Applying UML & Patterns (3rd ed.)

Chapter 16

UML CLASS DIAGRAMS

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Fig. 16.1

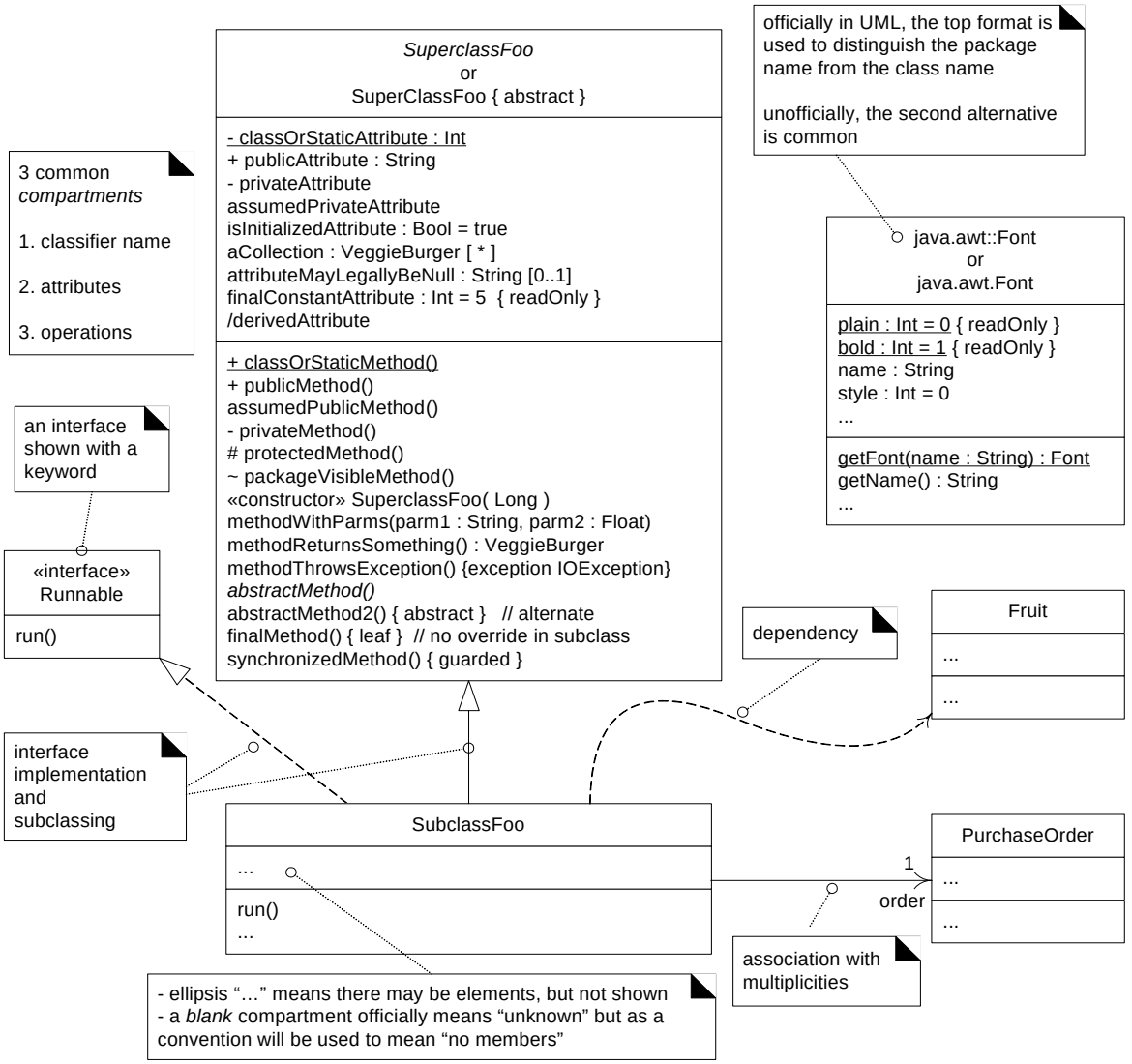
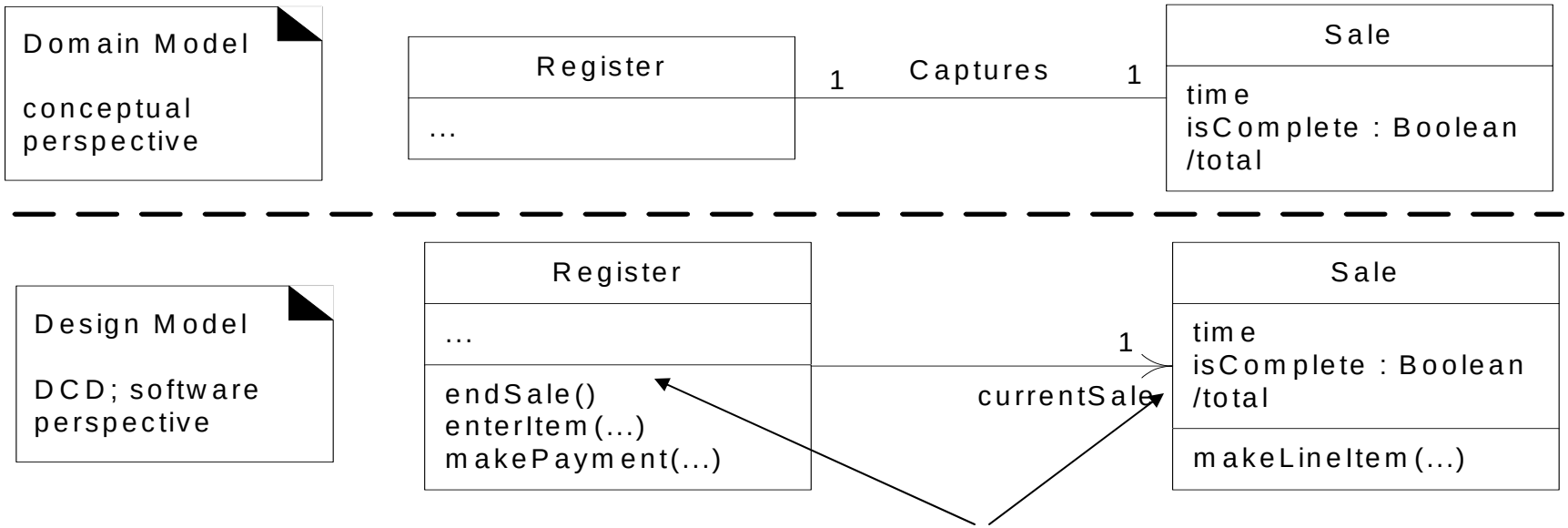


Fig. 16.2

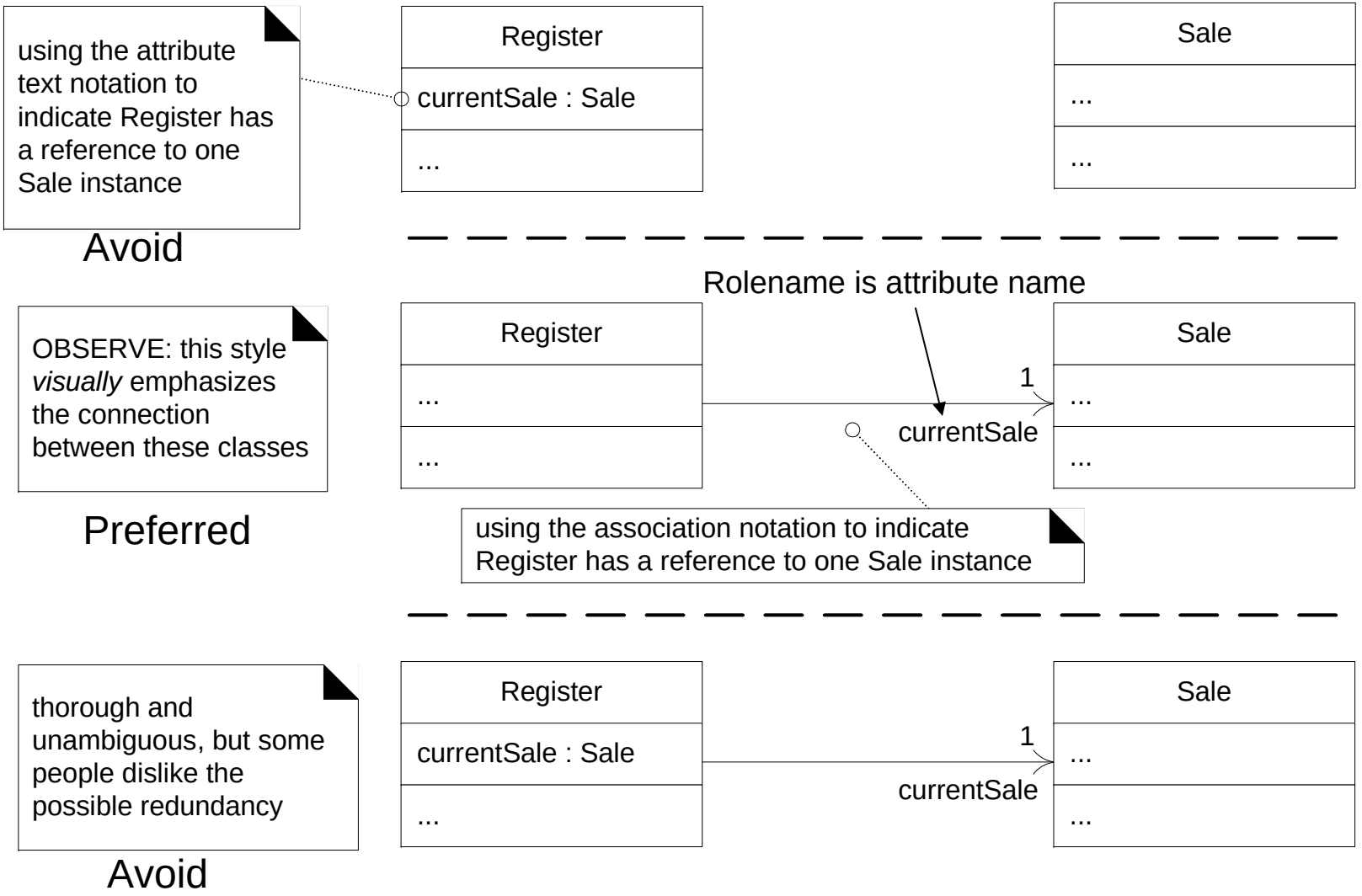
Domain model is the analysis class diagram
Don't show methods



Avoid showing no-argument constructors & getters/setters

Design model shows methods and visibility (arrowhead on association)
Register has reference to Sale; Sale does not have reference to Register

Fig. 16.3



Class Diagrams

- UML notation for attributes
  - You don't have to use entire notation
  - Visibility
    - + (public)
    - - (private)
  - Assume attributes are private & methods public unless stated otherwise

visibility attribName : type multiplicity = default {property-string}

Fig. 16.4

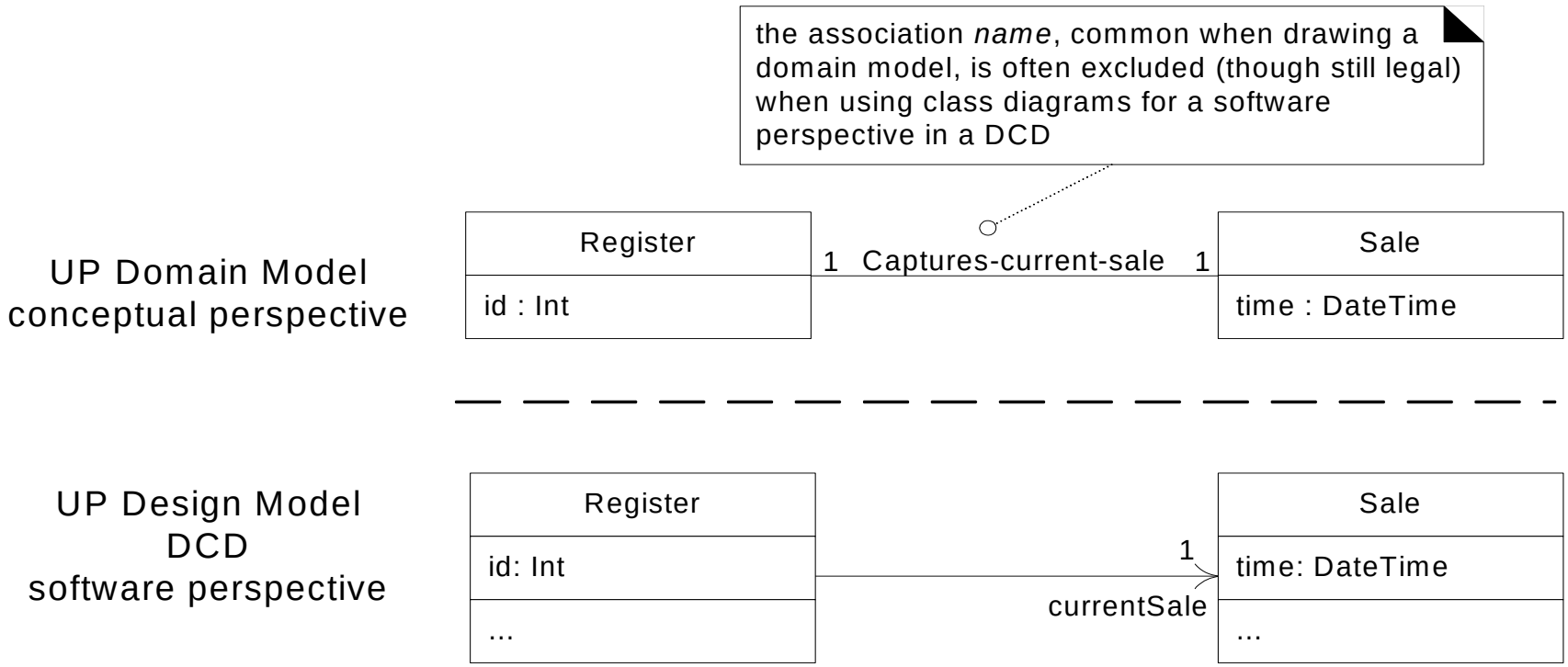
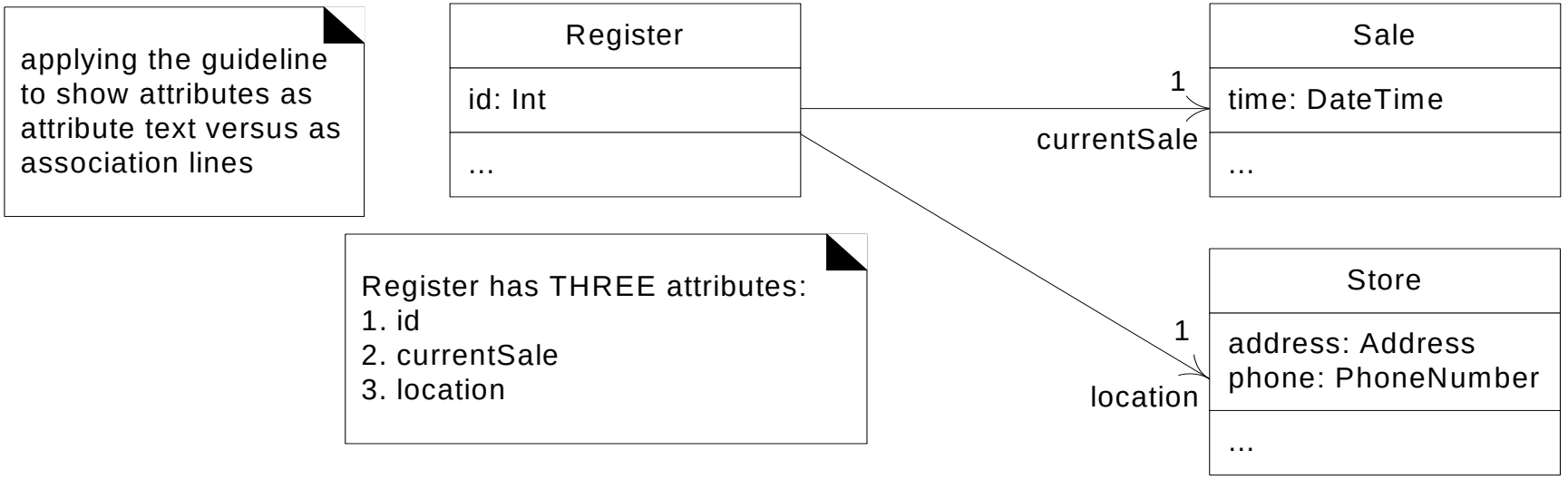
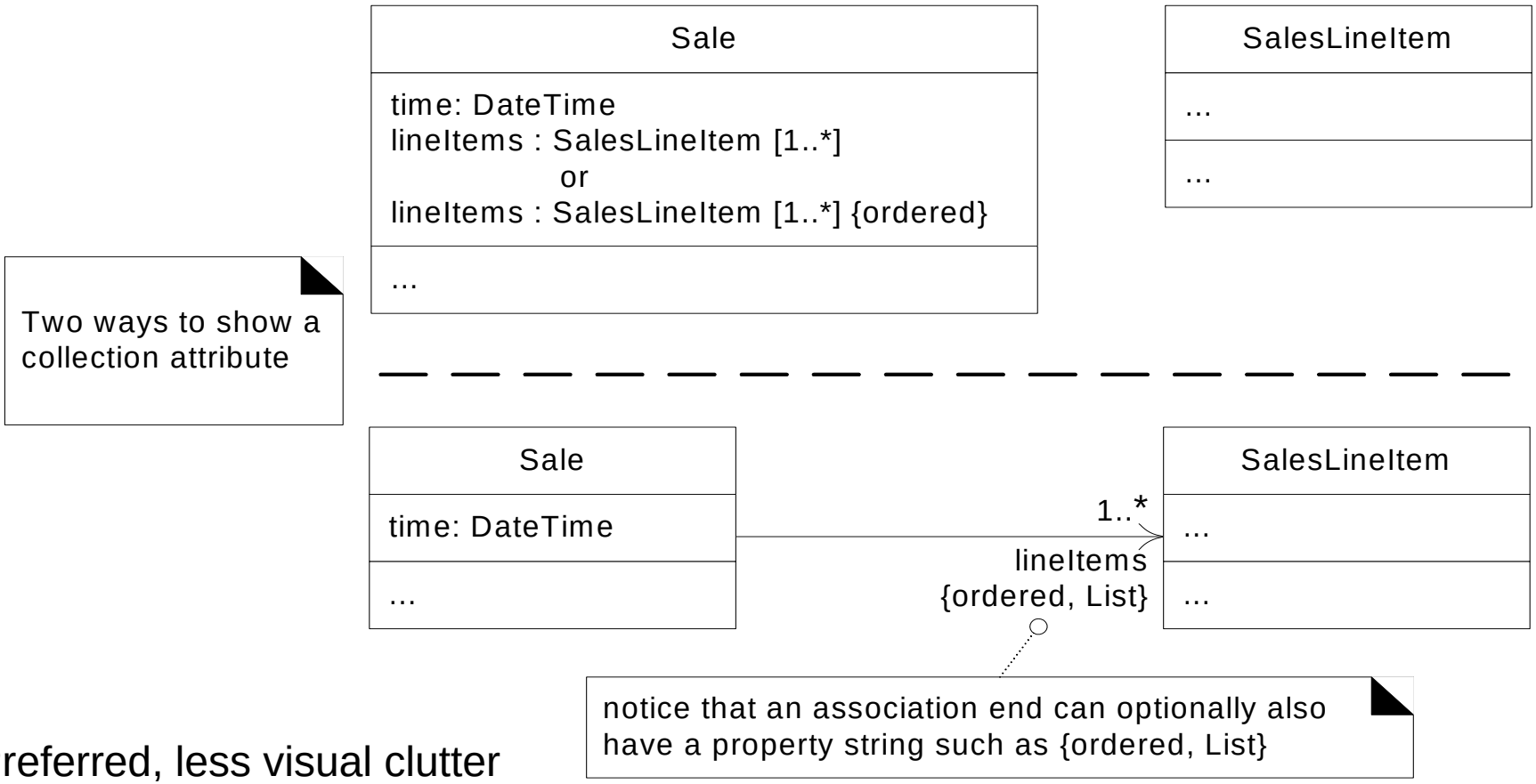


Fig. 16.5



Showing Sale & Store attributes as associations visually emphasizes relationships important in object collaboration

Fig. 16.6



Preferred, less visual clutter

1:N association implies a collection attribute

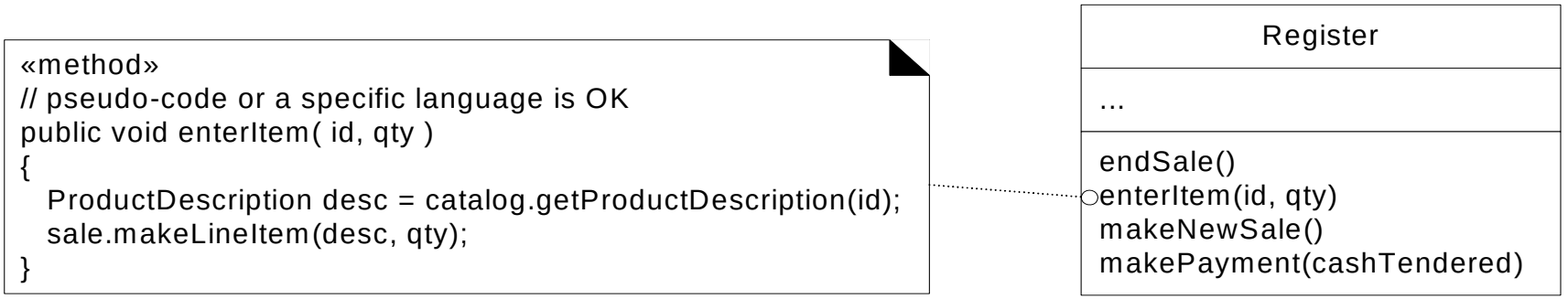
UML Operation Syntax

visibility operationName(parameter list) : return-type {property-string]

Guidelines

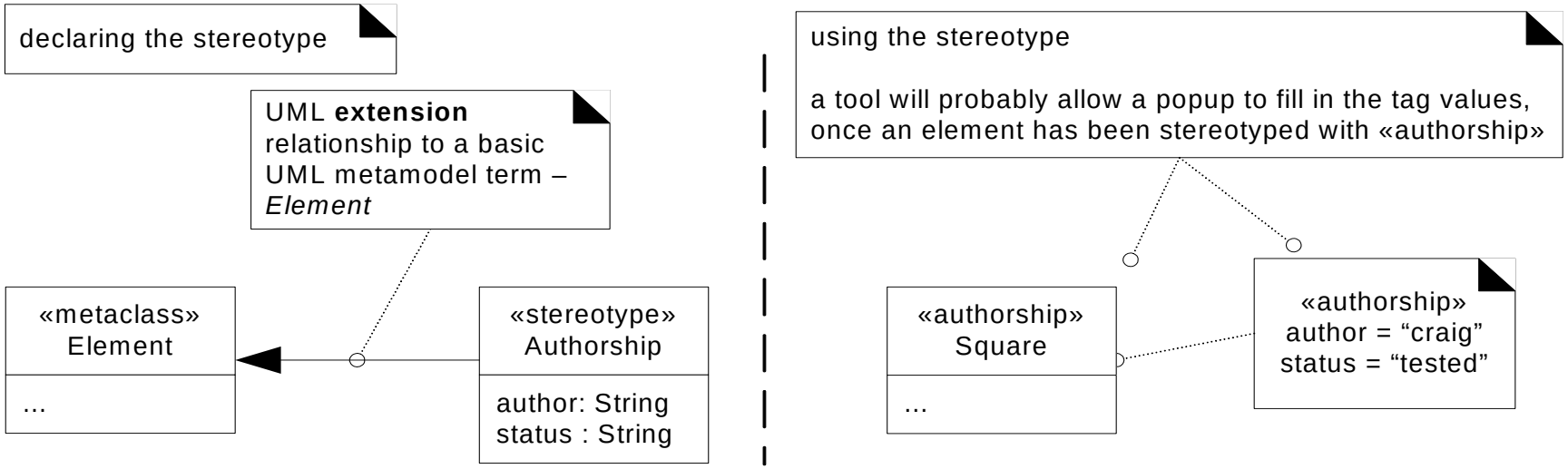
- Show return types
- Assume operations are public unless otherwise depicted
- Assume getters & setters, i.e., don’t show them on model

Fig. 16.7



UML note symbol showing a method body

Fig. 16.8



Stereotypes allow you to refine (i.e., extend) model elements
Groups of related model elements form a UML profile
Can substitute <<..>> for «..»

Class Diagrams

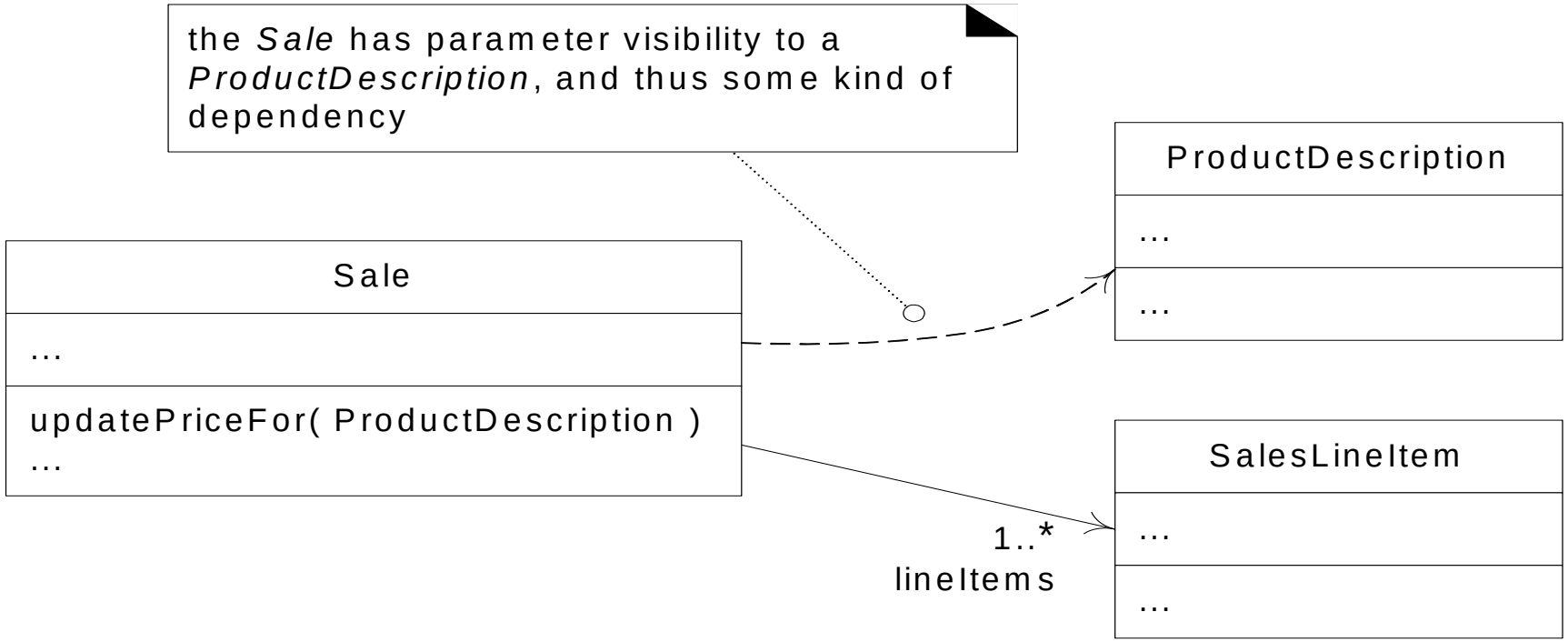
- More UML notation
  - Generalization
    - Same as inheritance when in design mode
    - Solid line with open arrow

  - To indicate *abstract*, use italics
  - For final classes or operations, use {*leaf*}

Class Diagrams

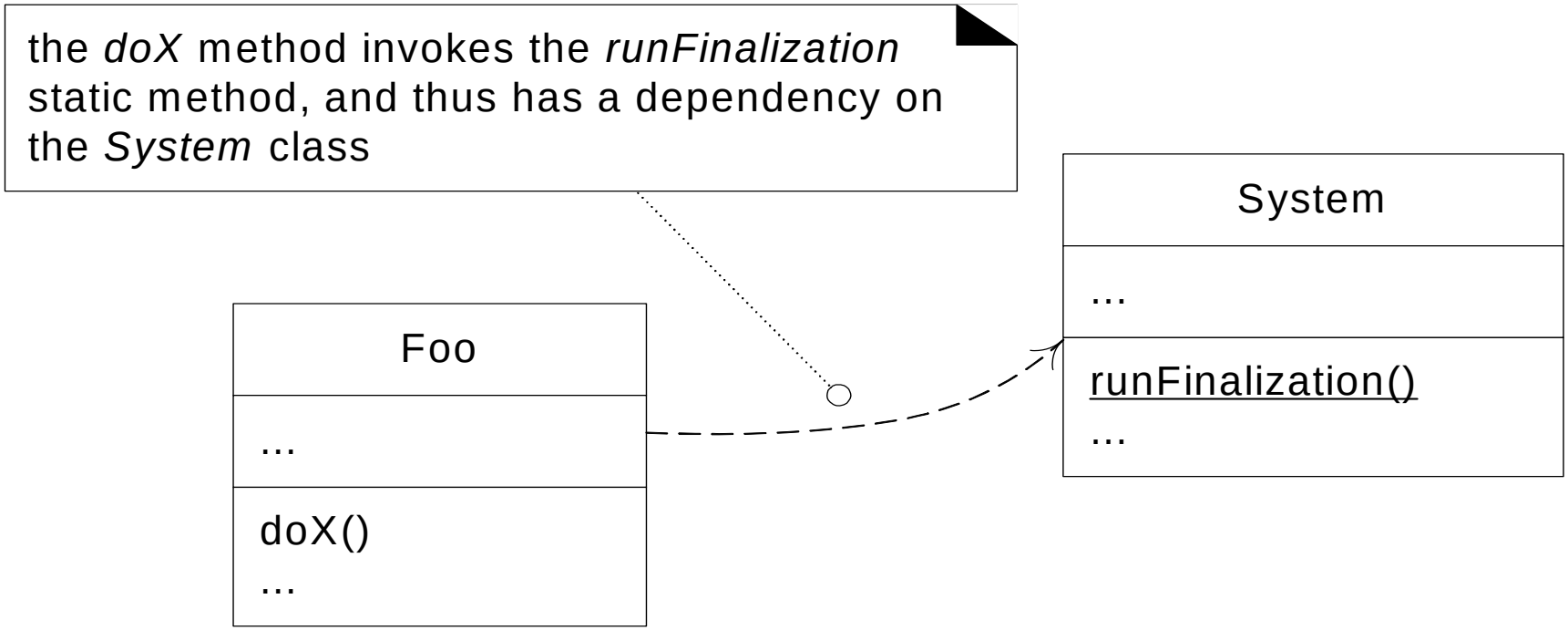
- Dependency
  - When a client has knowledge of a server
  - Changes in server affects client
  - Client and server are ‘coupled’
  - NOT a good thing! Leads to brittle design
  - Occurs anytime client has direct visibility to server
    - Can also be more subtle
    - We’ll cover types of visibility later

Fig. 16.9



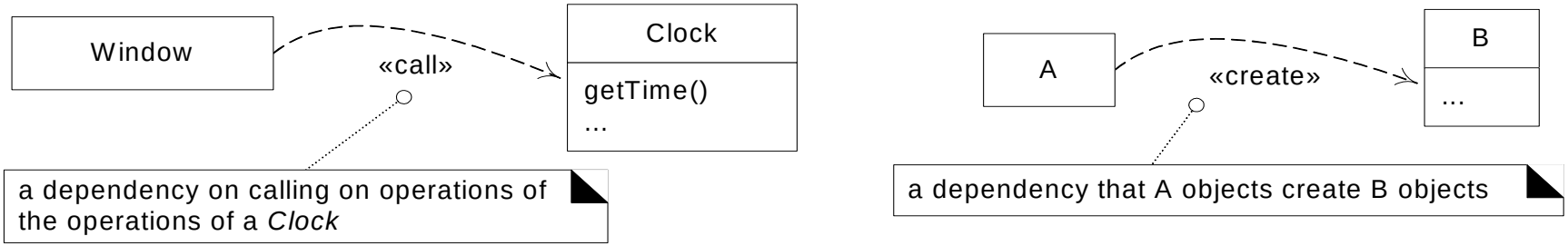
If ProductDescription's public interface changes, then Sale may need to be modified

Fig. 16.10



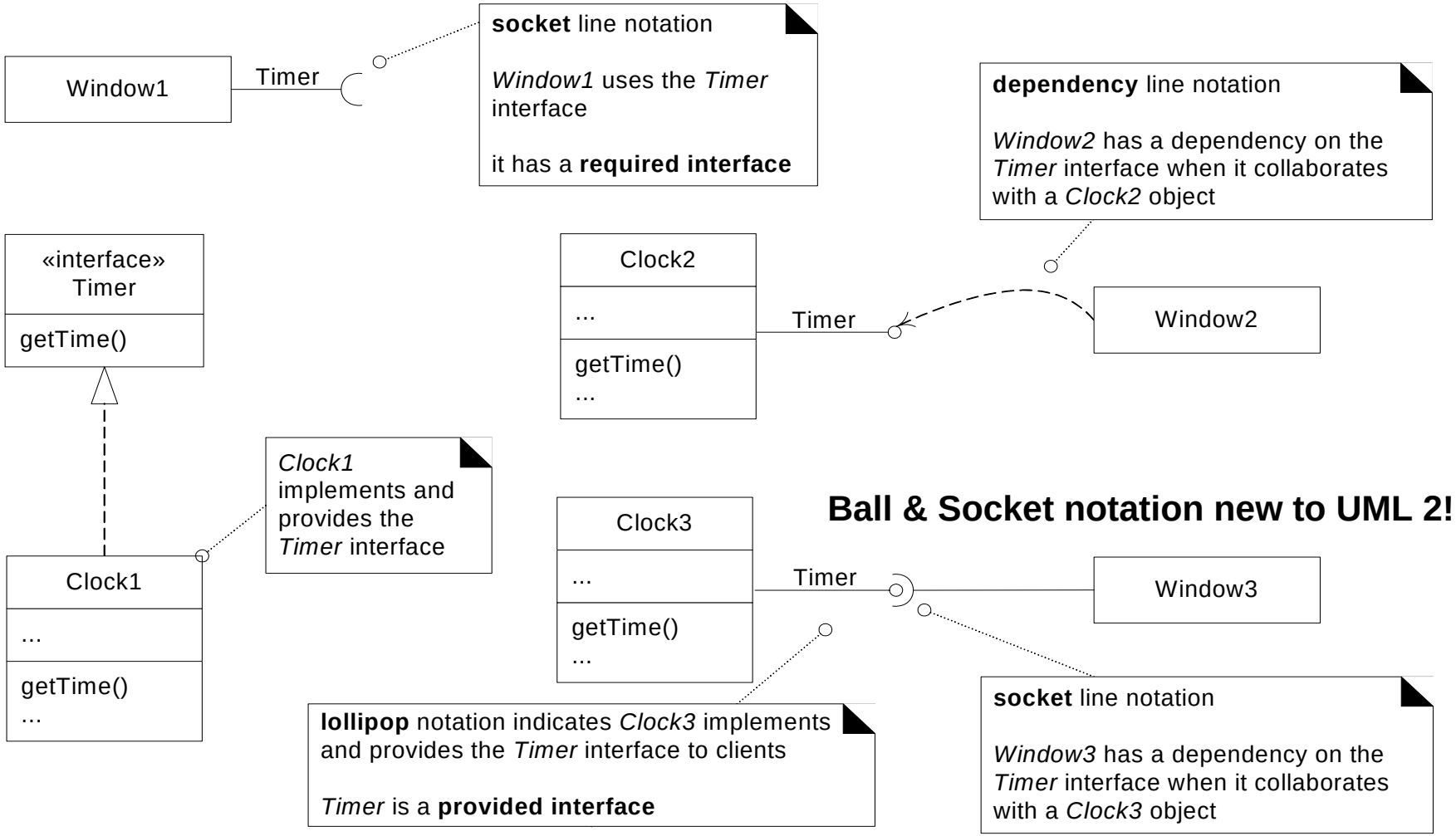
Dependency due to calling a static method

Fig. 16.11



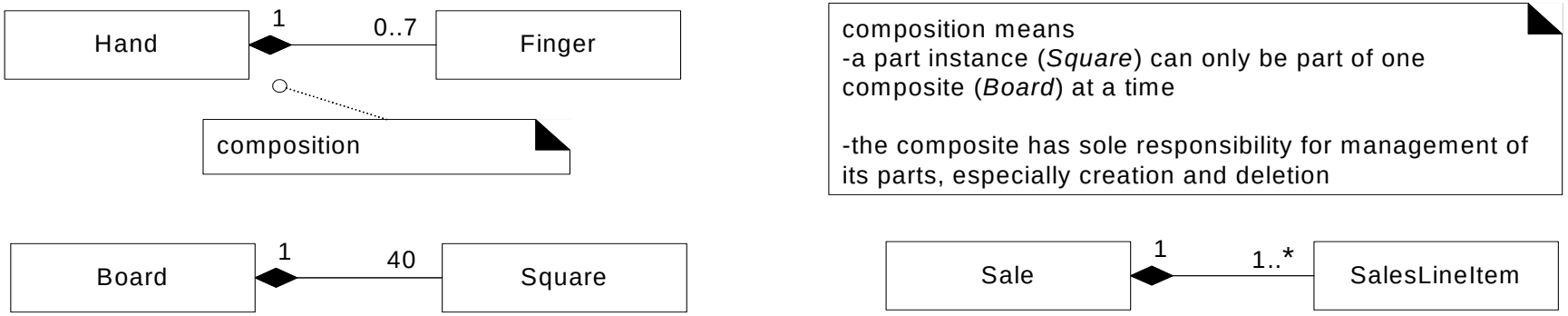
Using keywords or stereotypes to indicates type of dependency

Fig. 16.12



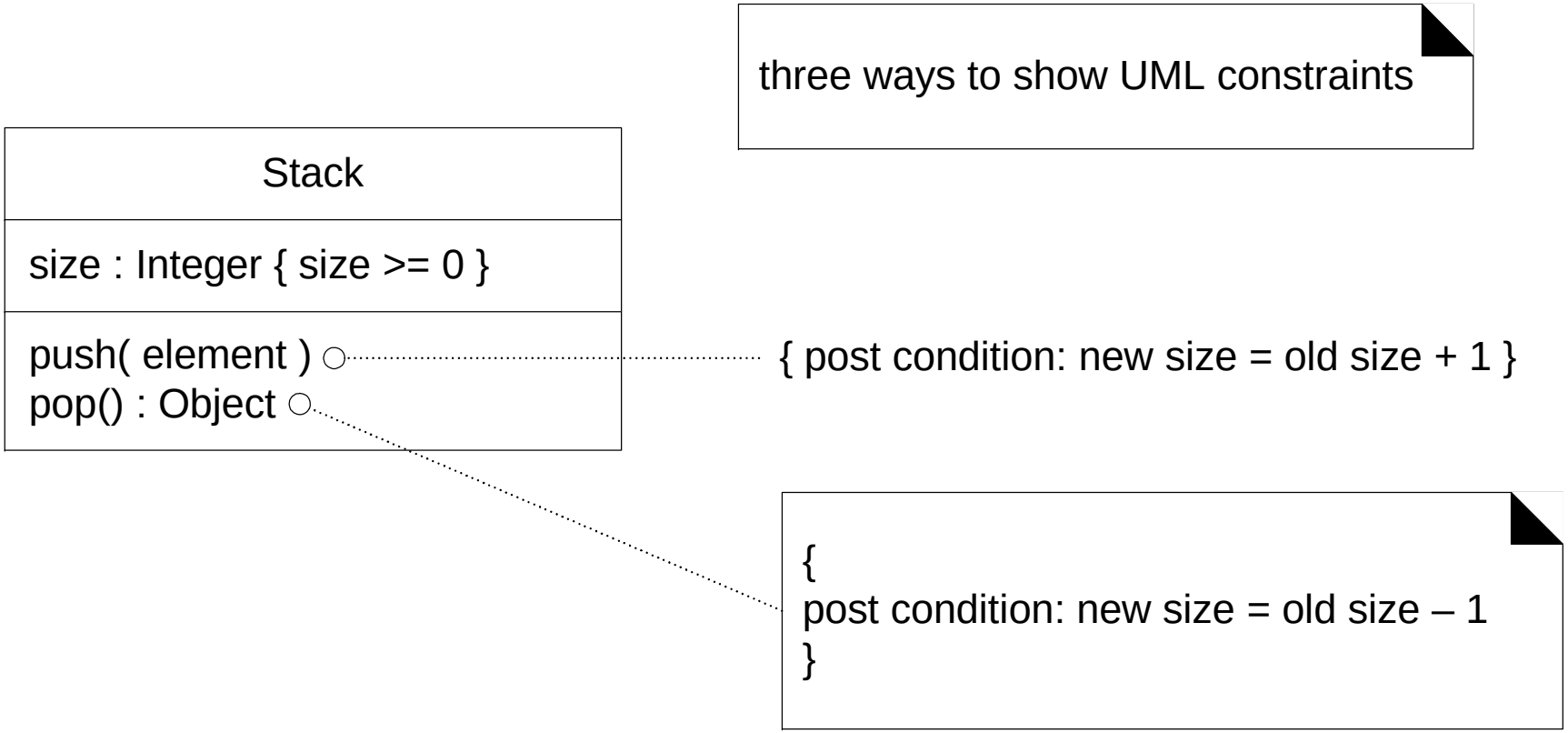
Interface notation

Fig. 16.13



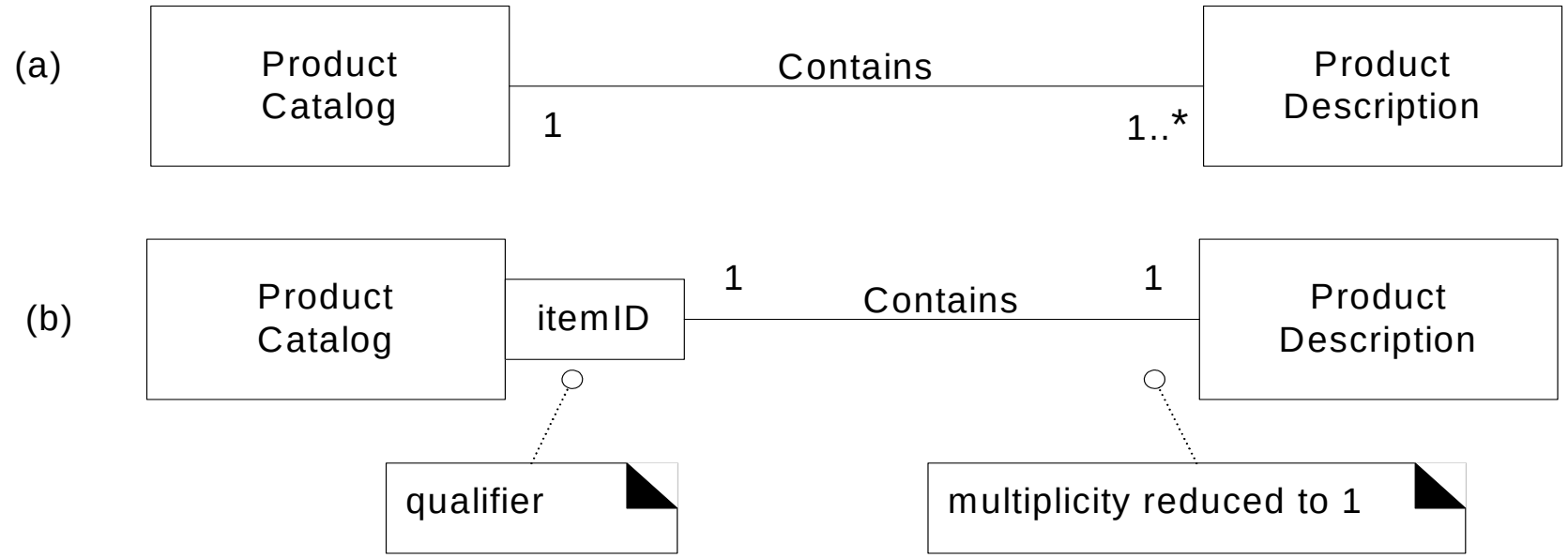
- Aggregation is not a distinctive term (same as regular association)
- Use composition when appropriate
- Composition is the ‘strong’ form of aggregation

Fig. 16.14



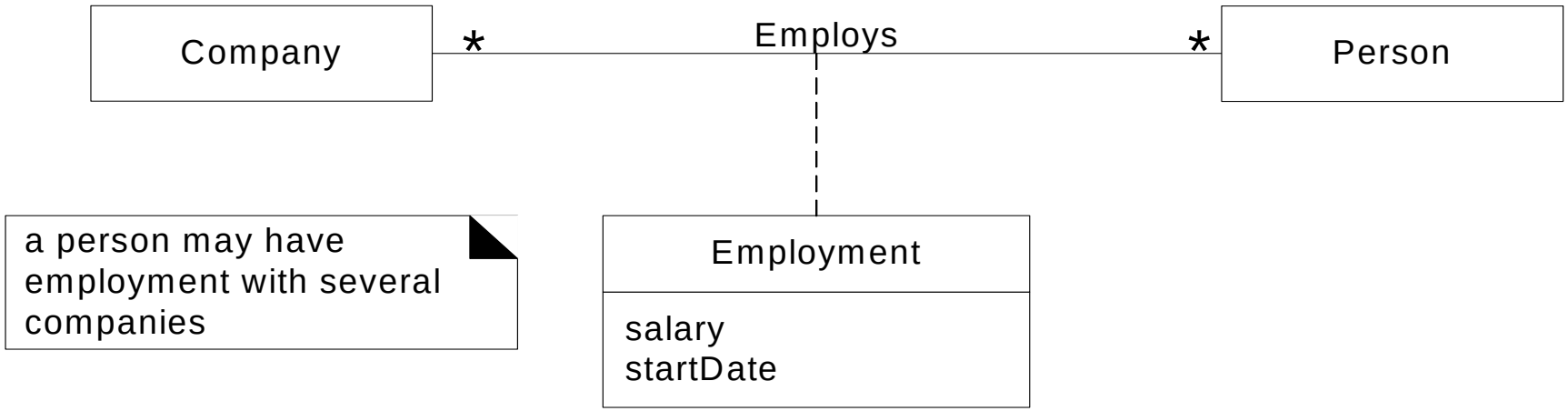
Constraint notation

Fig. 16.15



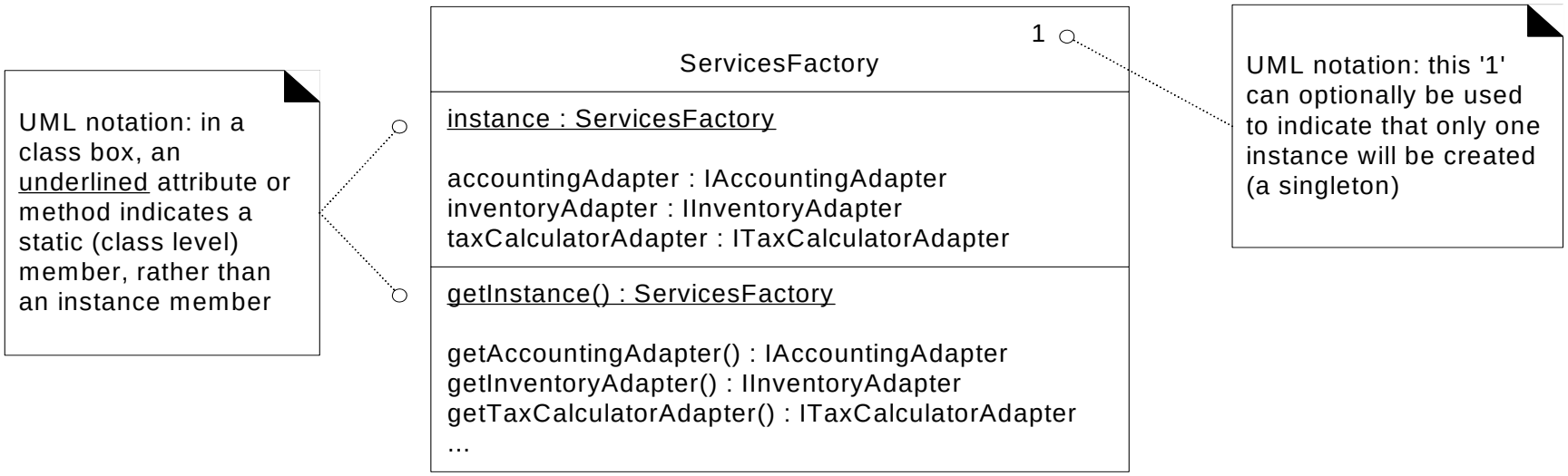
Qualified associations

Fig. 16.16



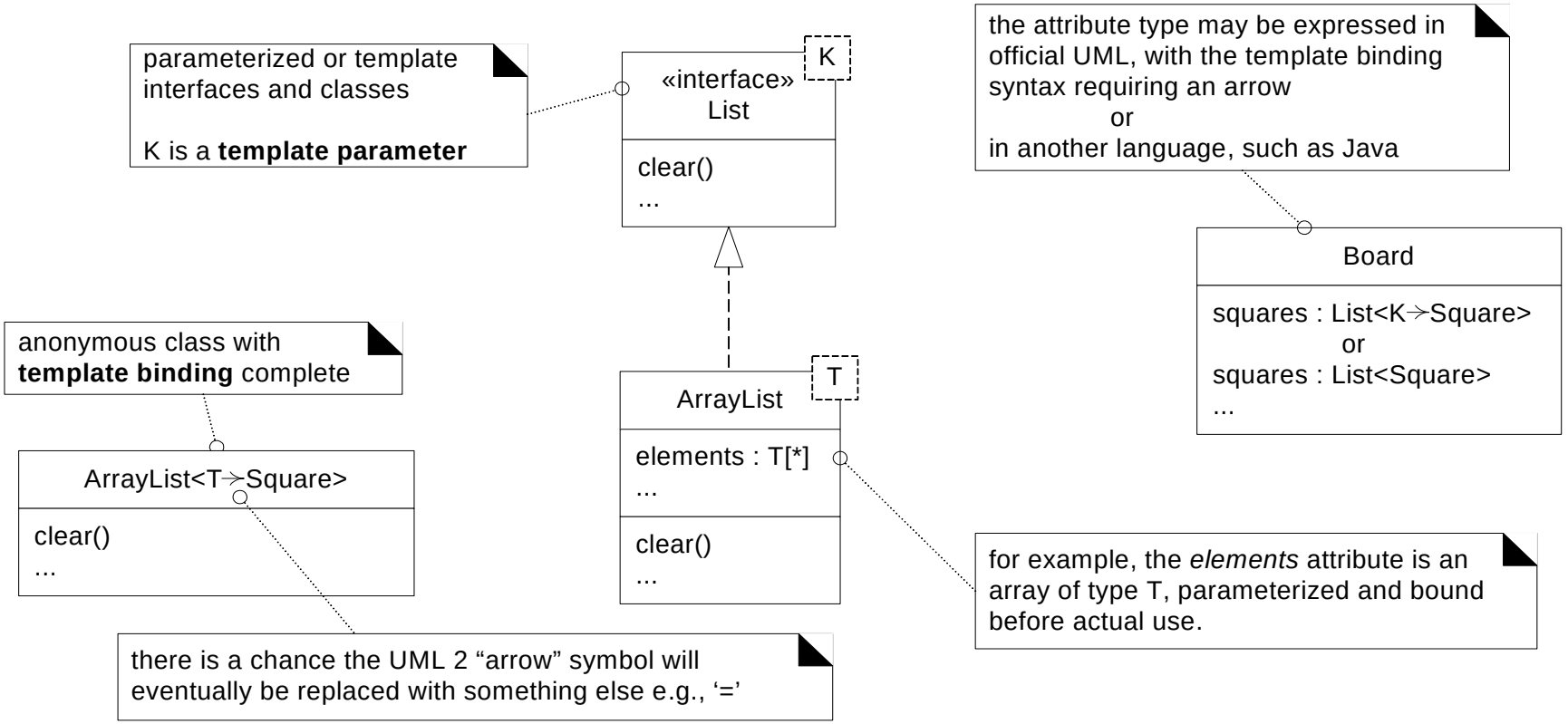
Association class simplifies many-to-many multiplicity

Fig. 16.17



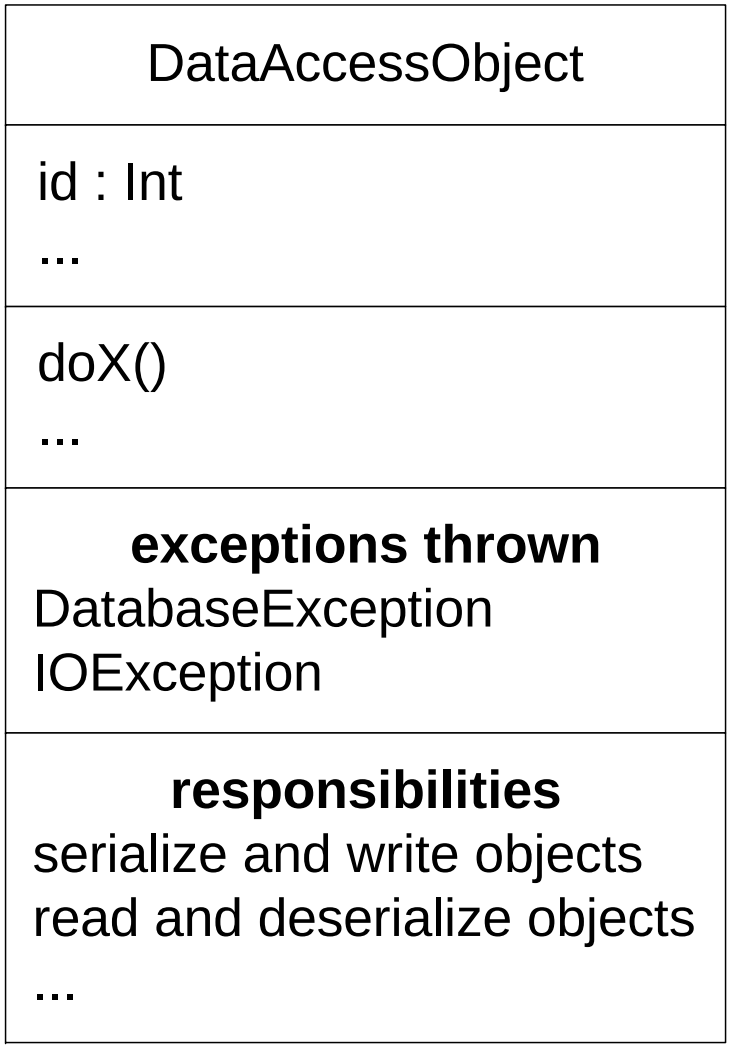
Singleton class: Only 1 instance can exist

Fig. 16.18



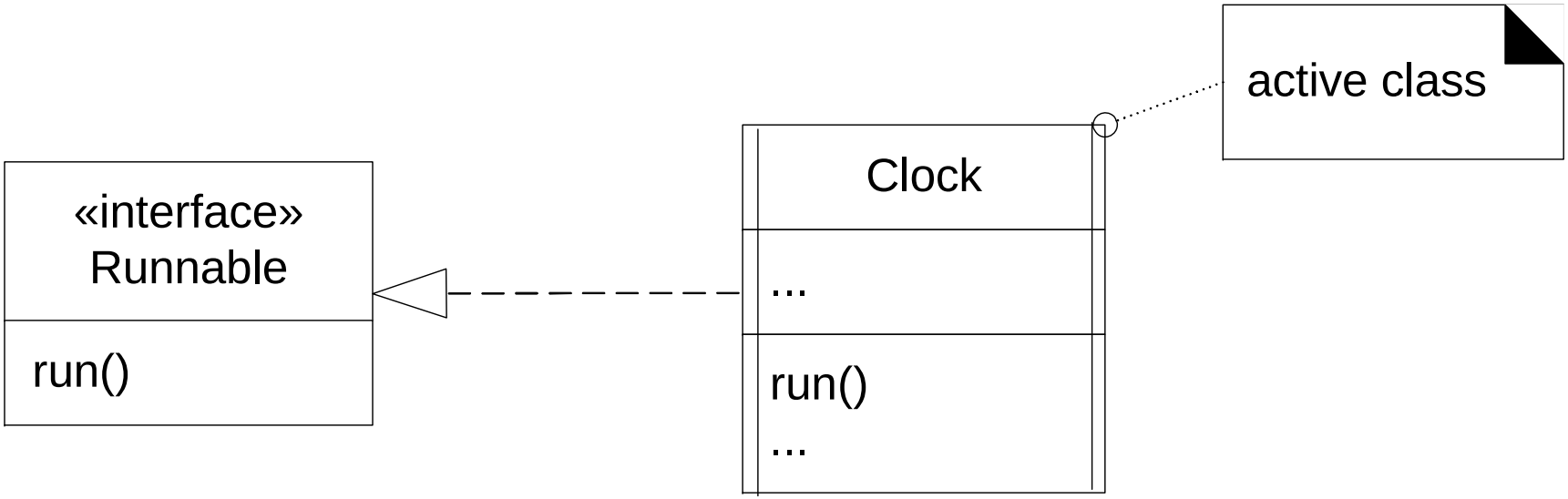
Template types are new to Java 1.5

Fig. 16.19



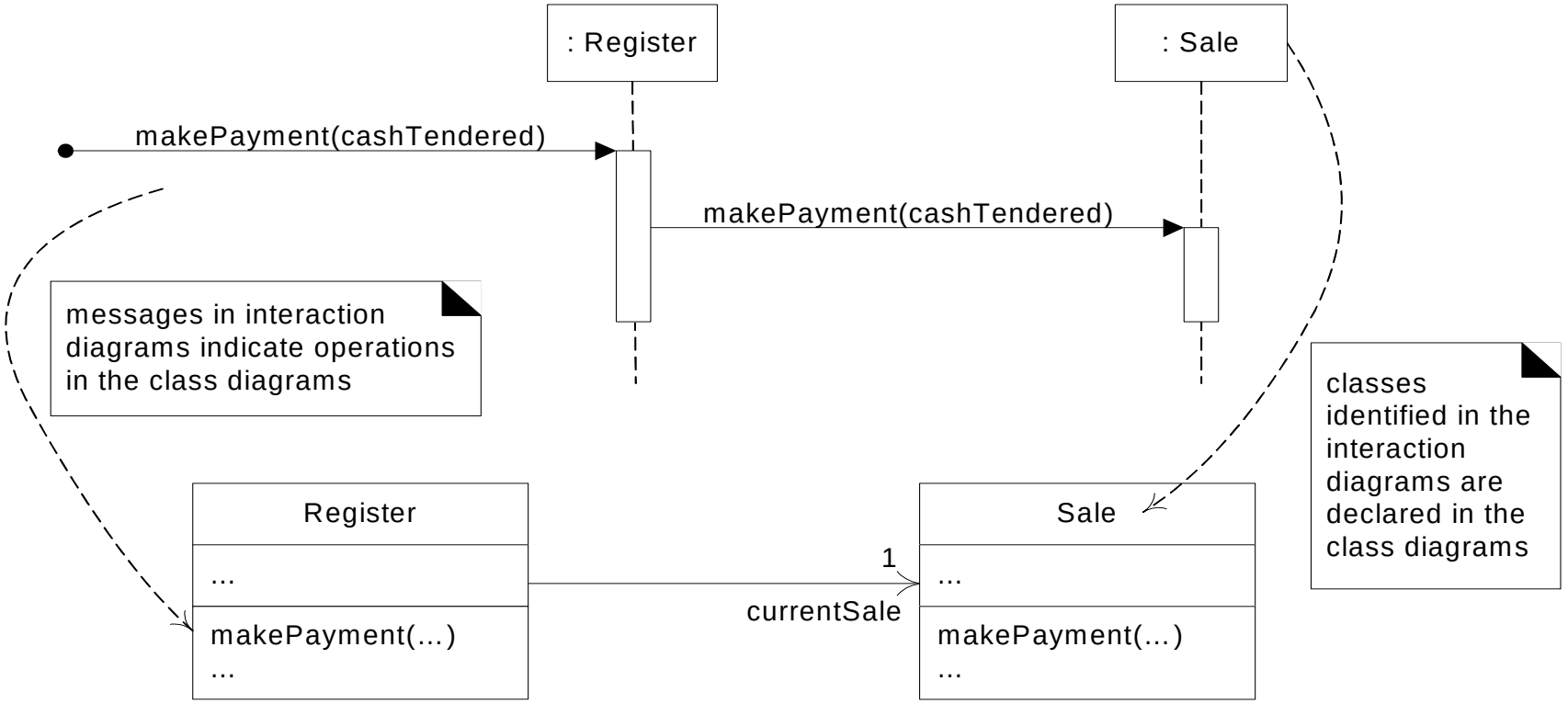
Additional compartments for a class

Fig. 16.20



Active class executes in its own thread

Fig. 16.21



Relationship between class & interaction diagrams
Models must be consistent with each other!!