SWEN 223
Software Engineering Analysis

Interaction Diagrams

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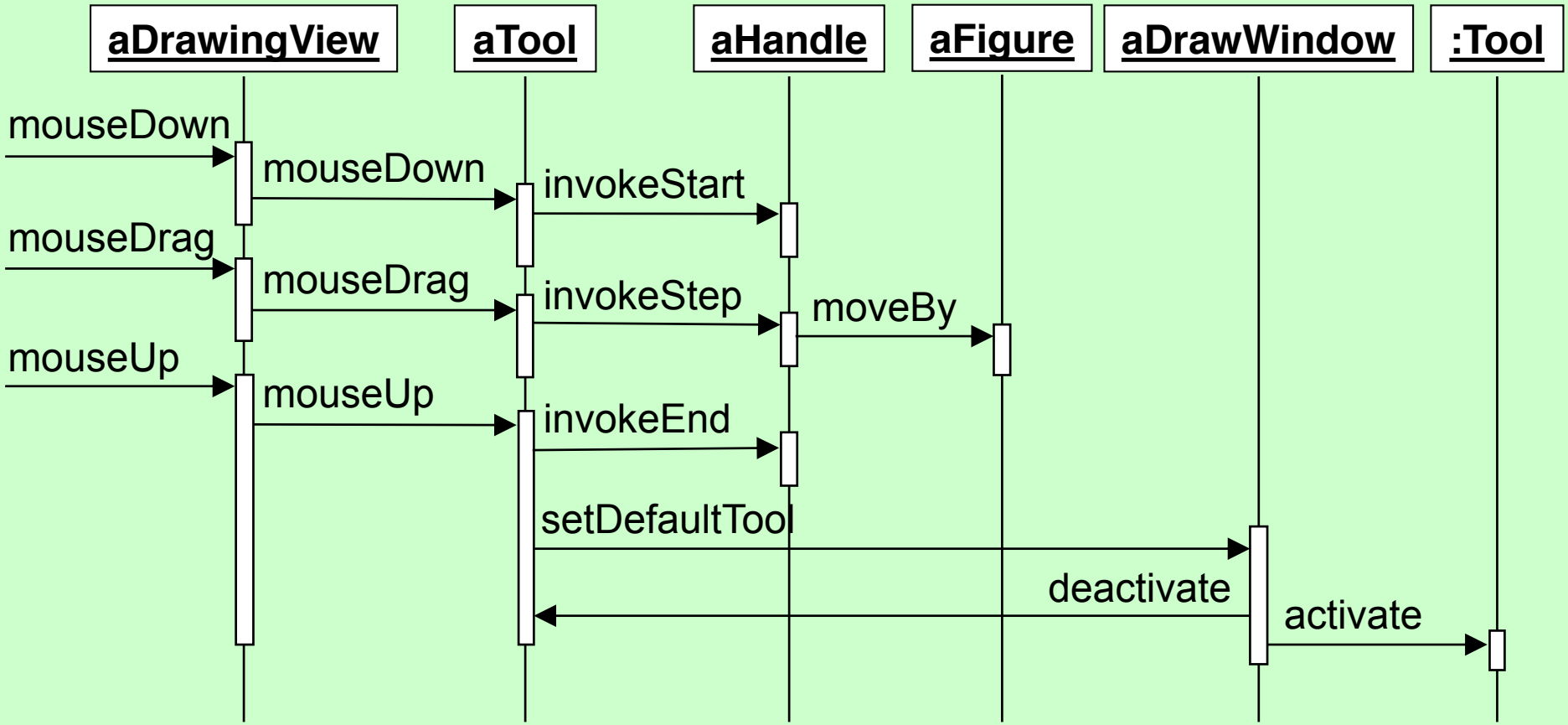
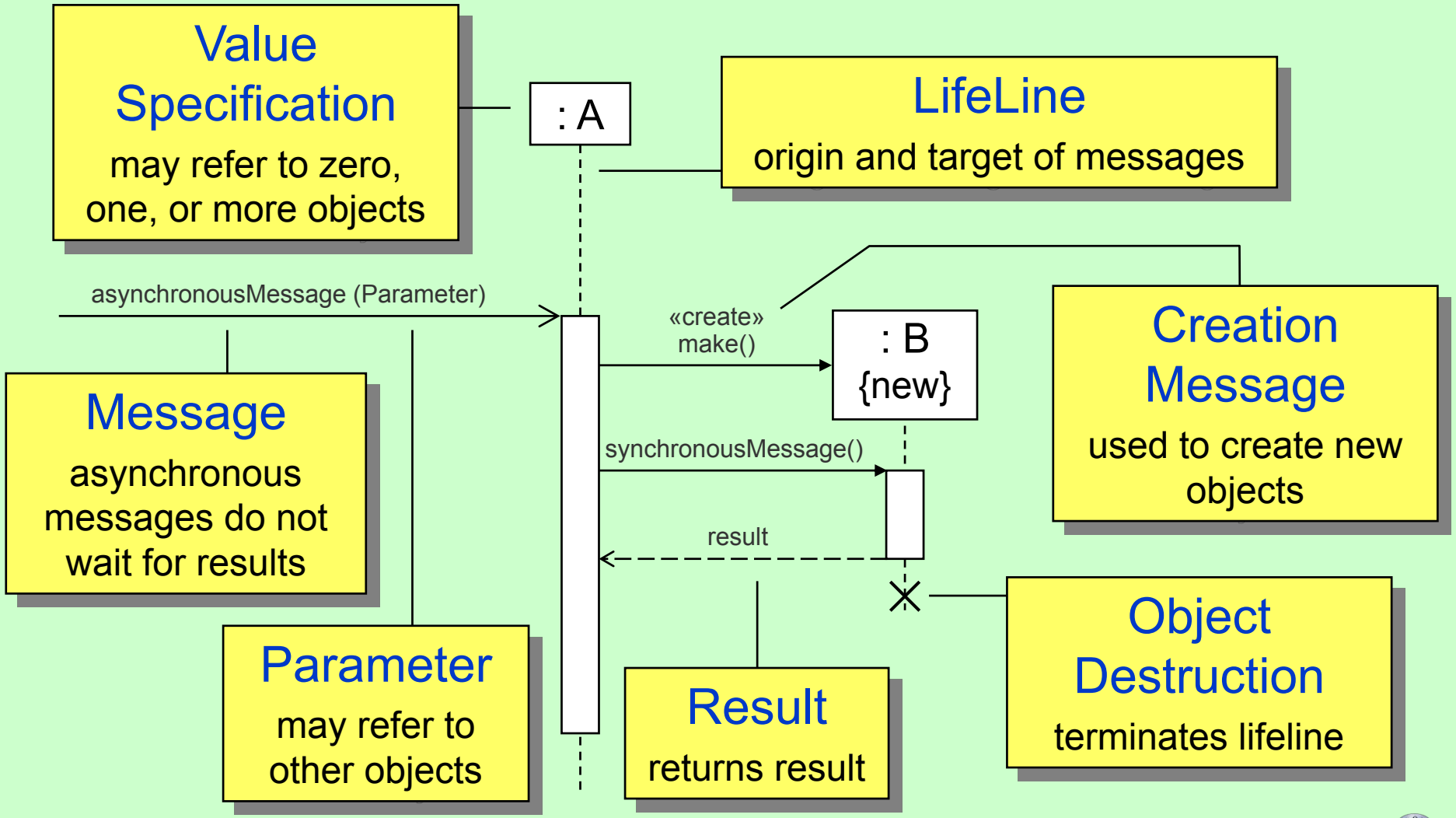
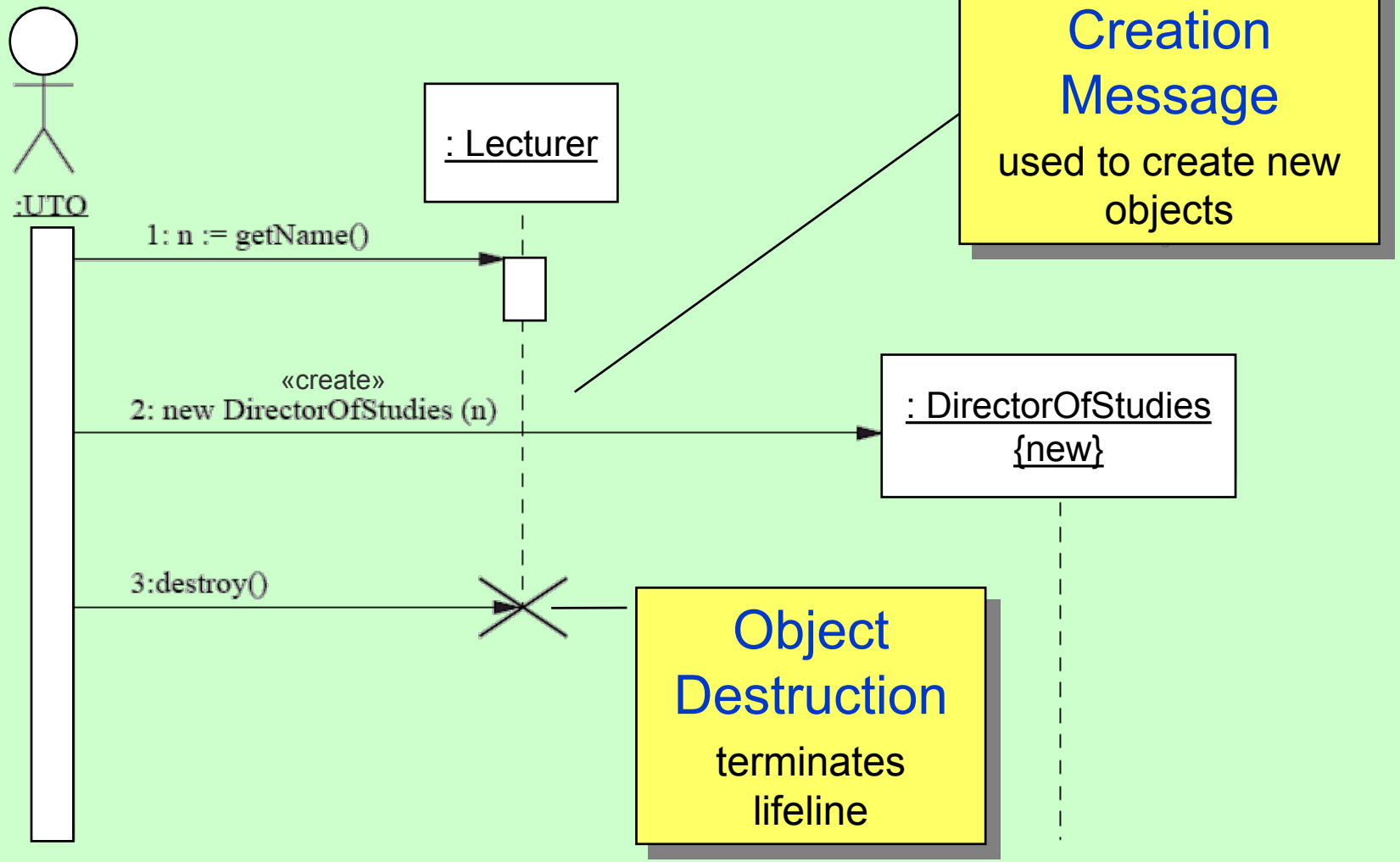
Documenting Behaviour



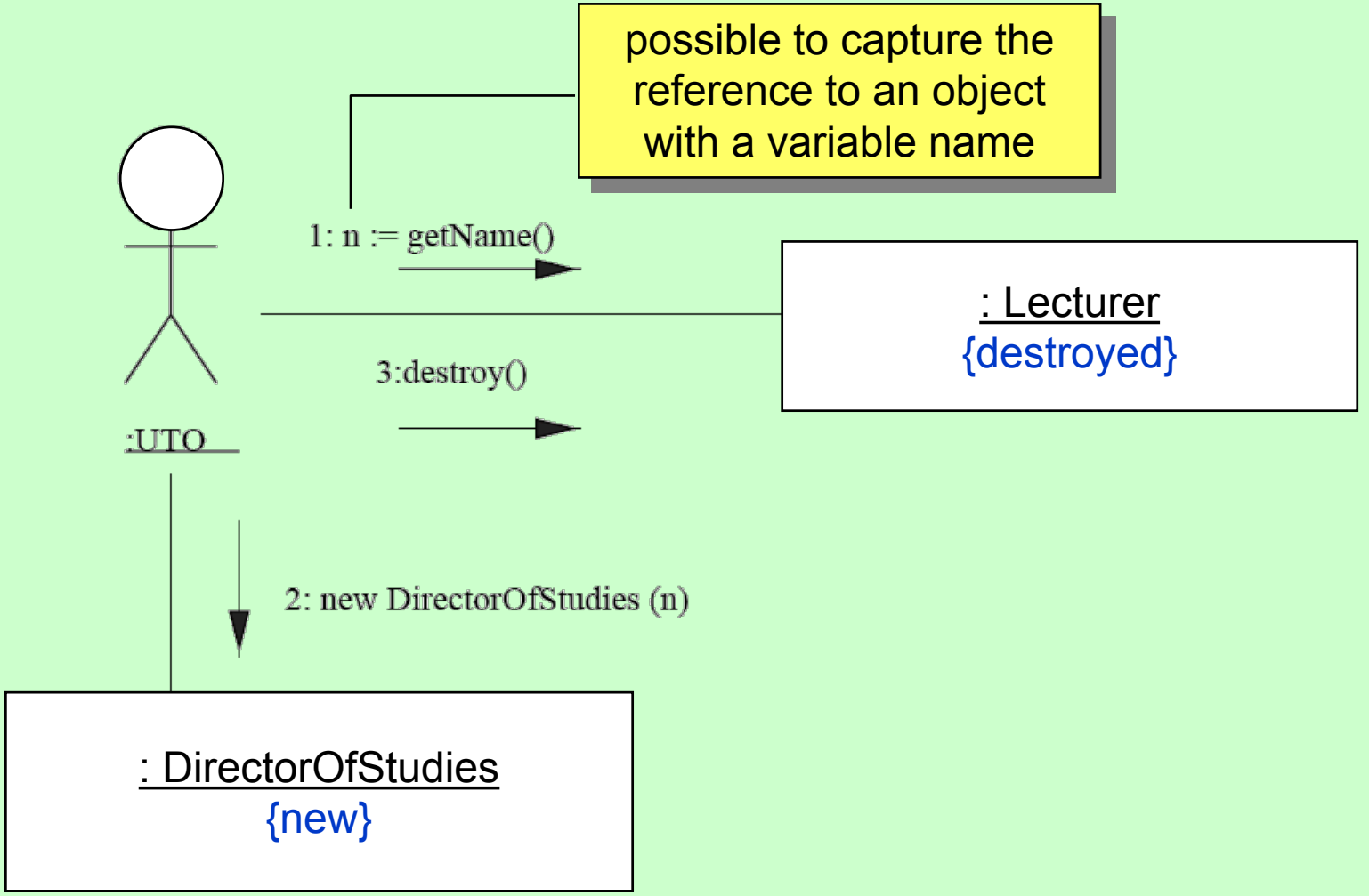
Sequence Diagram



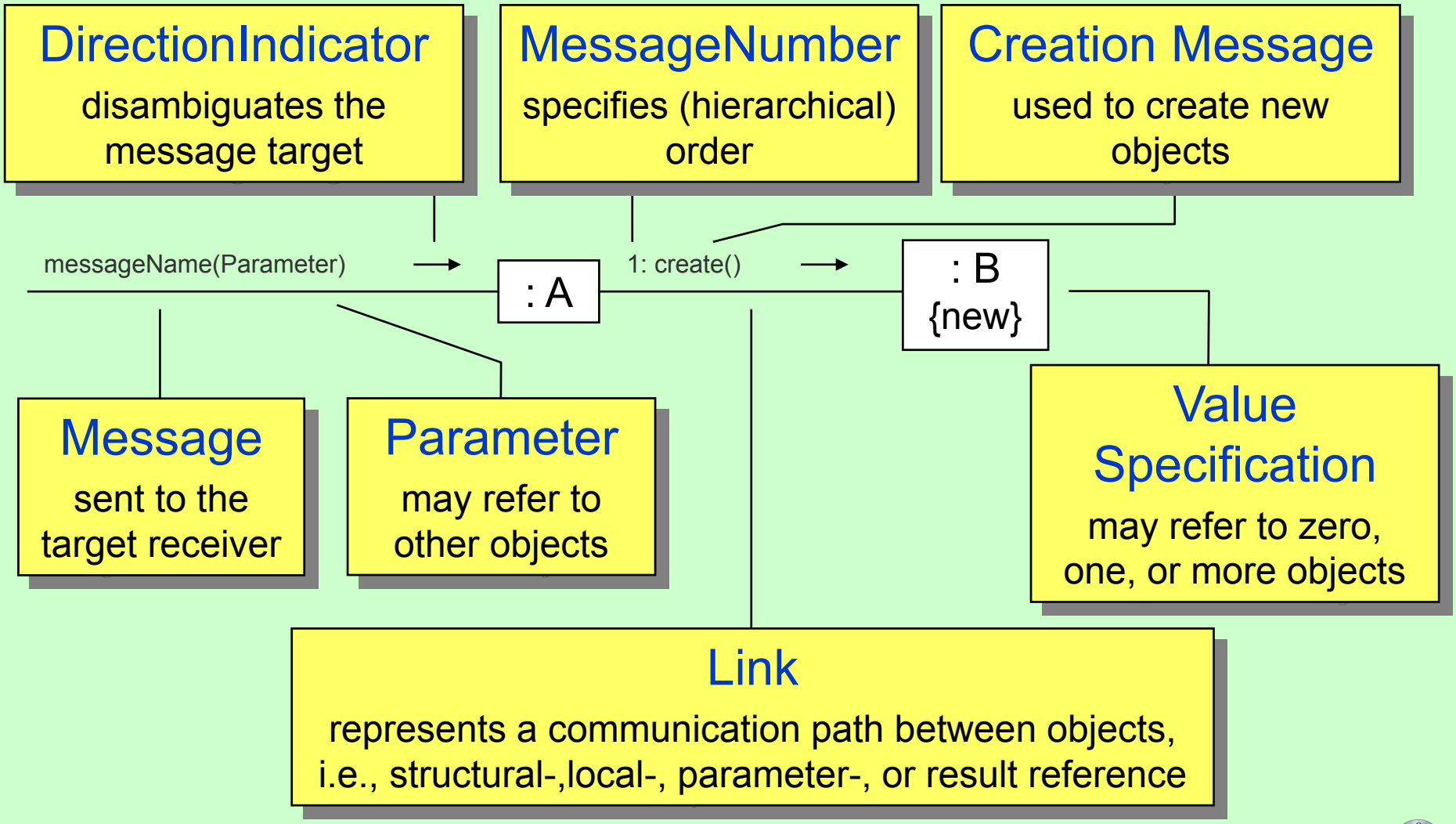
Creation & Deletion



Communication Diagram



Communication Diagram

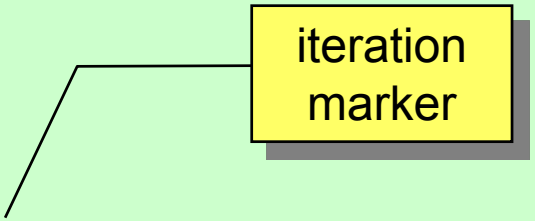


Annotations

- Possible Object/Link Existence Classification
  - **new**
    - the instance or link is created during the enclosing interaction
  - **destroyed**
    - the instance or link is destroyed prior to the completion of the enclosing interaction
  - **transient**
    - the instance or link is created during execution but is destroyed before completion of the enclosing interaction

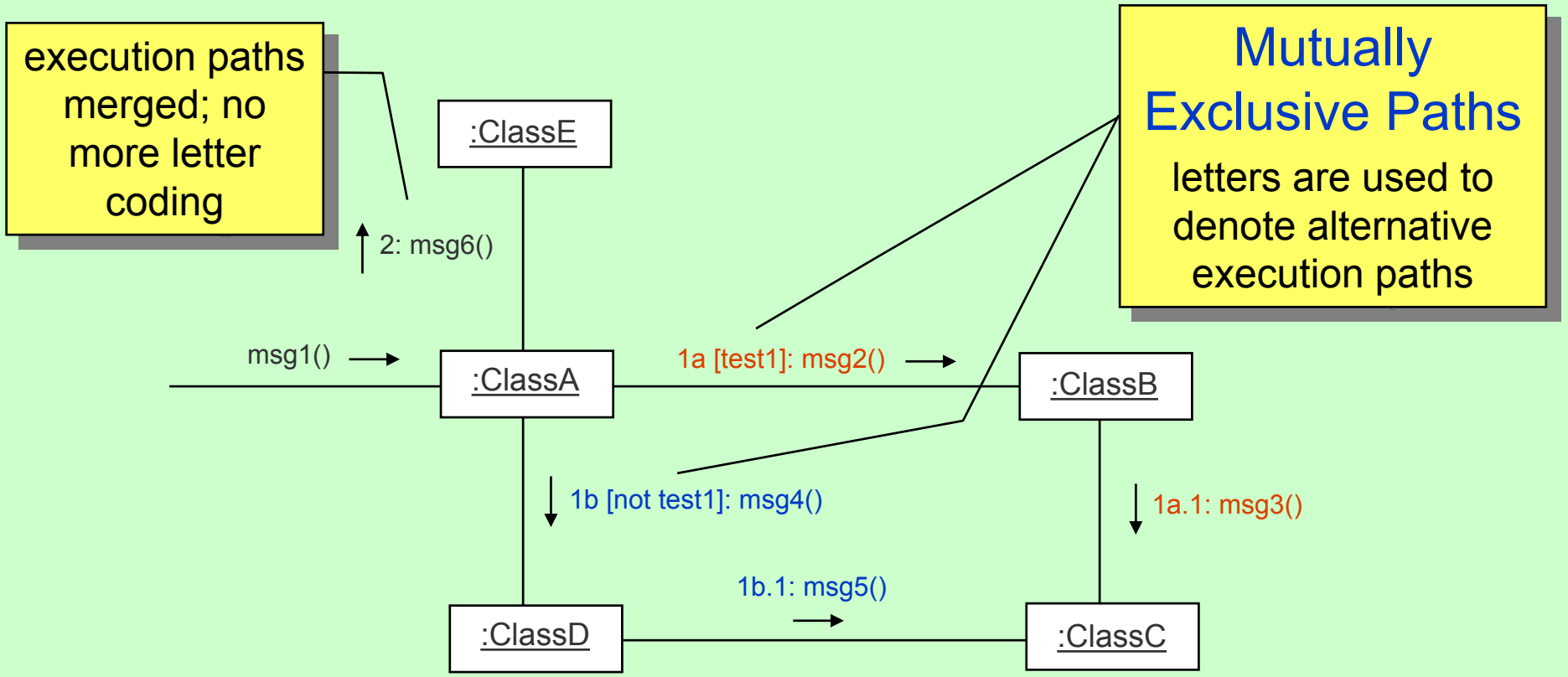
Specifying Behaviour

- Message Guards
  - » [pressure > 9]: playAlarm()
  - » the message is sent only if the condition evaluates to true
  - » are deprecated for sequence diagrams; use “opt” or “alt” notation instead
- Iteration
  - » * [i := 1..n]: knockAtDoor()
  - » conditions such as * [x<10] or * [isNotEmpty] are possible as well



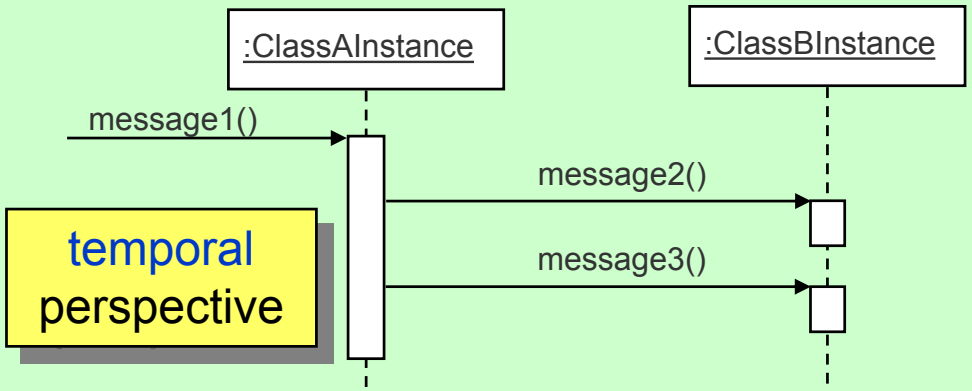
Conditional Paths

Extension of Hierarchical Notation



Sequence vs Communication

Sequence Diagrams



Strength

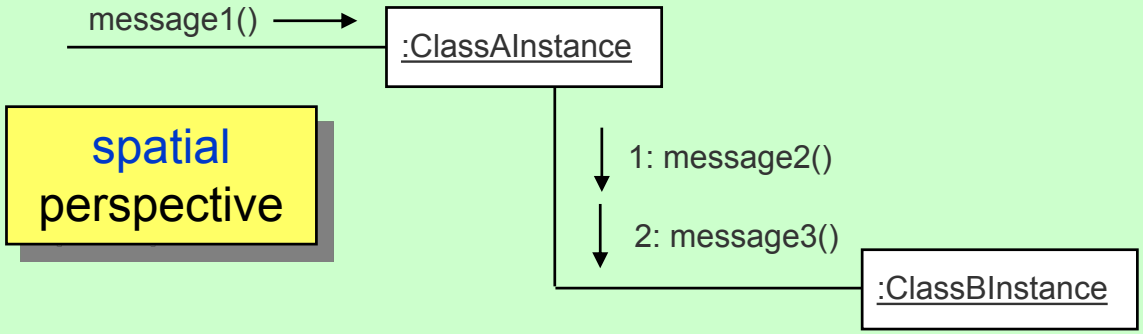
clearly show ordering of messages

Weakness

don't show links

become very wide

Communication Diagrams



Strength

show links & use space economically

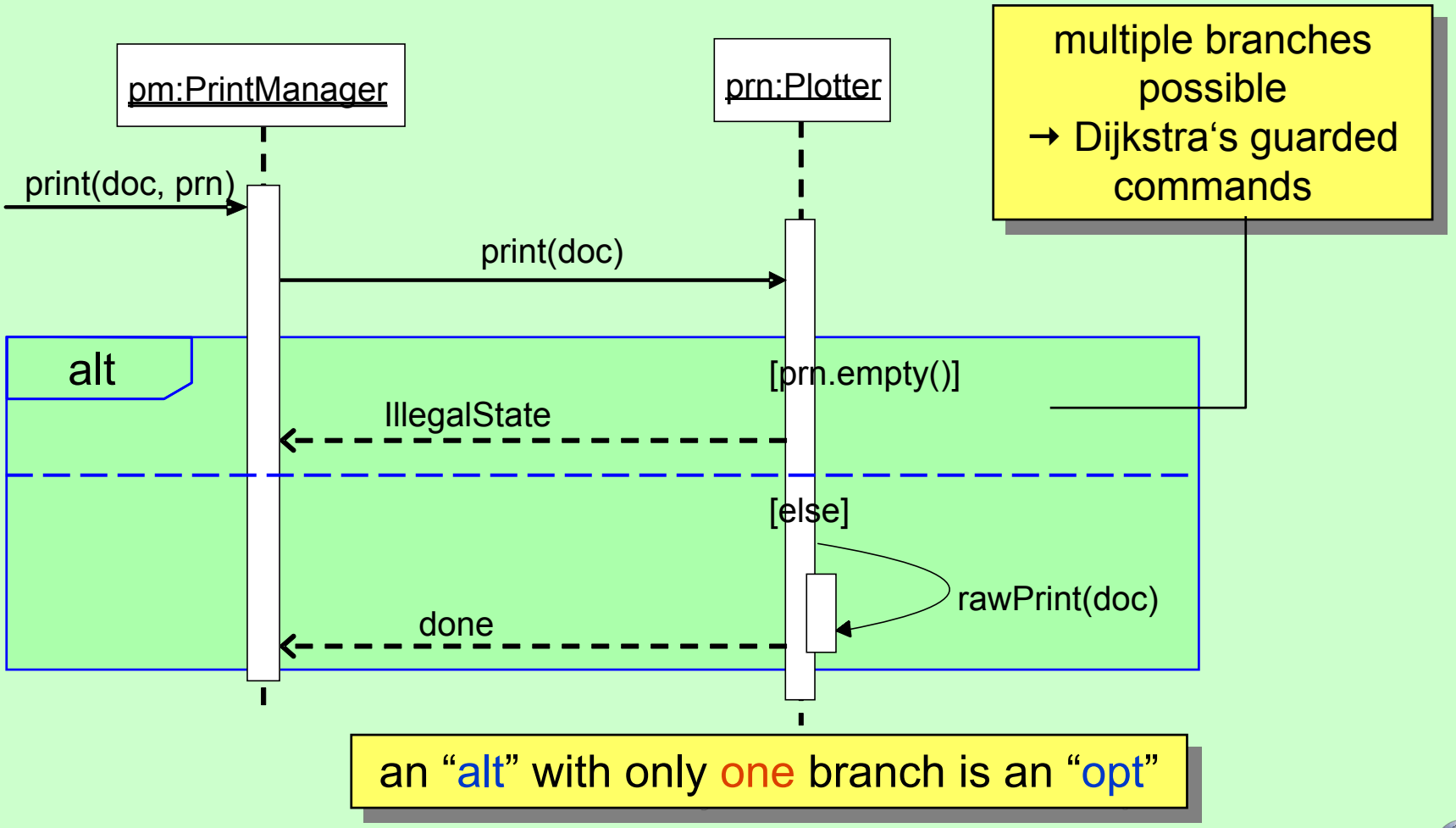
Weakness

difficult to see message sequence

Sequence vs Communication

- As of UML 2.0, Sequence Diagrams have a lot more expressive notation than Communication Diagrams
  - alternatives, loops
  - decomposition mechanisms
- With respect to their common basis, both diagram kinds can be translated into each other

Conditional



Iteration

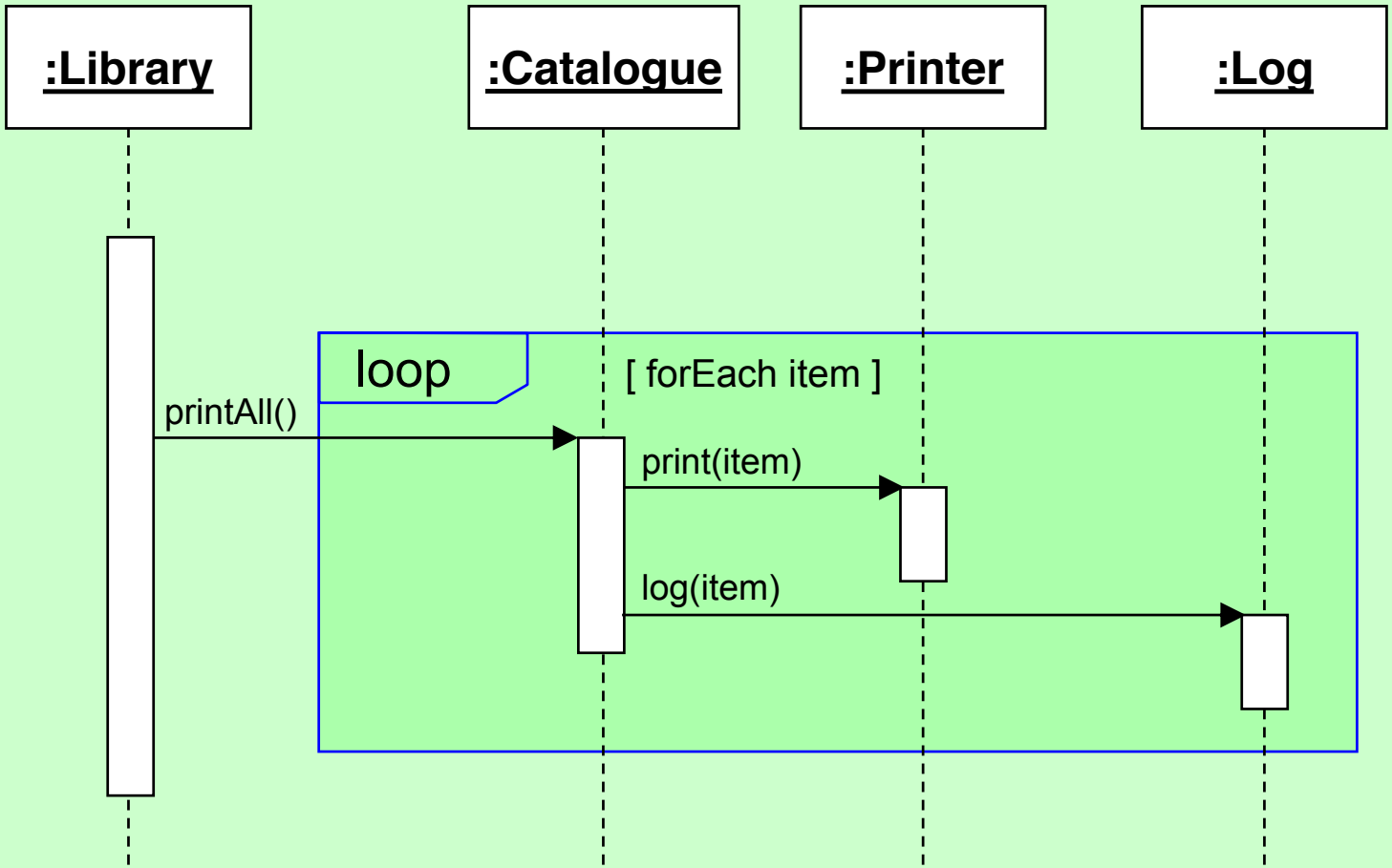
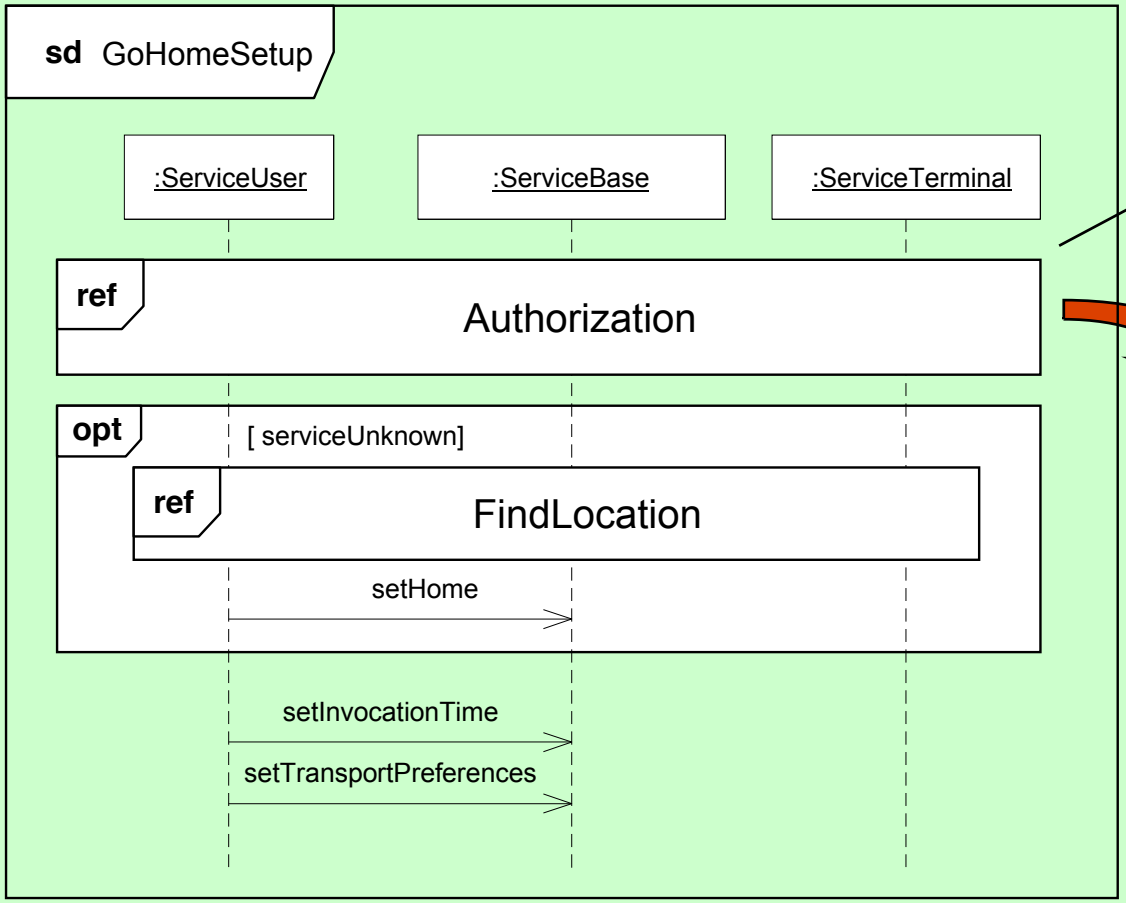
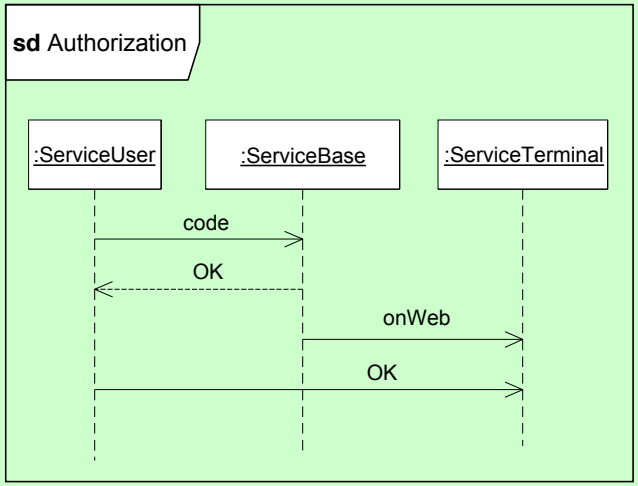

:Library
:Catalogue
:Printer
:Log
loop
[forEach item]
printAll()
print(item)
log(item)

Diagram Decomposition



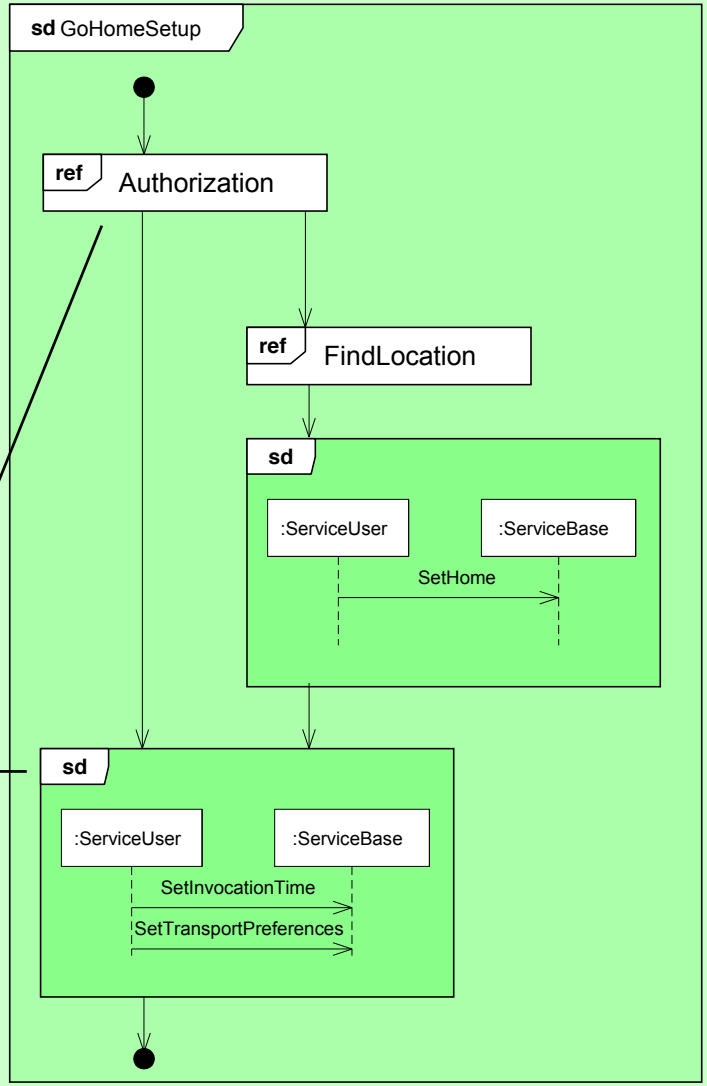
Interaction Occurrence

include interactions defined elsewhere



Interaction Overview Diagram

- Variation of Activity Diagrams
  - » provide overview of the control flow
  - » combines sequence fragments
    - – interaction occurrences
    - – interactions



Interaction Diagrams

Applicability

- during analysis, to improve individual or group understanding of inter-object behaviour
  - » are all communication paths required available?
  - » can complete message sequences be constructed?
  - » documentation for CRC scenarios
- during design, to precisely (but typically partially) describe inter-object/process communication
- during testing, the traces can be compared with those described in the earlier phases