

More Relationships: Aggregation & Composition



Aggregation and composition specify associations with special constraints. The concepts of aggregation & composition and how they are modelled in UML and Poseidon are covered in this section.

Aggregation

An aggregation is similar to a composition, but is a less rigorous way of grouping things. An aggregation also represents an asymmetric association, in which one of the ends plays a more important role than the other end. In UML, **aggregation** is shown with an **open diamond**.

The following criteria imply an aggregation:

- A class is part of another class
- The attribute values of one class propagate to the attribute values of another class
- An action on one class implies an action on another class
- The objects of one class are subordinates of the objects of another class

The opposite is not always true – aggregation does not necessarily imply the criteria evoked above. If there is any doubt, associations are preferable. In general, it is always necessary to choose the solution that implies the weakest coupling.

Some Sloopies can ride a Skateboard, which can be represented by two classes: *Sloopy* and *Skateboard*. The relationship between *Sloopy* and *Skateboard* would be a one-to-one aggregation, modelling the fact that a Sloopy can ride a single skateboard (to be exact, it would be a one-to-zero relationship, because the Sloopy can either ride one skateboard or be inactive). However, the Skateboard still exists on its own, even if the Sloopy abandons the Skateboard.

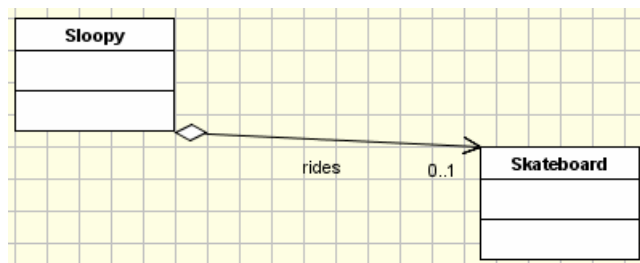




Figure 2: *Sloopy* – *Skateboard* Aggregation

Associations can be specialized to an aggregation. To do this, navigate to one of the association ends and change the association type from none to aggregation (). They can also be created directly from the toolbar, using the 'Create Aggregation' button .

Composition

A **composition** indicates that one class belongs to the other (also known as physical containment). Physical containment is a particular case of aggregation referred to as **composition**. Attributes are a particular case of aggregation implemented by value – they are physically contained in the aggregate. It implies a constraint on the multiplicity of the association side: it can only take the values 0 or 1. In UML, **composition** is shown with a **closed diamond**.

Sloopies live in a house. The *SloopyHome* has a room for each Sloopy. The relationship between *SloopyHome* and *SloopyRoom* would be a one-to-many composition, modelling the fact that a building is composed of one or more rooms. However, the rooms cannot exist by themselves which is expressed by the composition constraint.

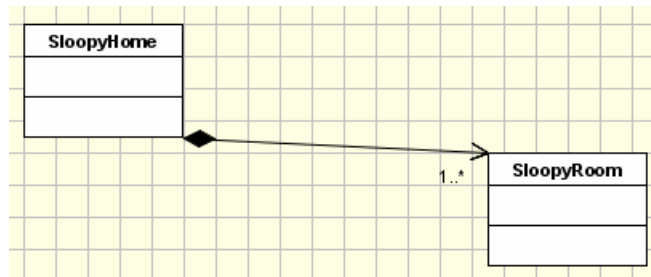


Figure 1: *SloopyHome* – *SloopyRoom* Composition

In Poseidon, associations can be specialized to a composition. To do this, navigate to one of the association ends and change the association type from none to composition (◄). They can also be created directly from the toolbar, using the 'Create Composition button' ◄.



The concepts of composition & aggregation and how they are modelled in UML and Poseidon have been covered in this section.