Advanced Management of Data
Exercise 1 Topic 1:
Unified Modeling Language

Unified Modeling Language Class Diagrams

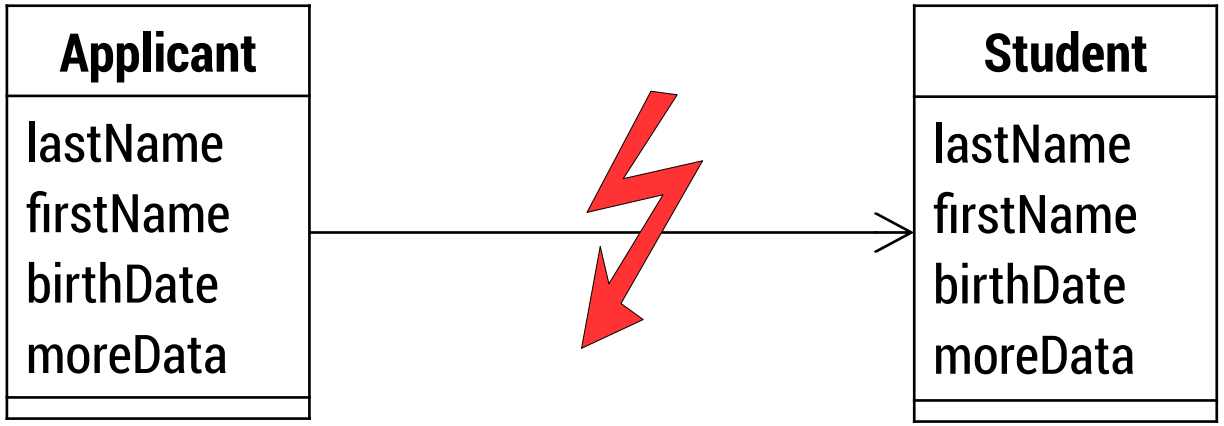
- type of static structure diagram
- describes the structure of a system
- shows
  - system's classes
  - their attributes
  - operations (or methods)
  - relationships among objects

- usage in Database Design:

  1st main-phase: Conceptual Design
  - Remember: Construct a model of the data independent of all physical considerations
- also in this exercise:

  2nd main-phase: Logical Design
  - Map the UML diagram to the relational model

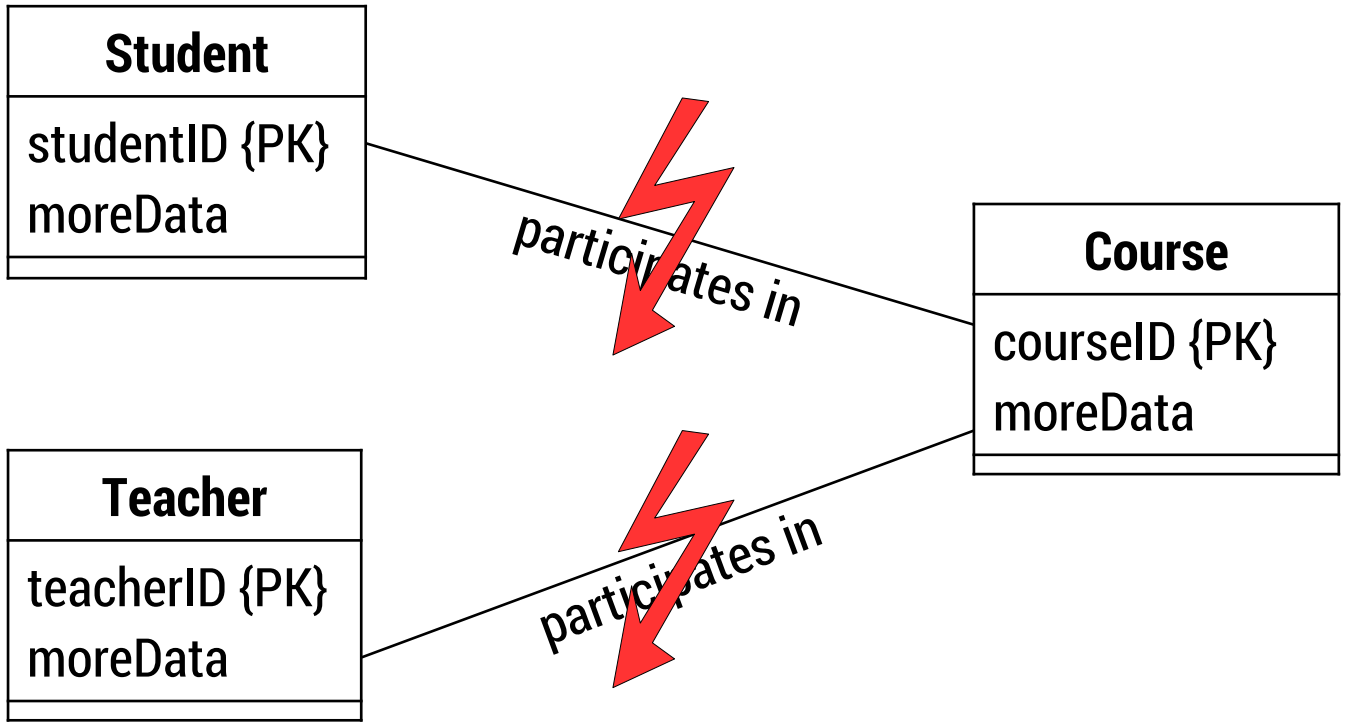
Some not-uncommen UML mistakes
What might be wrong?



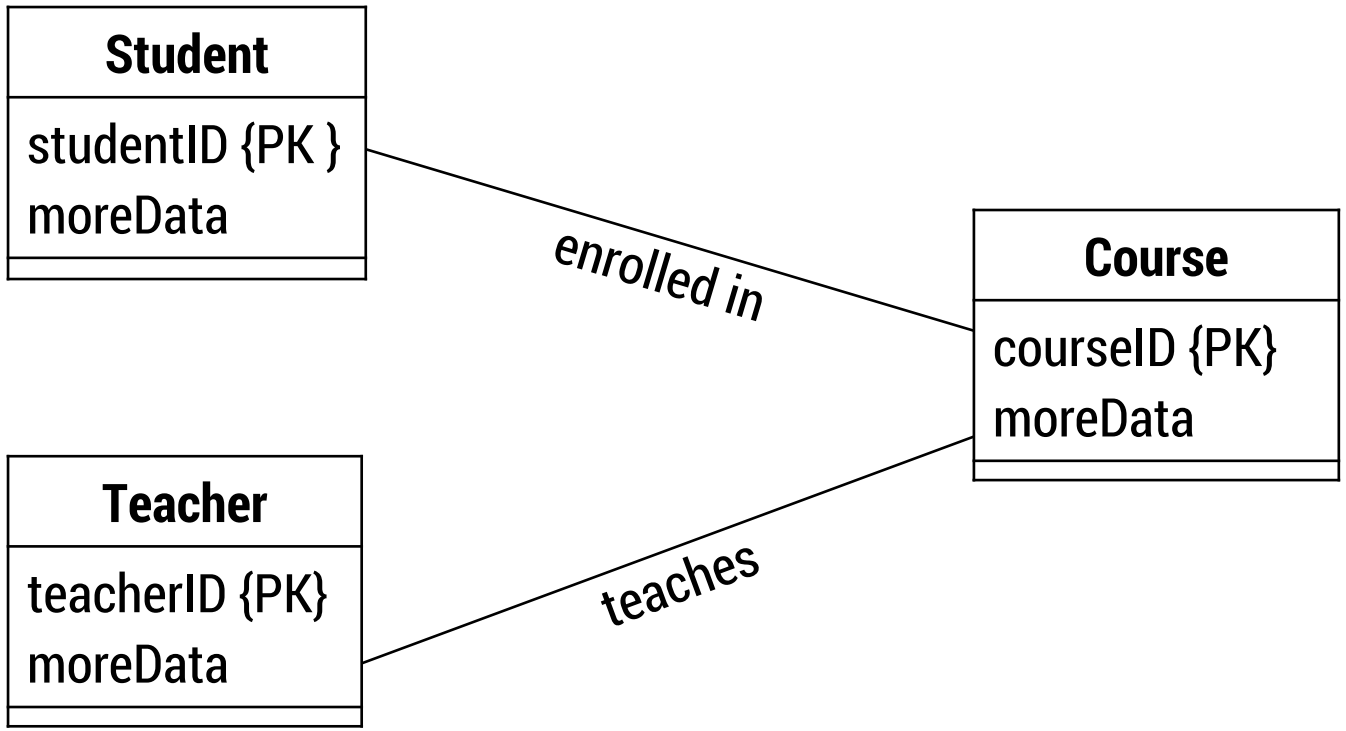
Some not-uncommen UML mistakes
UML diagrams do NOT represent control flow

If upon acceptance, a record from “Applicant” were copied (perhaps with revisions) to “Student”, we would NOT put an associative link between Applicant and Student for this reason – not because of CONTROL flow.

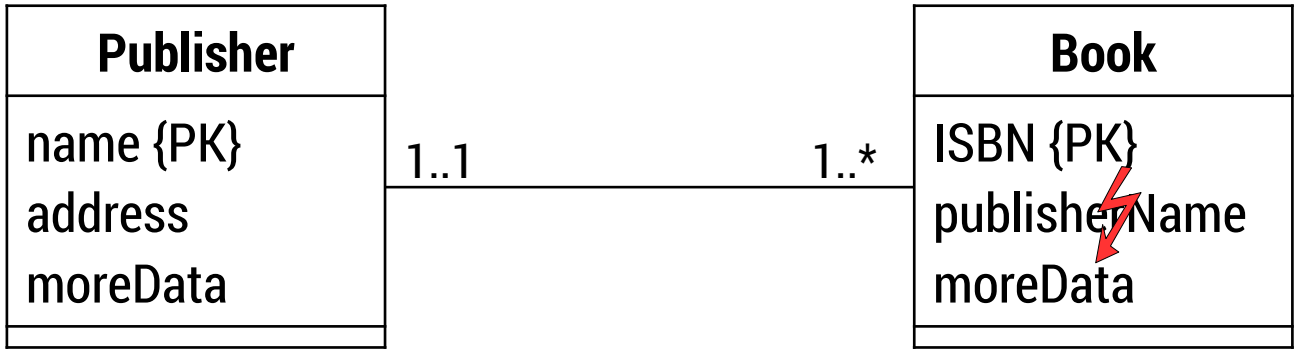
Some not-uncommen UML mistakes
What might be wrong?



Some not-uncommen UML mistakes
All relationships/associations (and classes) should have unique names

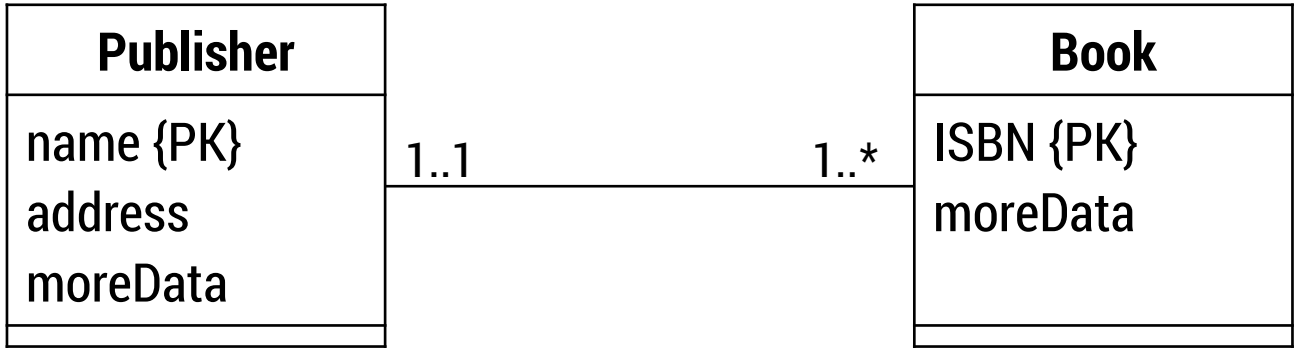


Some not-uncommen UML mistakes
What might be wrong?

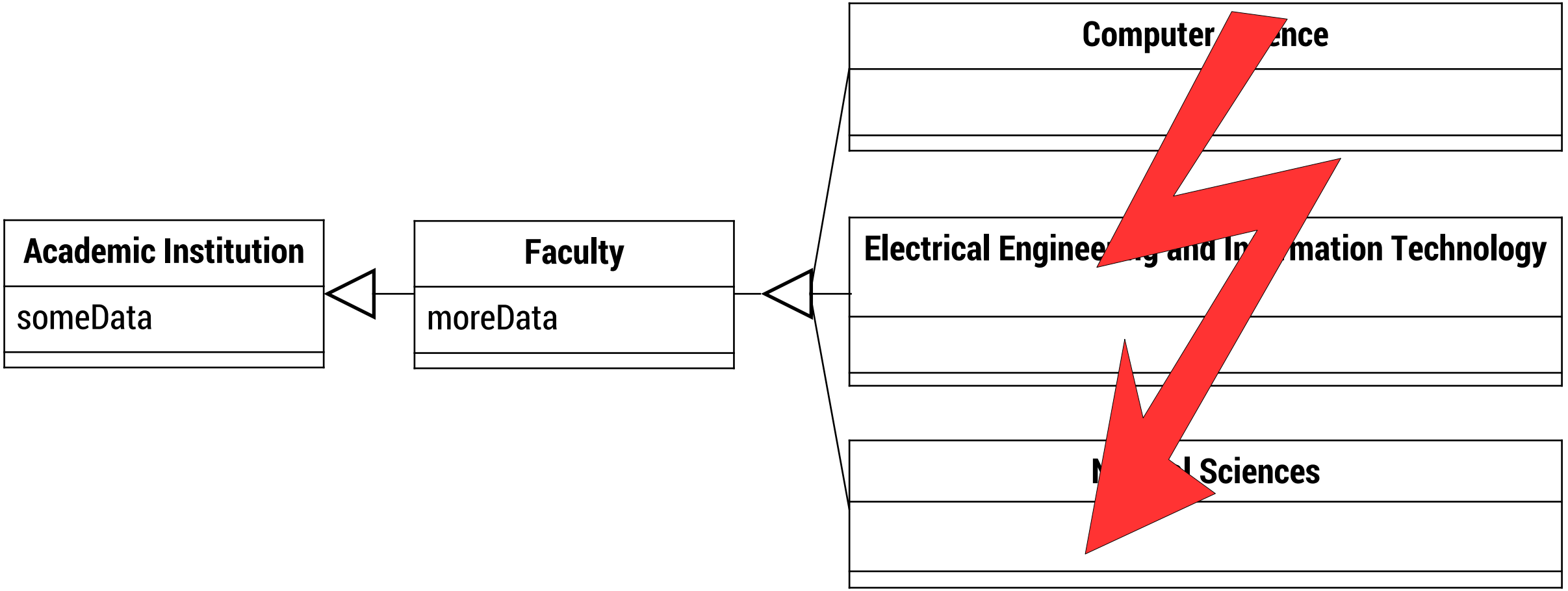


Some not-uncommen UML mistakes
Avoid implicit associations

the name of the publisher is an implicit association that is redundant

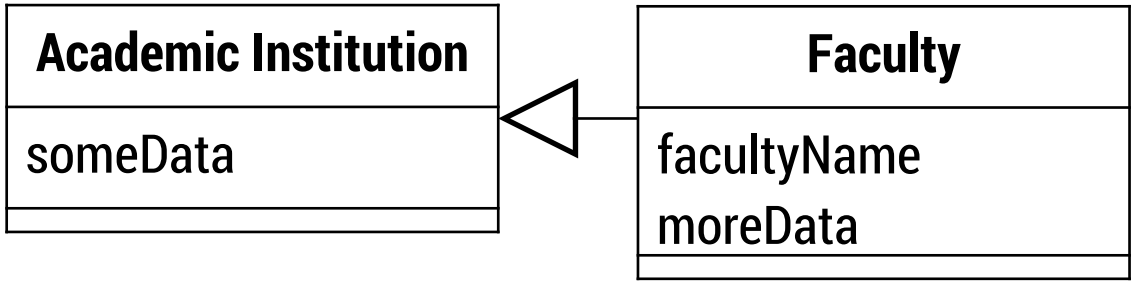


Some not-uncommen UML mistakes
What might be wrong?

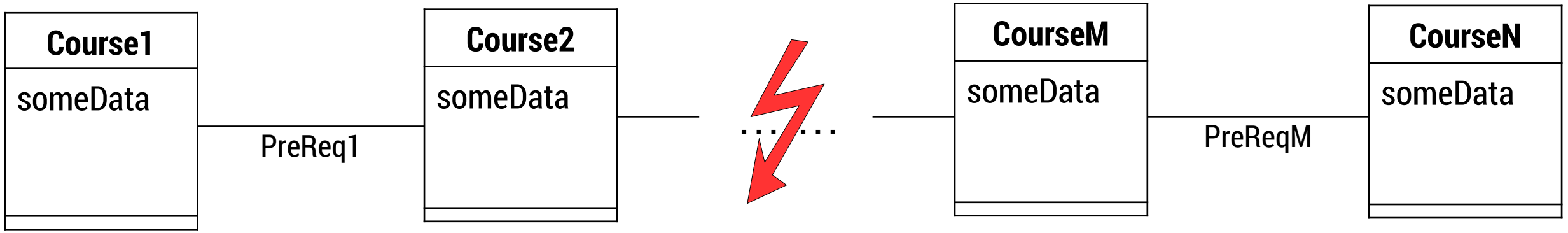


Some not-uncommen UML mistakes
UML diagrams show form of the data, not specifics about content

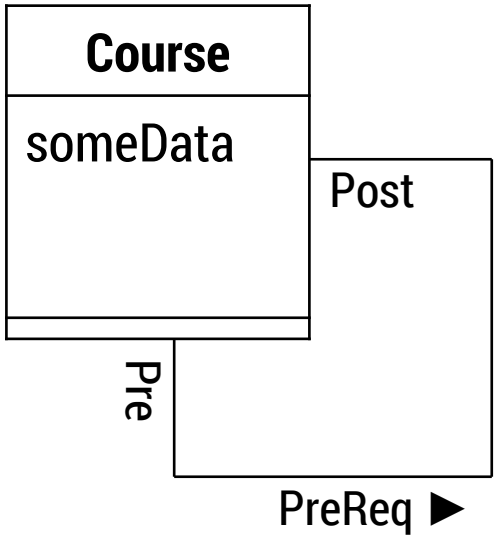
if you have a class that you intend to have only one entry in it, then that one “entry” is better represented as the value of an attribute



Some not-uncommen UML mistakes
What might be wrong?

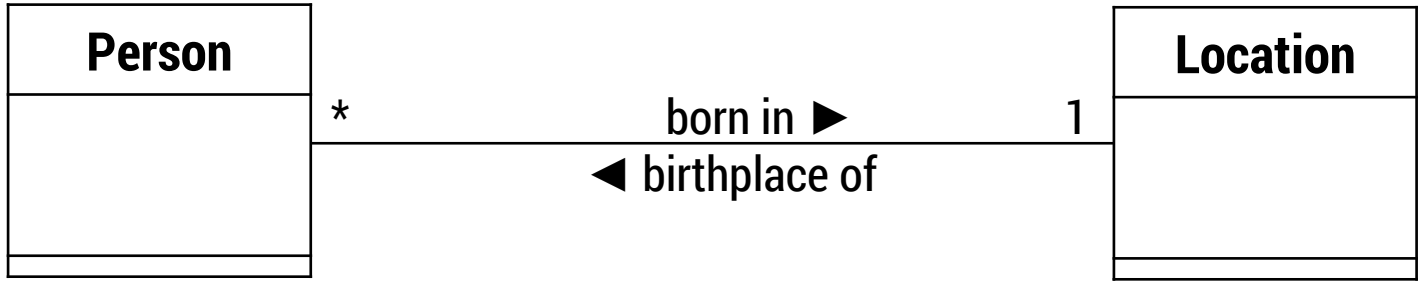


Some not-uncommen UML mistakes
UML diagrams have a well defined number of classes and relationships

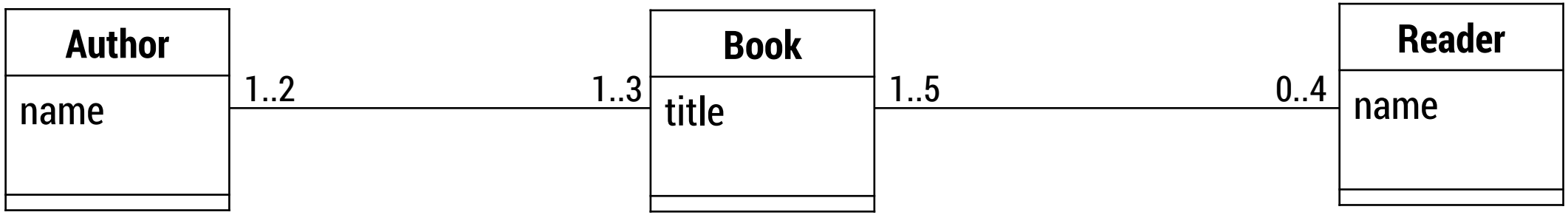


Some other UML mistakes
What might be wrong?

Some other UML mistakes
Use UML and not Chen's notation for entity-relationship modeling



Consider the following UML diagram



- If there are 6 Authors,
  - what's the minimum and maximum number of Books?
  - what's the minimum and maximum number of Readers?
- If there are 6 Readers,
  - what's the minimum and maximum number of Books?
  - what's the minimum and maximum number of Authors?

Draw an UML diagram that models this information

There is an online rental video shop. Customers of this shop may log in with their customer ID and their password. Then they can rent films, that each have a different name and a rental fee, but they may only watch it, if they have enough prepaid balance with the shop.