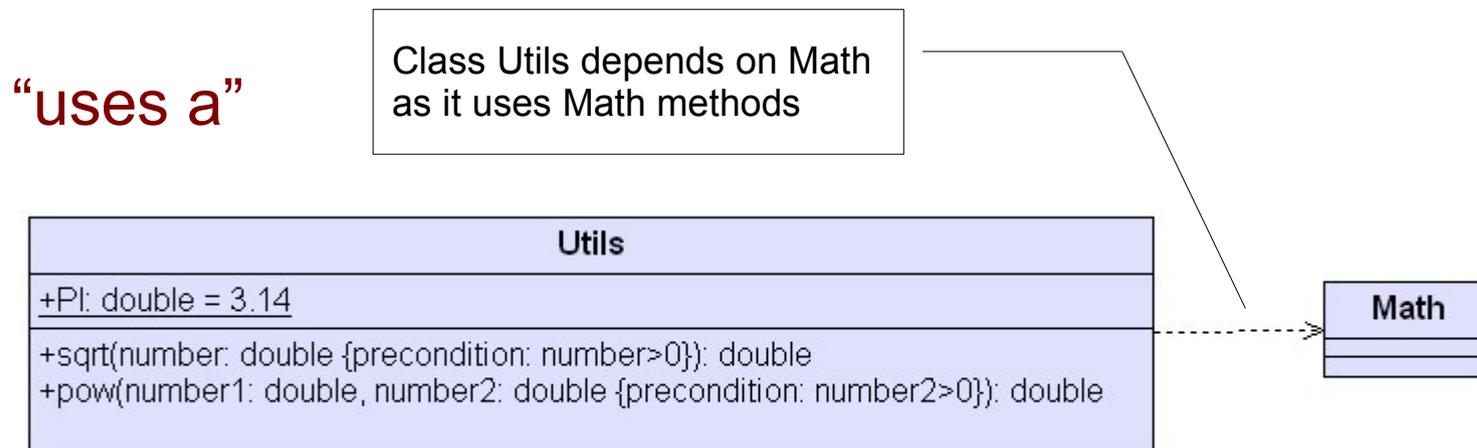


Objects Relationships

The Dependency Relationship

- One class has a dependency relationship with another class when it uses or had knowledge of it.
- The dependency relationship is usually known as “uses a”.
- Dependency relationship is marked using a dashed arrow.

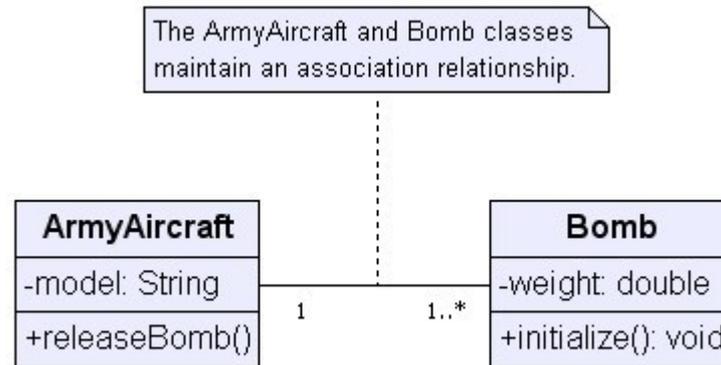


The Association Relationship

- The association relationship is a bit stronger than the dependency one.
- One class has an association relationship with another class when it retains a relationship to that class over an extended period of time and the life lines of the two objects that were instantiated from the two classes is not tied together.
- The association relationship is usually known as “has a”.
- The association relationship is denoted using a simple line.

The Association Relationship

“has a”



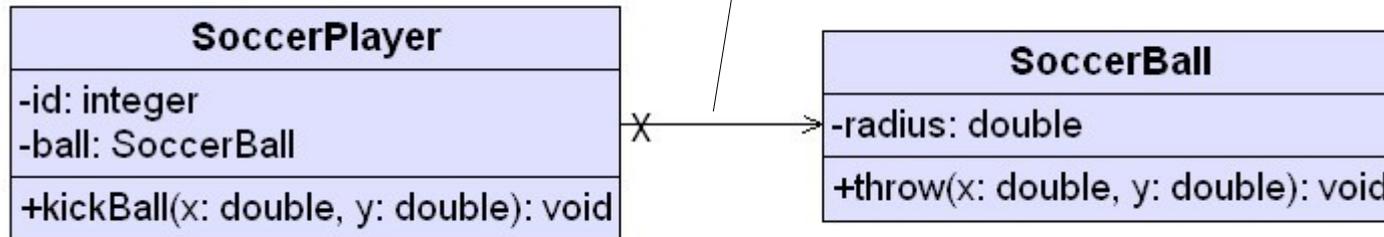
The Association Relationship

- When drawing an association relationship between two classes it is possible to indicate the possibility to navigate in a specific direction from one class to another, by adding a simple arrow to the association line.
- Placing 'X' on the association line near one of the classes will indicate that it is forbidden to navigate in its direction.

The Association Relationship

“has a”

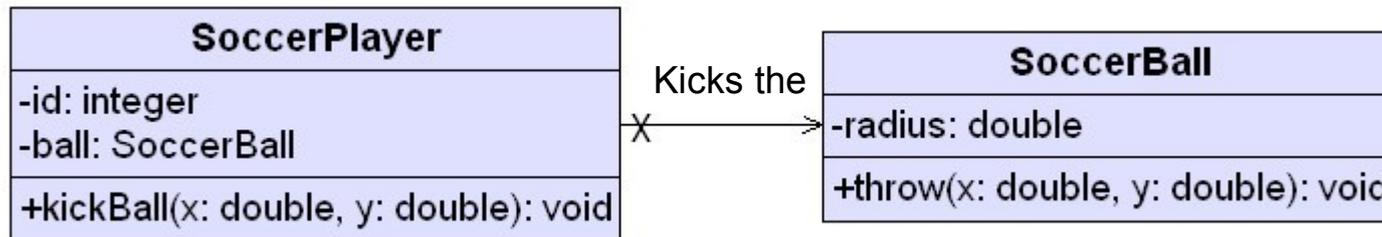
In this association each SoccerPlayer object holds a reference to the ball. Each soccer player object can navigate to the soccer ball. The other way around is not possible. A soccer ball doesn't hold a reference to a player.. so the soccer ball can never navigate to the player that is connected to it.



The Association Relationship

- When drawing the association line it is possible to add a small textual phrase above the line. By doing so we can provide some context.

“has a”

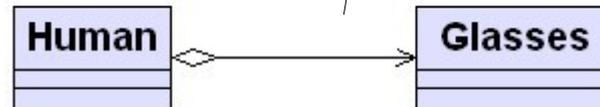


The Aggregation Relationship

- The aggregation relationship is a bit stronger than association.
- Unlike association, an aggregation relationship between two classes implies about ownership and might imply about some kind of relationship between the life lines.
- The aggregation relationship is usually known as “owns a”.
- The aggregation relationship is depicted using a line with an arrow on one end and an empty diamond on the other.

The Aggregation Relationship

“owns a”



Each human that use glasses owns a pair of glasses. Unlike the composition relationship (explained in the next slides) the glasses can be used by other humans as well. The glasses are not part of human.

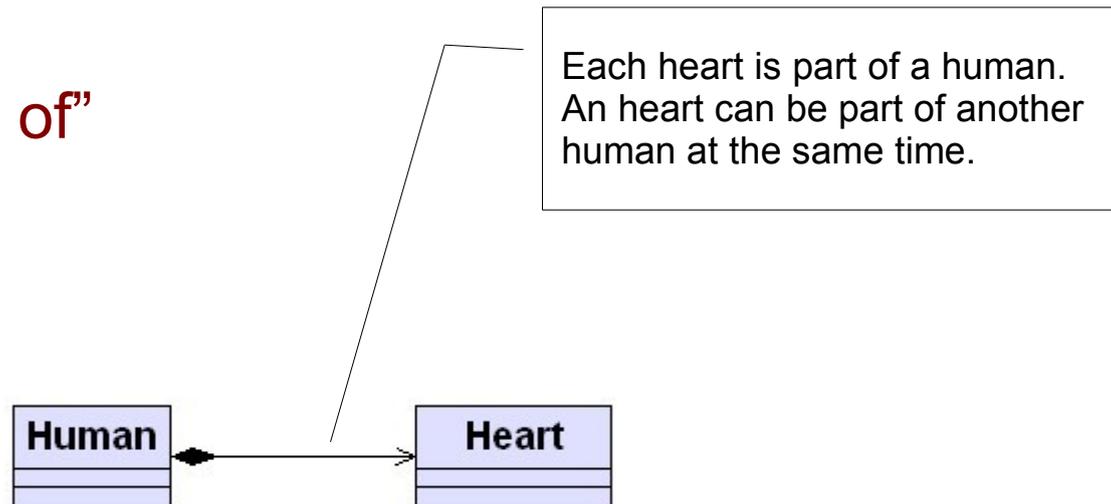
The Composition Relationship

- The composition relationship is a very strong relationship between classes. Stronger than aggregation.
- The composition relationship indicates a whole-part relationship. Unlike the other relationships, the “part” piece can be involved in one composition relationship at any given time.
- We depicted the composition relationship the same way we depict the aggregation one, just that instead of empty diamond we use a black one.

The Composition Relationship

- The life lines of any two instances involved in the composition relationships is (nearly) always linked.
- The composition relationship is usually known as “is part of”.

“is part of”



Classes Relationships Summary

Relationship	Description	Arrow	Description
Dependency	“uses a”		One class uses another
Association	“has a”		One class retains relationship to the other over an extended period of time. The lifeline of the two is not tied.
Aggregation	“owns a”		Ownership & some sort of relationship between the two life lines.
Composition	“is part of”		The two life lines is (nearly) always linked.