Sequence Diagram

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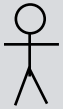
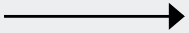
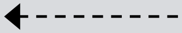
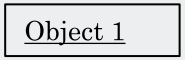
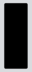
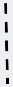
What is Sequence Diagram?

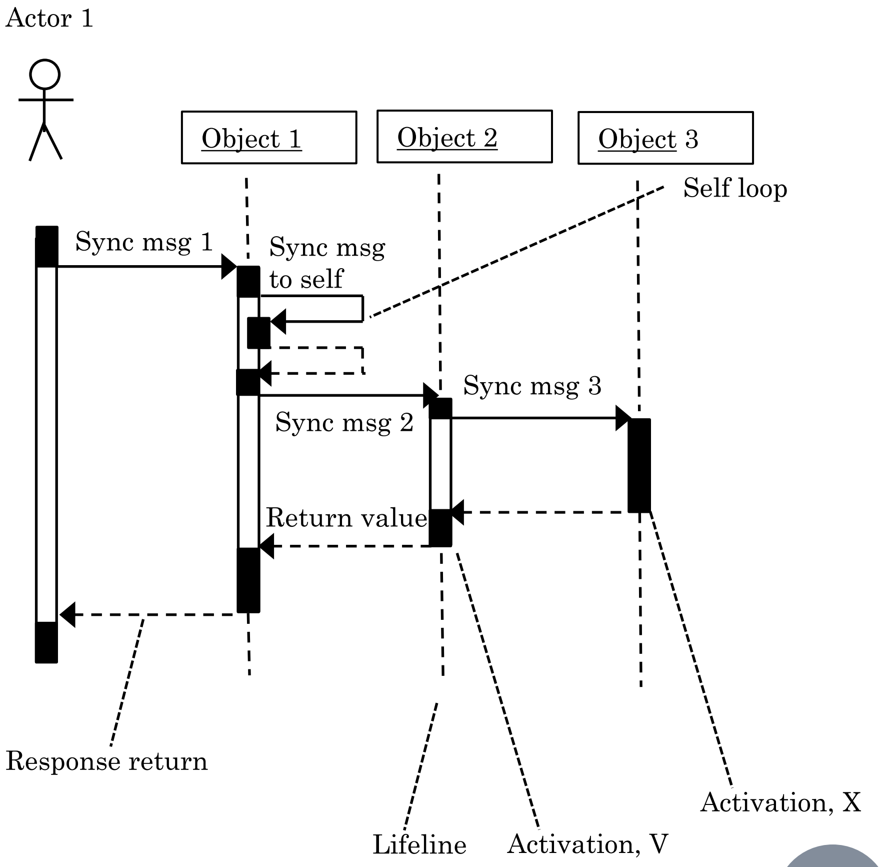
- A Sequence Diagram describes how objects talk with each other
- Sequence diagram emphasizes the time-ordered sequence of messages sent and received
- It focuses on flow of information

Symbols: Sequence Diagram

Symbols	Meaning
	Actor
	Message
	Response
	Object
	Activation
	Lifeline

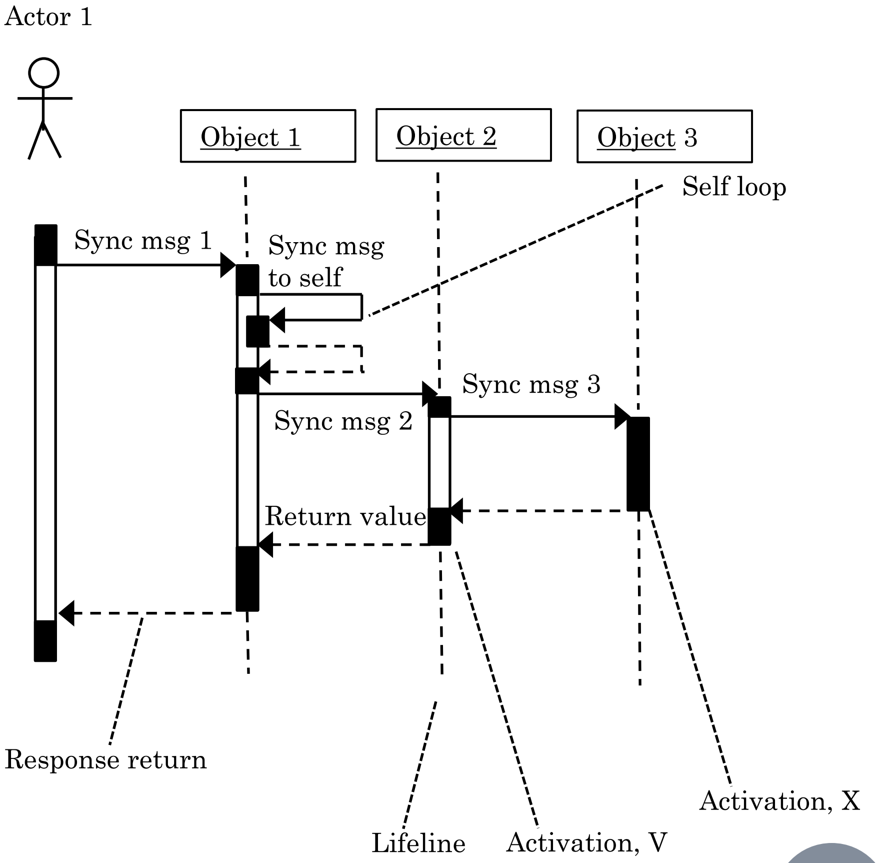
WHAT IS SEQUENCE DIAGRAM?

- Sequence diagram shows how actors and objects interact to realize a use case scenario
- Only shows actors and objects involved in the scenario
- Each object or actor is called a *participant* and is represented by an icon in a row across the top of the diagram
- Extending down the page from each participant is a dashed line called a *lifeline*



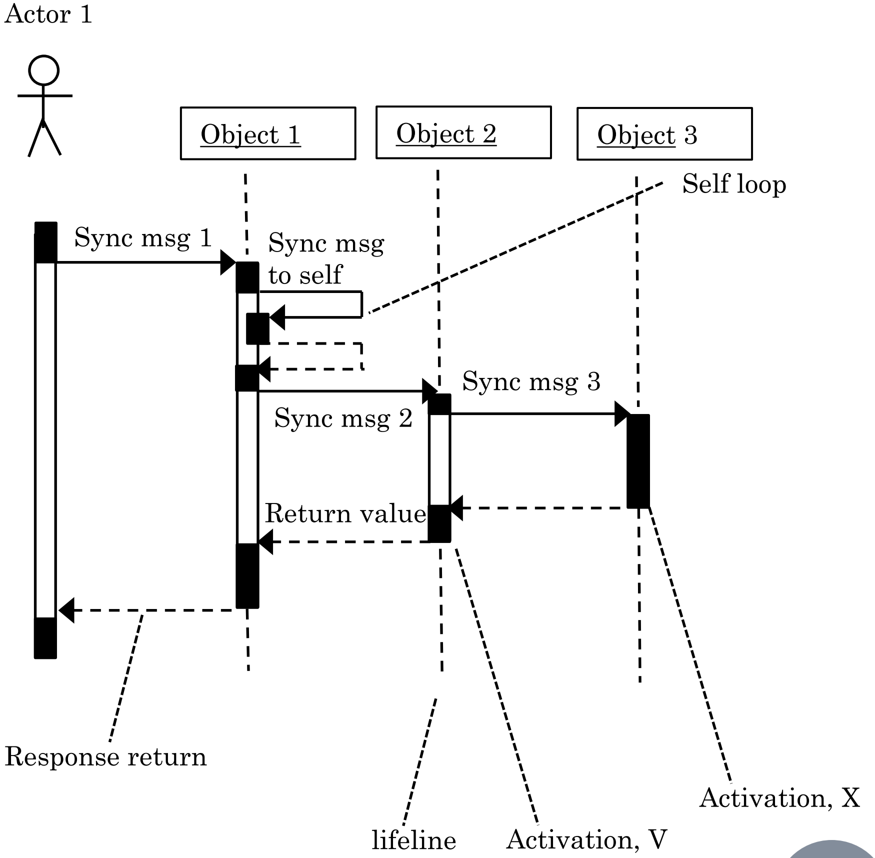
WHAT IS SEQUENCE DIAGRAM?

- Time is understood to move forward as we move down the diagram
- A message sent from participant Object 1 to participant Object 2 is represented by an arrow with a solid line drawn from the lifeline of Object 1 to the lifeline of Object 2 (sync msg 2)
- If Object 1 has to stop computing while Object 2 carries out the operation invoked by the message sent to it by Object 1, then this message is said to be synchronous and control is passed from Object 1 to Object 2
- A synchronous message is represented on a sequence diagram by an arrow with a solid black triangular head



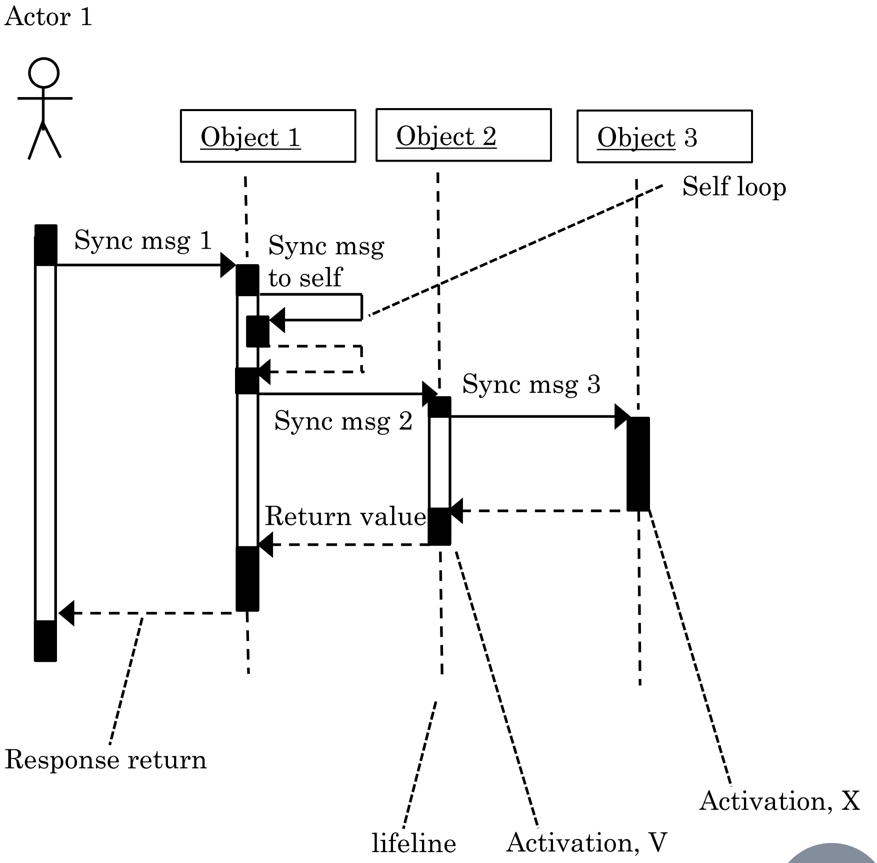
WHAT IS SEQUENCE DIAGRAM?

- When Object 2 receives the message, it starts to have a new live activation, denoted here by V
- This activation is represented by drawing a narrow rectangle covering the lifeline of Object 2, starting at the point where the arrow representing the message from Object 1 hits the lifeline of Object 2
- In a procedural interaction (no concurrency), exactly one object is computing at any given instant
- If Object 2 sends a message to another object, Object 3, Object 2 may stop computing temporarily while Object 3 starts to have a new live activation, X
- Object 2 will continue to have the live activation, V, until it has finished carrying out the operation invoked by the message, sync msg 2, sent to it by Object 1



WHAT IS SEQUENCE DIAGRAM?

- At the end of its activation, Object 2 might send a return value to Object 1, indicated by the dashed arrow with the stick head shown
- Can indicate when an object is computing by shading those periods on the activations
- For readability, the participants should generally be arranged in the order in which they first participate in the interaction
- This means that most of the message sends are represented by arrows that go from left to right
- If an object of class, Object 1 sends a message to an object of class, Object 2 in a sequence diagram, this implies that there is an association between class, Object 1 and class, Object 2 in the class model



What is Sequence Diagram?

- In procedural systems, only actors can initiate activity by sending a message "out of the blue"
- System objects can only send messages when they have been made active by receiving a message from another object
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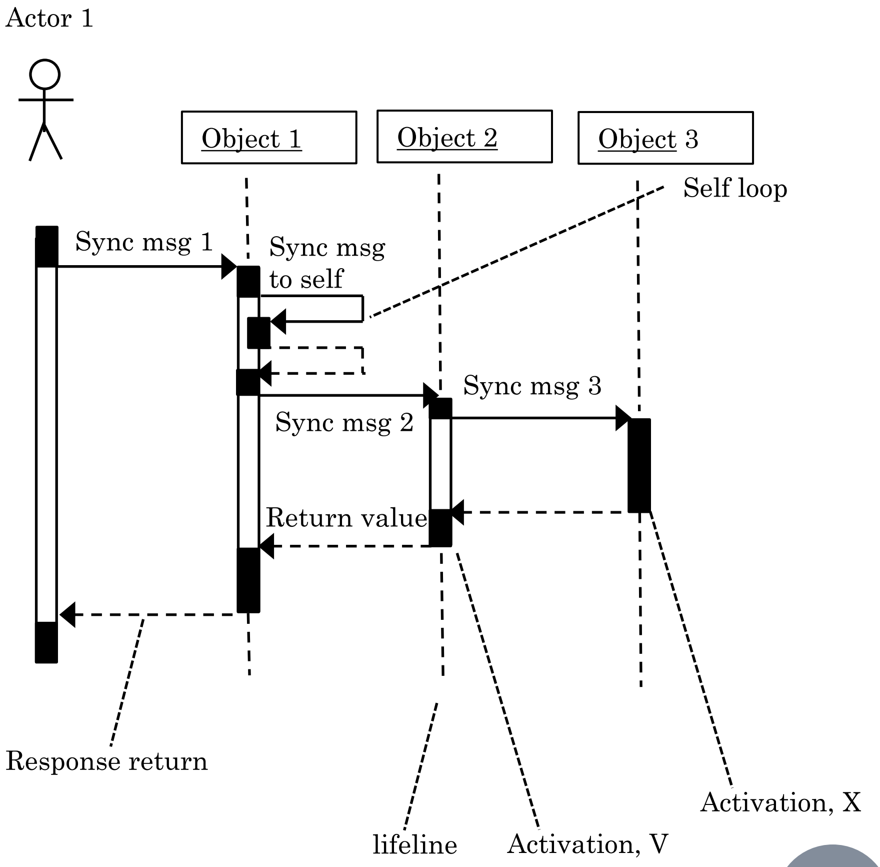
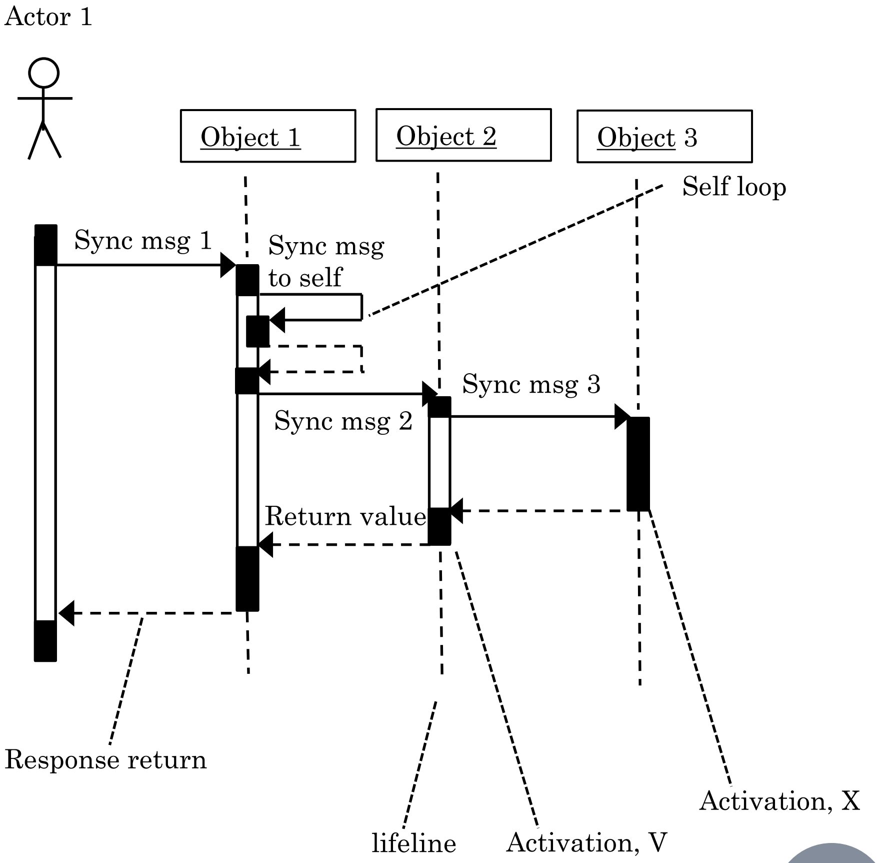
- At any given instant there will be a stack of live activations and the one at the top of the stack will be the one that currently has control and is computing



WHAT IS SEQUENCE DIAGRAM?

- All the other activated objects are waiting to receive control back from objects to which they have sent messages
- If the object whose activation is currently at the top of the stack (e.g., Object 2) sends a message, then the object that receives this message (Object 3) becomes active and its activation (X) becomes the top of the stack
- If the activation X of the object, Object 3, is at the top of the stack and it terminates, then its activation is removed from the stack and control returns to the object, Object 2 whose message send, sync msg 3, started the activation X
- The activation V during which sync msg 3 was sent then becomes the new top of



What is Sequence Diagram?

- If an object sends a message to itself, then the object gets another new live activation
- That is, the object now has two live activations on the stack
- Represented on sequence diagram by a nested activation, with activation resulting from message to self slightly offset from older activation
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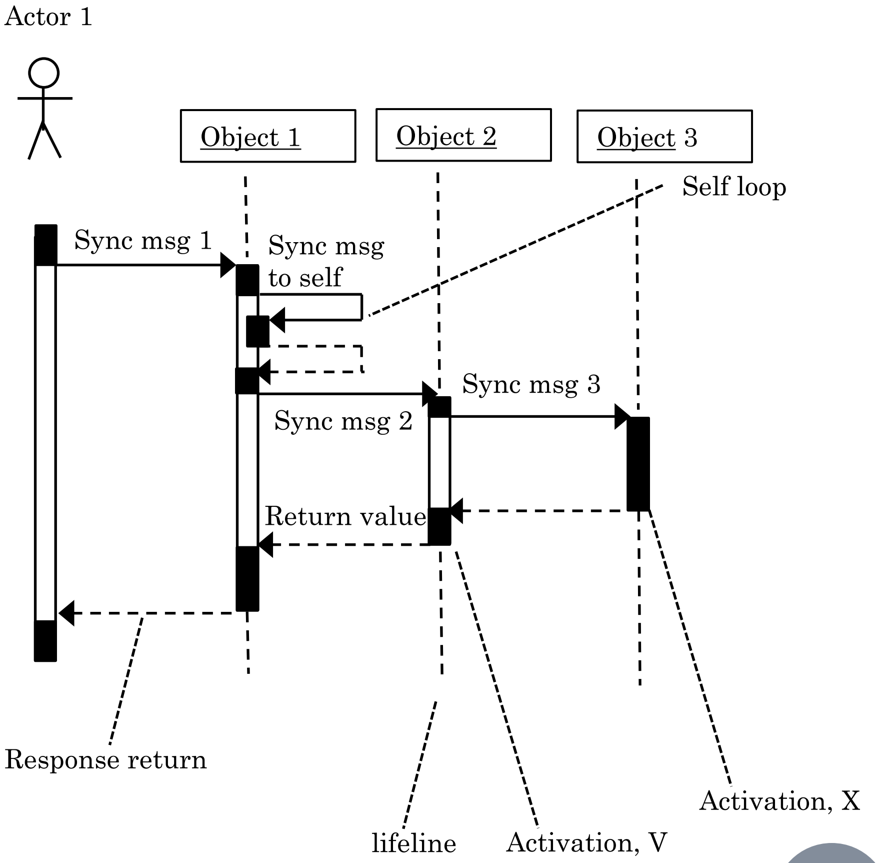

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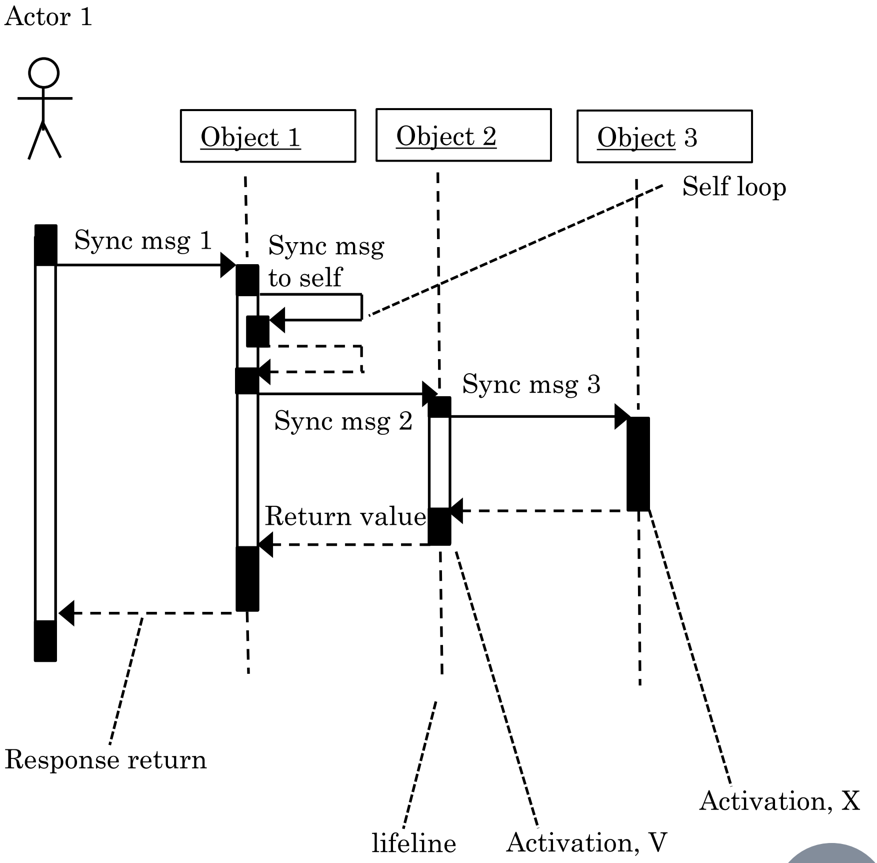
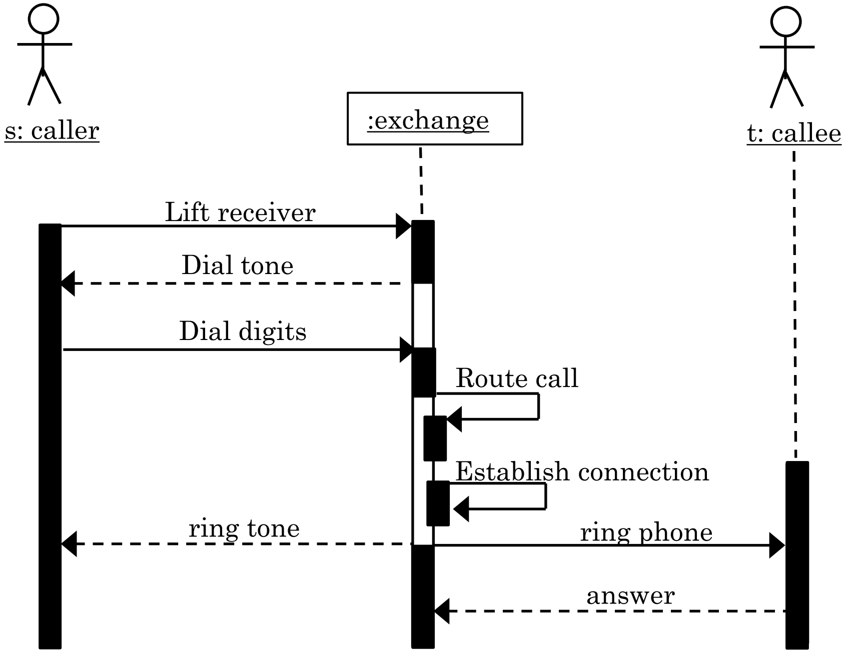


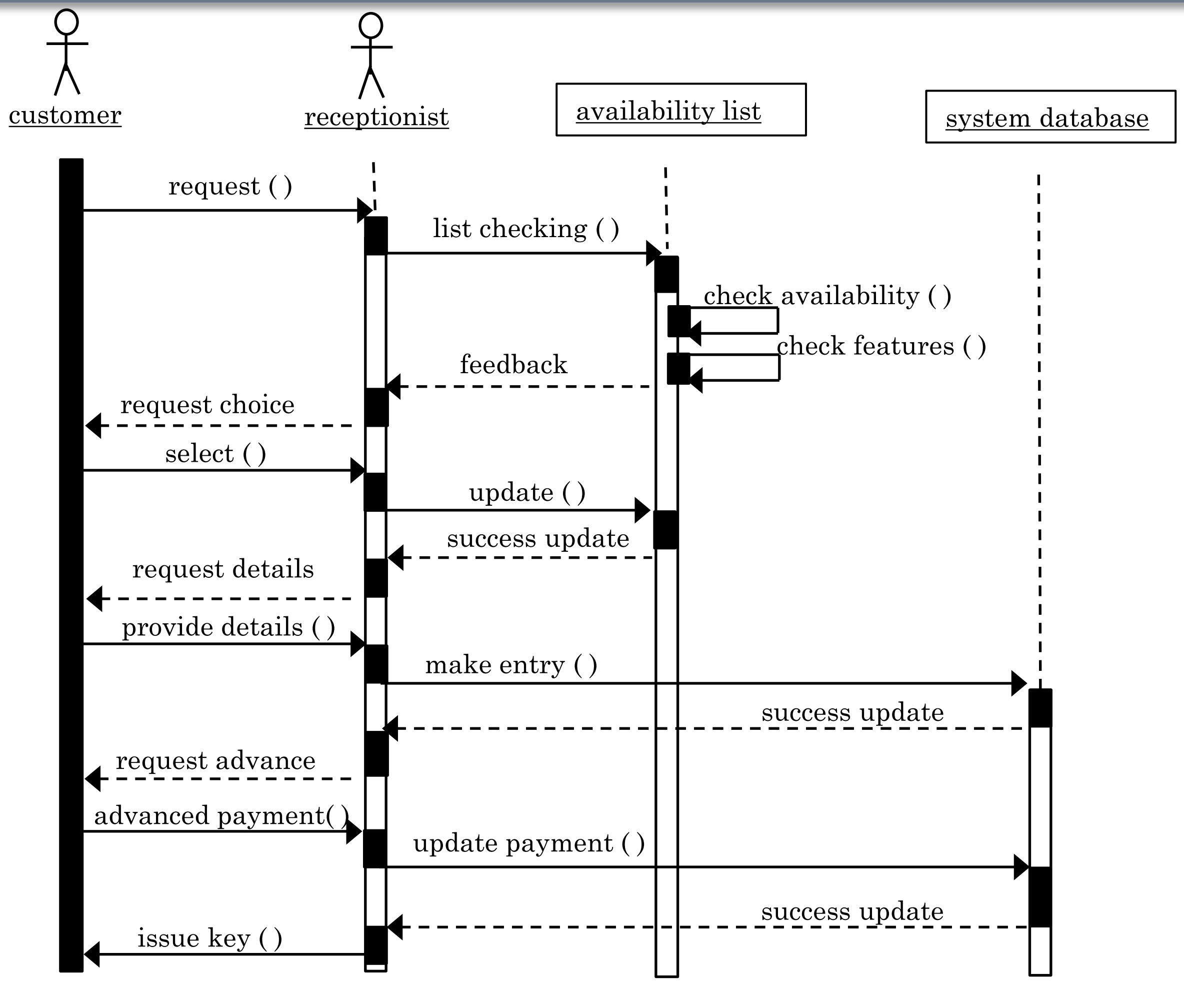
Example: Telephone Call



Assignment: Hotel Room Booking System

- A customer arrives in a hotel
- He/She wants a room
- Receptionist is there for
  - Checking availability of rooms
  - Taking details
  - Taking payment in advanced
  - Final issue of key
- Make sequence diagram

Solution: Hotel Room Booking System



THANK YOU