UML INTERACTION DIAGRAMS

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Contents

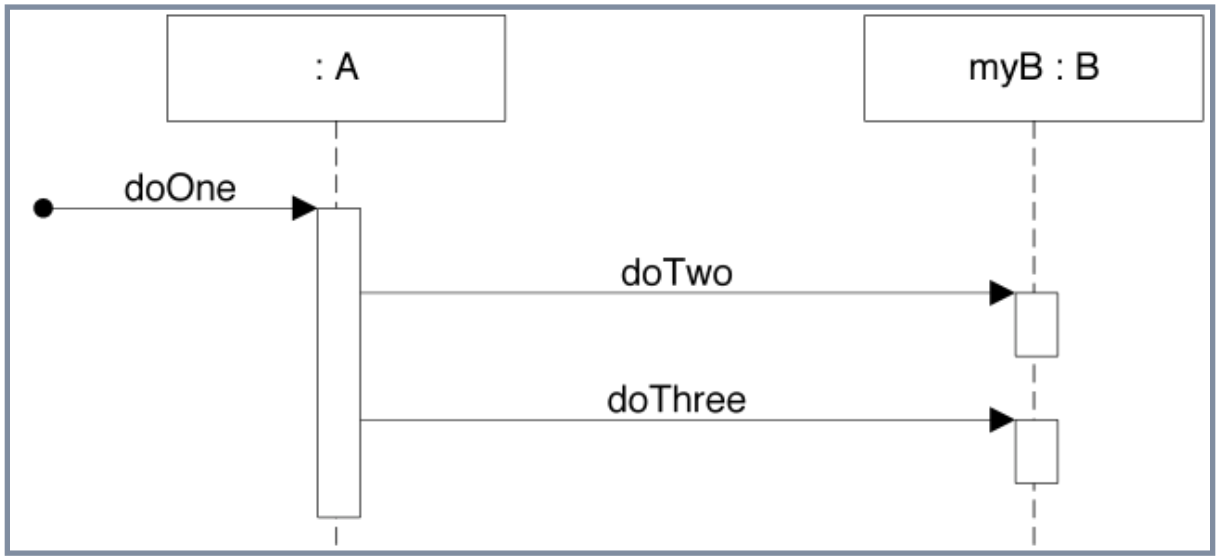
- Sequence diagram
- Collaboration diagram

Interaction Diagrams

- Used for dynamic object modeling of systems
- Answer questions about behavior (i.e. events and sequencing)
- Two common types:
  - Sequence Diagrams (Superset of Systems Sequence Diagram)
  - Collaboration Diagrams

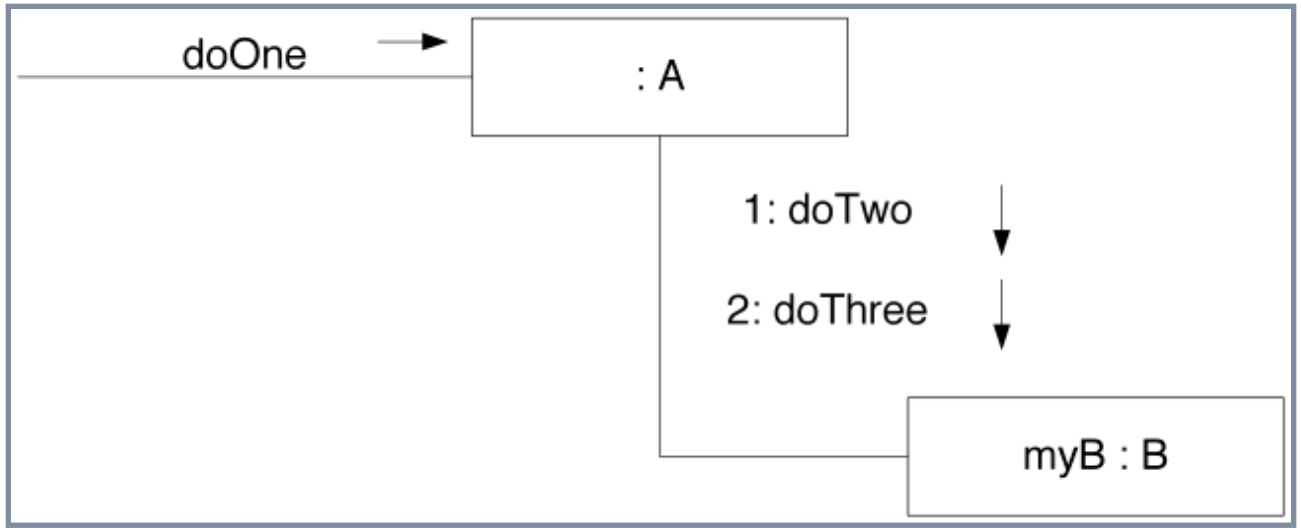
Sequence Diagram Example

```
public class A {
 private B myB = new B();

 public void doOne() {
  myB.doTwo();
  myB.doThree();
 }
}
```



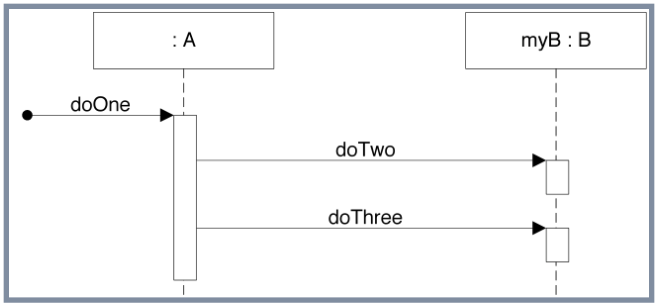
Communication Diagram Example

```
public class A {
 private B myB = new B();

 public void doOne() {
  myB.doTwo();
  myB.doThree();
 }
}
```

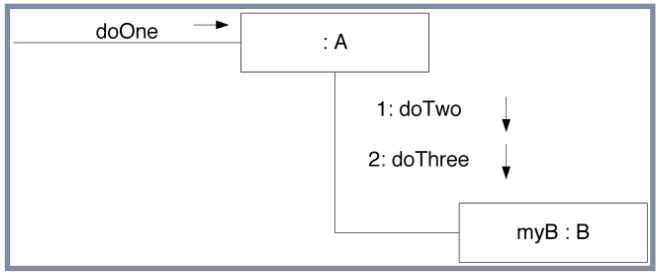


Relative Strengths

- Sequence Diagrams (SD)
  - Clearer notation & semantics
  - Better tool support
  - Easier to follow
  - Excellent for documents

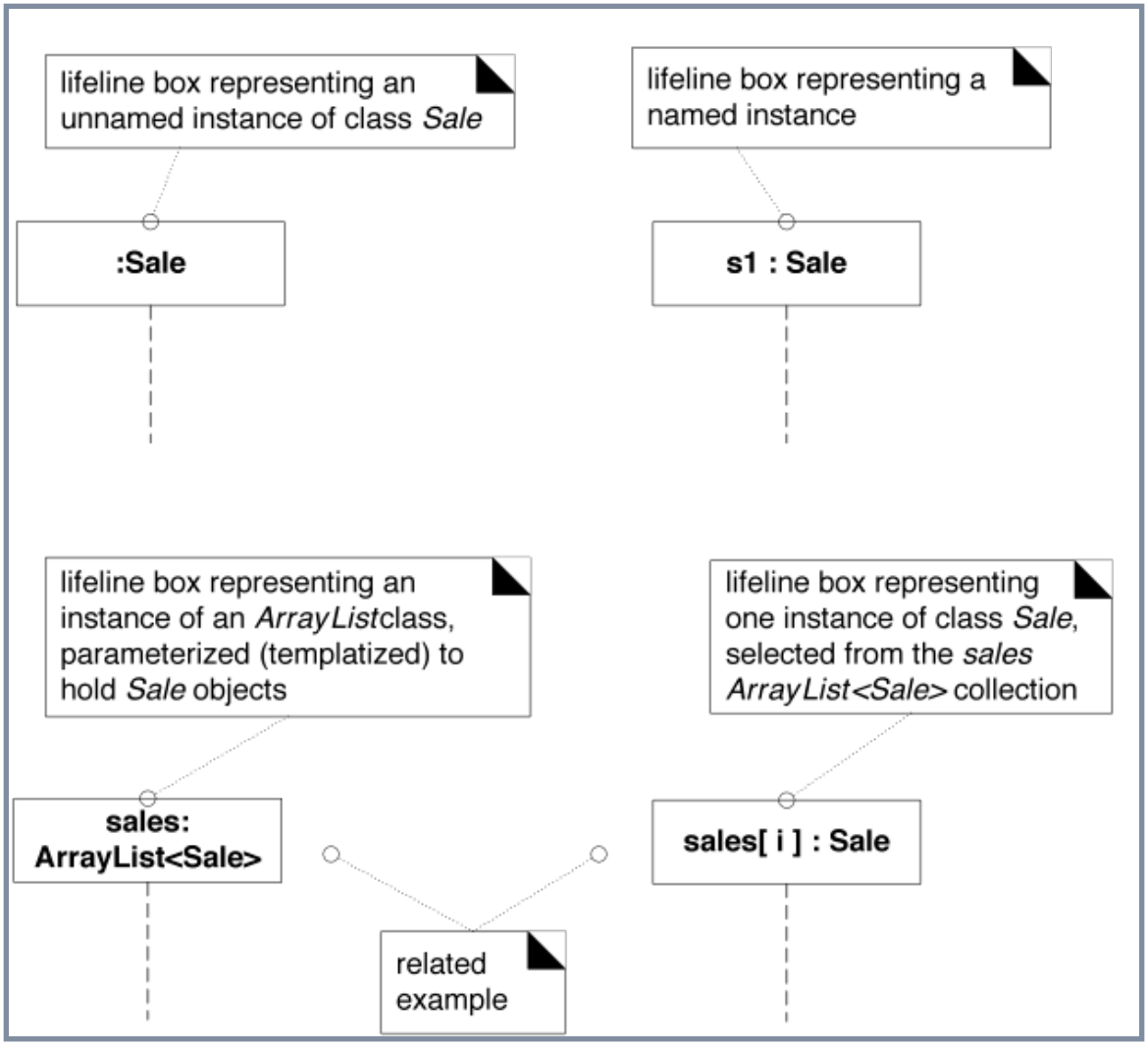


- Communication Diagrams (CD)
  - Much more space efficient
  - Easier to modify quickly
  - Excellent for UML as sketch

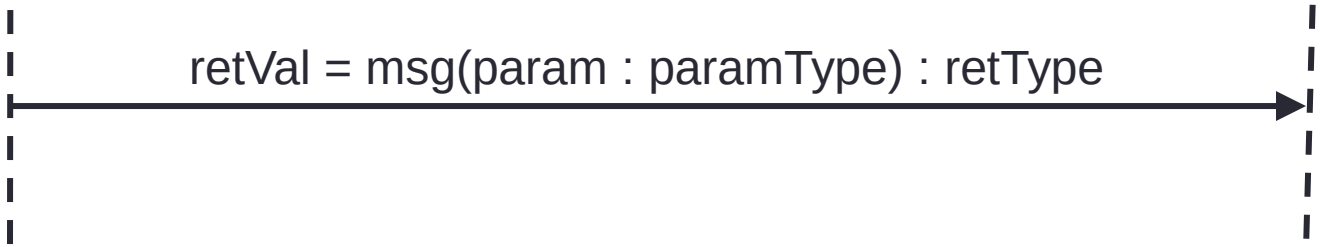


SEQUENCE DIAGRAM

Lifeline Boxes



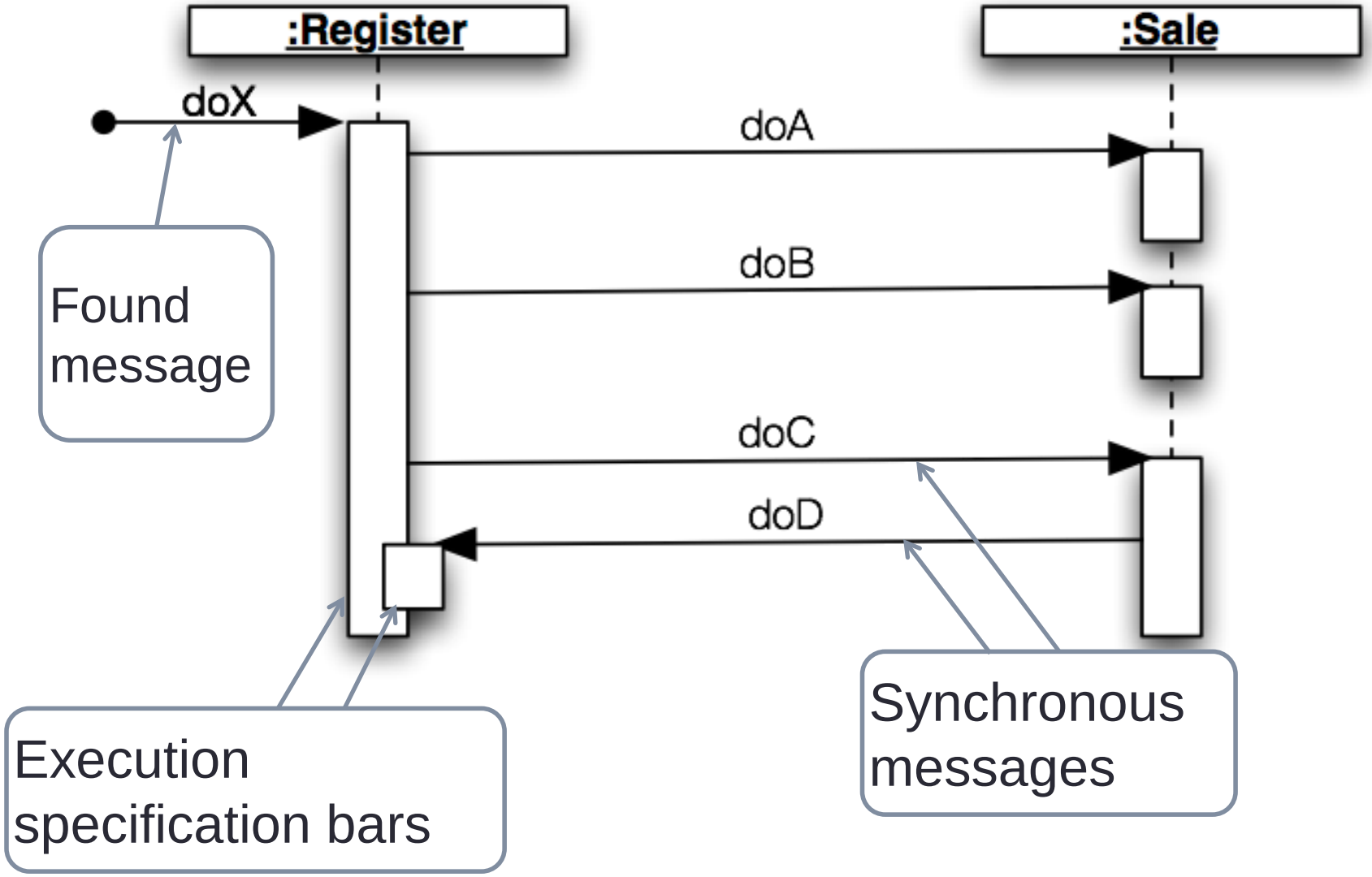
General Messaging Syntax



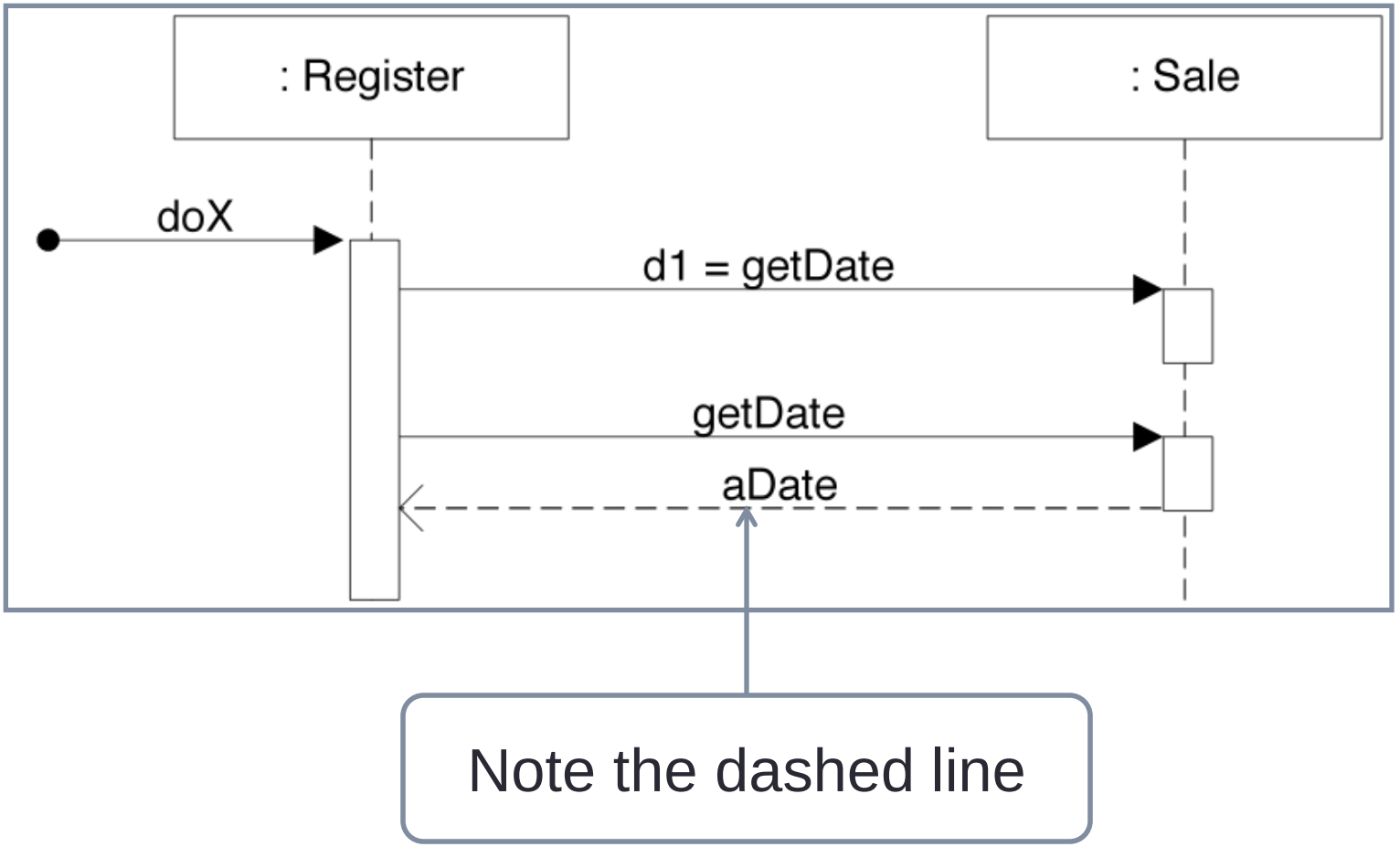
Type of information and params may be ignored for brevity, e.g.,

- *initialize(code)*
- *initialize*
- *d = getProductDescription(id)*
- *d = getProductDescription(id : ItemID)*
- *d = getProductDescription(id : ItemID) : ProductDescription*

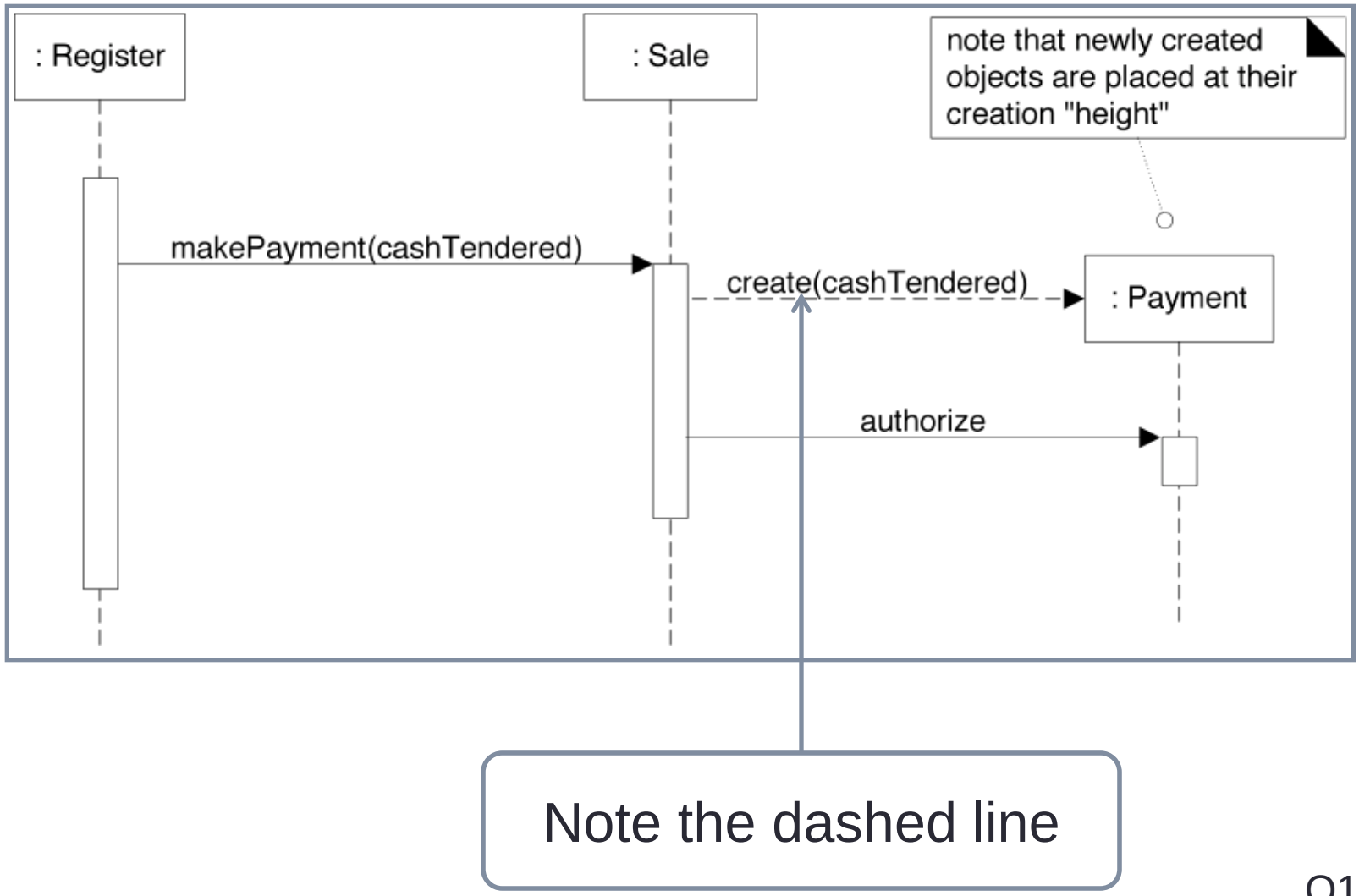
Basic SD Terminology



Return Values – Two Ways



Creating a New Instance



Q1-2

Object Destruction

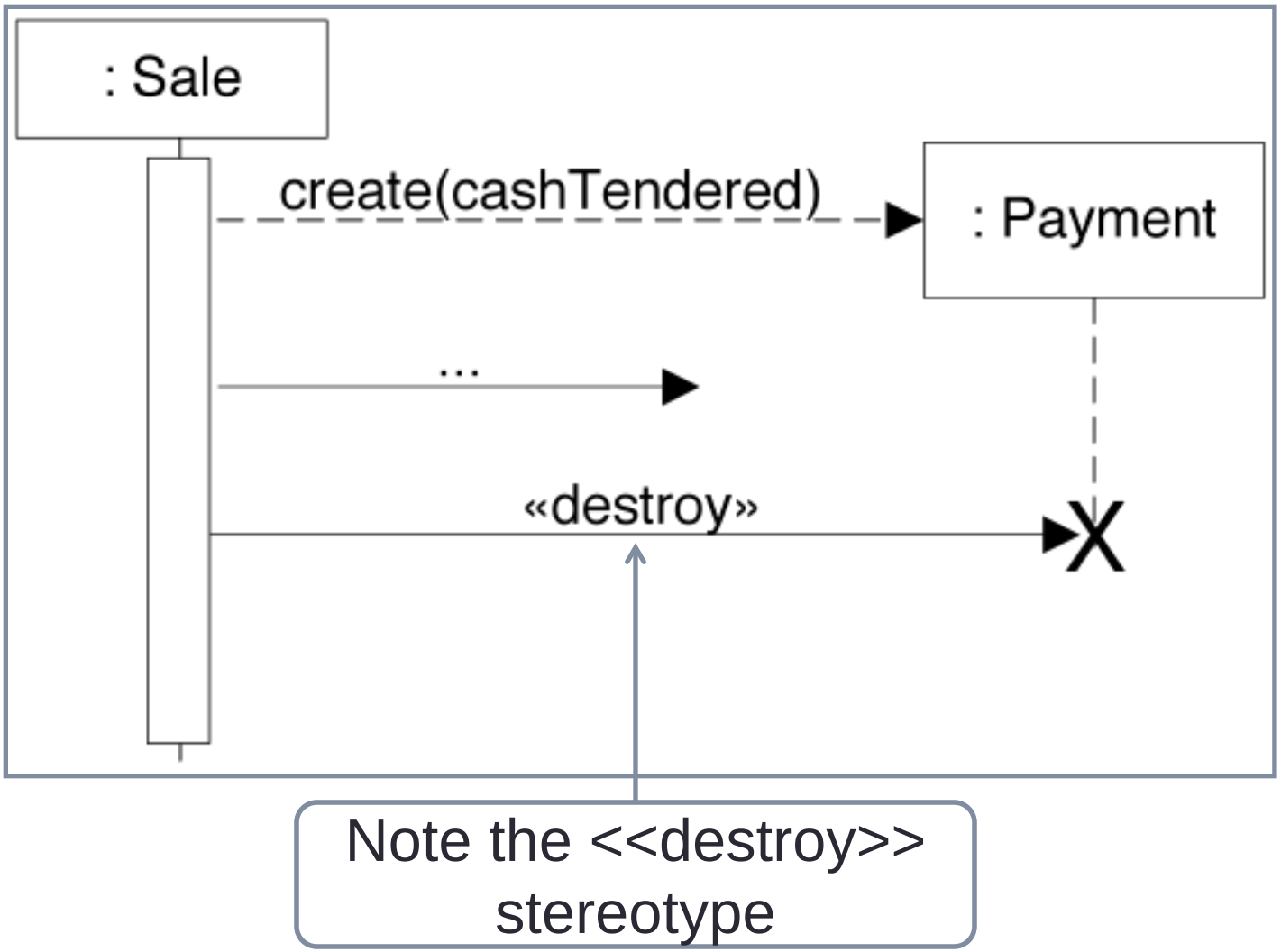
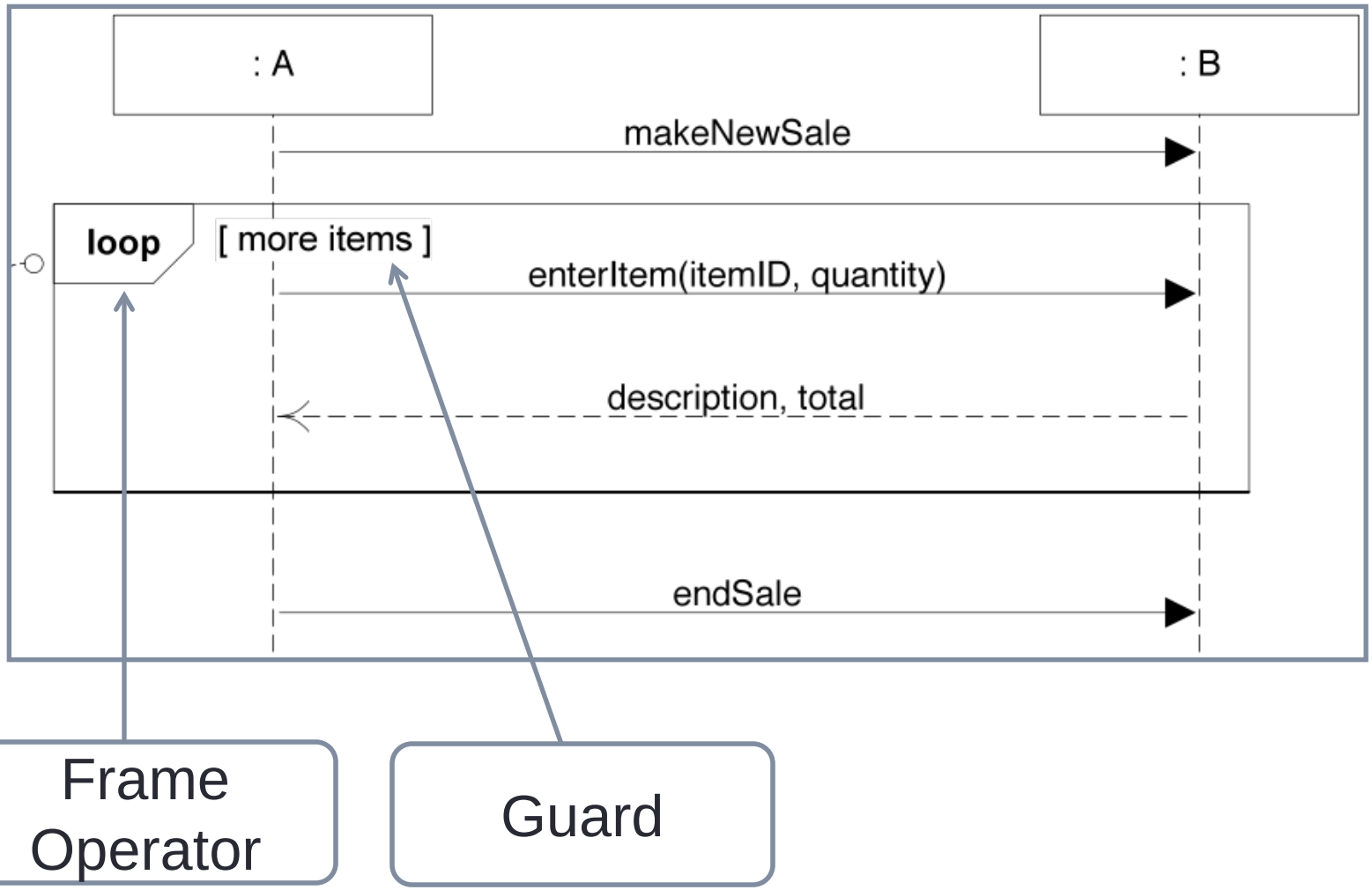


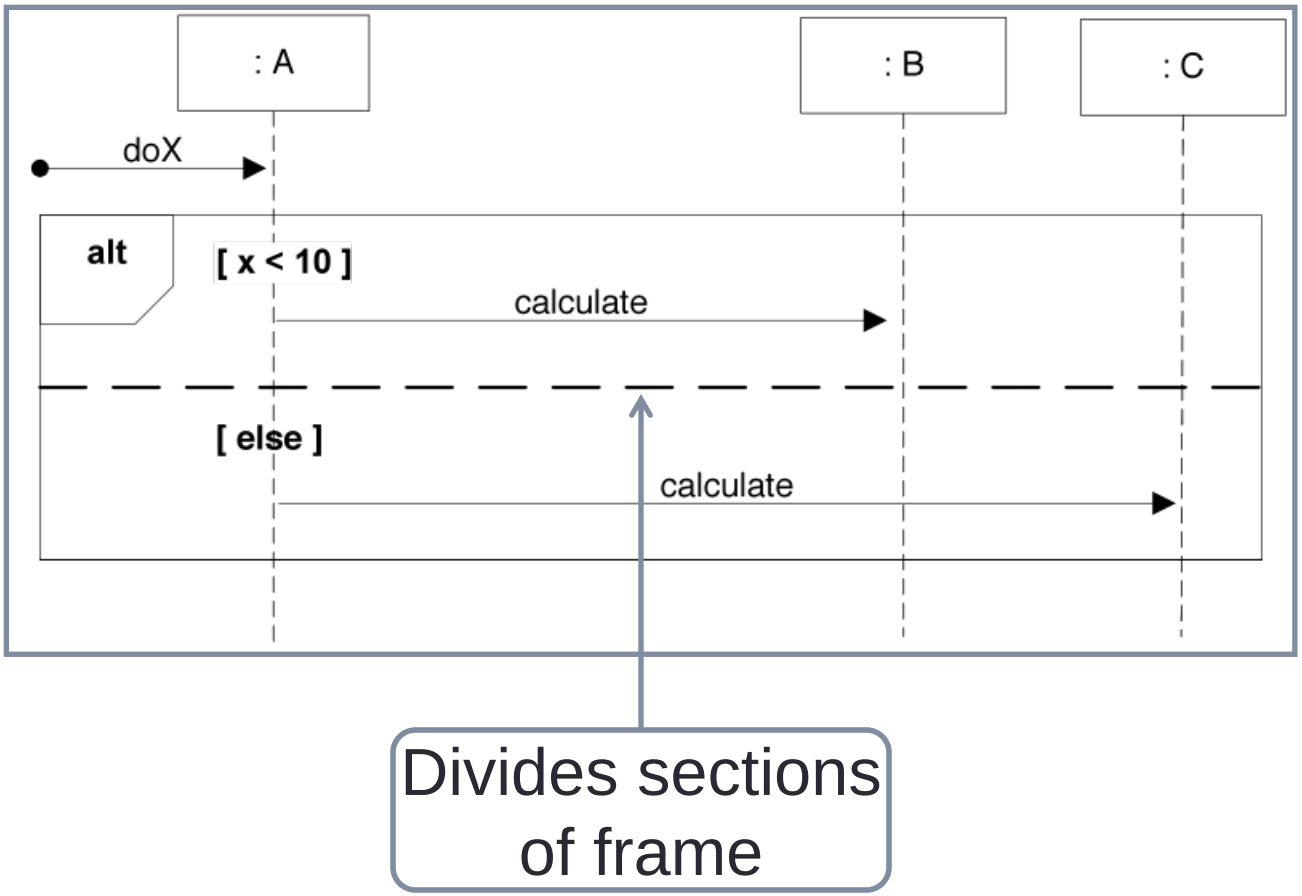
Diagram Frames



Common Frame Operators

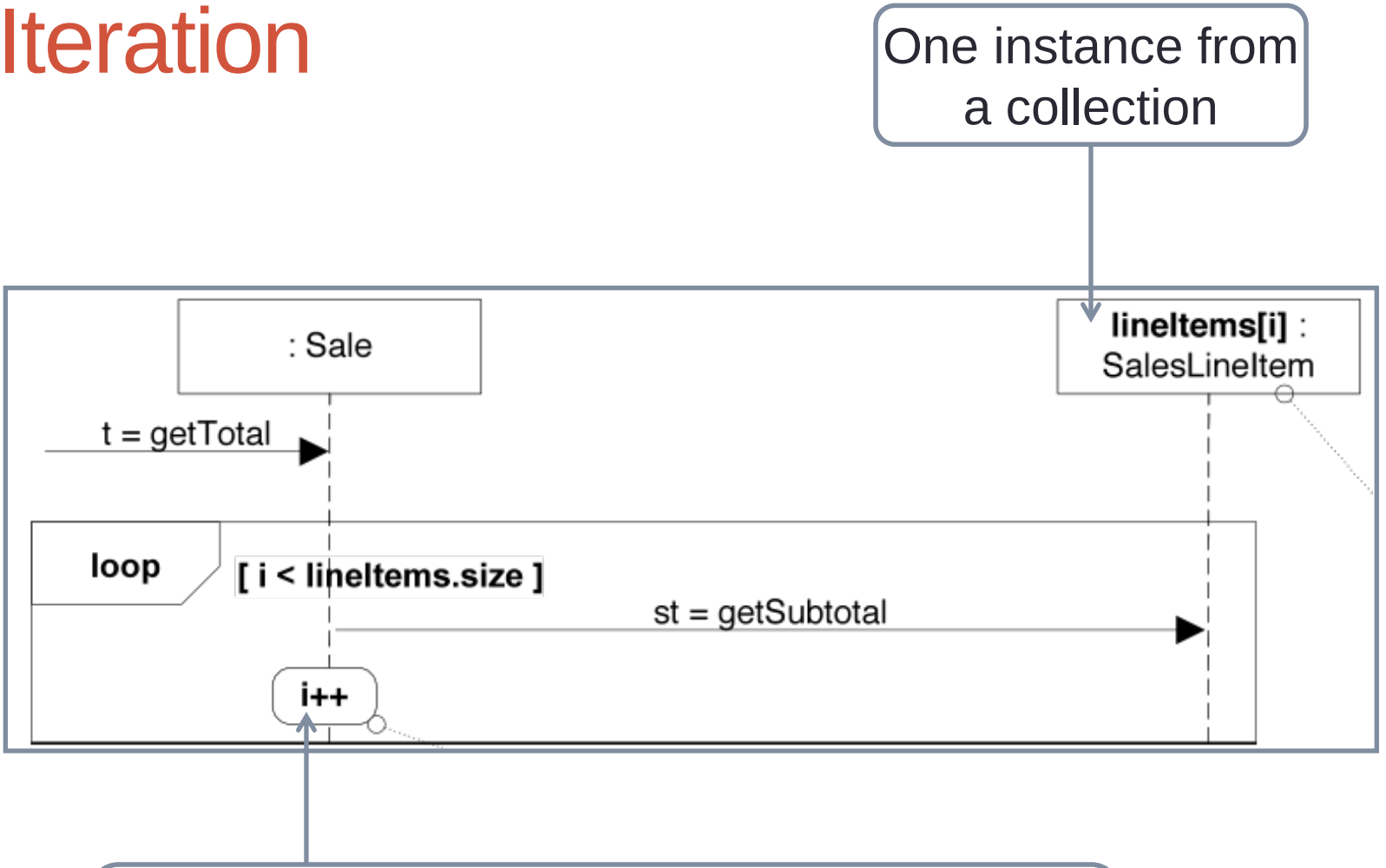
Operator	Meaning
alt	“Alternative”, if-then-else or switch
loop	Loop while guard is true, or loop(n) times
opt	Optional fragment executes if guard is true
par	Parallel fragments
region	Critical region (only one thread can enter)
ref	A “call” to another sequence diagram
sd	A sequence diagram that can be “called”

Mutually Exclusive Condition



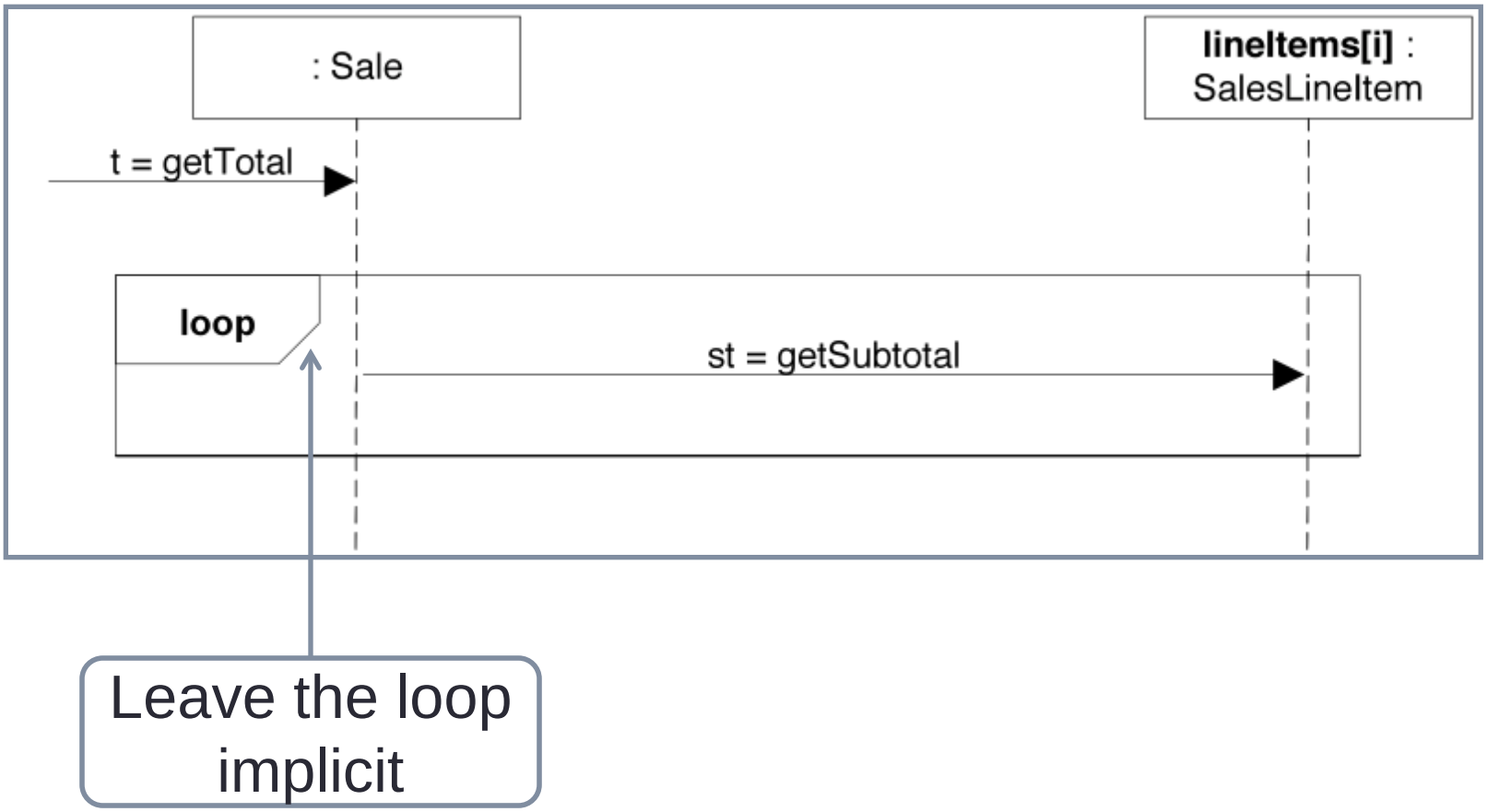
Q3

Iteration

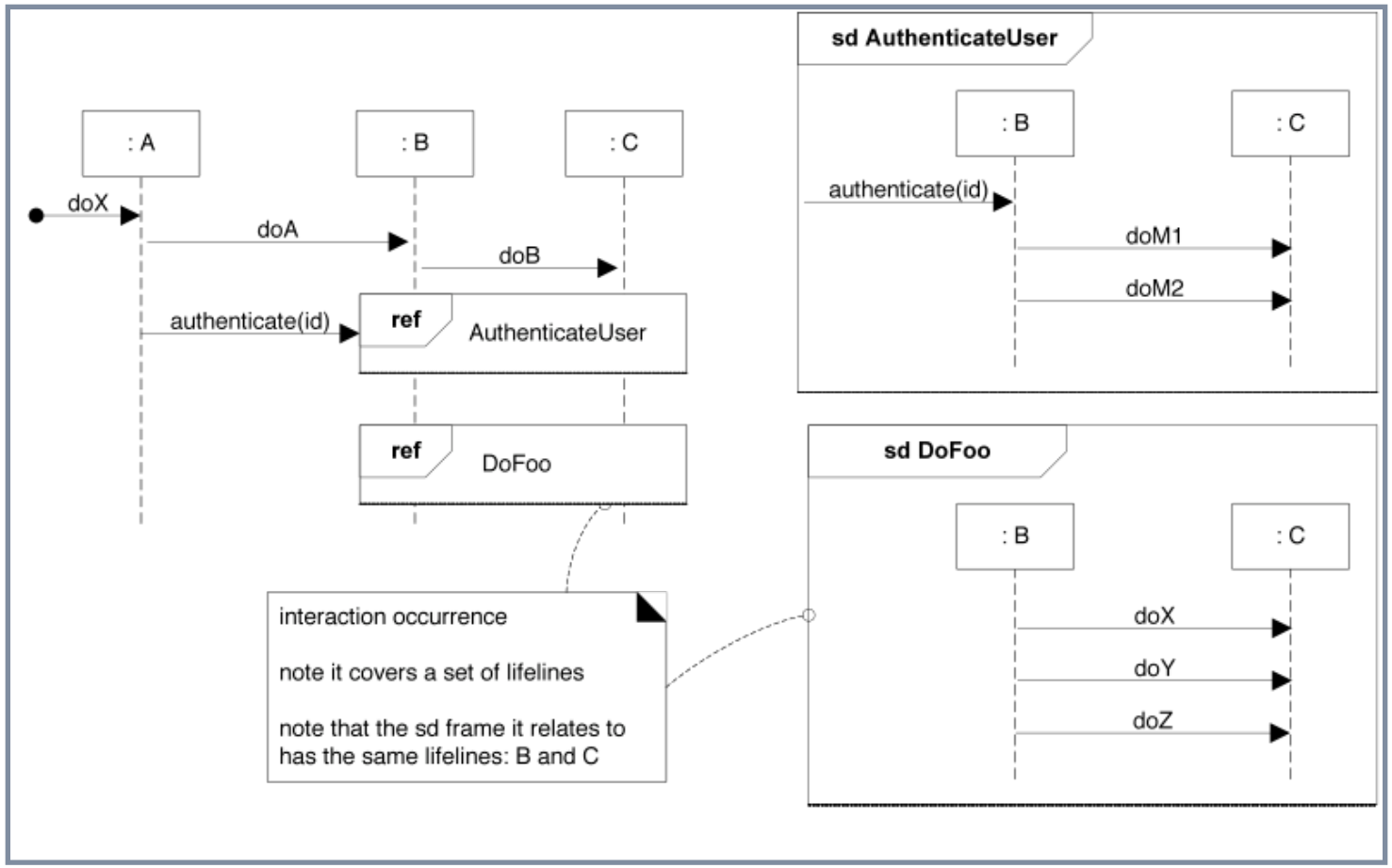


Q4

Iteration - Informal

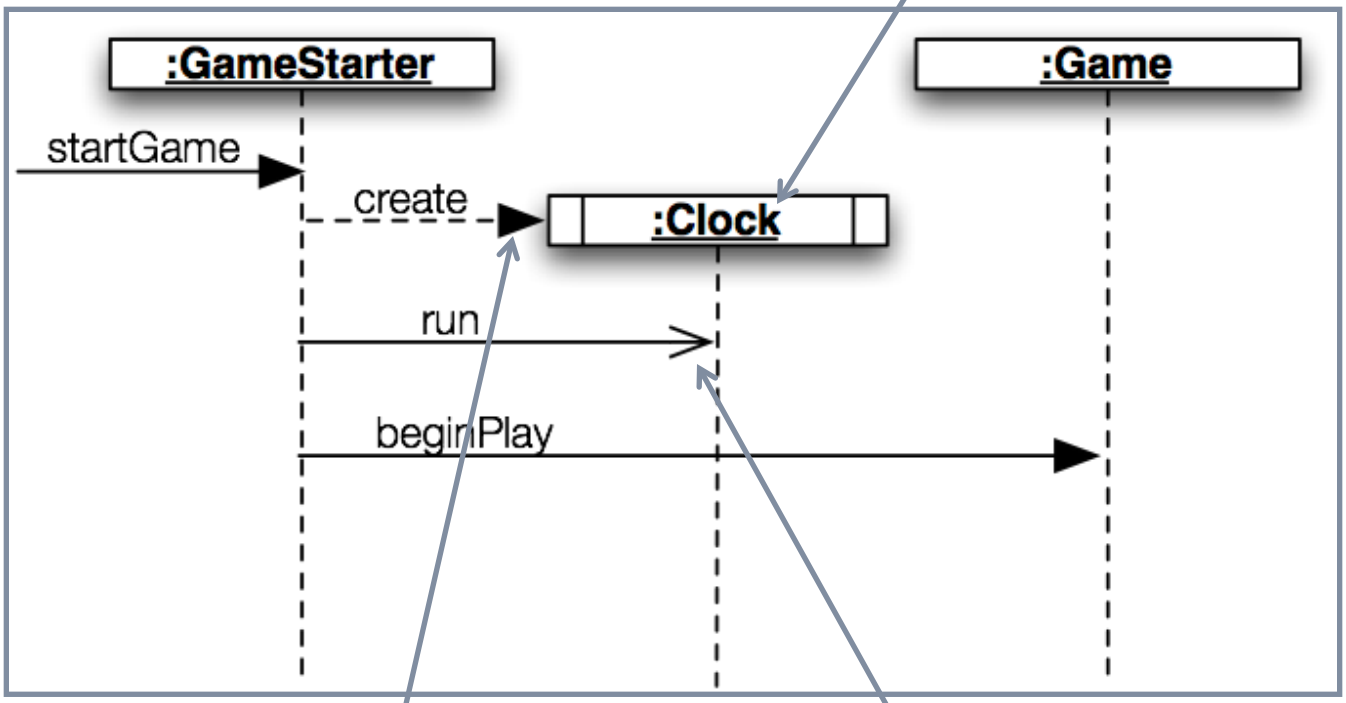


Abstracting Interaction



Q5-6

Asynchronous Call



Active object has its own thread

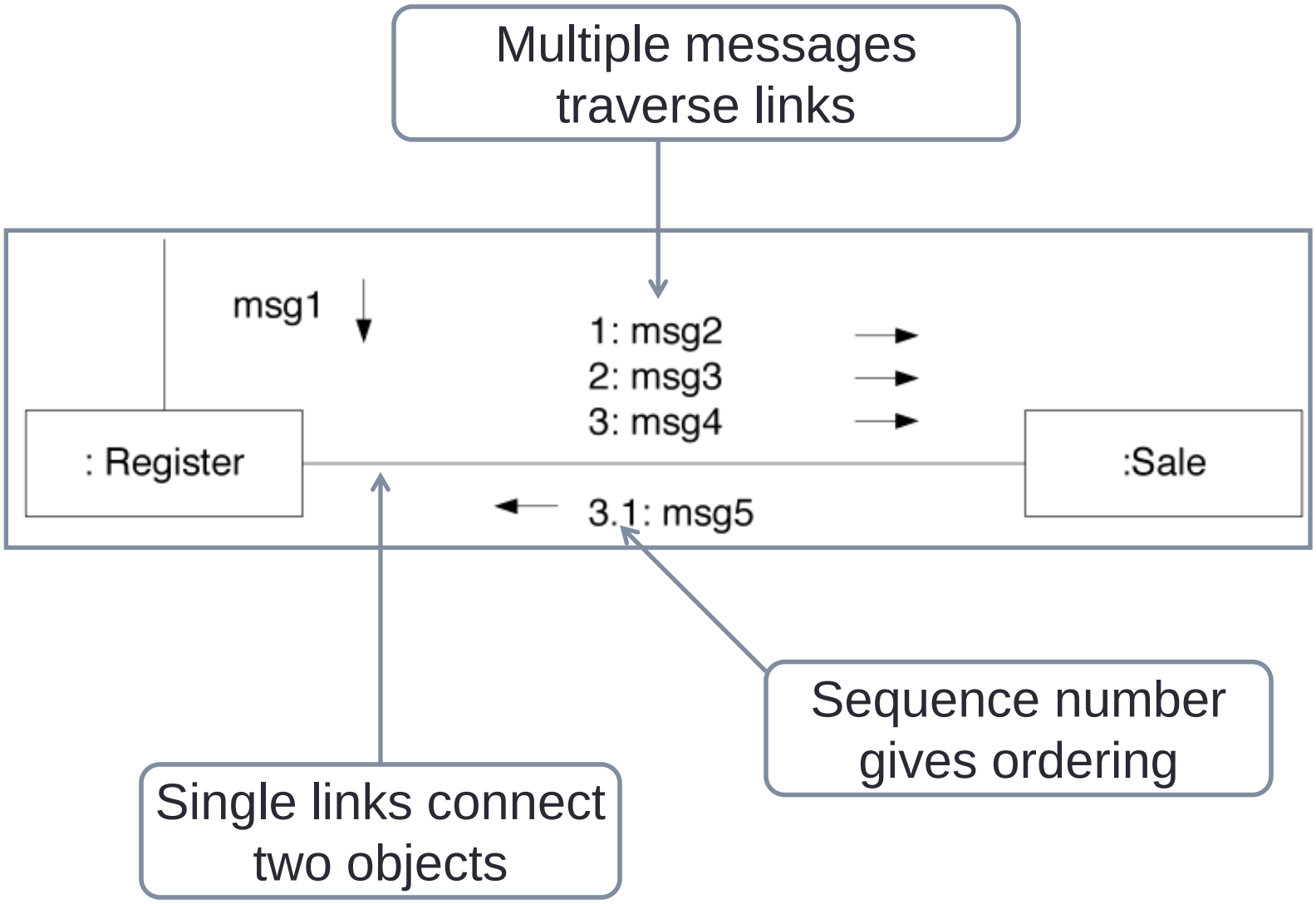
Synchronous (blocking) call

Asynchronous call

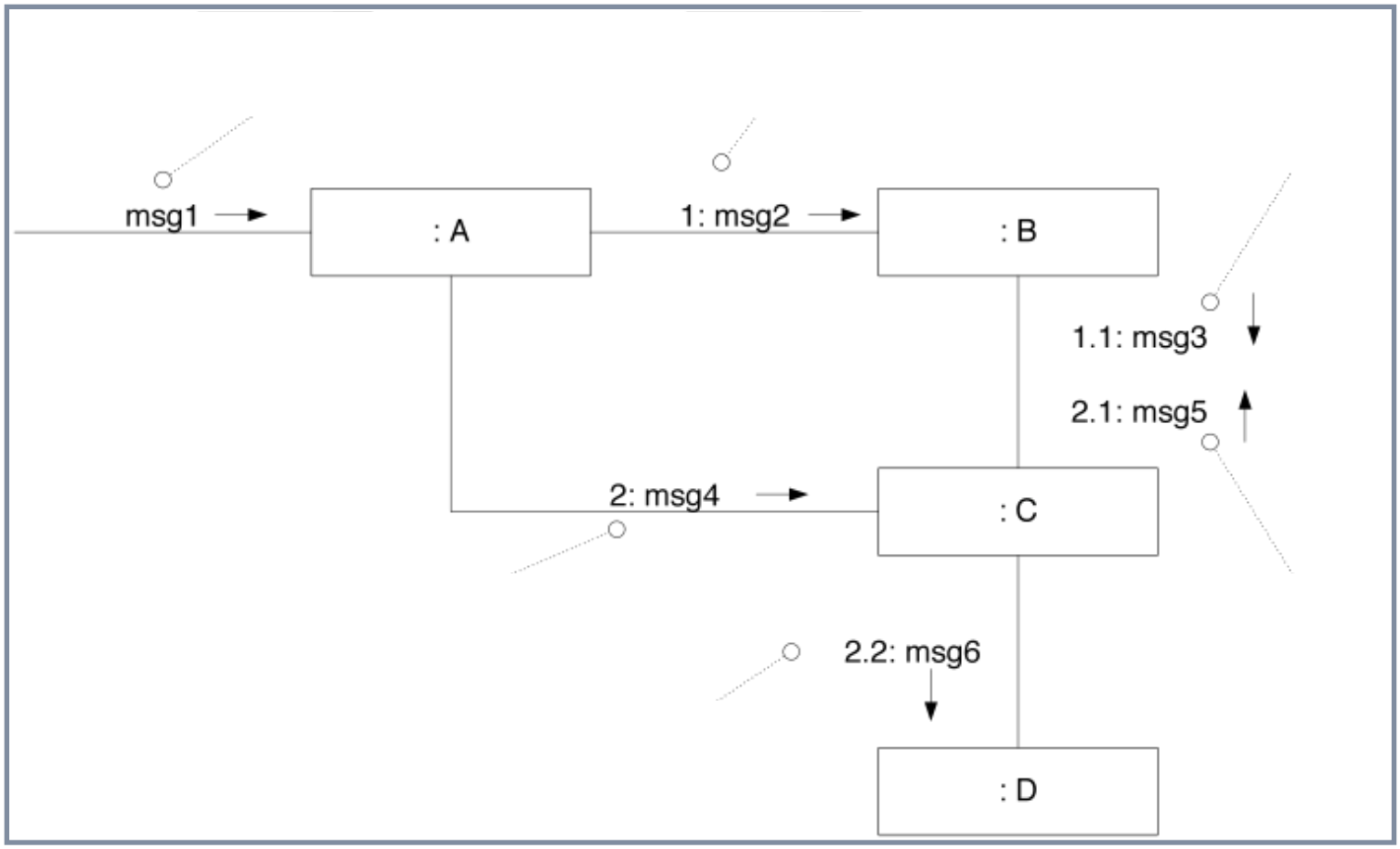
Q7

COMMUNICATION DIAGRAM

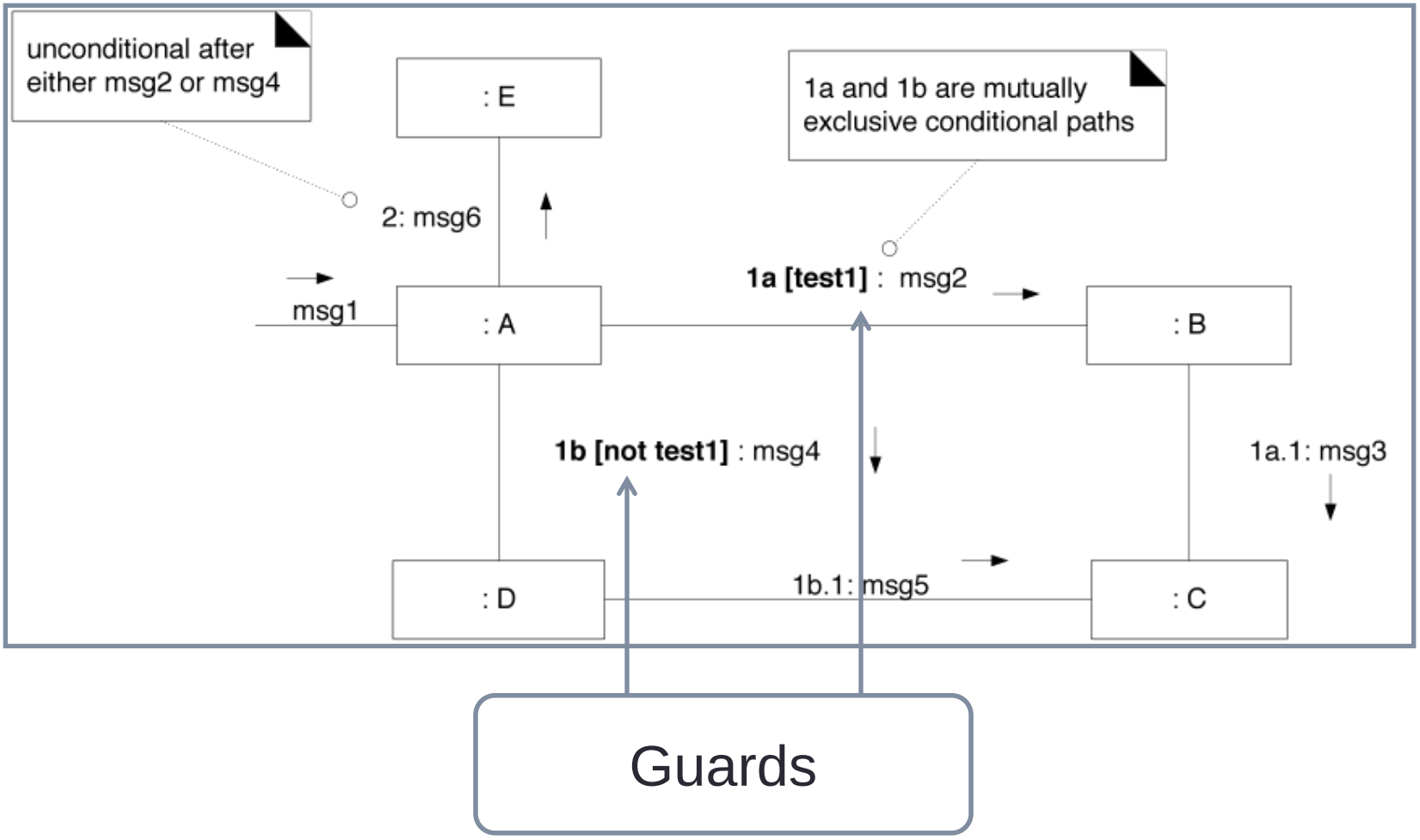
Links and Messages



Complex Sequence Numbering

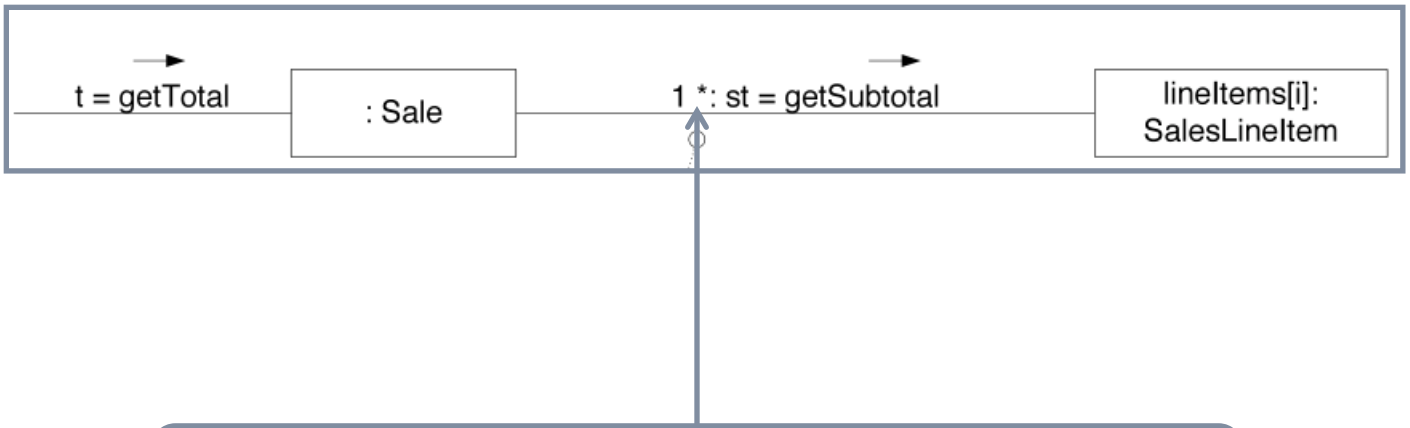


Conditional Messages



Iteration – Use *

Any Limitations?



Iteration is indicated with “*”
Optional: 1 * **[i = 1..n]**: st =getSubtotal

Q10

Asynchronous Calls