

Association



Define

- A **link** is a physical or conceptual structural relationship between objects.

Examples: Mark **owns** Spot, order #123 **belongs to** the Baldwin Company.

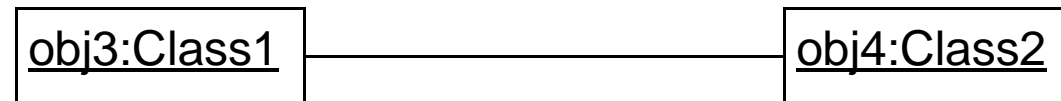
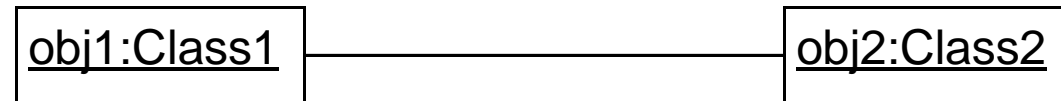
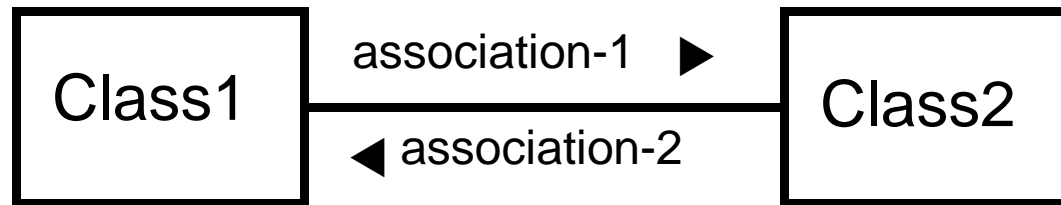
- An **association** is the definition of a set of links with the same name, structure, and meaning. A link is an instance of an association.

Example: Person **owns** dog, orders **belong to** customers.

Association



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Cardinality



Define

- **Cardinality** (sometimes called **multiplicity**) specifies how many objects of one class are associated with a single object of another class.



Discover

- Ask “how many?” What is the minimum number of objects in the association? What is the maximum number?

Cardinality



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One to one



Zero to many



Zero or one



One to many



Specific number



Zero to many in both directions

Aggregation



Define

- An **aggregation** is a *whole-part* relationship between objects.
- In a true aggregation, the whole is greater than the sum of its parts, i.e. the aggregation must have at least one property that cannot be deduced by examining its individual components.
- In addition, aggregation supports abstraction for use in layered class diagrams.

Aggregation



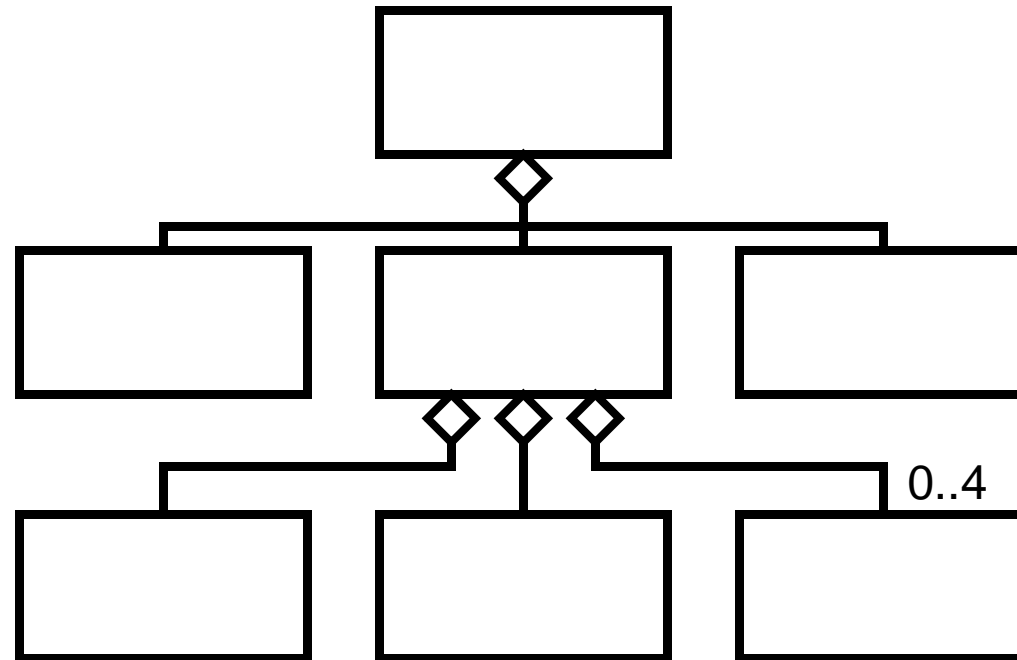
Discover

- Look and listen for these phrases:
 - Whole-part
 - Consists-of
 - Made-up-of
 - Is-a-part-of

Aggregation



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- An aggregate can be thought of as a mega-object. Messages are generally sent to the top level object. It may pass the message on to one or more of its component objects for processing if necessary.

Generalization/Specialization



Define

- **Generalization** is defined as "to reduce to a general form, to make generally applicable, to define commonality."
- **Specialization** is defined as "to concentrate on a specific activity, to give a particular character or function, to refine or specialize."
- In the object oriented paradigm we discover and implement generalizations and from those create specializations that reuse the general again and again while adding specific details.