# SWEN 223
# Software Engineering Analysis

# Interaction Diagrams

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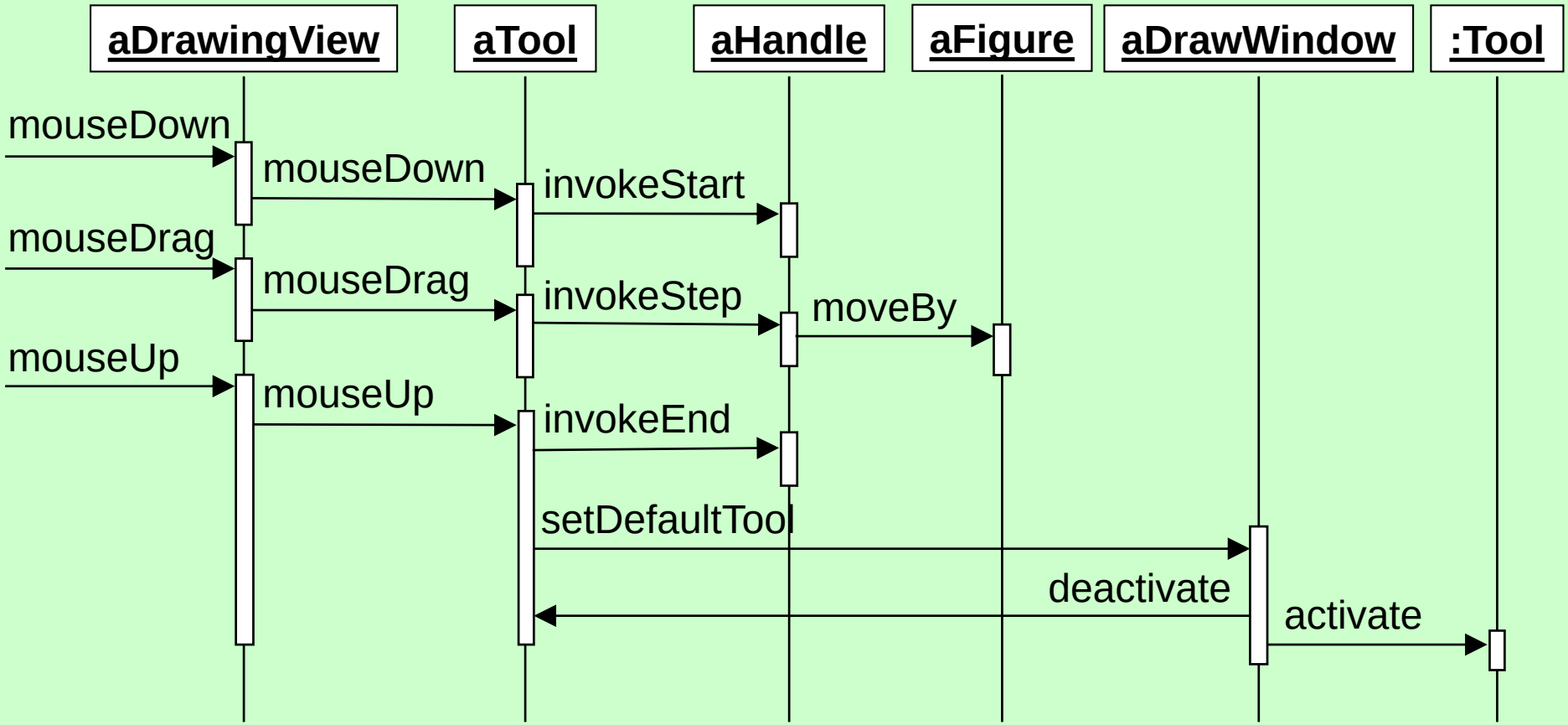
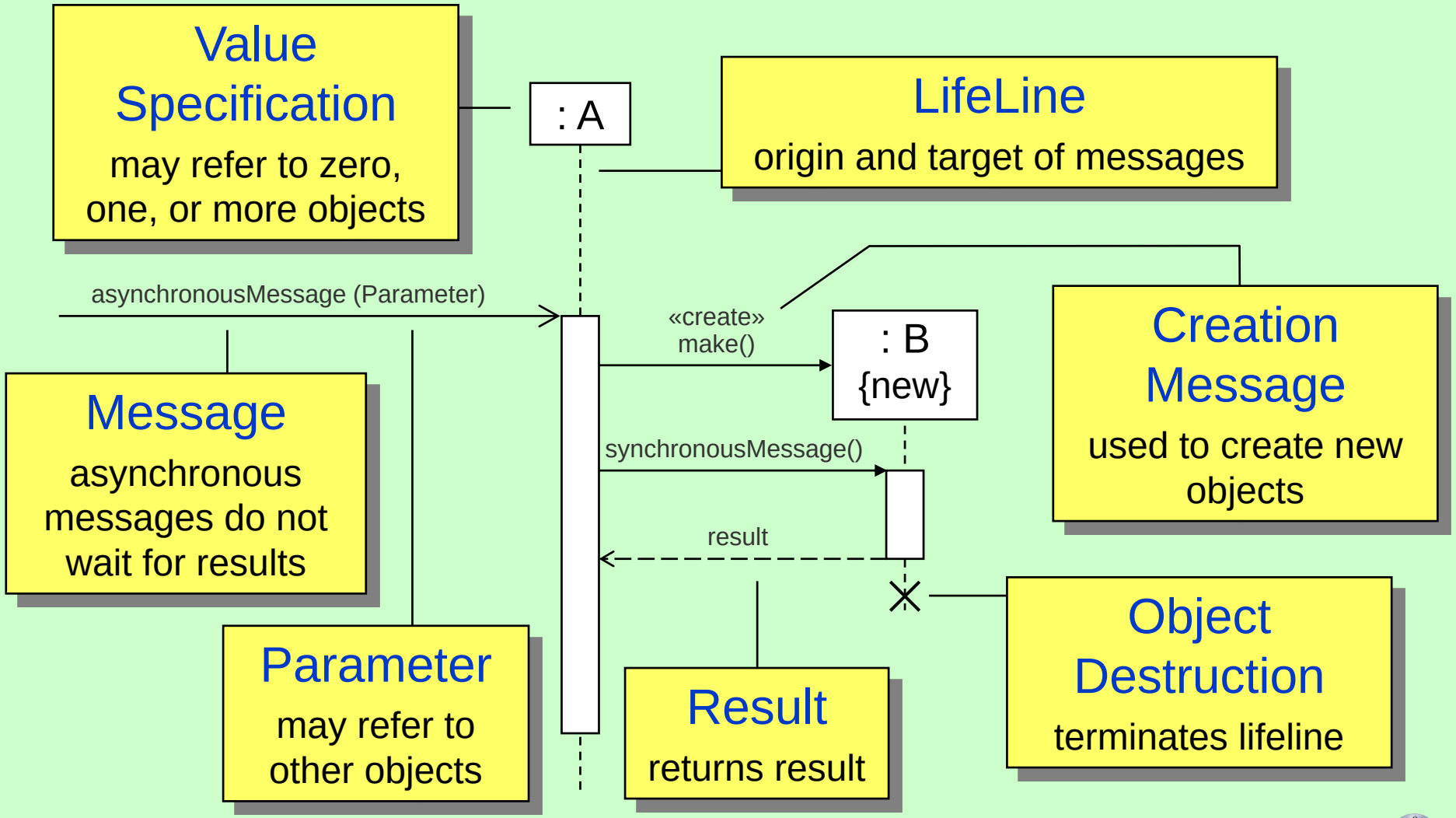
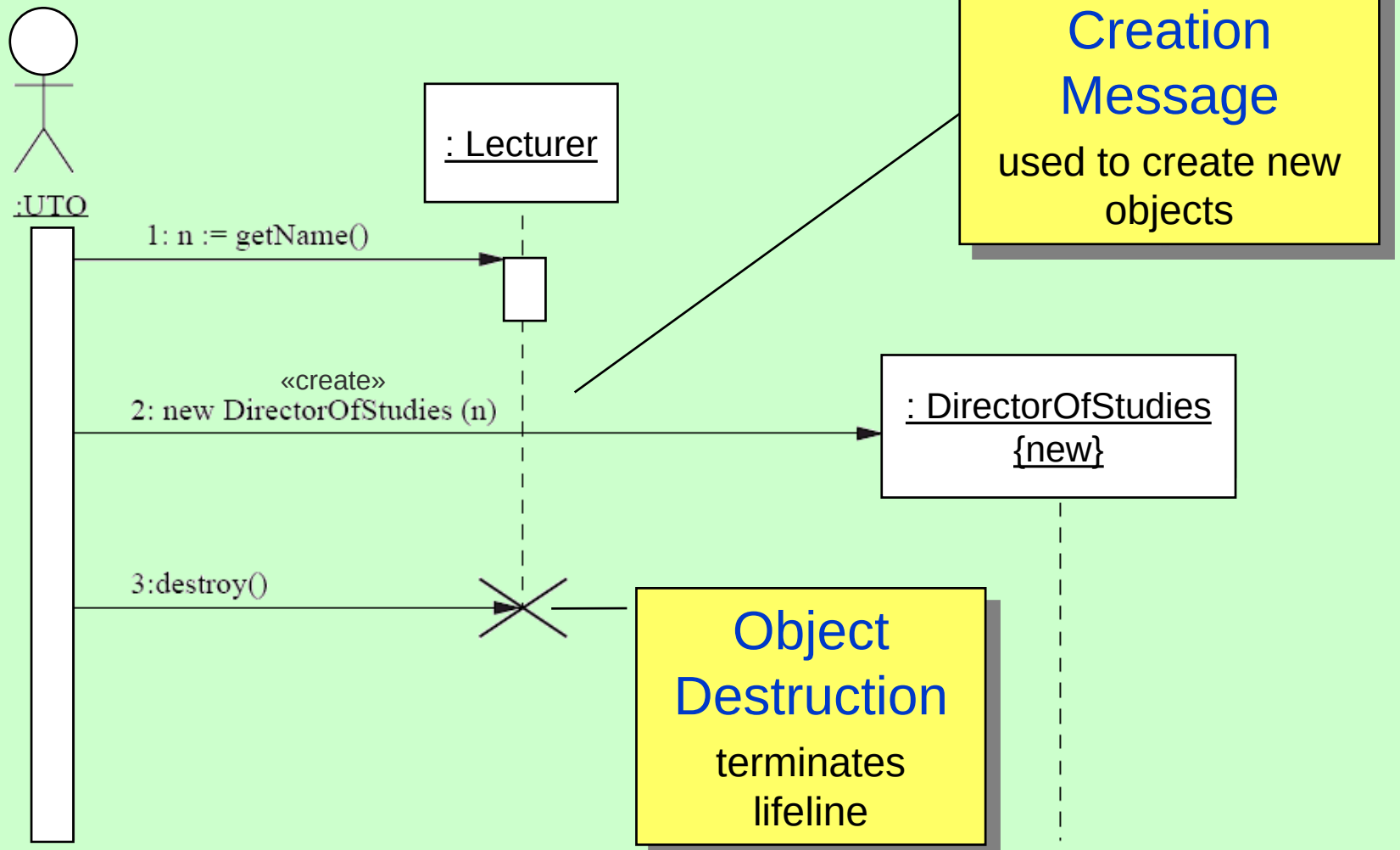
# Documenting Behaviour



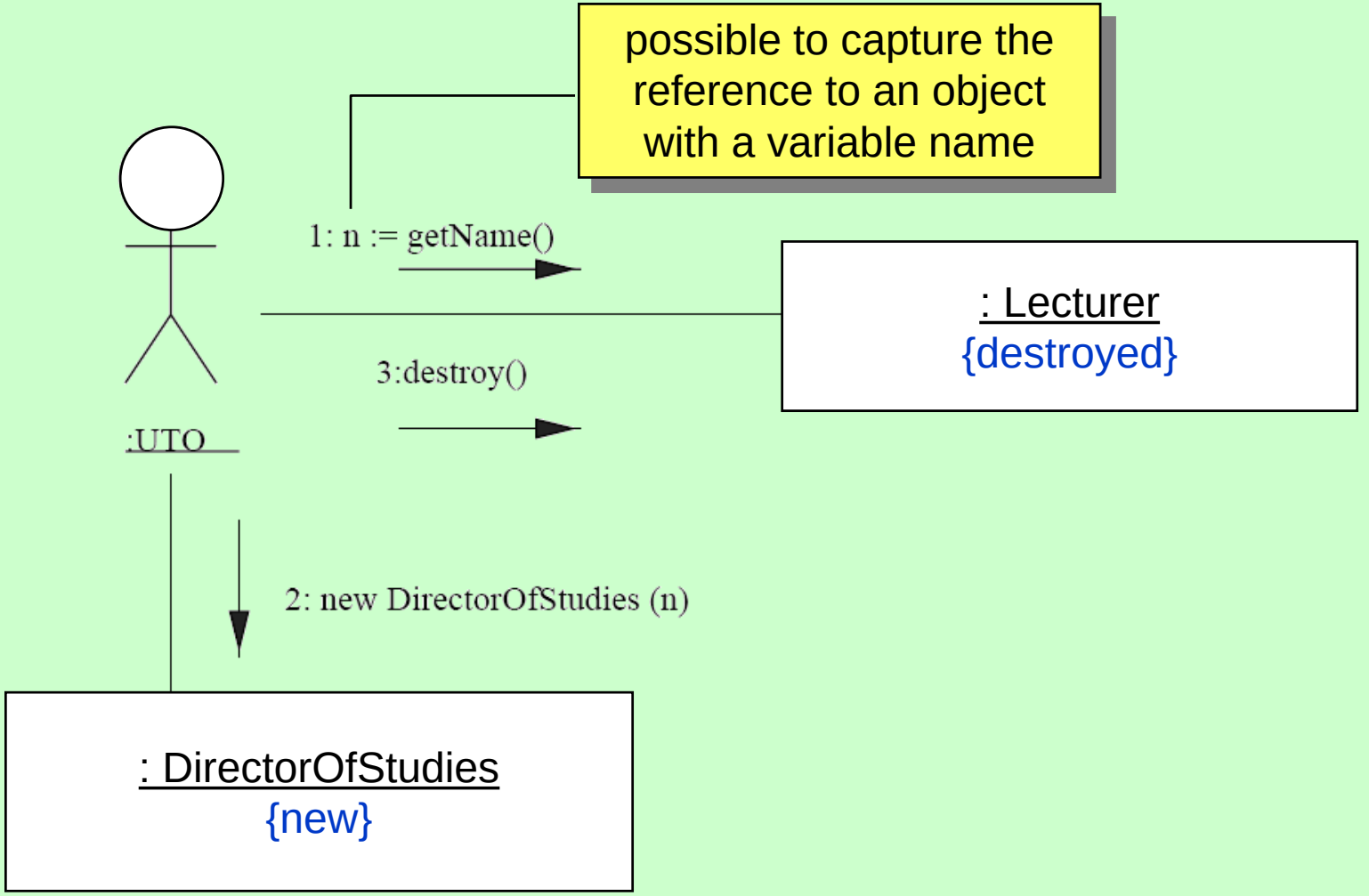
# Sequence Diagram



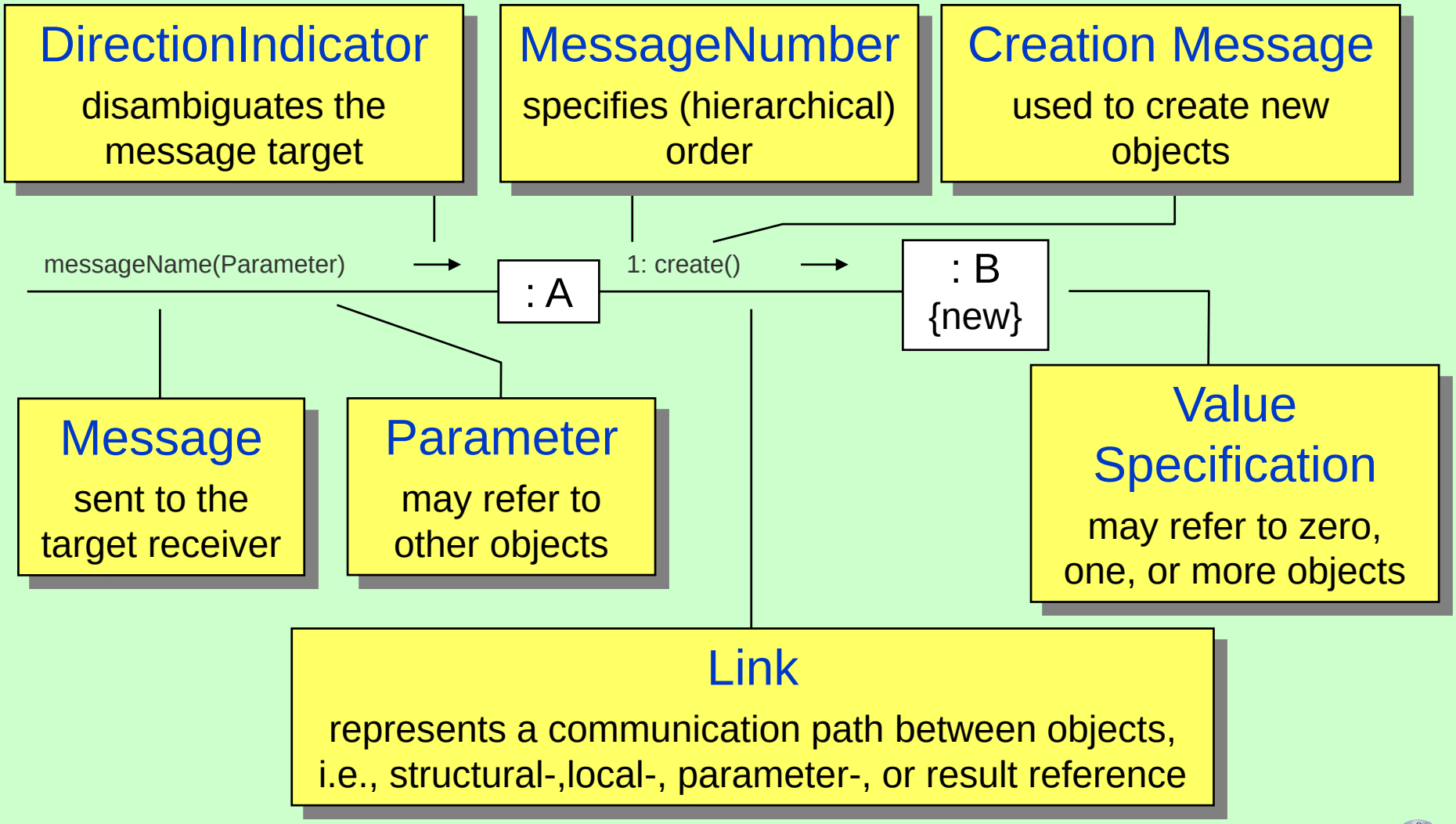
# Creation & Deletion



# Communication Diagram



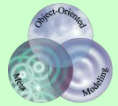
# Communication Diagram



# Annotations

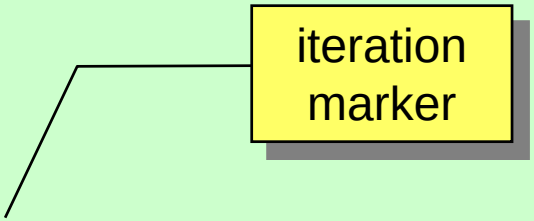
- Possible Object/Link Existence Classification
  - **new**
    - the instance or link is created during the enclosing interaction
  - **destroyed**
    - the instance or link is destroyed prior to the completion of the enclosing interaction
  - **transient**
    - the instance or link is created during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





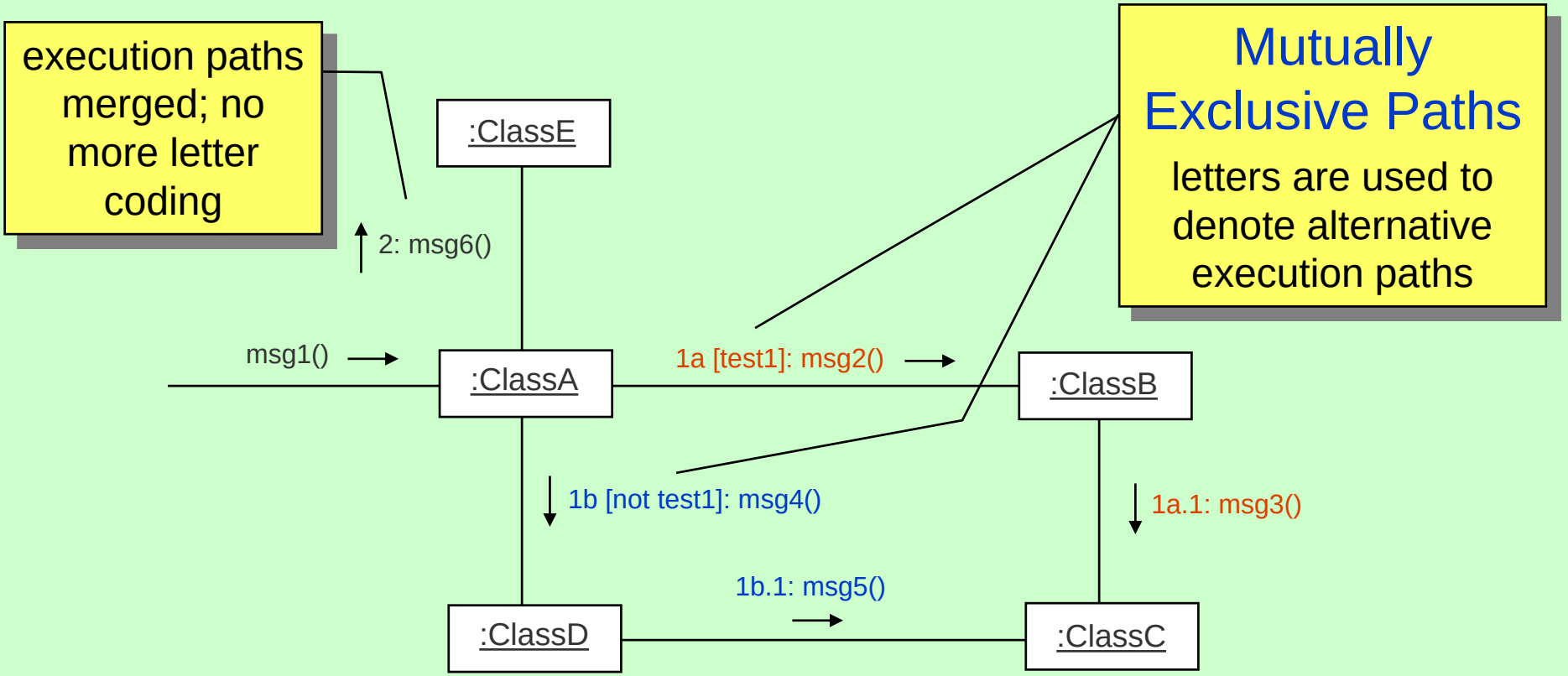
# Specifying Behaviour

- 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



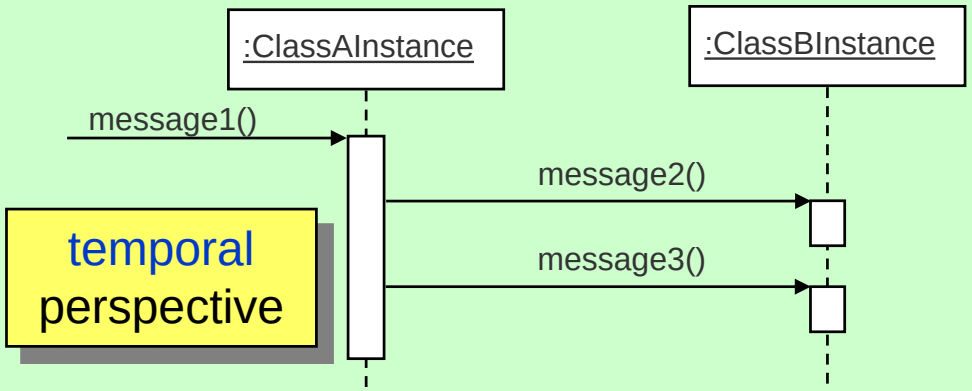
# Conditional Paths

## Extension of Hierarchical Notation



# Sequence vs Communication

## Sequence Diagrams




### Strength

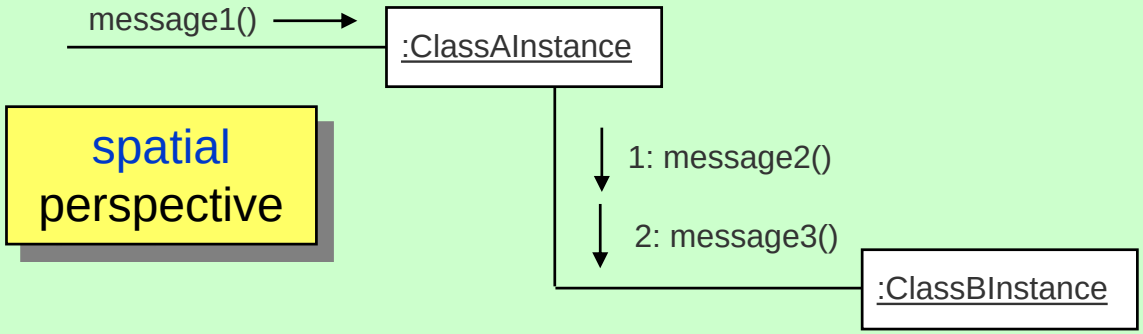
clearly show ordering of messages

### Weakness

don't show links

become very wide

## Communication Diagrams




### Strength

show links & use space economically

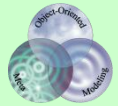
### Weakness

difficult to see message sequence

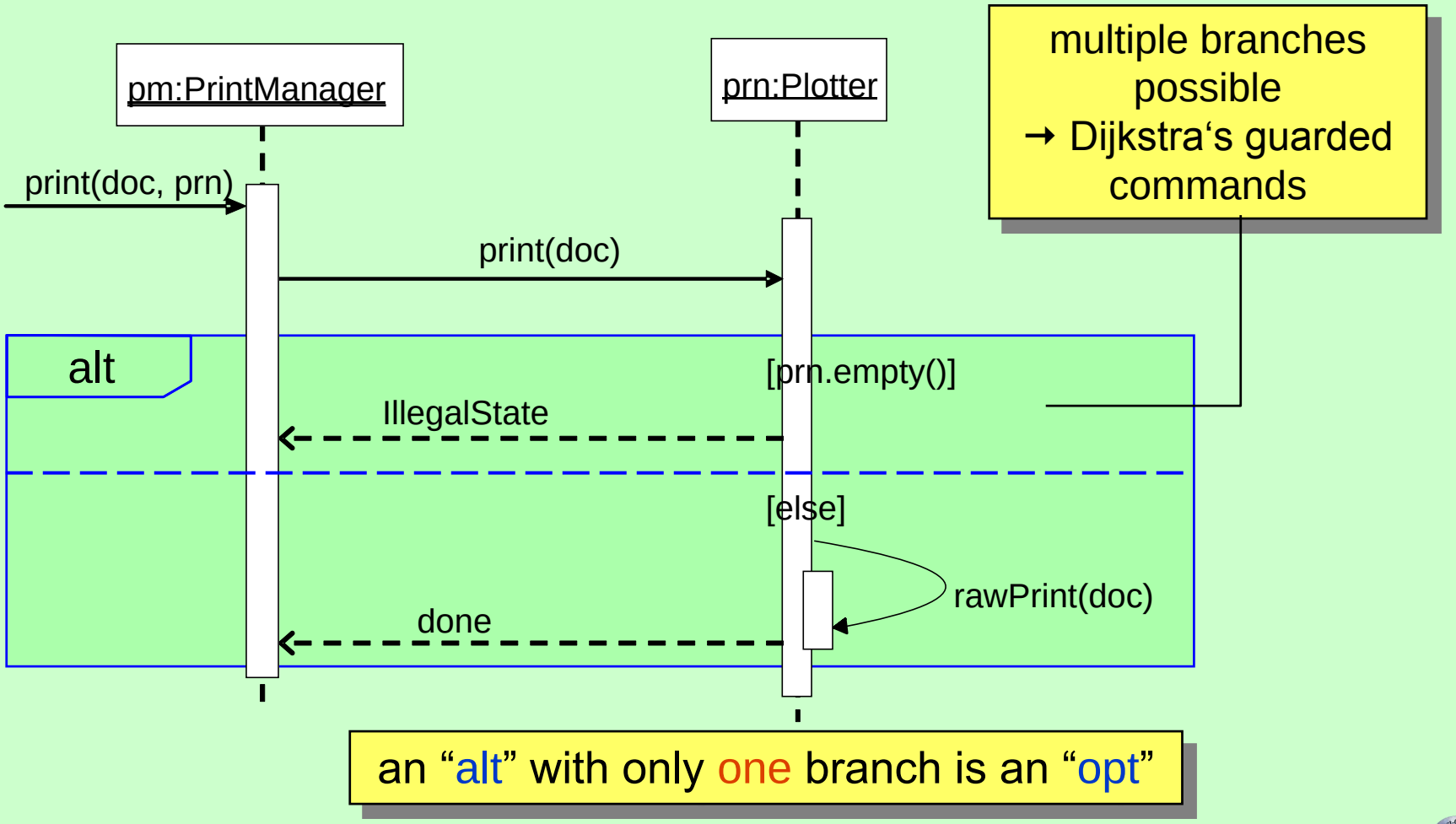
# Sequence vs Communication

- 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

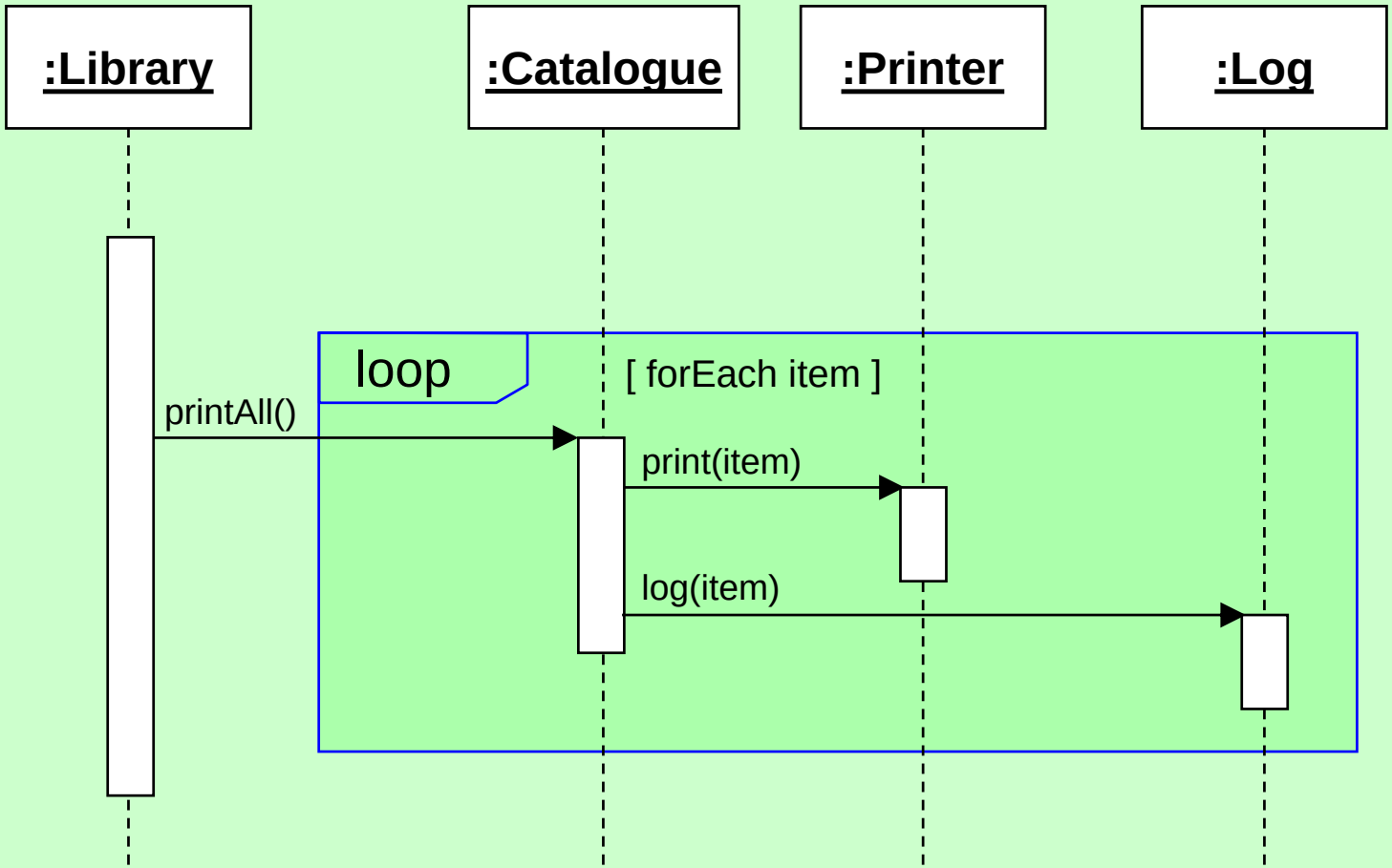




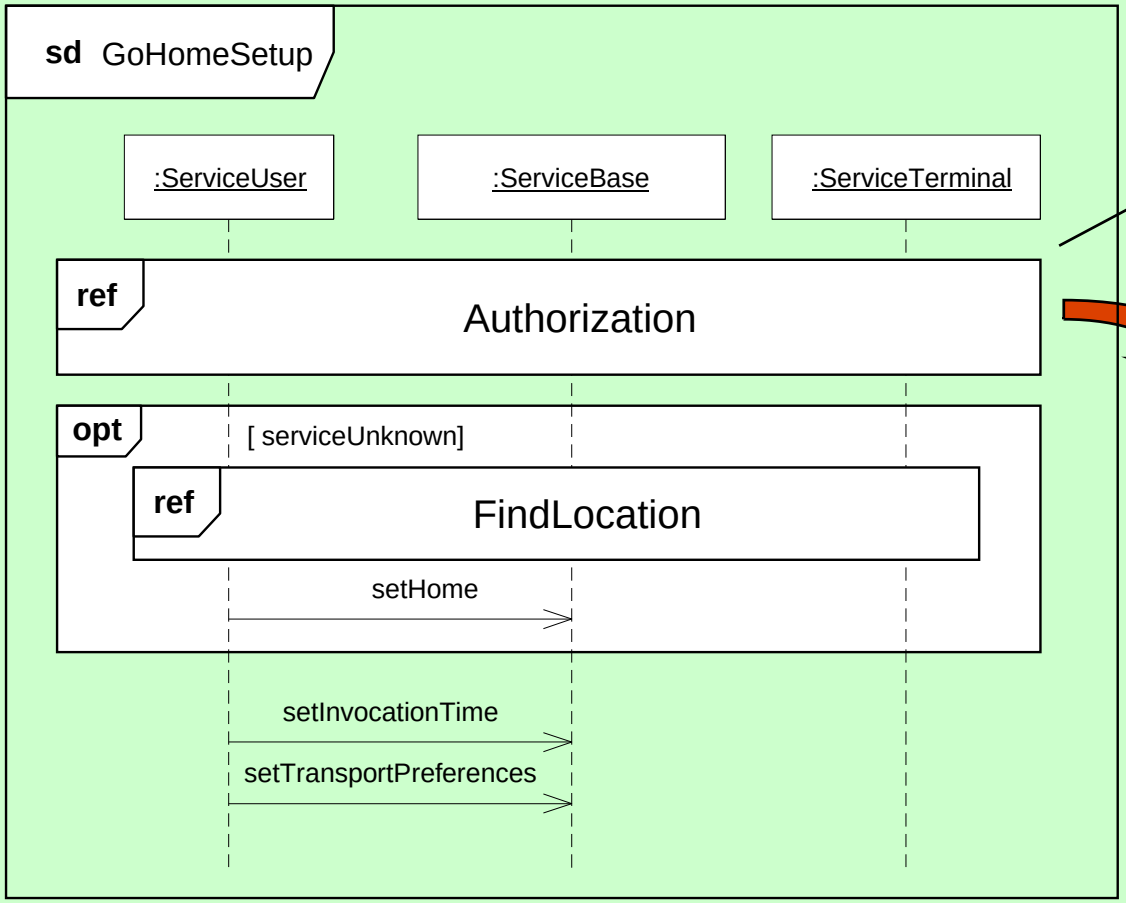
# Conditional



# Iteration

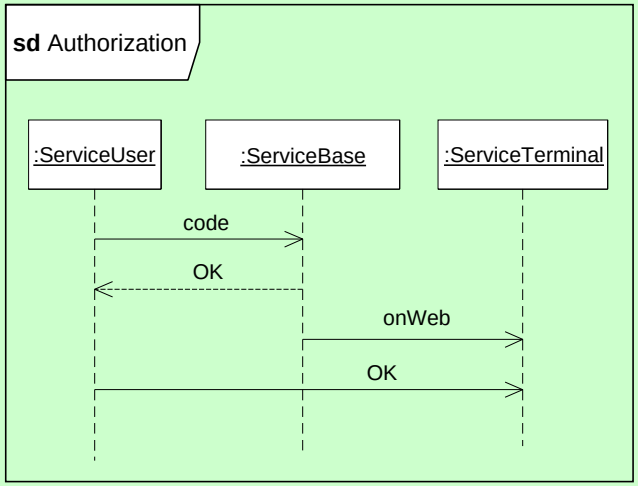

:Library
:Catalogue
:Printer
:Log
loop
[ forEach item ]
printAll()
print(item)
log(item)

# Diagram Decomposition



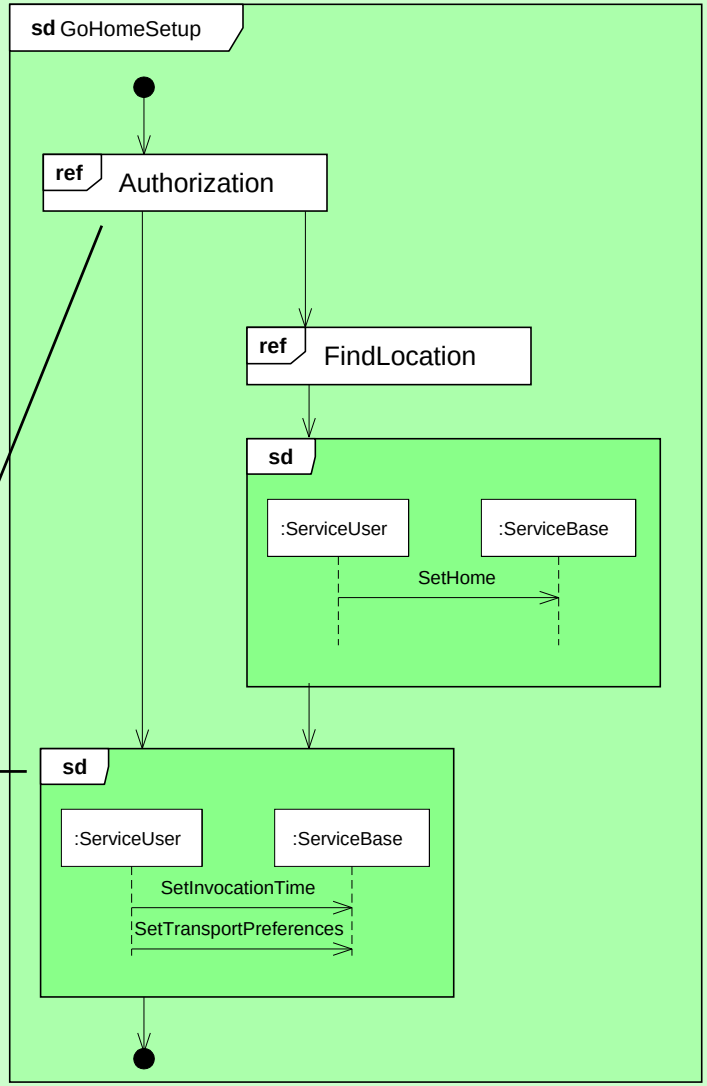

**Interaction Occurrence**

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