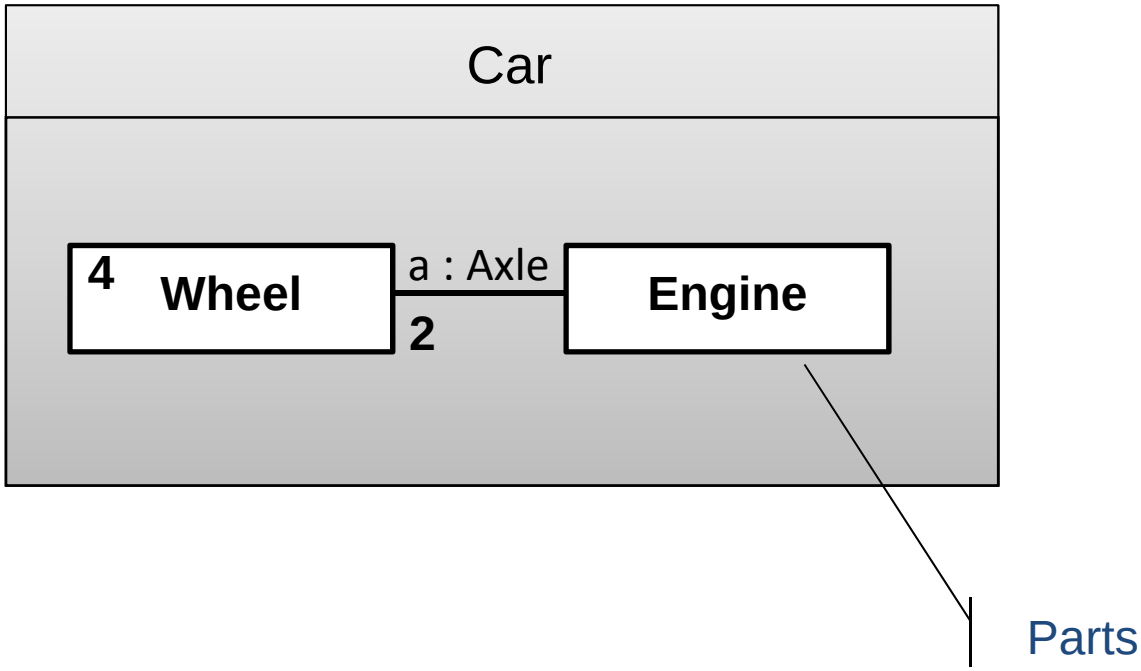
Composite Structure

- Richer and more precise way to express composition
  - Can also express aggregation (dashed lines)
  - Warning: Parts are Properties, not instances



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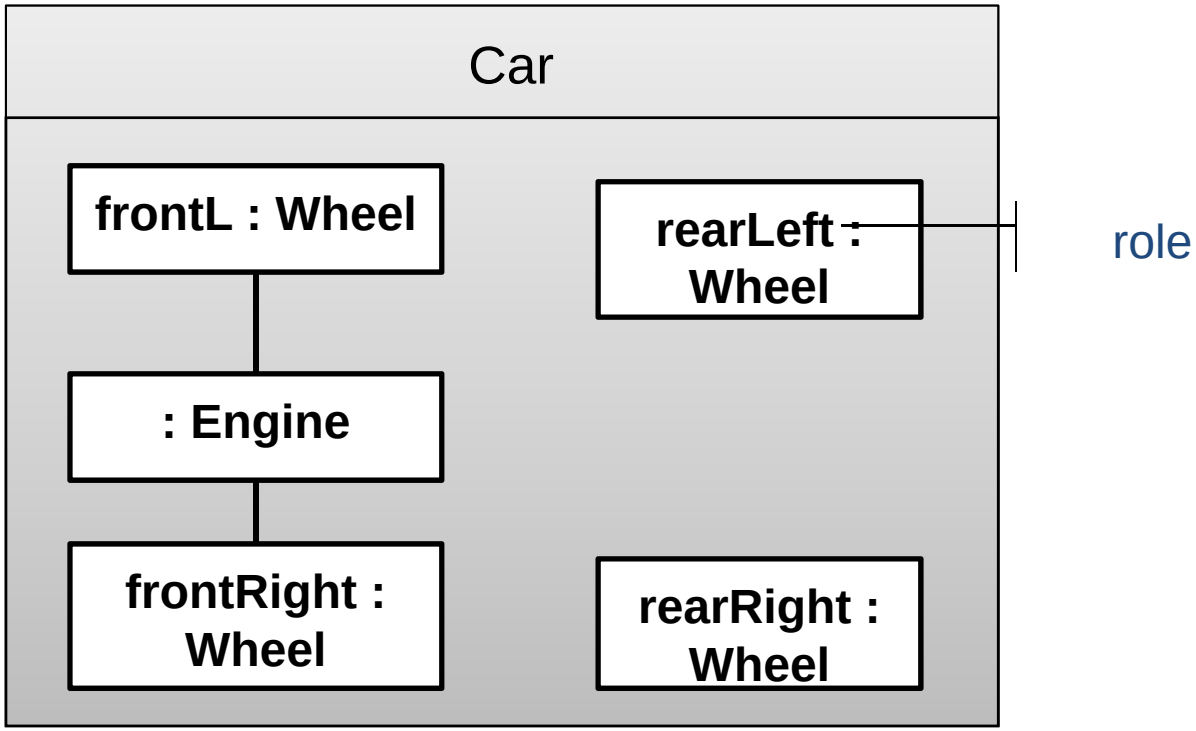
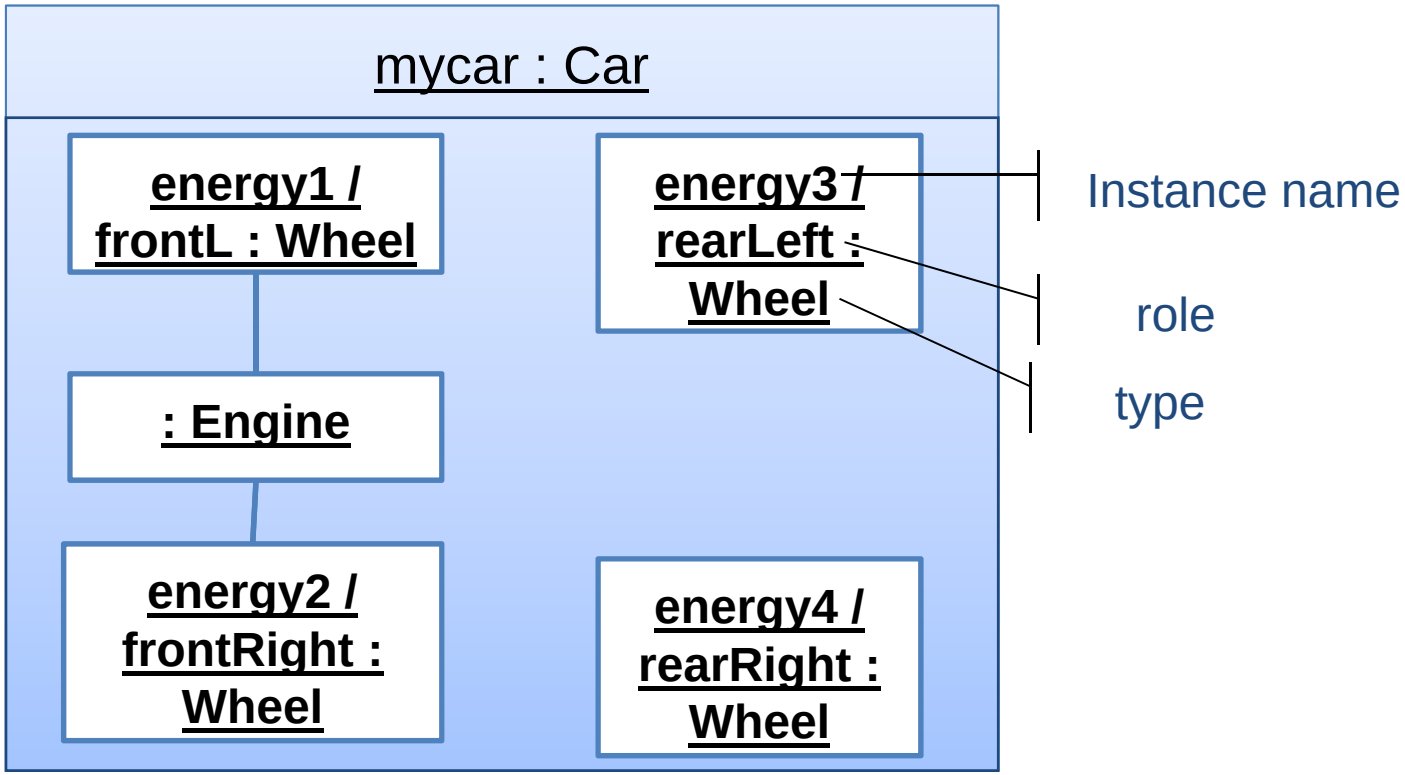
Structured classifiers

- Show roles of parts
  - Parts ARE NOT instances



Instance of a structured classifiers

- Show roles of parts
  - Instance parts have
    - An instance name, a role and a type (optional)



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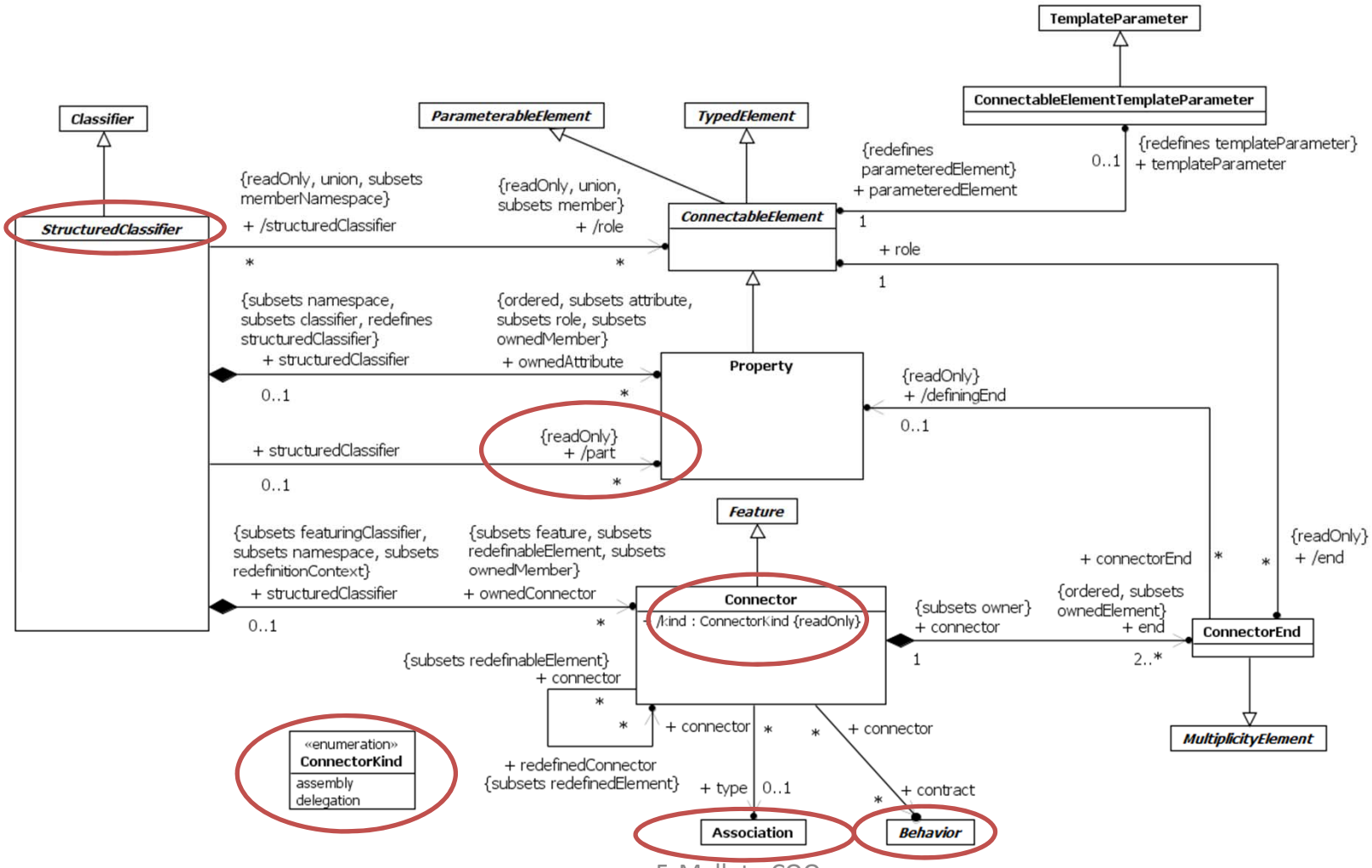
Structured Classifiers

Metamodel



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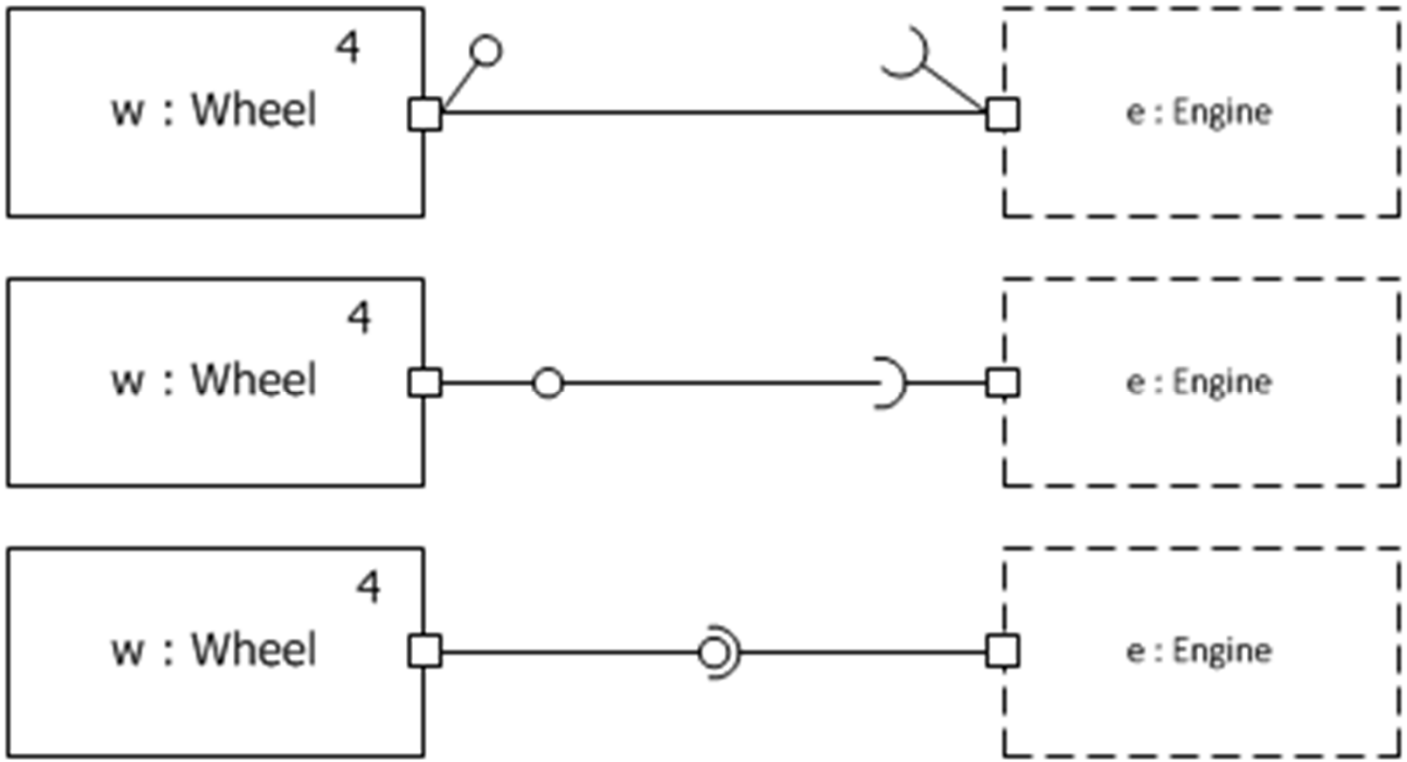
Connectors and Ports

- Provided & Required Interfaces



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COLLABORATIONS

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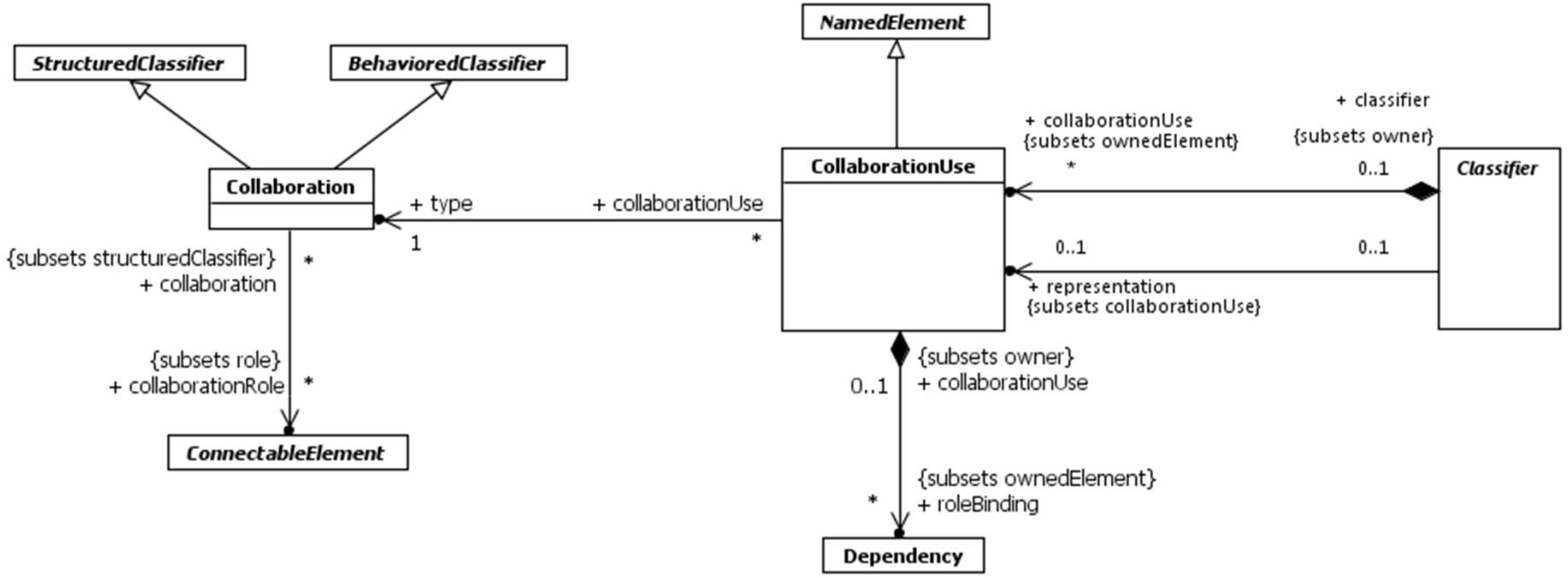
Collaborations

- Semantics
  - How a system of communicating elements collectively accomplish a specific task or set of tasks (pattern)
- Metamodel



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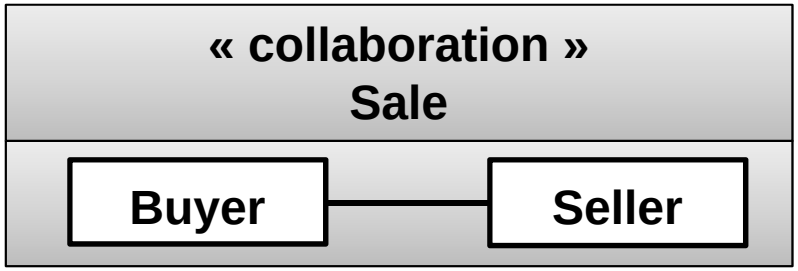
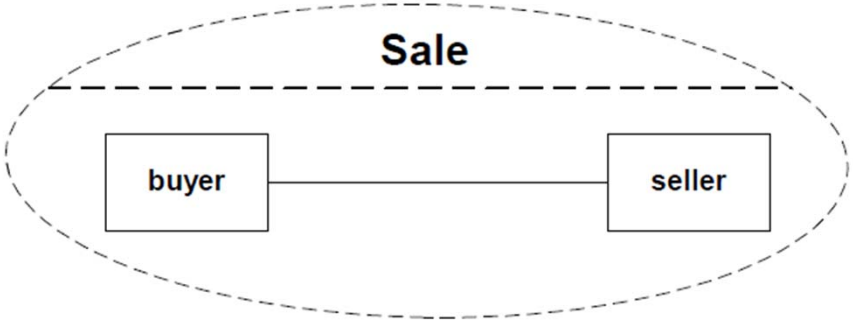
Example

- Collaboration





- CollaborationUse