

SWEN 223

Software Engineering Analysis

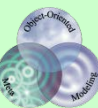
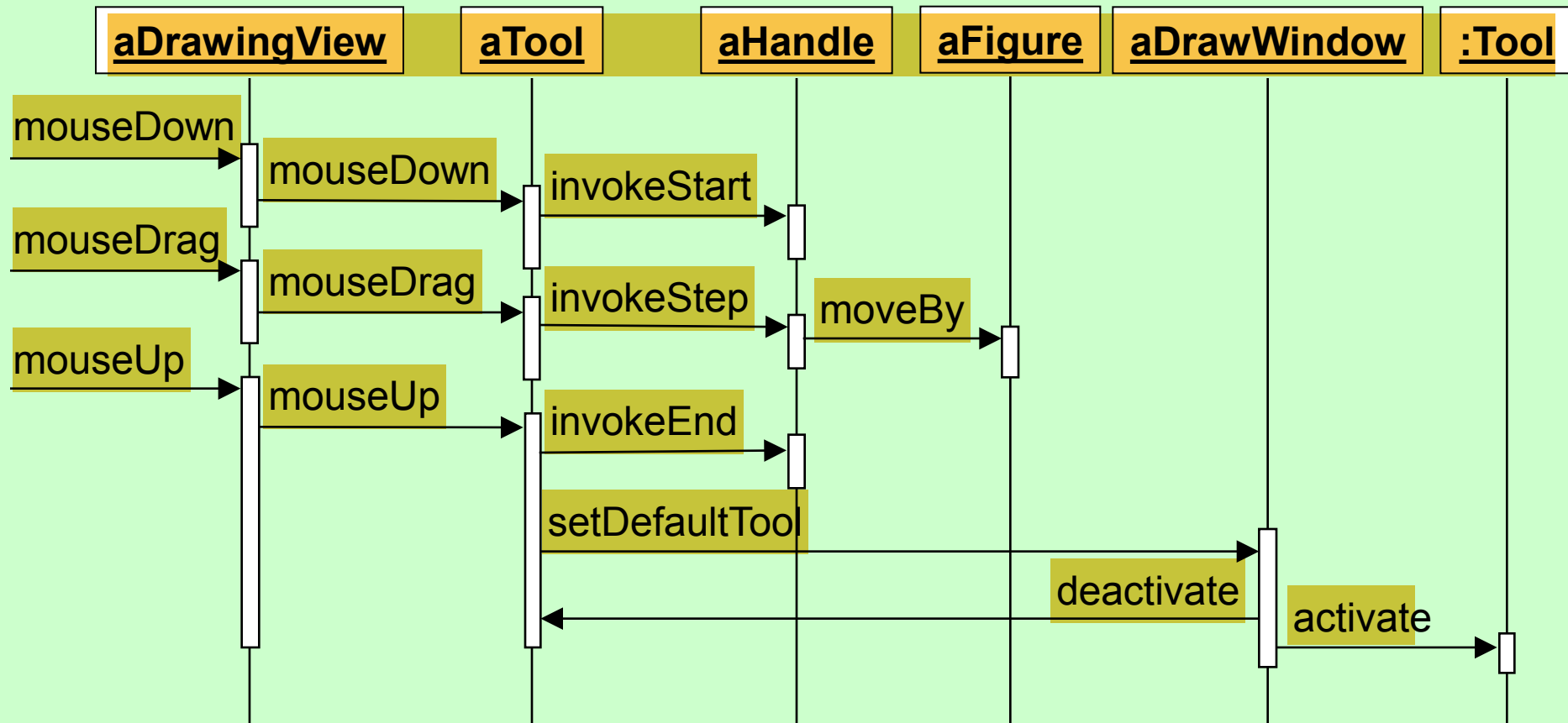
Interaction Diagrams

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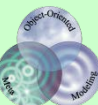
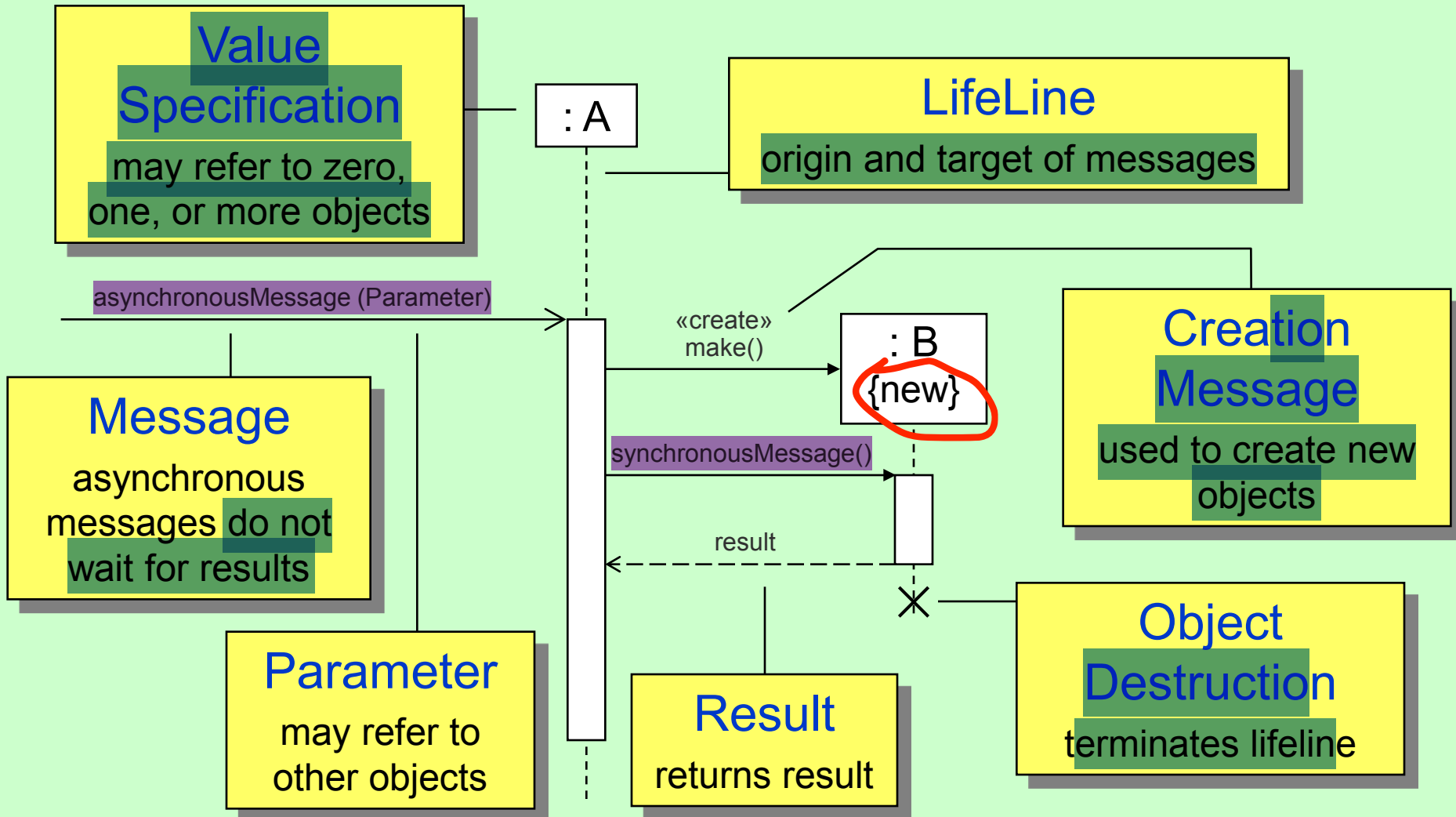


Documenting Behaviour



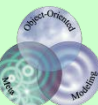
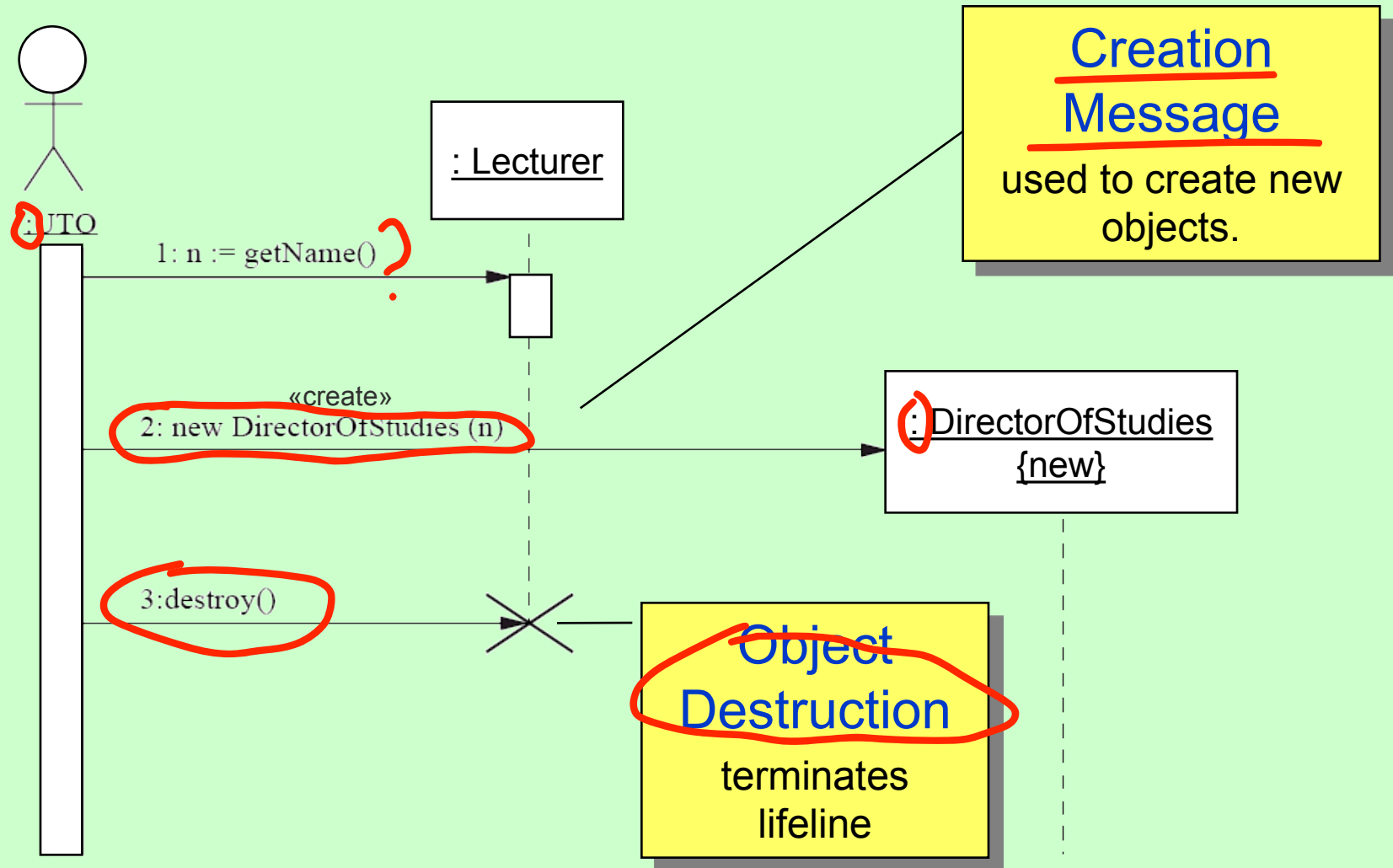


Sequence Diagram



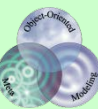
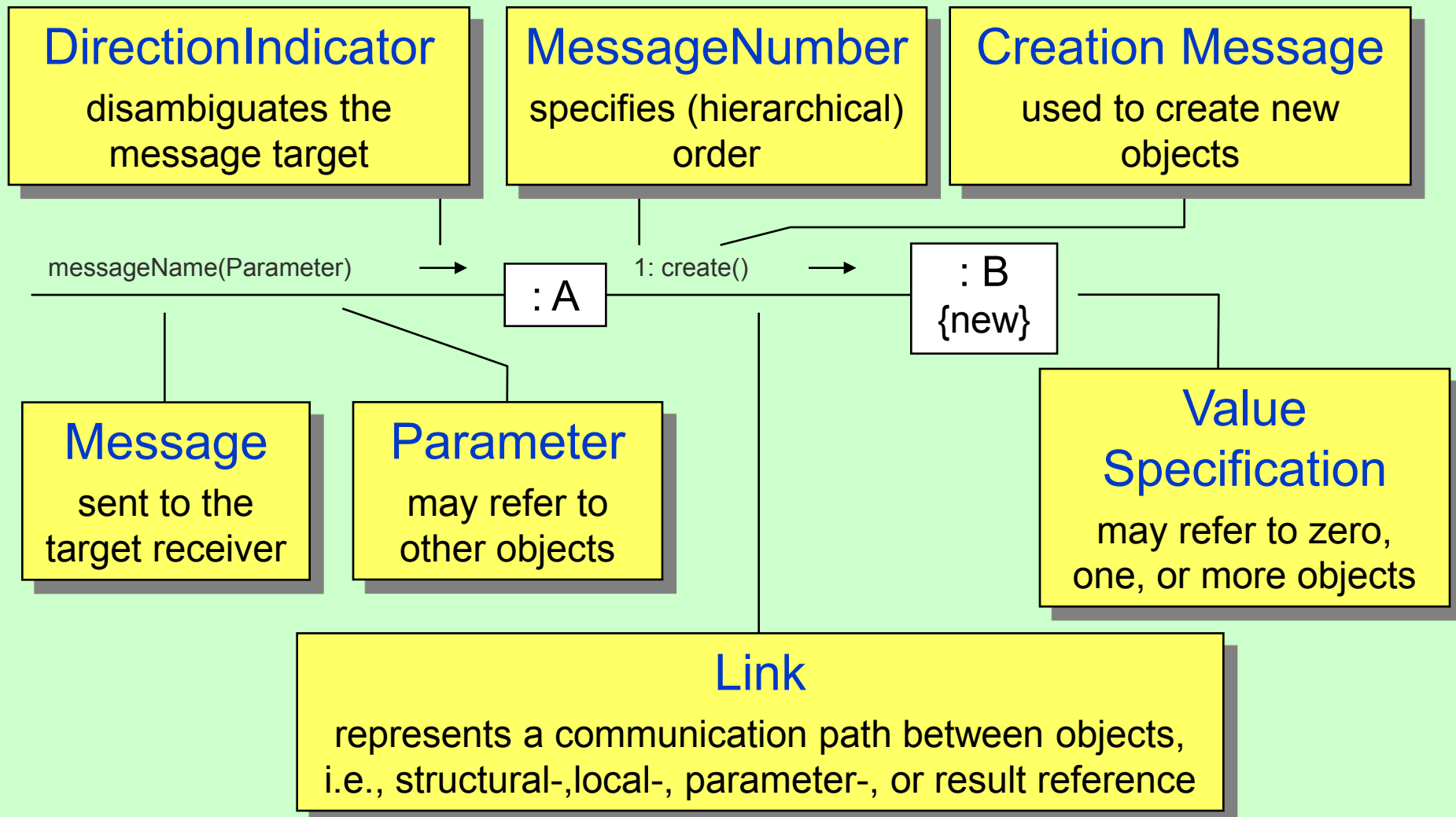


Creation & Deletion





Communication Diagram





- Possible Object/Link Existence Classification

- » **new**

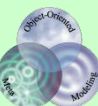
- the instance or link is created during the enclosing interaction

- » **destroyed**

- the instance or link is destroyed prior to the completion of the enclosing interaction

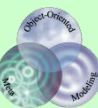
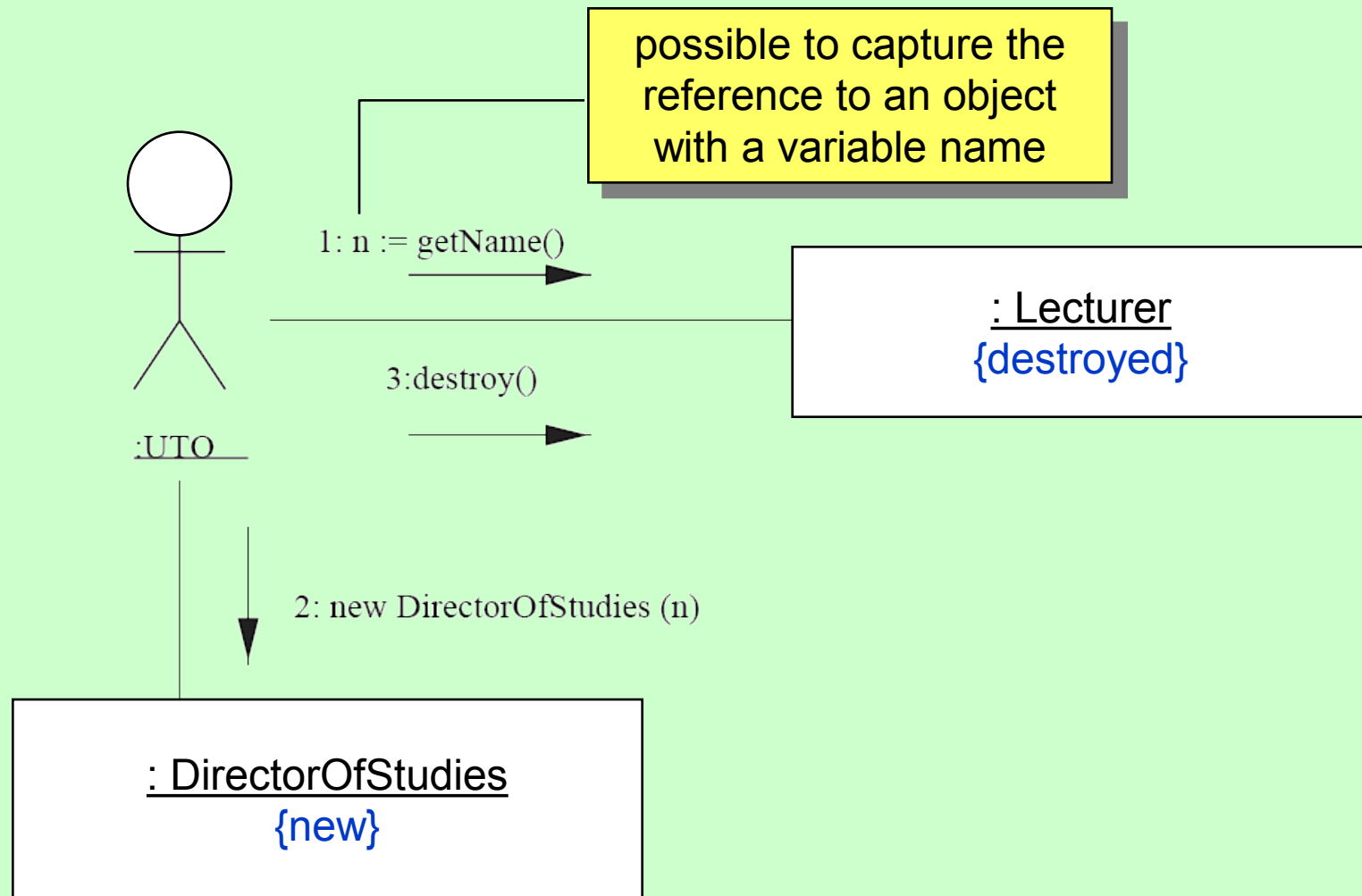
- » **transient**

- the instance or link is created during execution but is destroyed before completion of the enclosing interaction





Communication Diagram





Specifying Behaviour

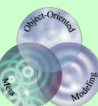
- Message Guards

- » `[pressure > 9]: playAlarm()`
- » the message is sent only if the condition evaluates to true
- » are deprecated for sequence diagrams; use “`alt`” notation instead

- Iteration

- » `* [i := 1..n]: knockAtDoor()`
- » conditions such as `* [x < 10]` or `* [isEmpty]` are possible as well

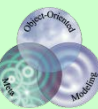
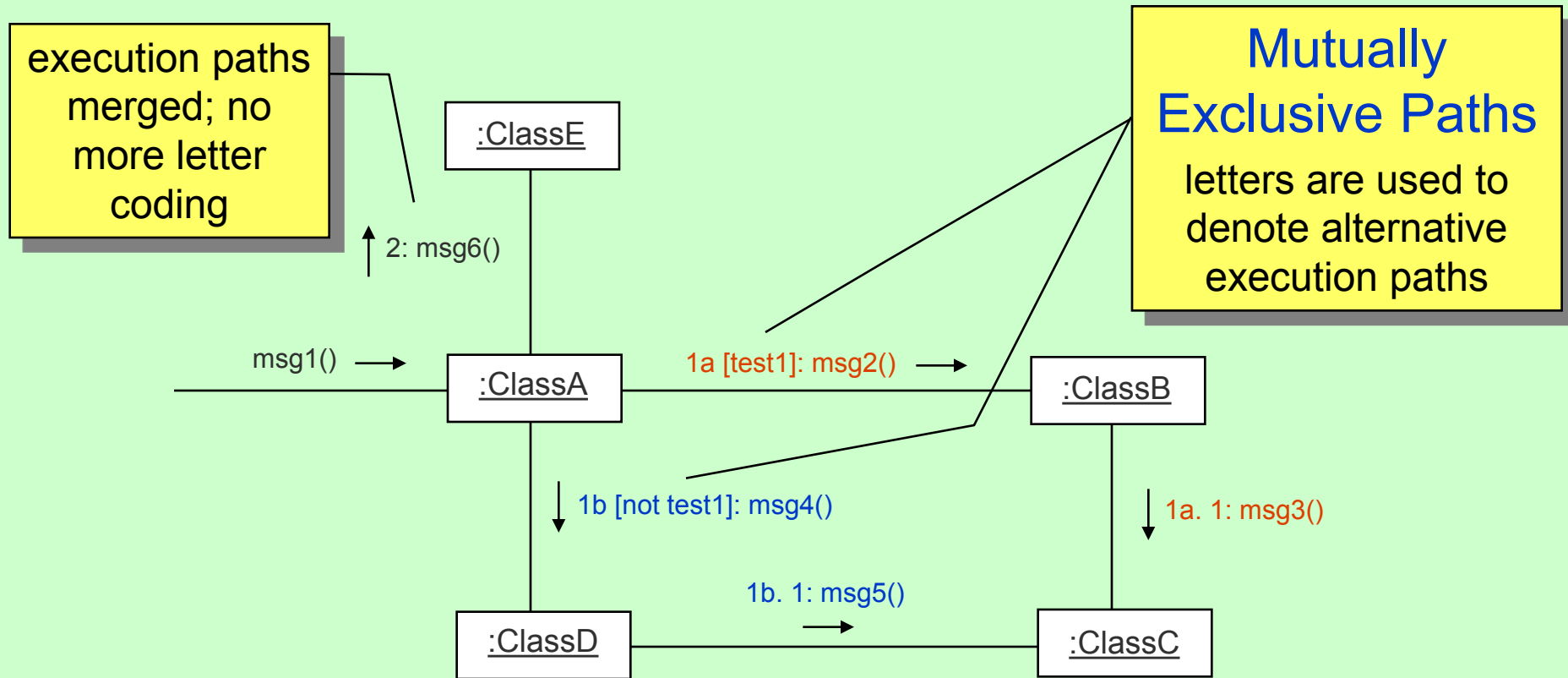
iteration
marker





Conditional Paths

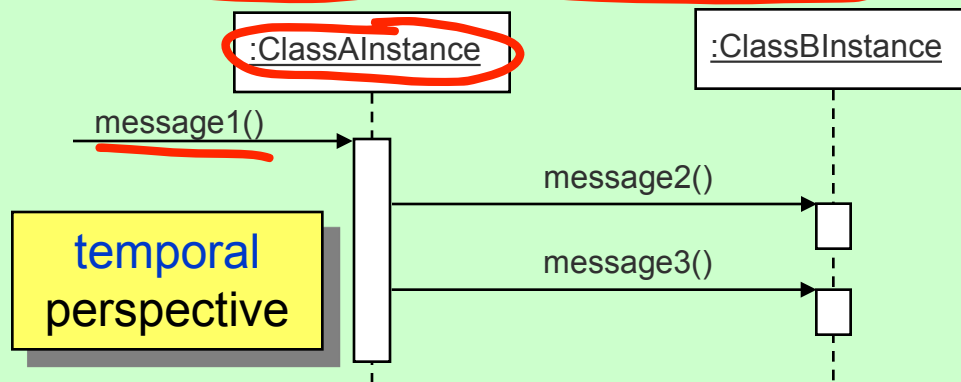
Extension of Hierarchical Notation





Sequence vs Communication

Sequence Diagrams



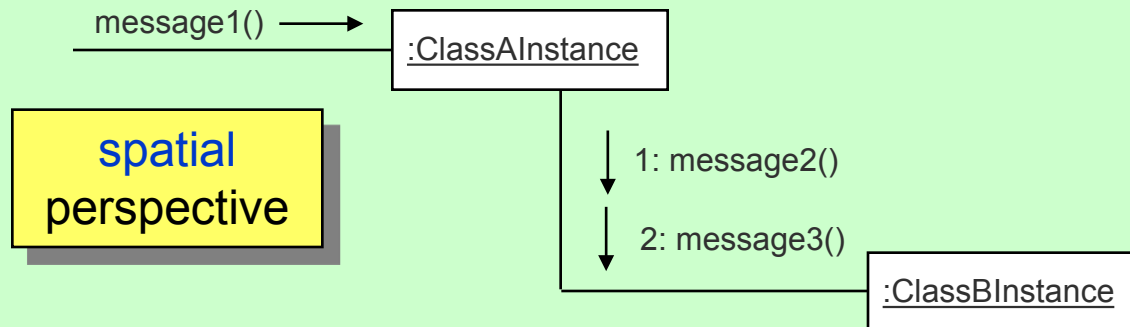
Strength

clearly show ordering of messages

Weakness

don't show links
become very wide

Communication Diagrams

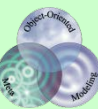


Strength

show links & use space economically

Weakness

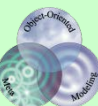
difficult to see message sequence





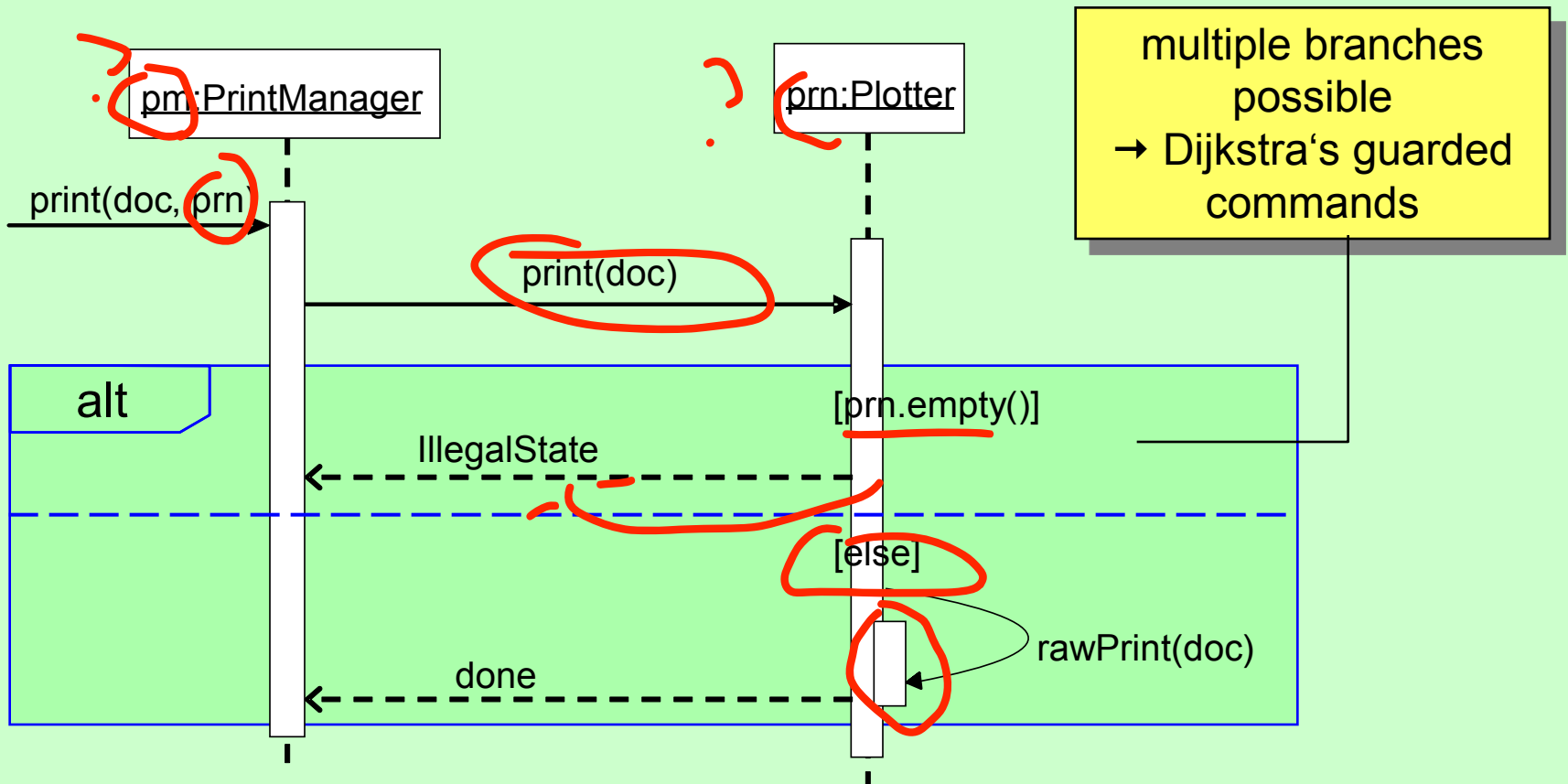
Sequence vs Communication

- 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



an “alt” with only one branch is an “opt”





Iteration

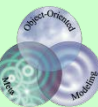
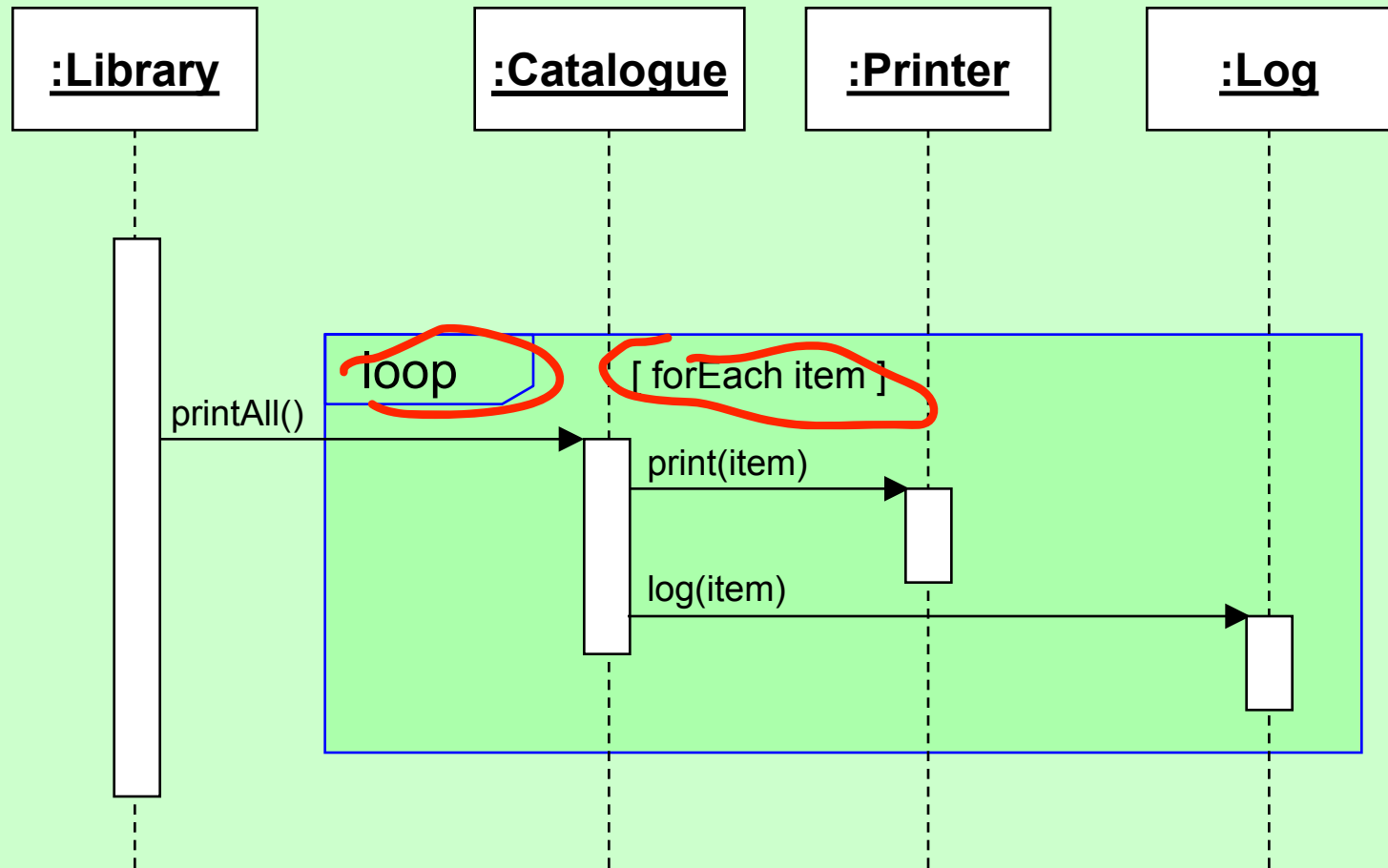
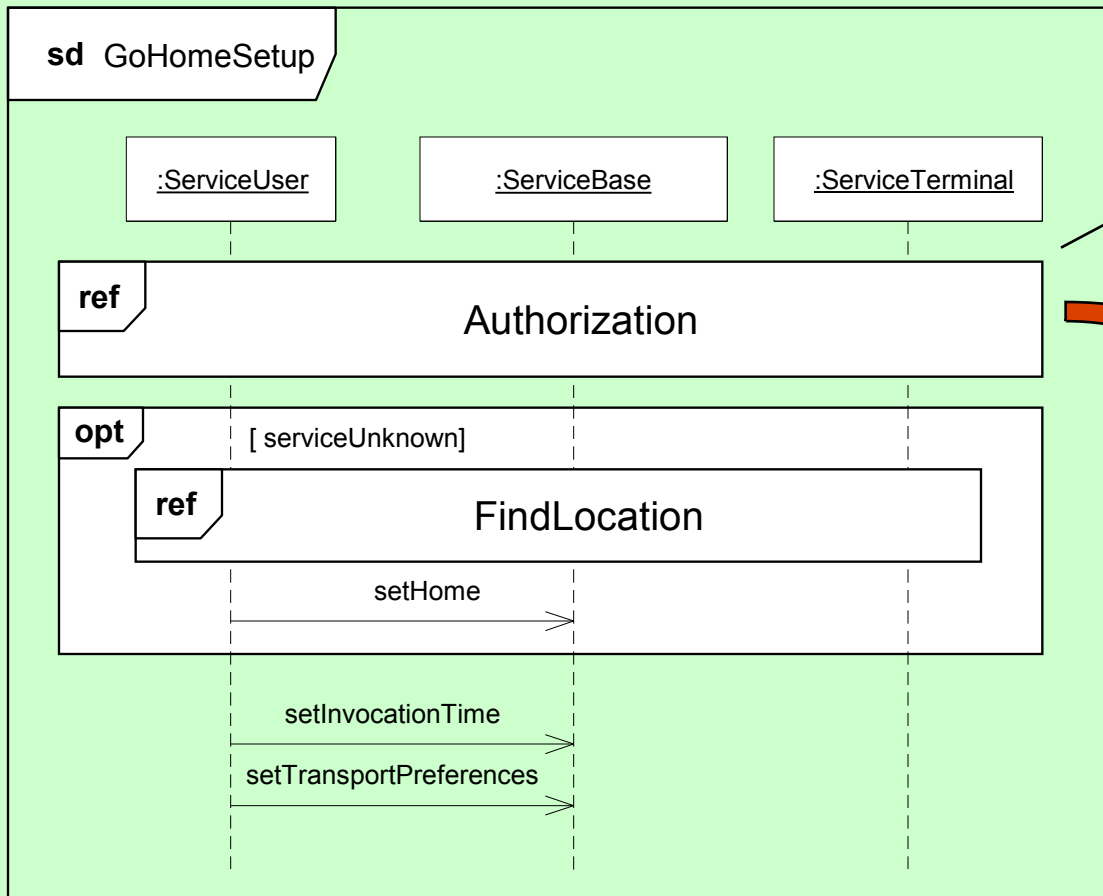


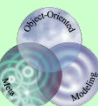
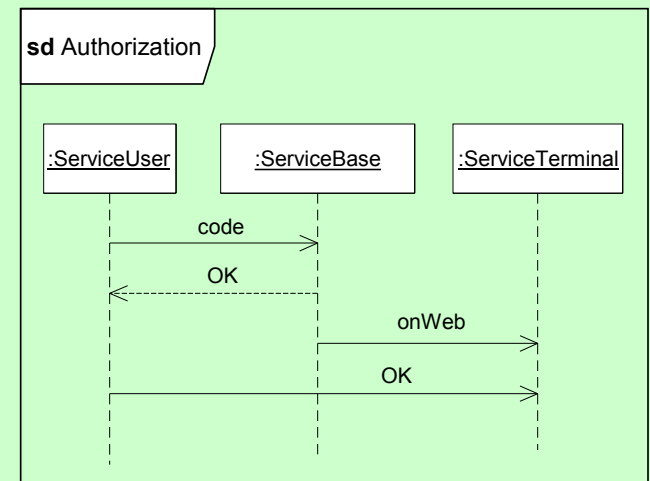


Diagram Decomposition



Interaction Occurrence

include interactions defined elsewhere

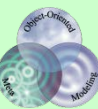
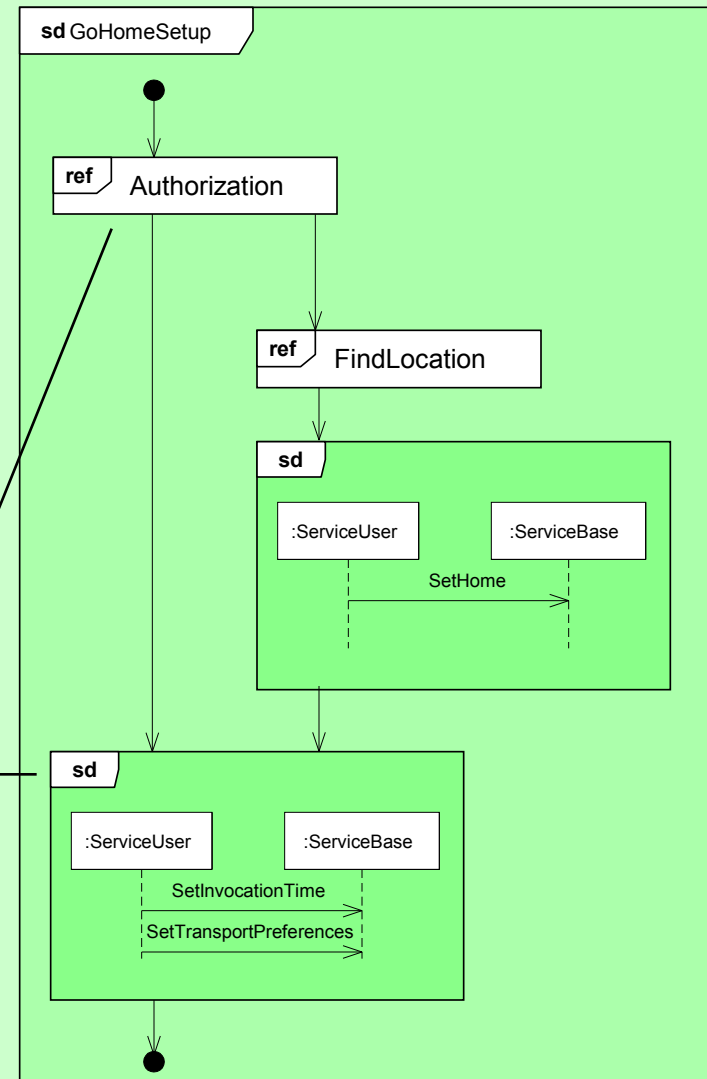




Interaction Overview Diagram

● 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

