

Kurs

Datenbankgrundlagen und Modellierung

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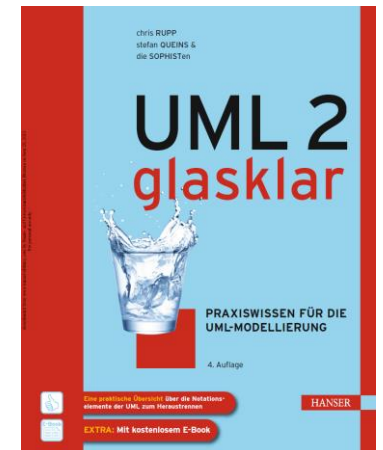
Tutorial 8: UML an Overview

Tutor: Marcel Westenberg

Today:

- Questions?
- Let's Talk Hierarchies and Histories (Pro)
- Last Weeks Exercises
- UML Overview:
- Class Diagram
- State Chart
- Sequence Diagram
- Examples

All diagrams are
from this book



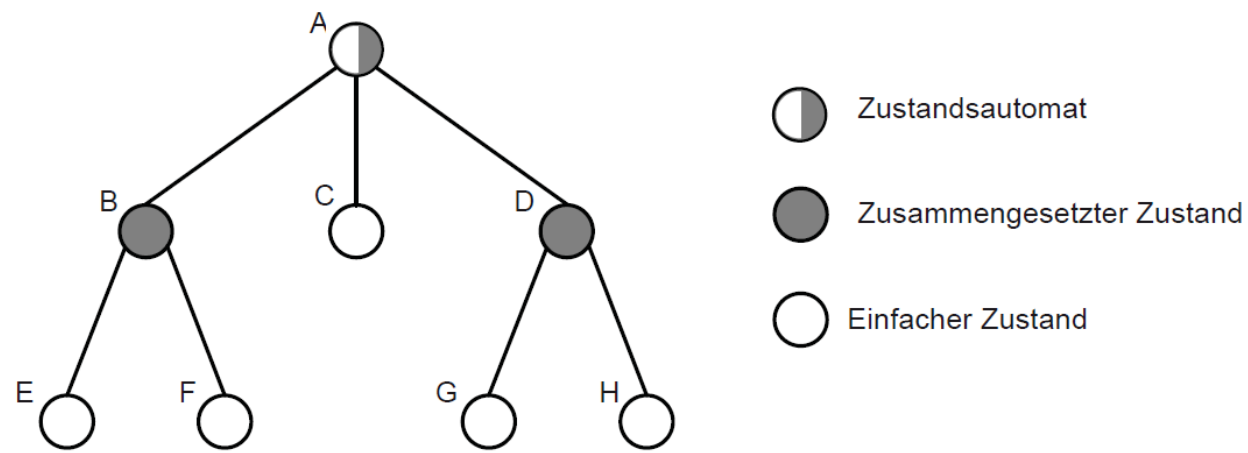


ABBILDUNG 14.44 Eine Hierarchie von Zuständen

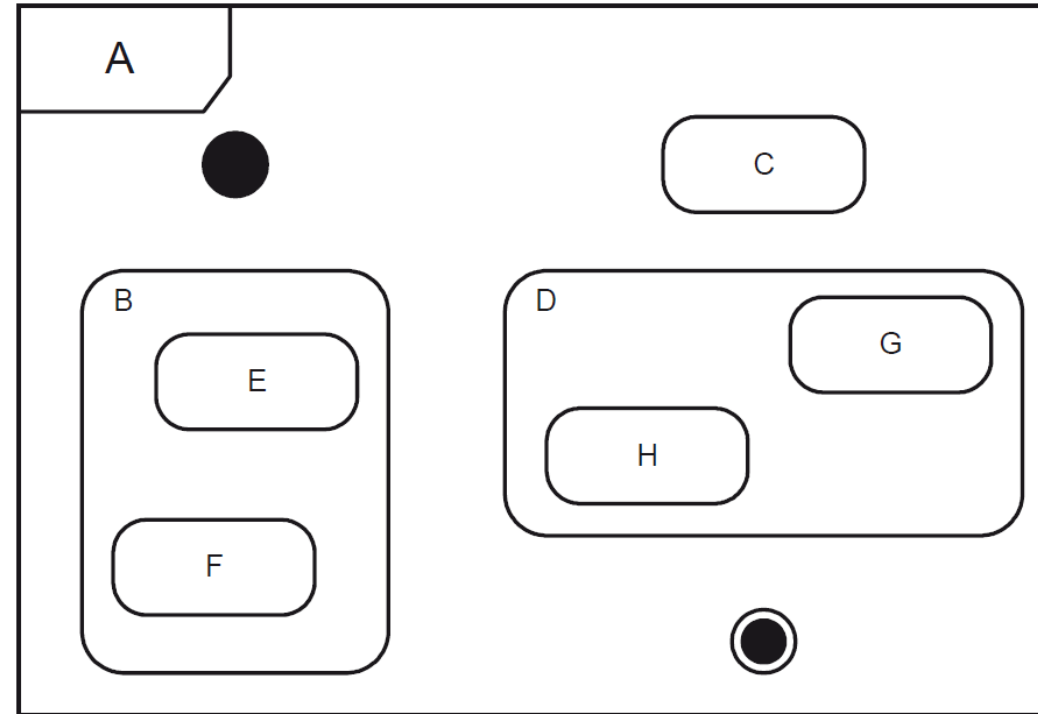


ABBILDUNG 14.45 Der Zustandsautomat aus der vorhergehenden Abbildung (ohne Transitionen)

Shallow History

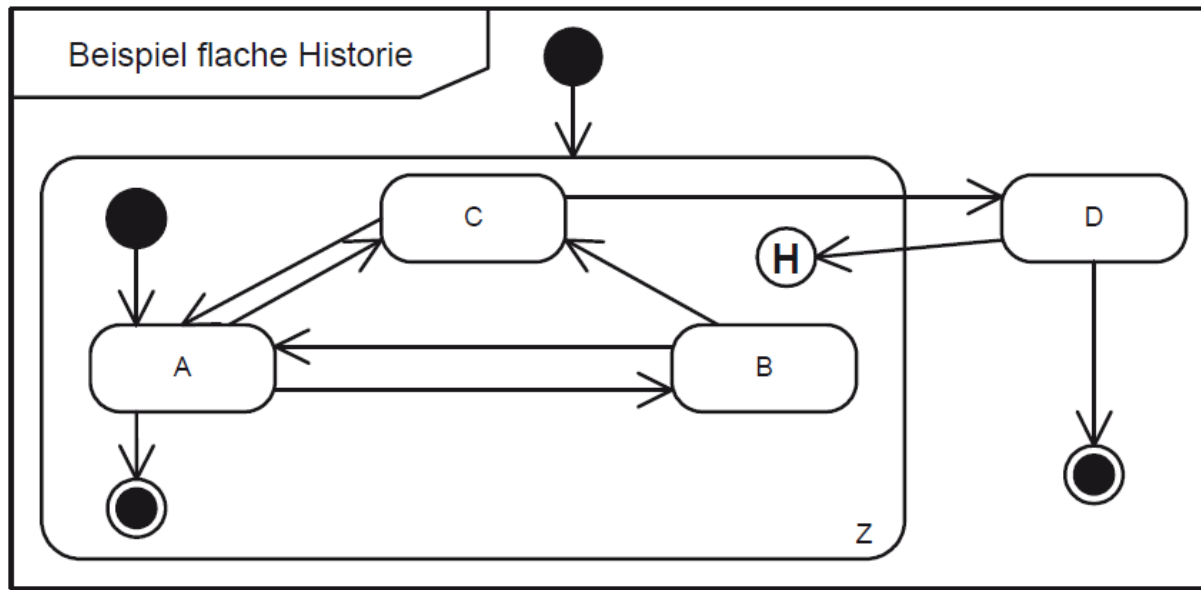


ABBILDUNG 14.75 Betreten eines zusammengesetzten Zustands über eine flache Historie

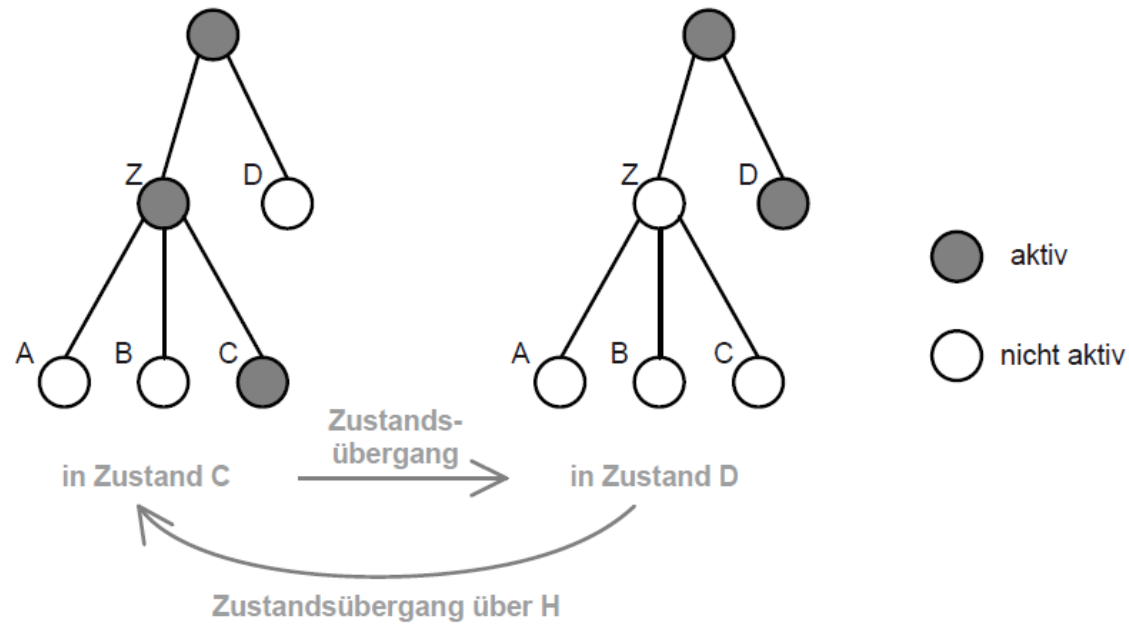


ABBILDUNG 14.76 Betreten über eine flache Historie: Der Baum zu Abbildung 14.75

Deep History

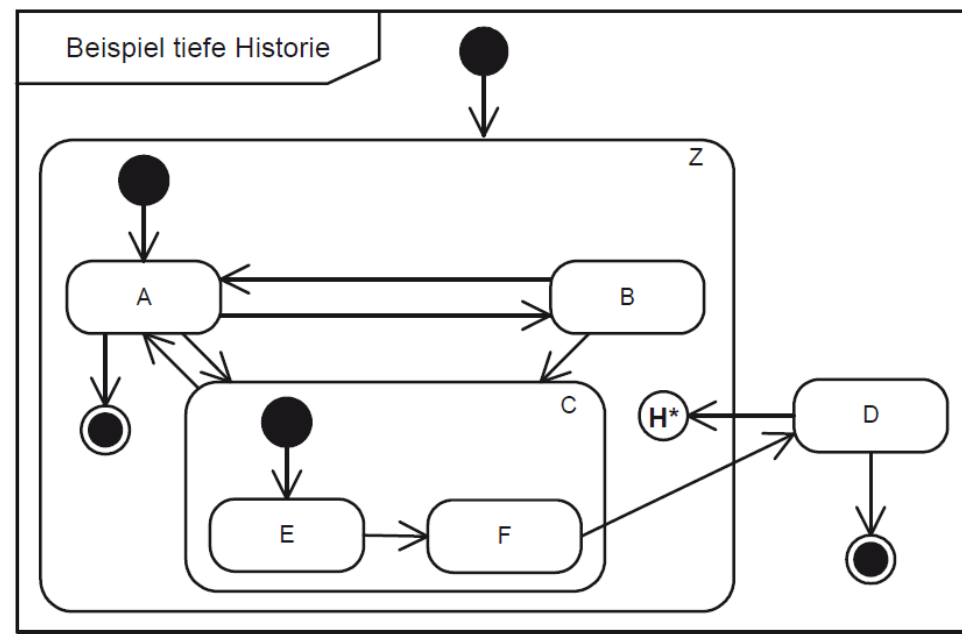


ABBILDUNG 14.77 Betreten eines zusammengesetzten Zustands über eine tiefe Historie

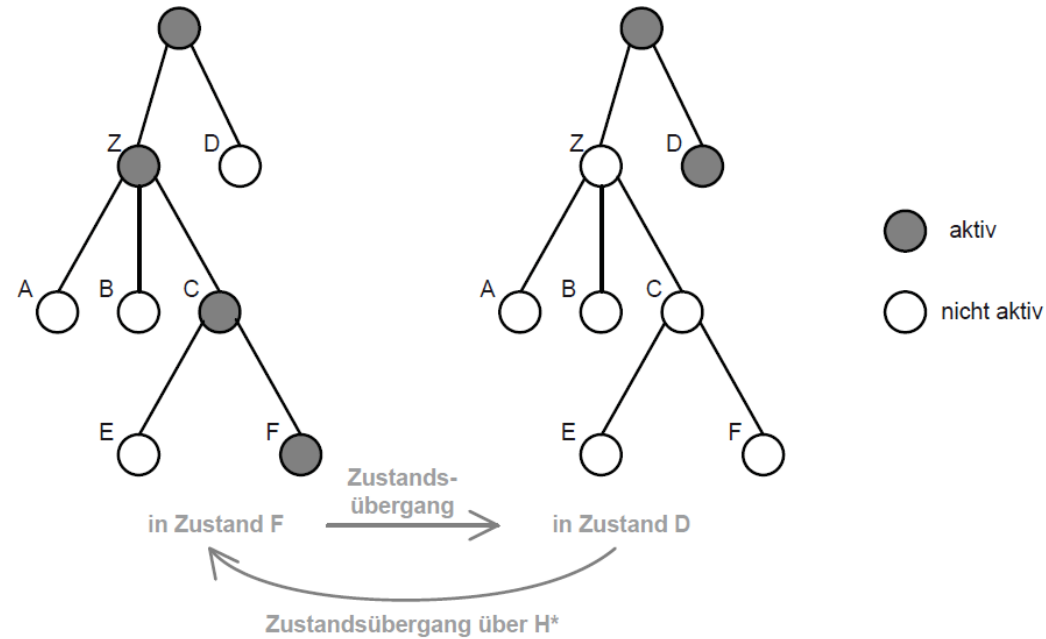


ABBILDUNG 14.78 Betreten über eine tiefe Historie: Der Baum zu Abbildung 14.77

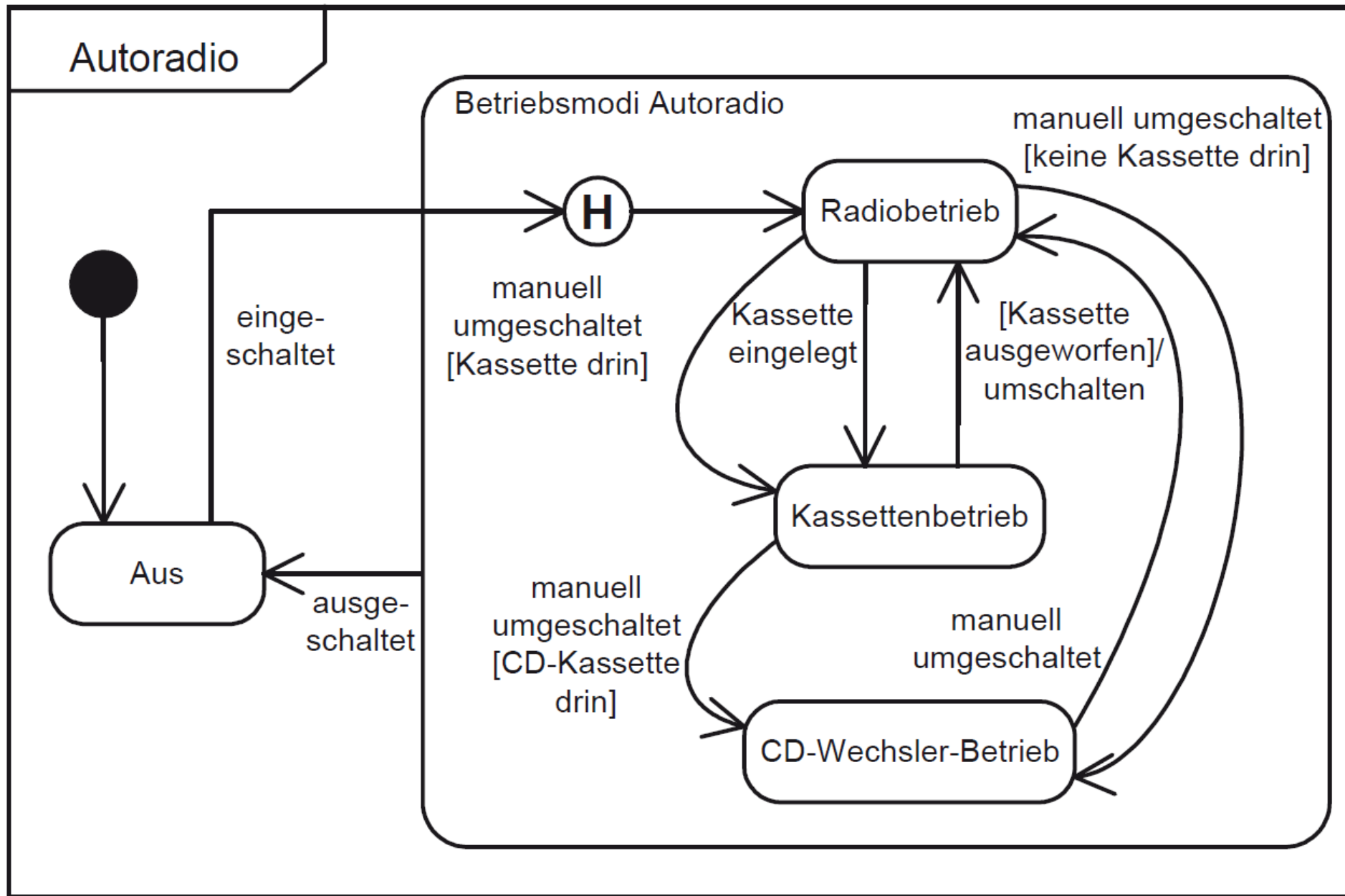


ABBILDUNG 14.79 Flache Historie

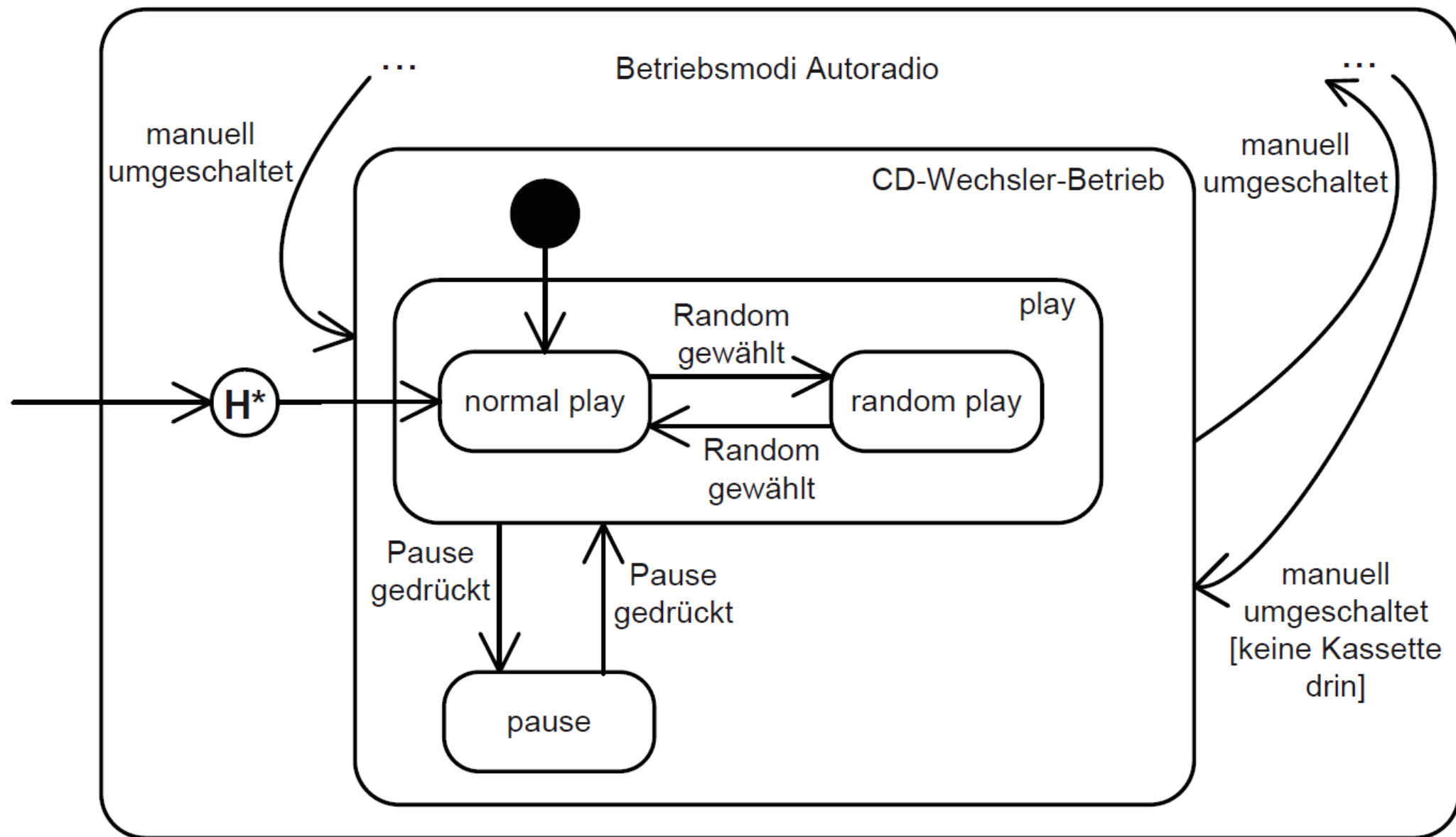
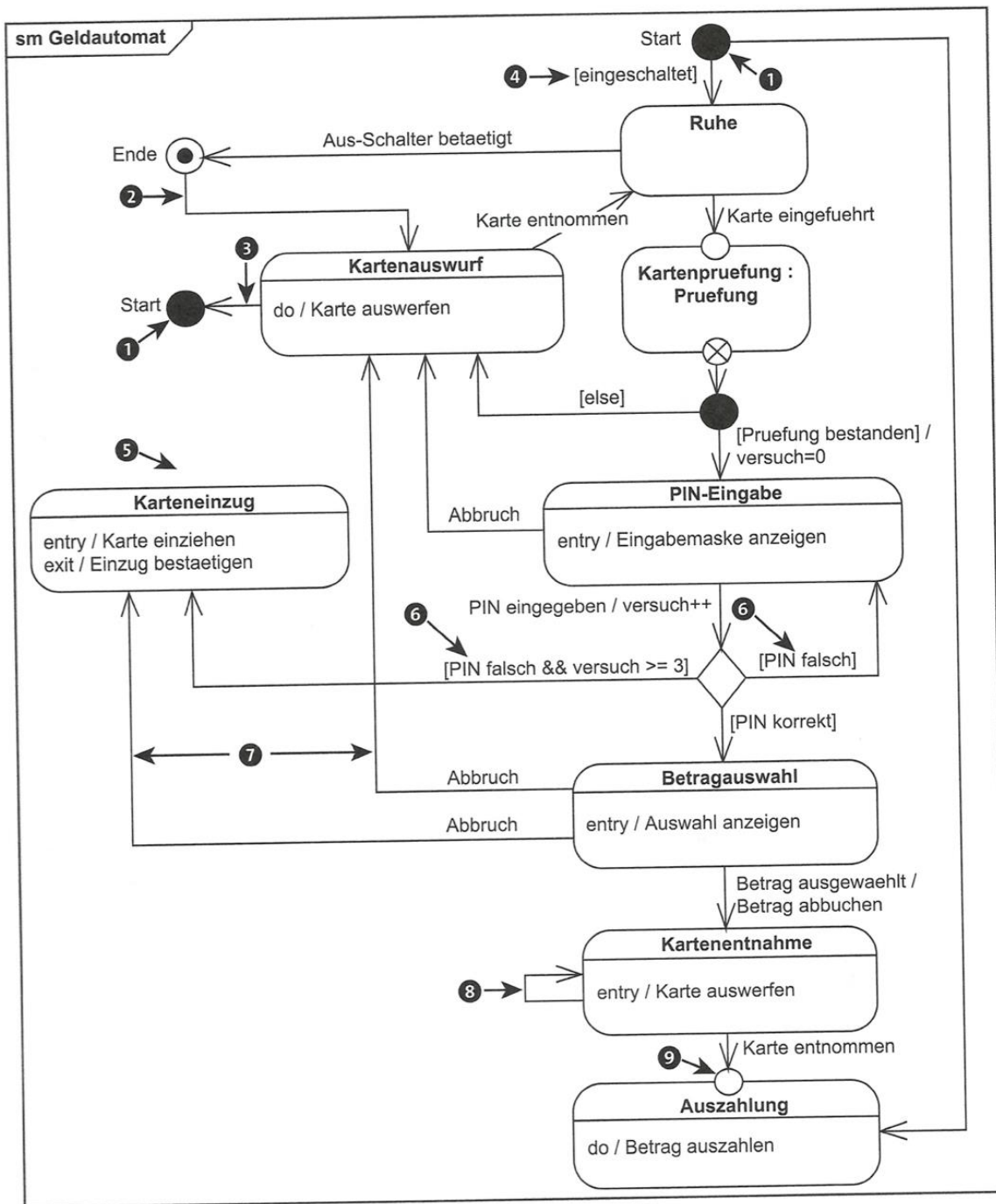


ABBILDUNG 14.80 Tiefe Historie



1. Es darf nur einen Startzustand geben
2. Keine Pfeile aus einem Endzustand
3. Keine Pfeile in einen Startzustand
4. Pfeil vom Start darf kein Label haben
5. Es gibt keinen Pfeil zu einem neuen Zustand
6. Modellierung nicht deterministisch (Else fehlt)
7. Selber Trigger führt zu verschiedenen Zuständen
8. Transition ohne Label
9. Eintrittspunkt ohne Austrittspunkt

UML Overview

- Class Diagram
- State Chart
- Sequence Diagram

Class Diagram

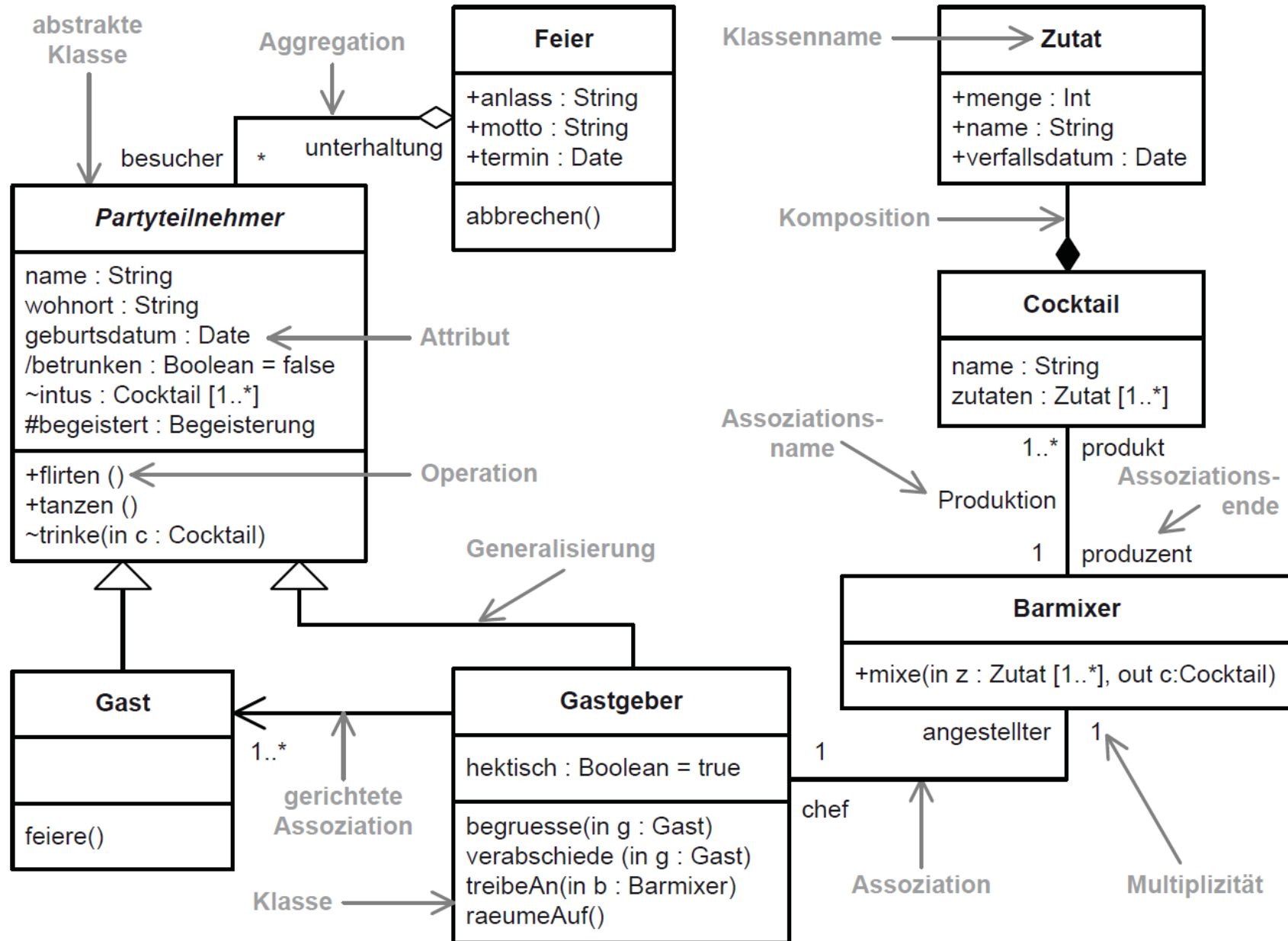


ABBILDUNG 6.1 Elemente des Klassendiagramms

Class Diagram Example

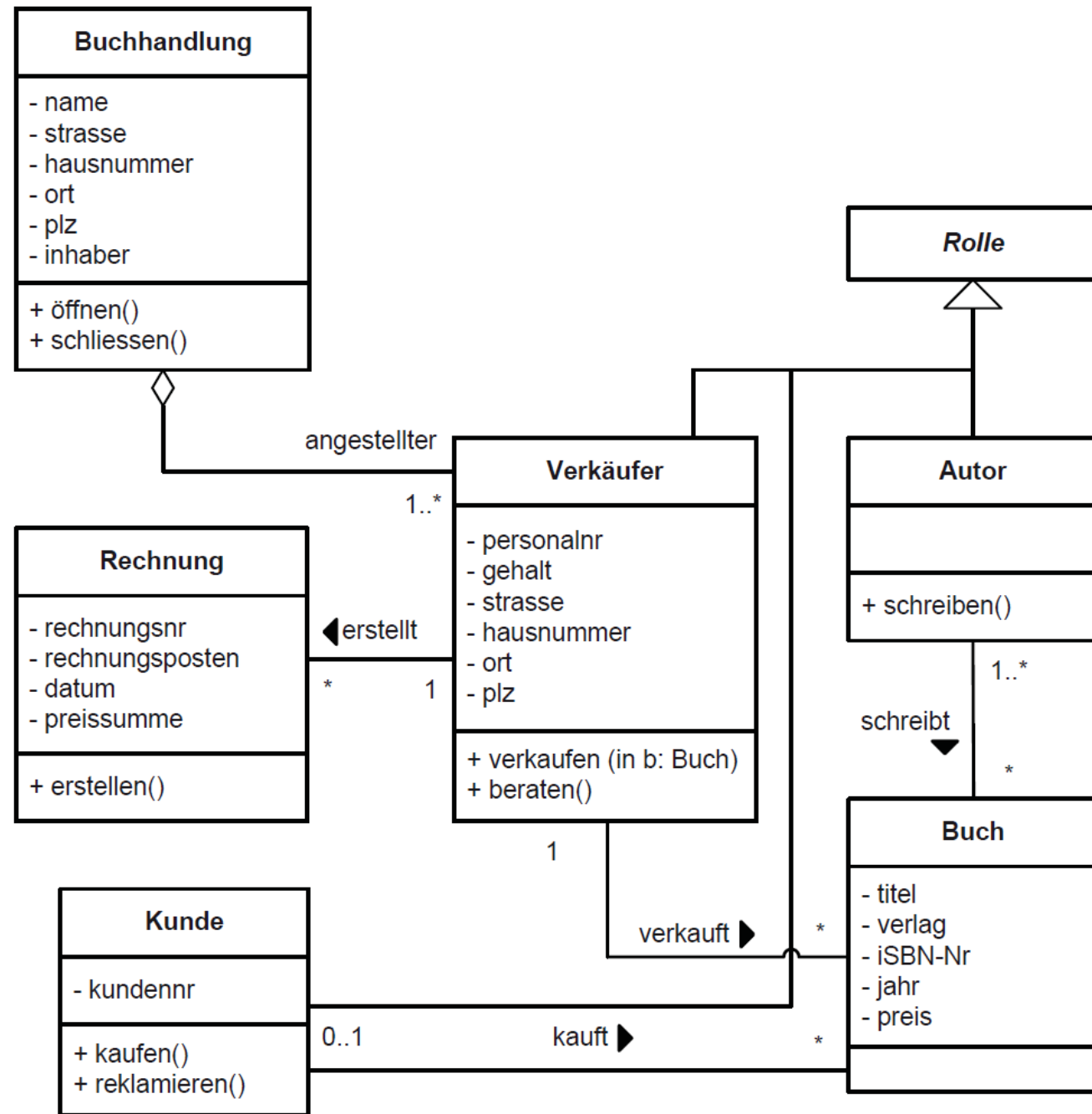


ABBILDUNG 6.3 Klassendiagramm Buchhandlung

State Chart

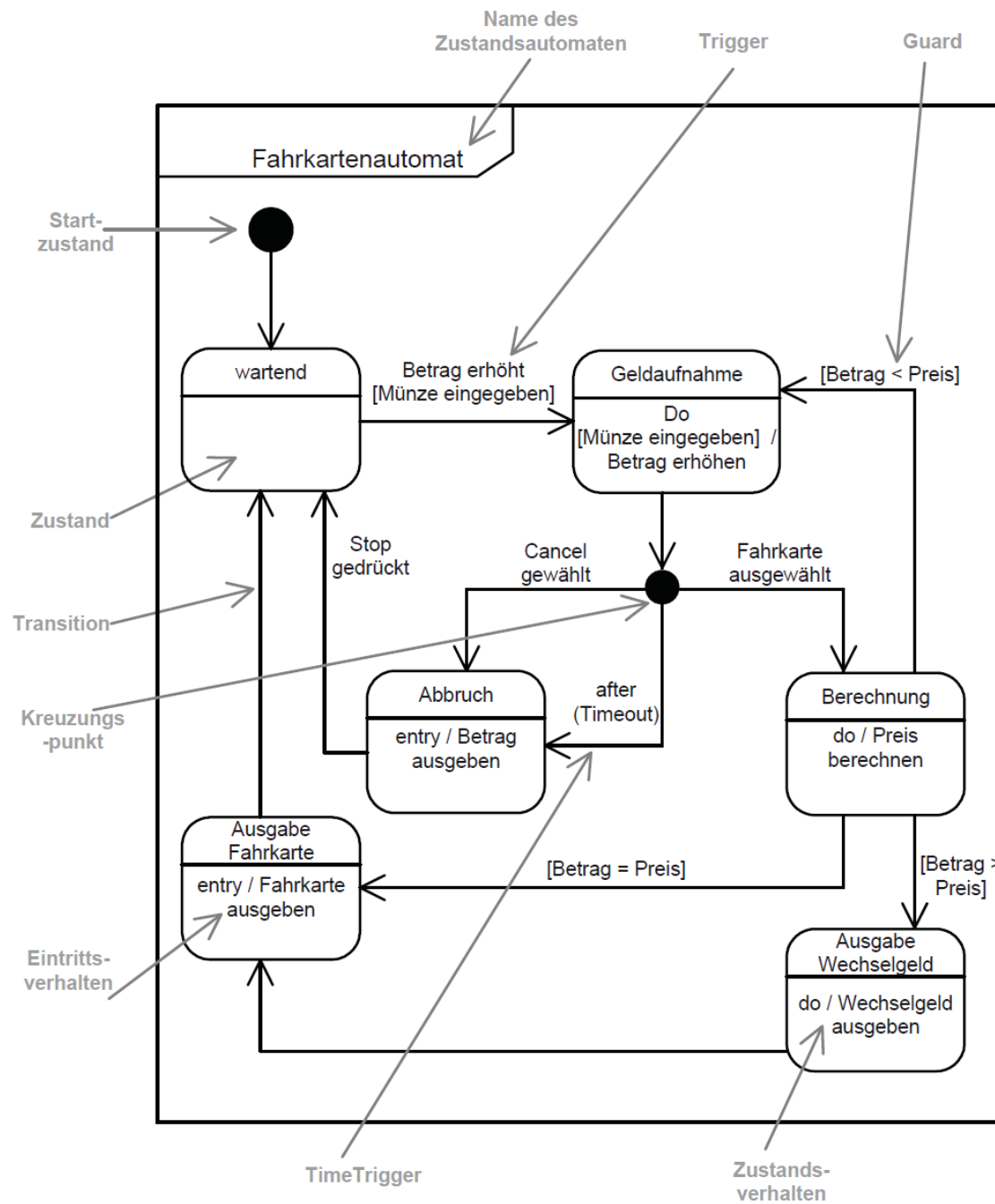


ABBILDUNG 14.1 Eine Auswahl der Notationselemente des Zustandsautomats

State Chart Example

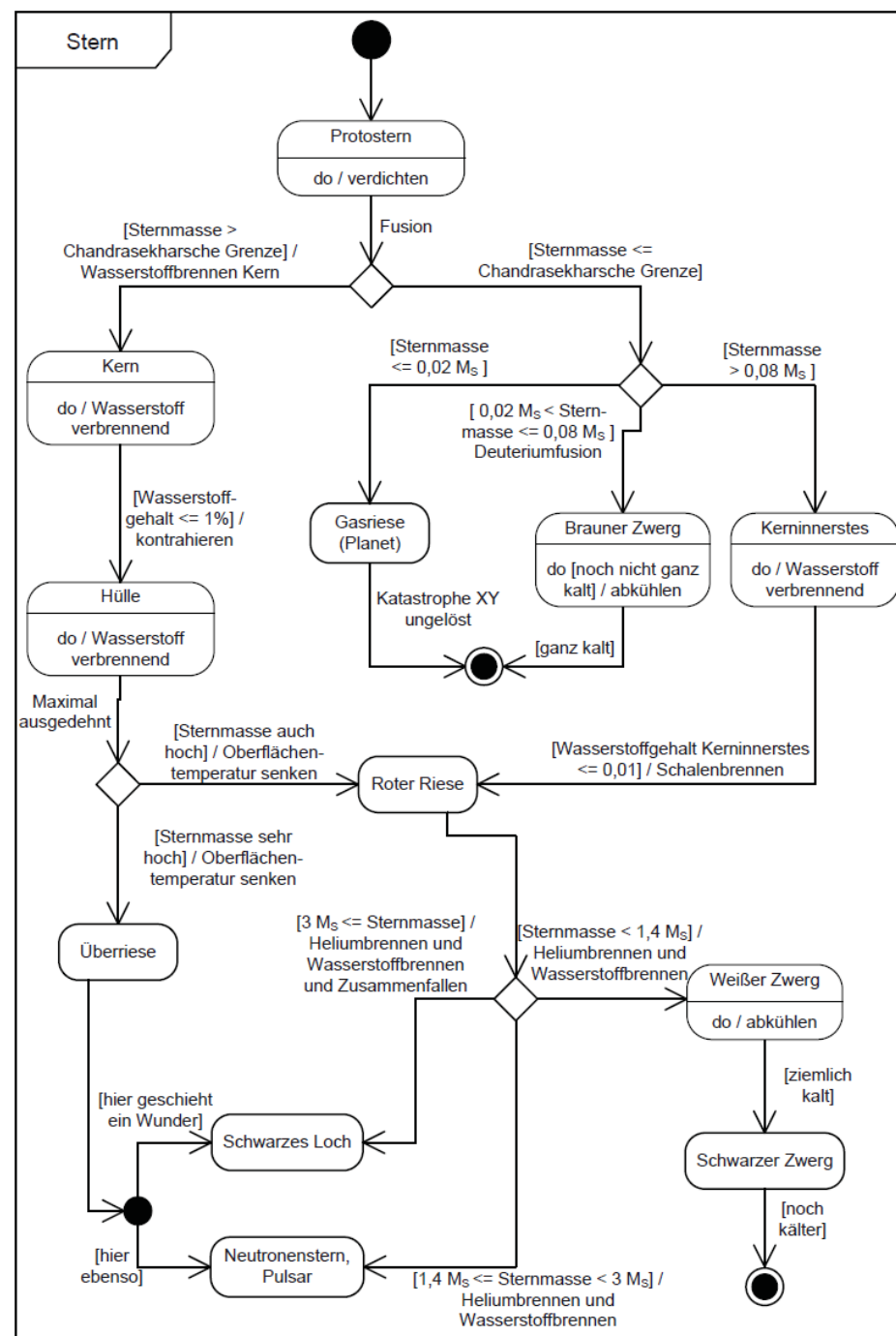


ABBILDUNG 14.2 Mögliche Zustände eines Sterns

State Chart Example

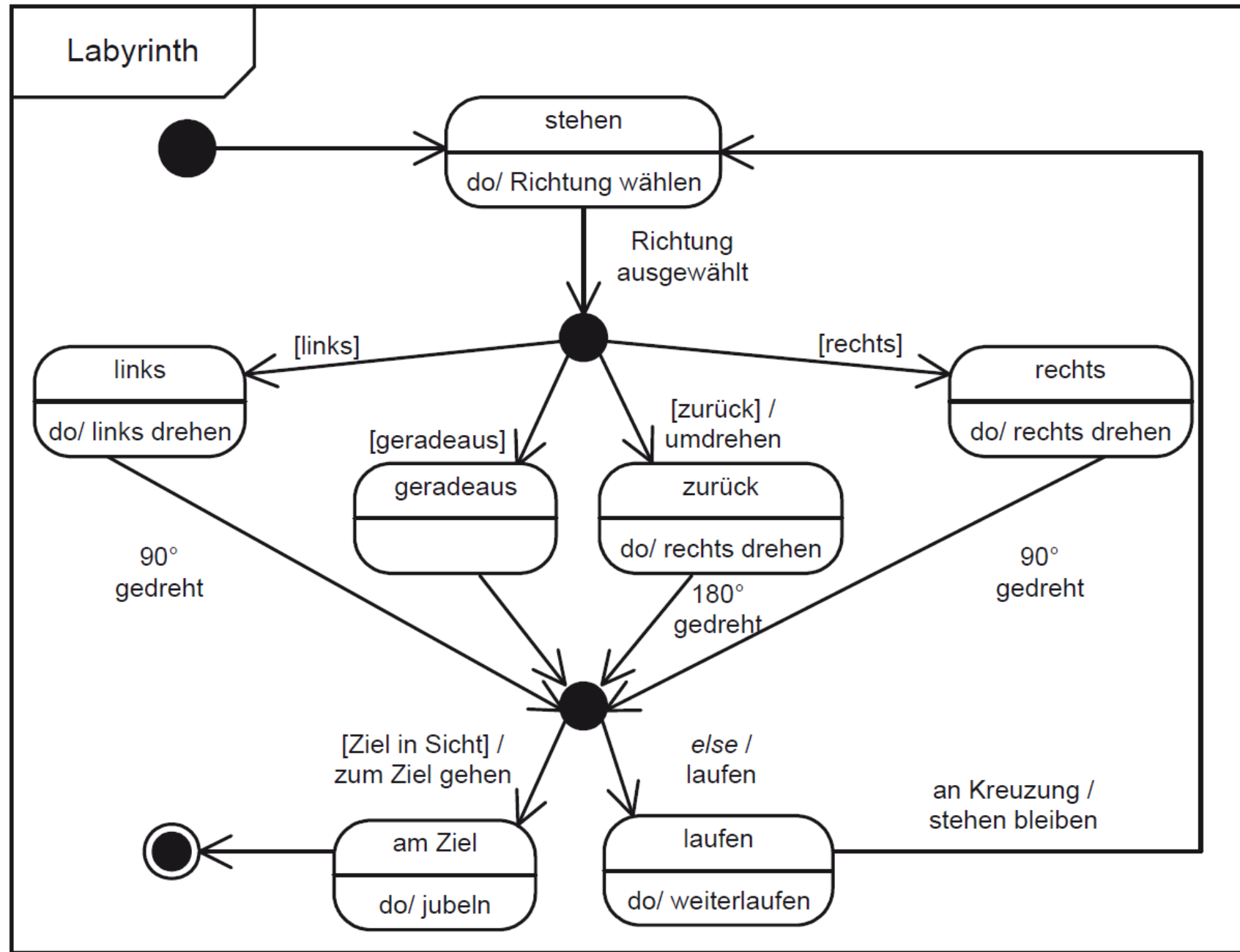


ABBILDUNG 14.34 Ein Labyrinth von Kreuzungen

State Chart Cheat Sheet

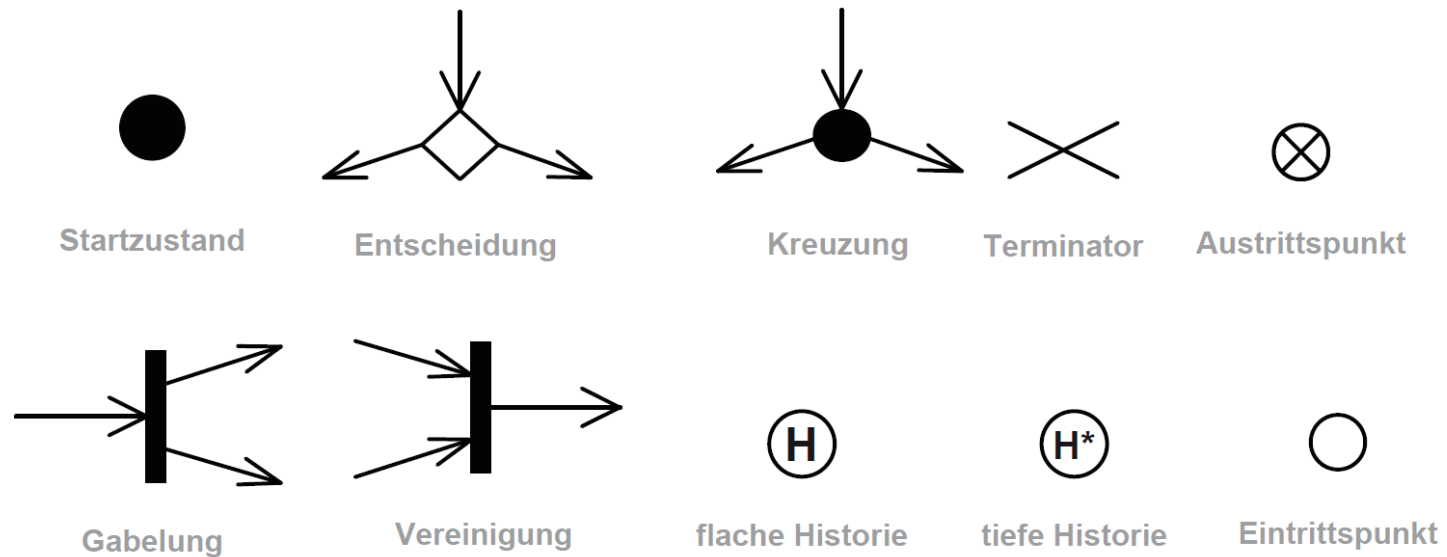


ABBILDUNG 14.28 Die Notationen der verschiedenen Pseudozustände

Examples and more are found in the book from pp. 329 onwards.

Sequence Diagram

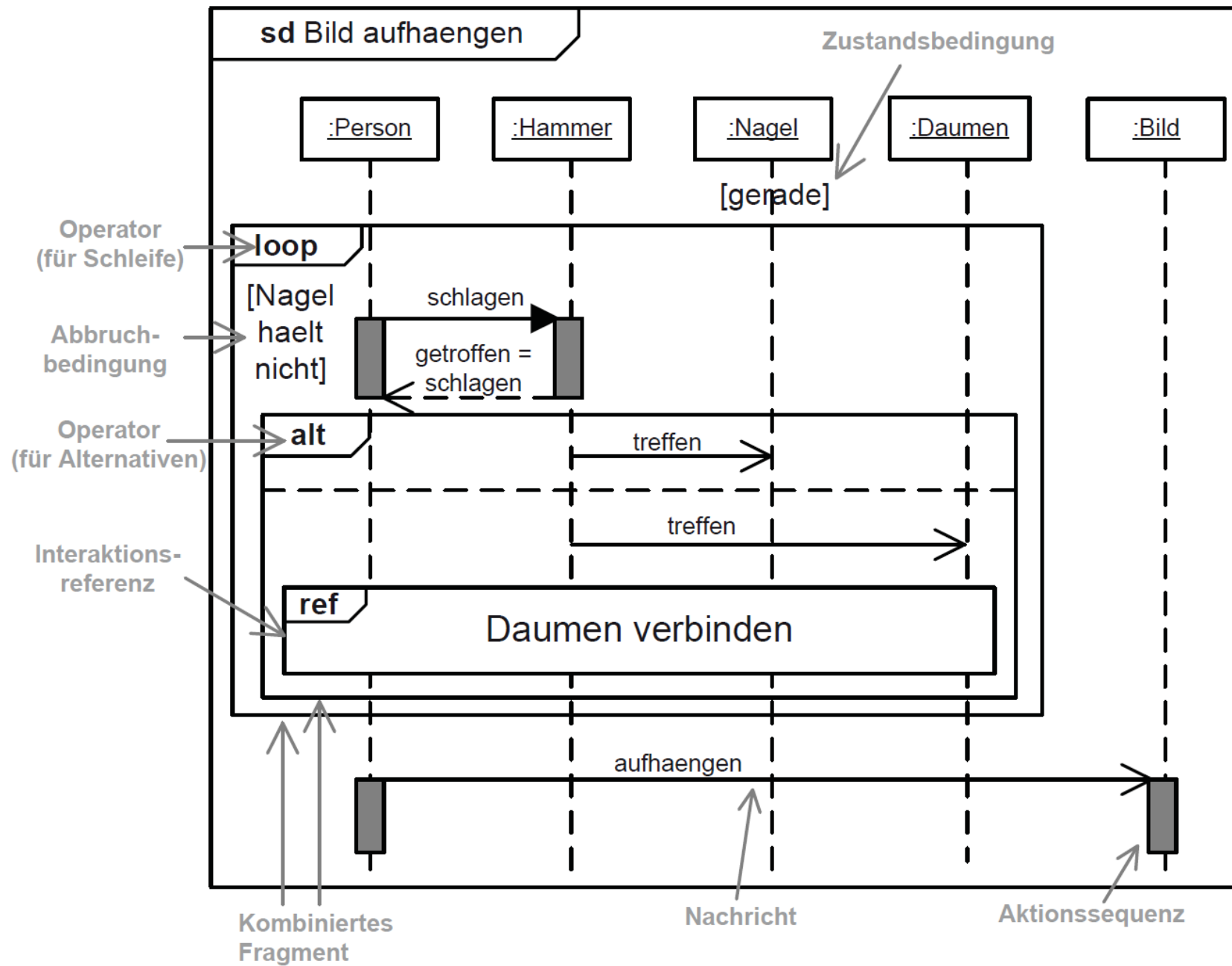


ABBILDUNG 15.8 Sequenzdiagramm mit Notationselementen

Sequence Diagram Example

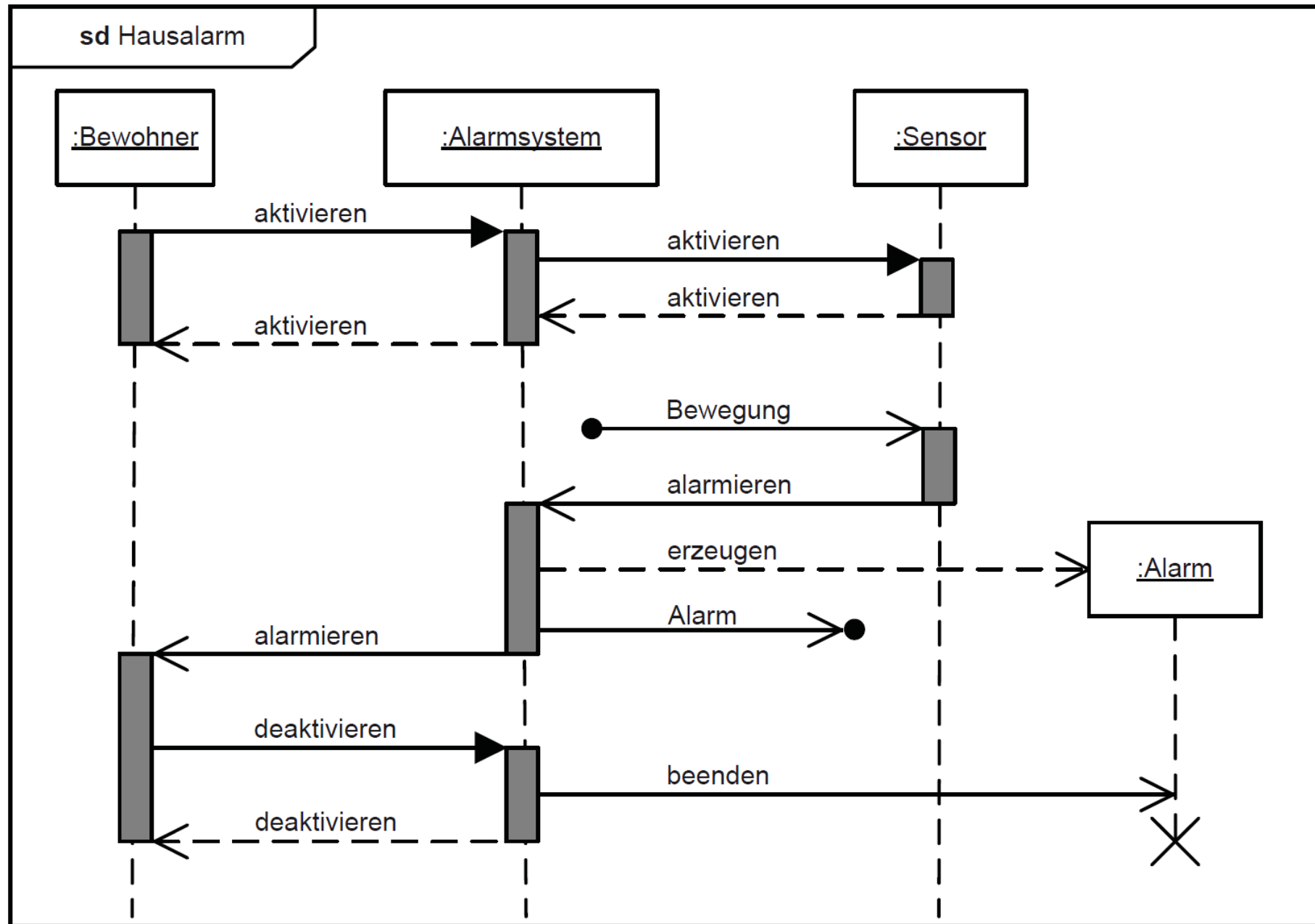


ABBILDUNG 15.51 Nachrichten am Beispiel eines Hausalarmsystems

Draw a sequence diagram for the warehouseOnFire scenario of Figure 2-21. Include the objects bob, alice, john, FRIEND, and instances of other classes you may need. Draw only the first five message sends.

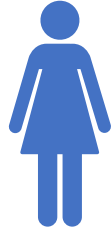
<i>Scenario name</i>	<u>warehouseOnFire</u>
<i>Participating actor instances</i>	<u>bob, alice:FieldOfficer</u> <u>john:Dispatcher</u>
<i>Flow of events</i>	1. Bob, driving down main street in his patrol car, notices smoke coming out of a warehouse. His partner, Alice, activates the “Report Emergency” function from her FRIEND laptop. 2. Alice enters the address of the building, a brief description of its location (i.e., northwest corner), and an emergency level. In addition to a fire unit, she requests several paramedic units on the scene given that area appears to be relatively busy. She confirms her input and waits for an acknowledgment. 3. John, the Dispatcher, is alerted to the emergency by a beep of his workstation. He reviews the information submitted by Alice and acknowledges the report. He allocates a fire unit and two paramedic units to the Incident site and sends their estimated arrival time (ETA) to Alice. 4. Alice receives the acknowledgment and the ETA.

Figure 2-21 The warehouseOnFire scenario for the ReportEmergency use case.

Draw a sequence diagram for the warehouseOnFire scenario of Figure 2-21. Include the objects bob, alice, john, FRIEND, and instances of other classes you may need. Draw only the first five message sends.

Scenario name	<u>warehouseOnFire</u>
Participating actor instances	<u>bob, alice:FieldOfficer</u> <u>john:Dispatcher</u>
Flow of events	1. Bob, driving down main street in his patrol car, notices smoke coming out of a warehouse. His partner, Alice, activates the “Report Emergency” function from her FRIEND laptop. 2. Alice enters the address of the building, a brief description of its location (i.e., northwest corner), and an emergency level. In addition to a fire unit, she requests several paramedic units on the scene given that area appears to be relatively busy. She confirms her input and waits for an acknowledgment. 3. John, the Dispatcher, is alerted to the emergency by a beep of his workstation. He reviews the information submitted by Alice and acknowledges the report. He allocates a fire unit and two paramedic units to the Incident site and sends their estimated arrival time (ETA) to Alice. 4. Alice receives the acknowledgment and the ETA.

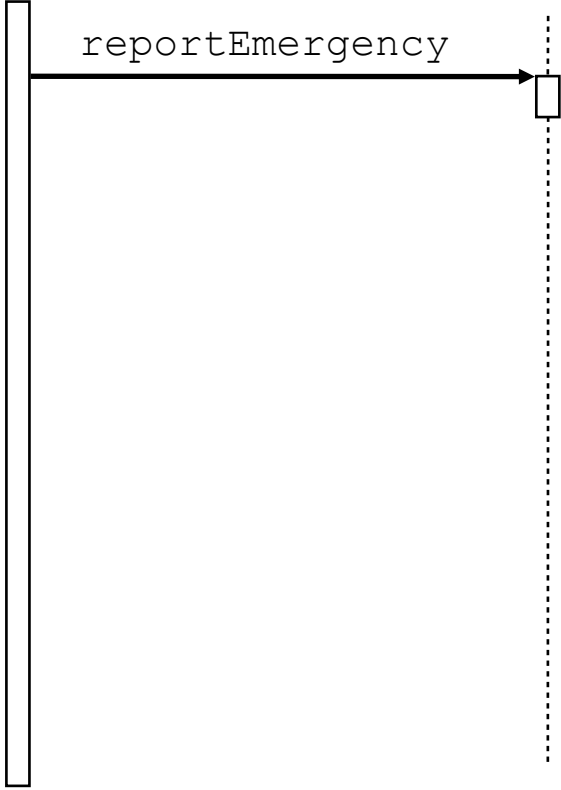
Figure 2-21 The warehouseOnFire scenario for the ReportEmergency use case.



Alice

FRIEND

reportEmergency



Draw a sequence diagram for the warehouseOnFire scenario of Figure 2-21. Include the objects bob, alice, john, FRIEND, and instances of other classes you may need. Draw only the first five message sends.

Scenario name	warehouseOnFire
Participating actor instances	bob, alice:FieldOfficer john:Dispatcher
Flow of events	1. Bob, driving down main street in his patrol car, notices smoke coming out of a warehouse. His partner, Alice, activates the “Report Emergency” function from her FRIEND laptop. 2. Alice enters the address of the building, a brief description of its location (i.e., northwest corner), and an emergency level. In addition to a fire unit, she requests several paramedic units on the scene given that area appears to be relatively busy. She confirms her input and waits for an acknowledgment. 3. John, the Dispatcher, is alerted to the emergency by a beep of his workstation. He reviews the information submitted by Alice and acknowledges the report. He allocates a fire unit and two paramedic units to the Incident site and sends their estimated arrival time (ETA) to Alice. 4. Alice receives the acknowledgment and the ETA. Alice fills out an EmergencyForm

Figure 2-21 The warehouseOnFire scenario for the ReportEmergency use case.



Alice

FRIEND

reportEmergency

new

EmergencyForm

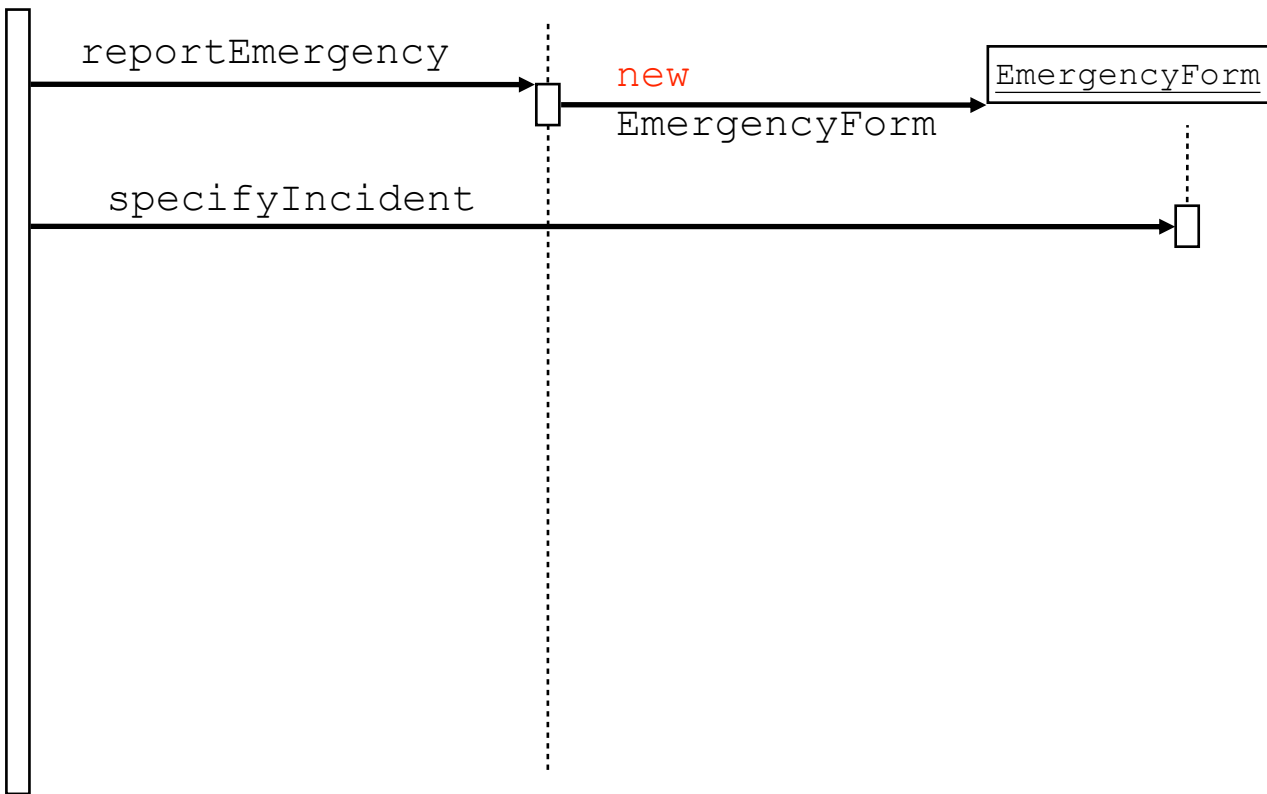
EmergencyForm





Alice

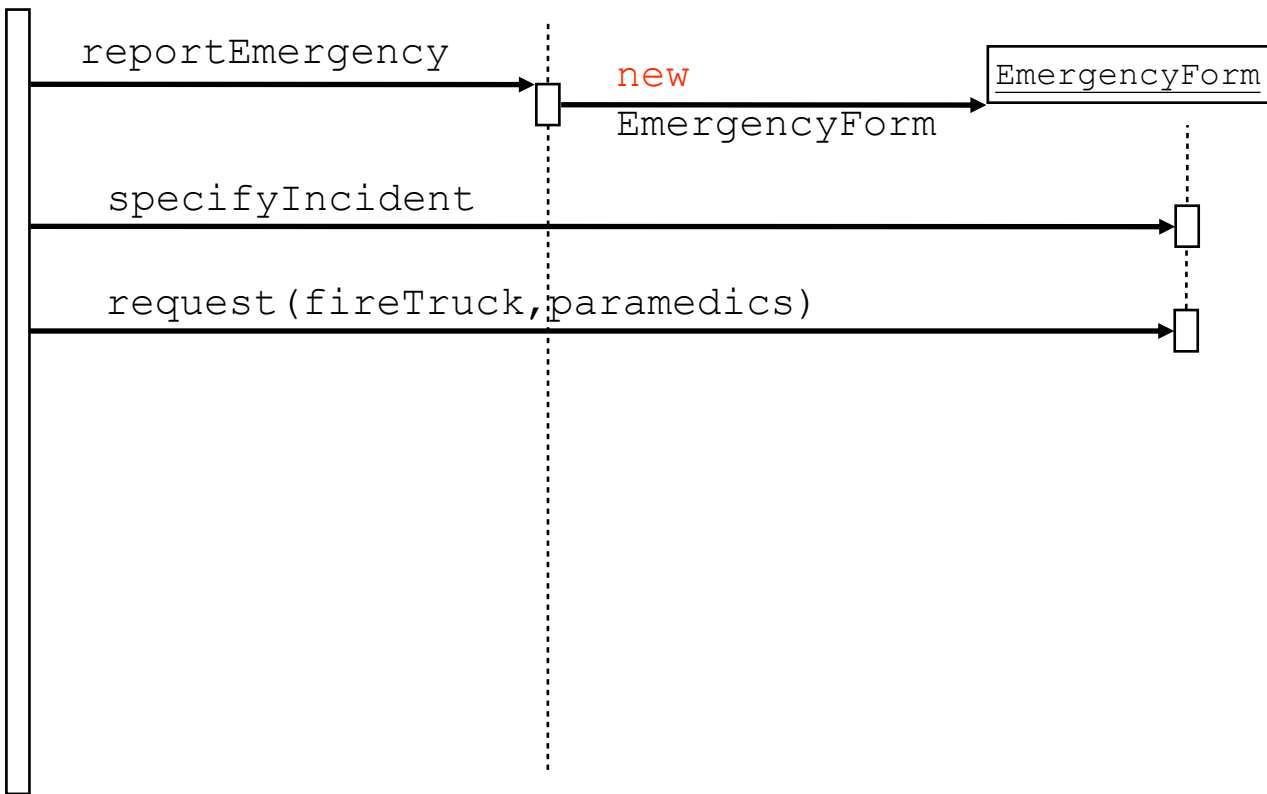
FRIEND





Alice

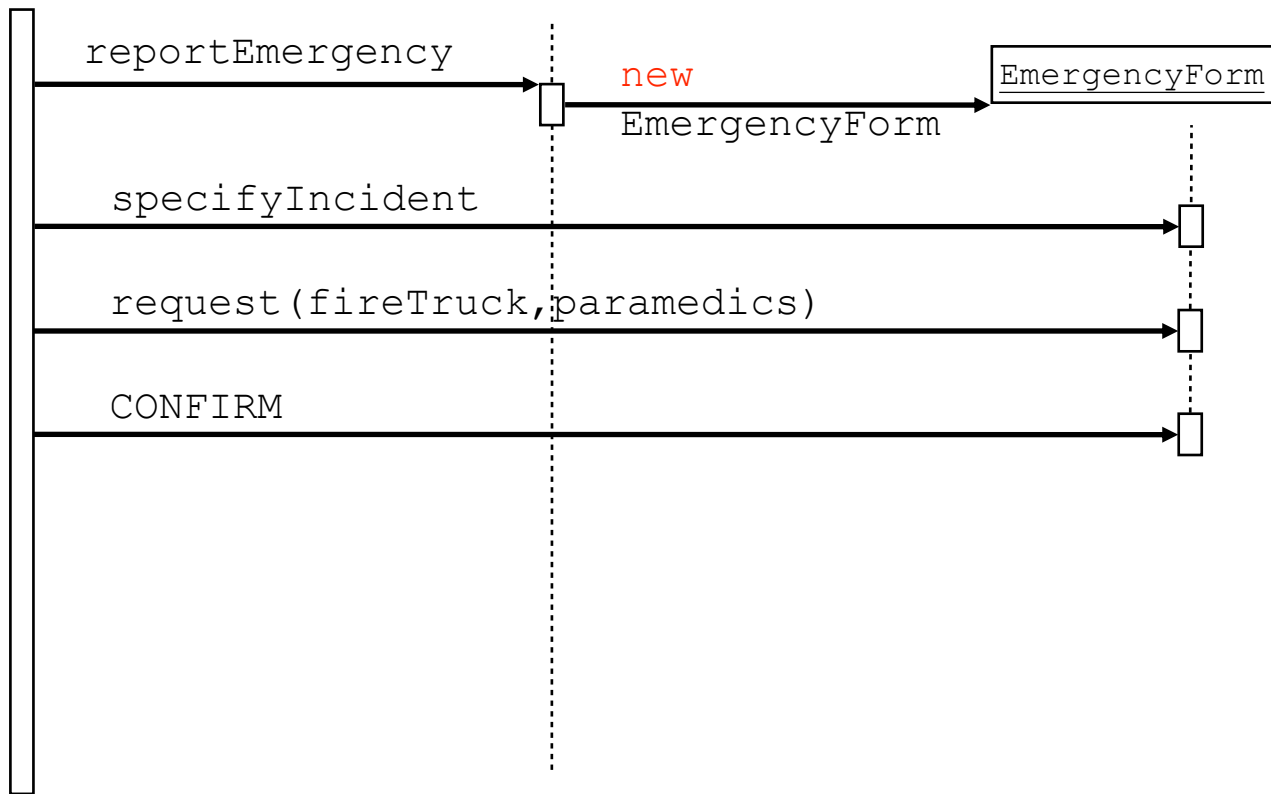
FRIEND

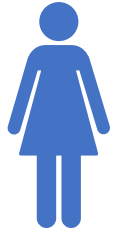




Alice

FRIEND



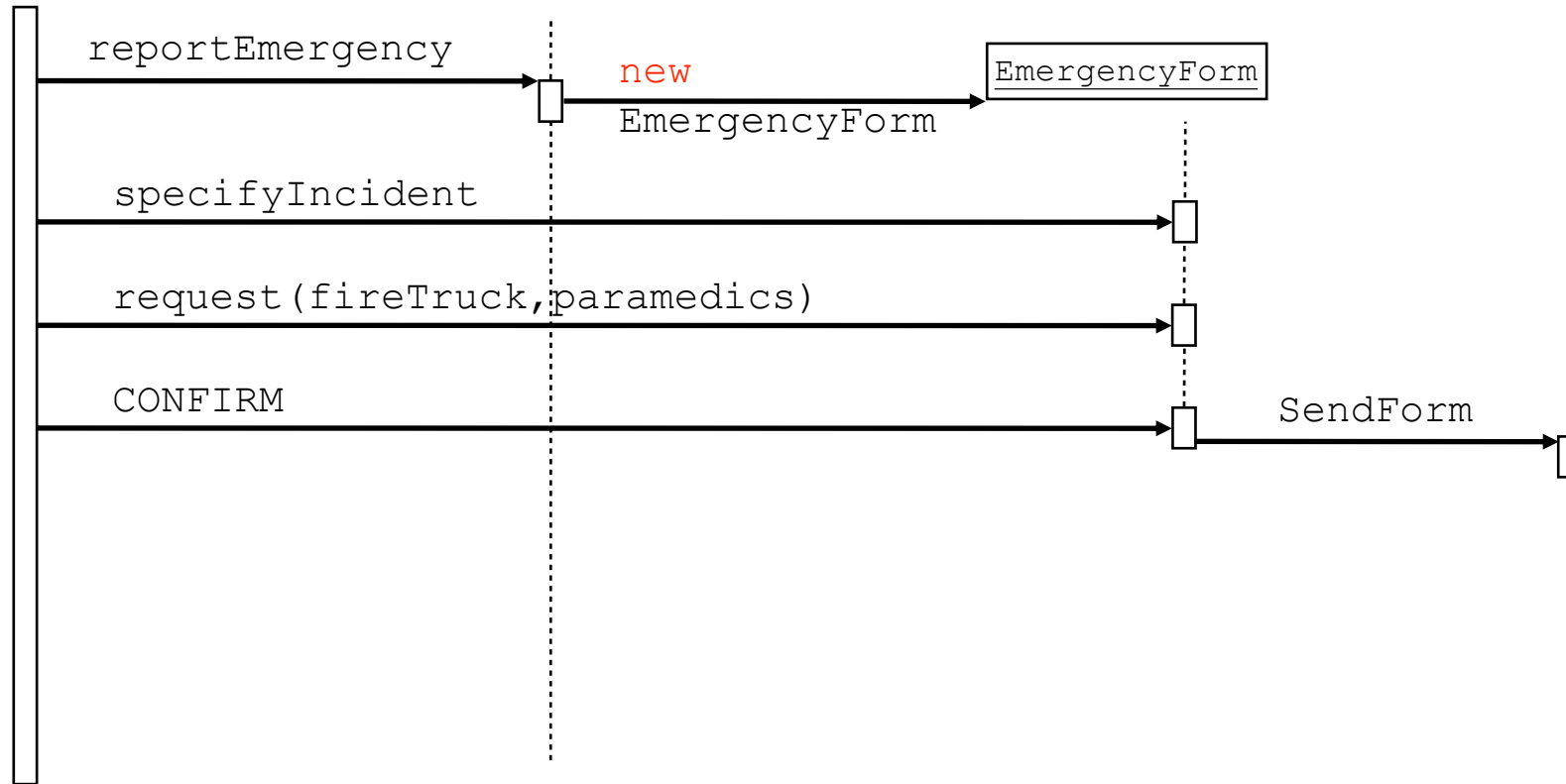


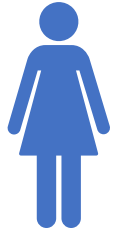
Alice

FRIEND



John



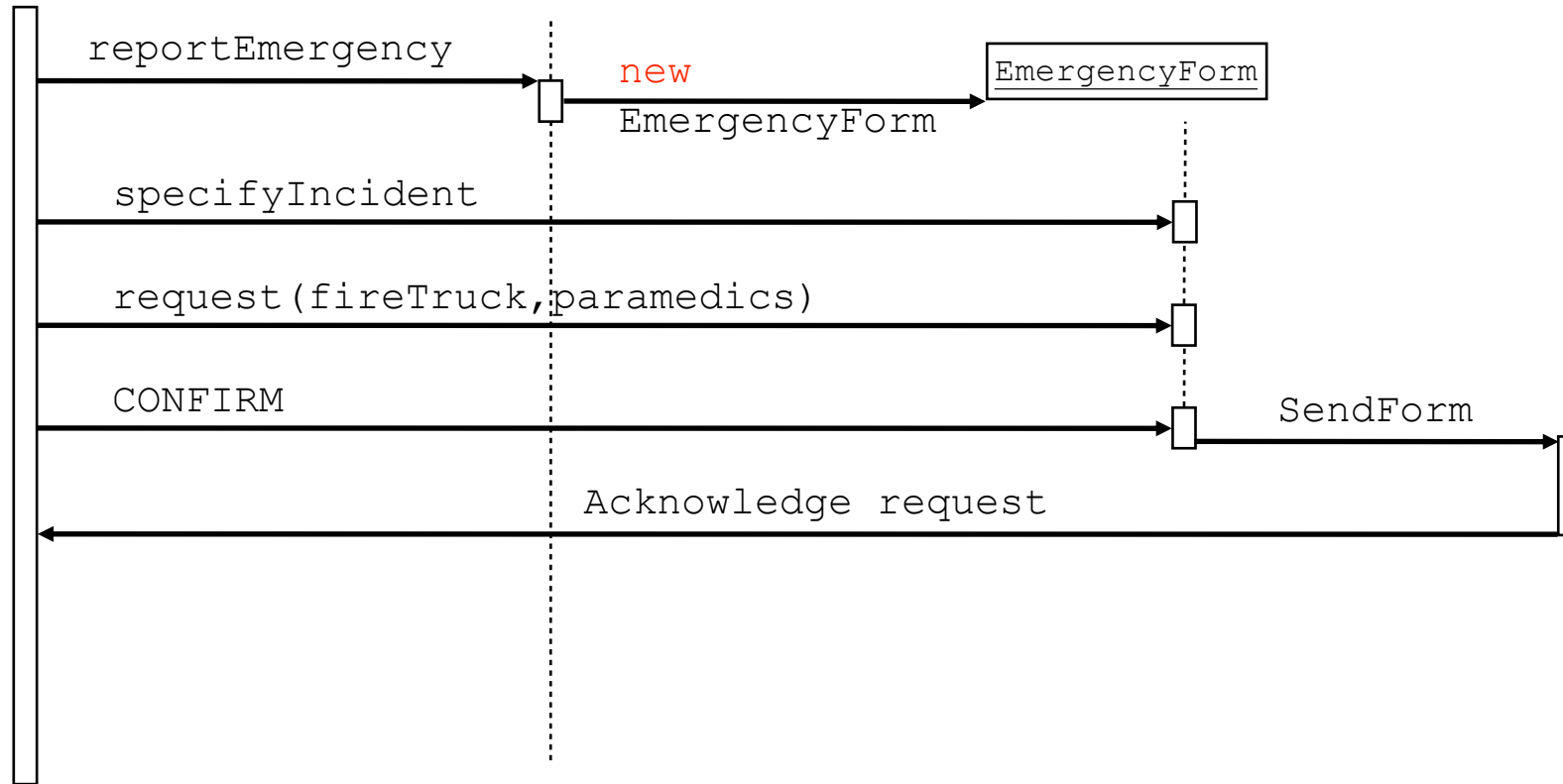


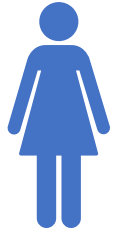
Alice

FRIEND



John



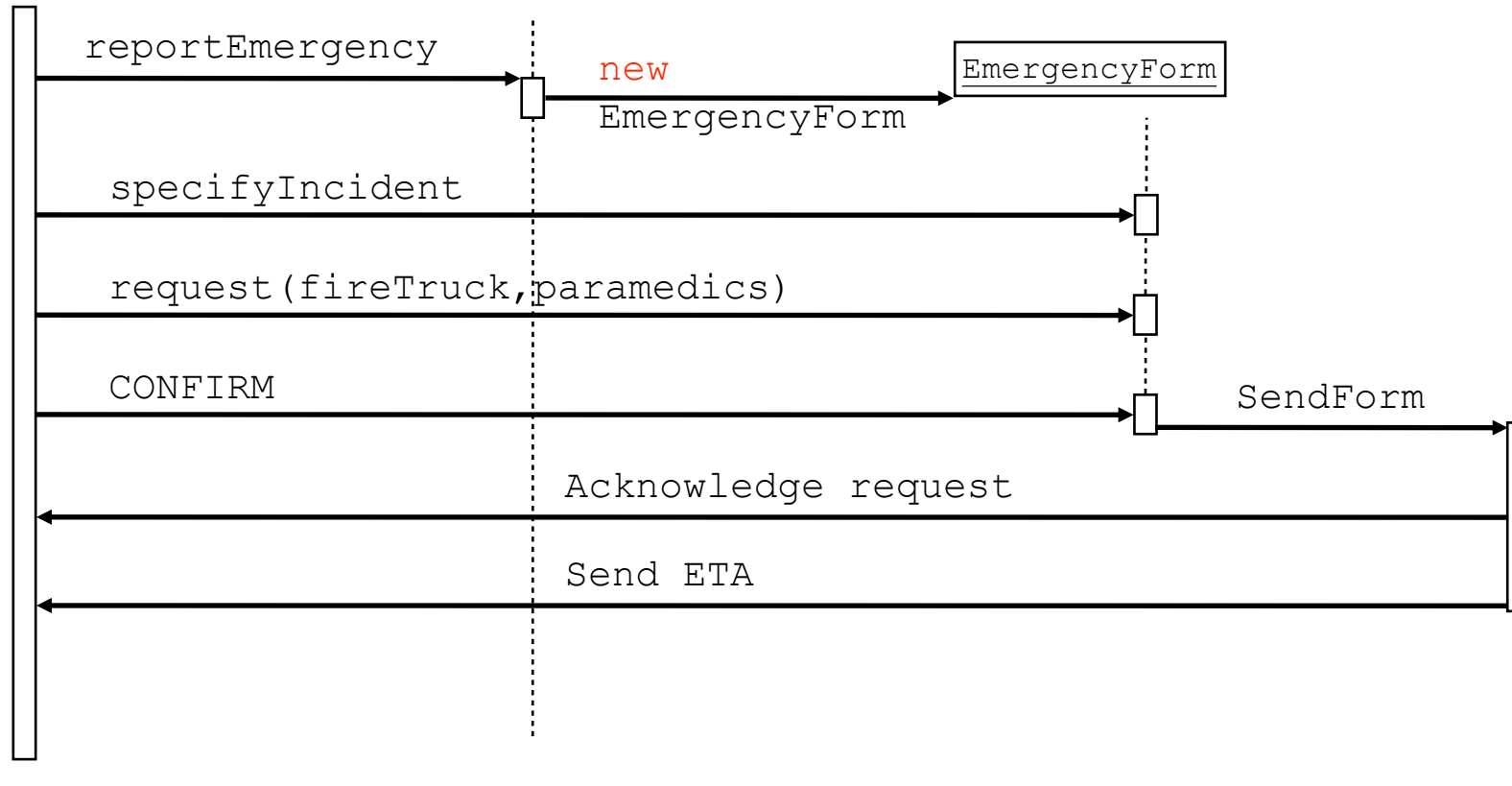


Alice

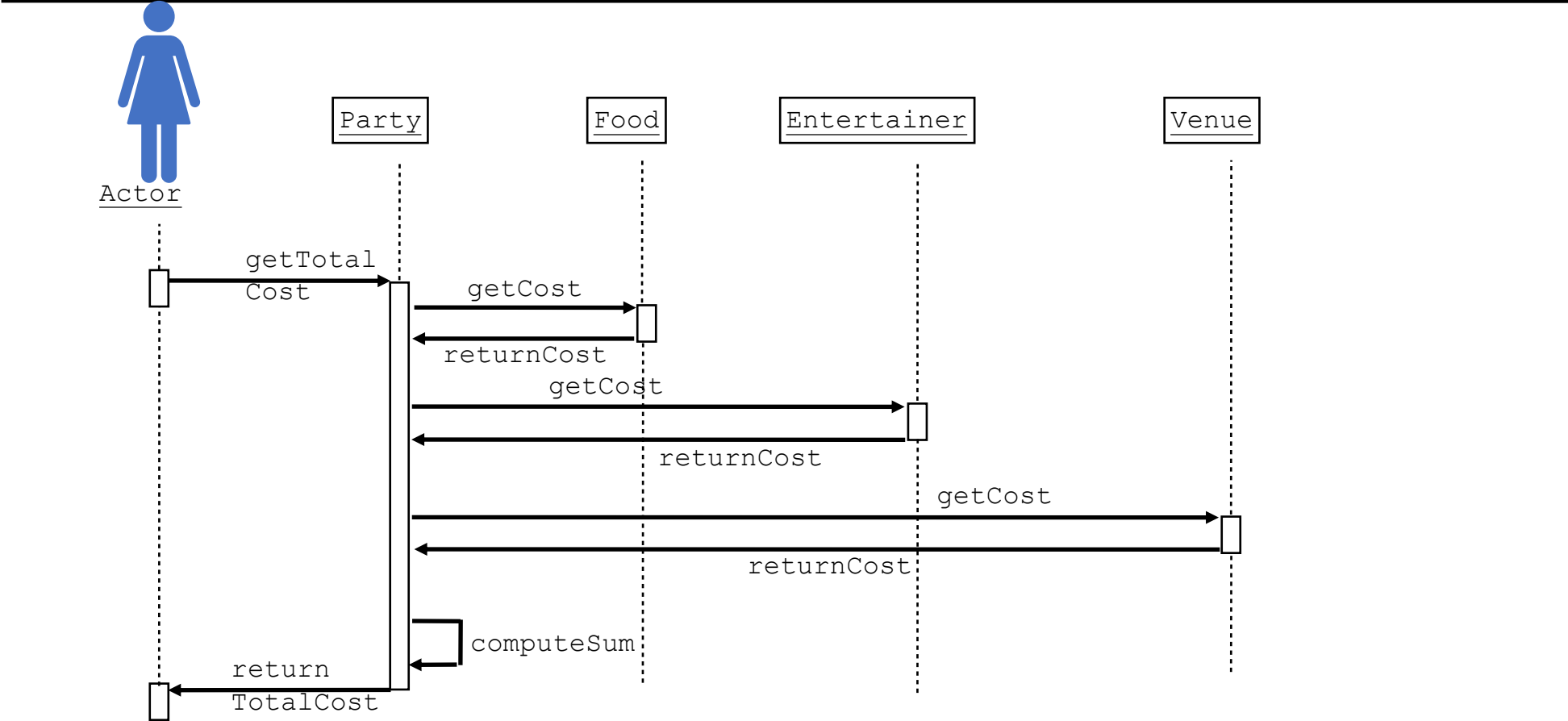
FRIEND



John



It is decided that the `getTotalCost` operation should be implemented by the object of class `Party` asking an object of each class `Food`, `Entertainer`, `Venue` for the value of its `cost` attribute, summing them and returning the result. Draw a sequence diagram that shows this behaviour being invoked by an actor.



Steve Orders a Pizza

A drama in four scenarios

- if not stated otherwise,
 - “phone” refers to Steve's IP Phone
 - “server” refers to the Call Relay Server

Scenario I variant A: Steve orders a pizza at the "Restaurante da Luigi",

1. Steve picks up the telephone receiver
2. The phone establishes a connection with the server
3. The phone produces a dial tone to signal that the connection was established.
4. Steve uses the dial pad to enter the number of Luigi's Pizza Service
5. The phone display shows the number digits as Steve types them in and transmits the digits to the server
6. The connection to the companies network is established and Luigi's phone starts ringing
7. The server reports the established connection back to the phone.
8. The phone produces a repeating one second interval tone to signal that the peer is ringing.
9. The server reports to the phone that Luigi has answered the call and that the talk line is now up.
10. The phone stops the ring tone and starts to transmit / receive PCM data.
11. Steve and Luigi talk (Steve orders the pizza, etc).
12. Steve hangs up.
13. The phone asks the server to terminate the connection.
14. The server terminates the connection and sends a confirmation to the phone.
15. The phone closes the connection to the server.
16. The display is cleared.

First, identify the participating components.

Then draw a sequence diagram for this Scenario.

