Use Case Diagrams & Sequence Diagrams

SE3A04 – Tutorial

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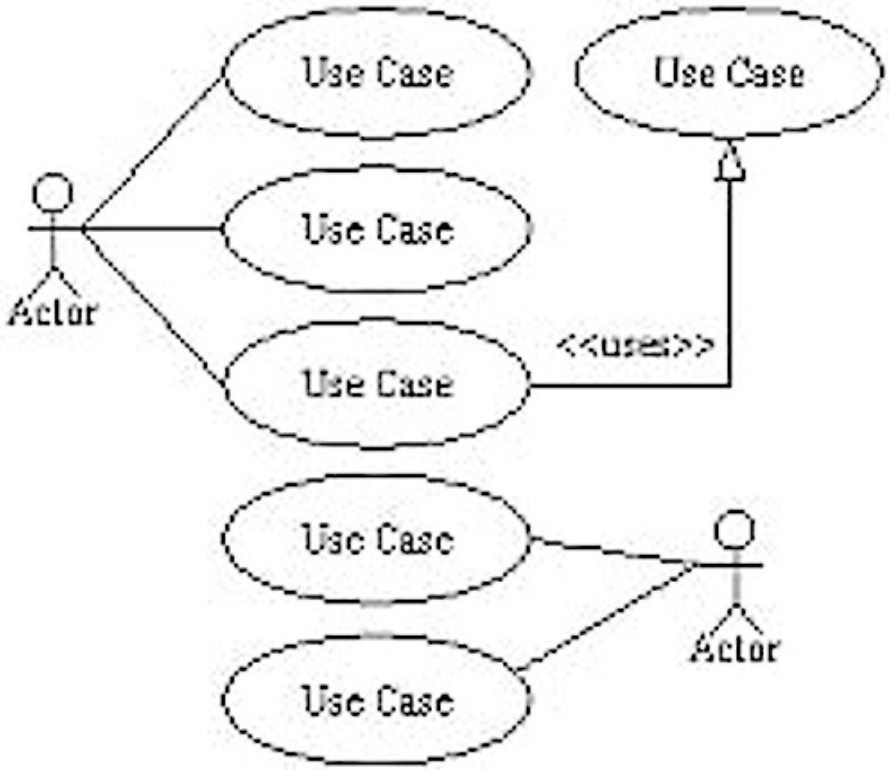
Outline

Use Case Diagrams

Definition (Use Case Diagram)

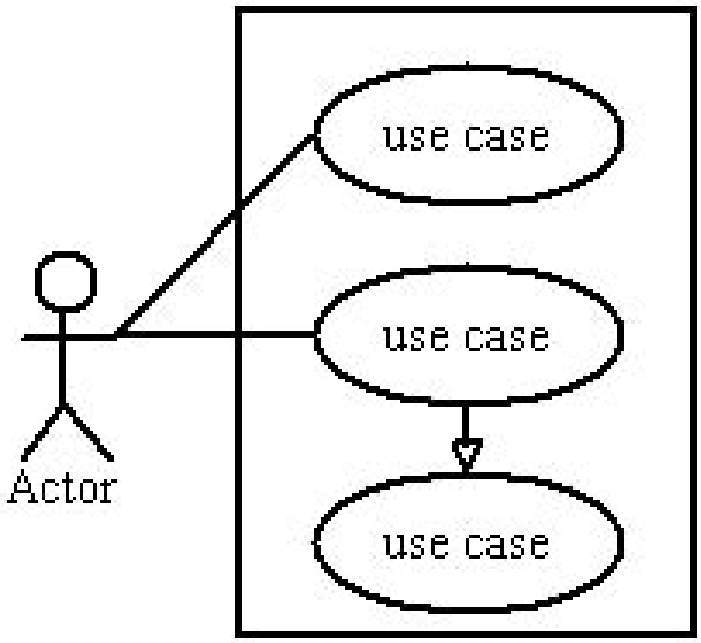
Use case diagrams model the functionality of system using actors and use cases.



Use Case Diagrams

System

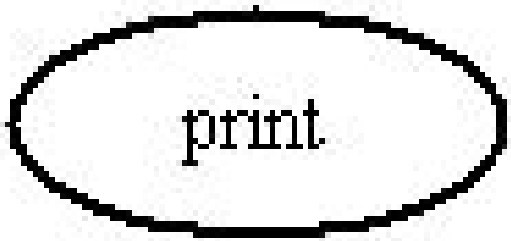
- Draw your system's boundaries using a rectangle that contains use cases
- Place actors outside the system's boundaries



Use Case Diagrams

Use Cases

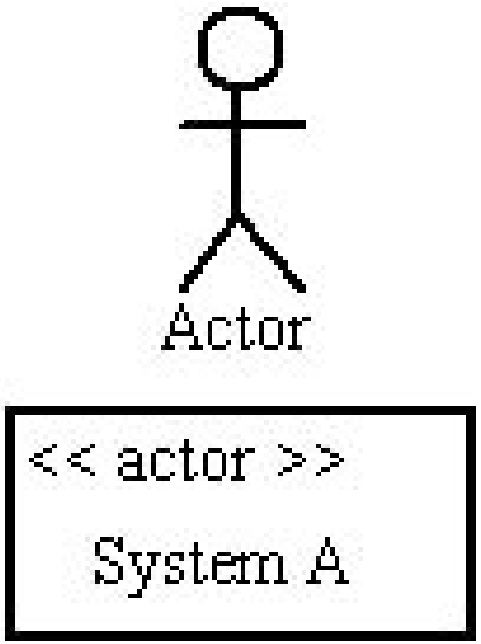
- Draw use cases using ovals
- Label with ovals with verbs that represent the system's functions



Use Case Diagrams

Actors

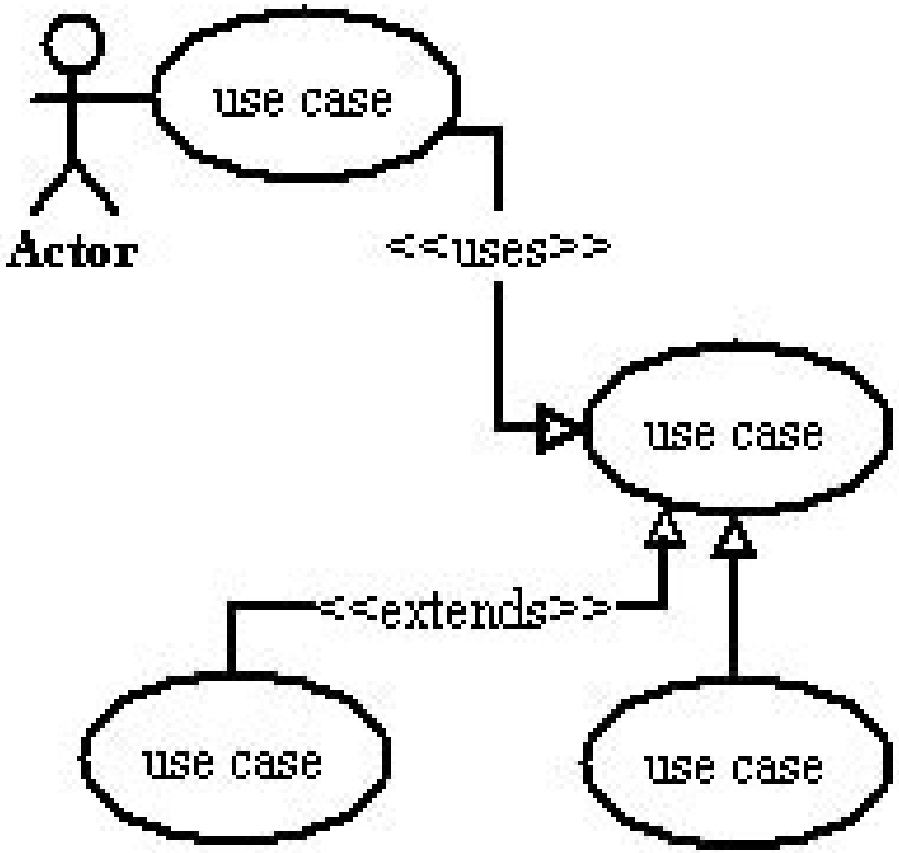
- **Actors** are the users of a system
- When one system is the actor of another system, label the actor system with the «actor» stereotype



Use Case Diagrams
Relationships

- Illustrate relationships between an actor and a use case with a simple line
- For relationships among use cases, use arrows labeled either «uses» (or «includes») or «extends»
- A «uses» relationship indicates that one use case is needed by another in order to perform a task
- An «extends» relationship indicates alternative options under a certain use case

Use Case Diagrams
Relationships



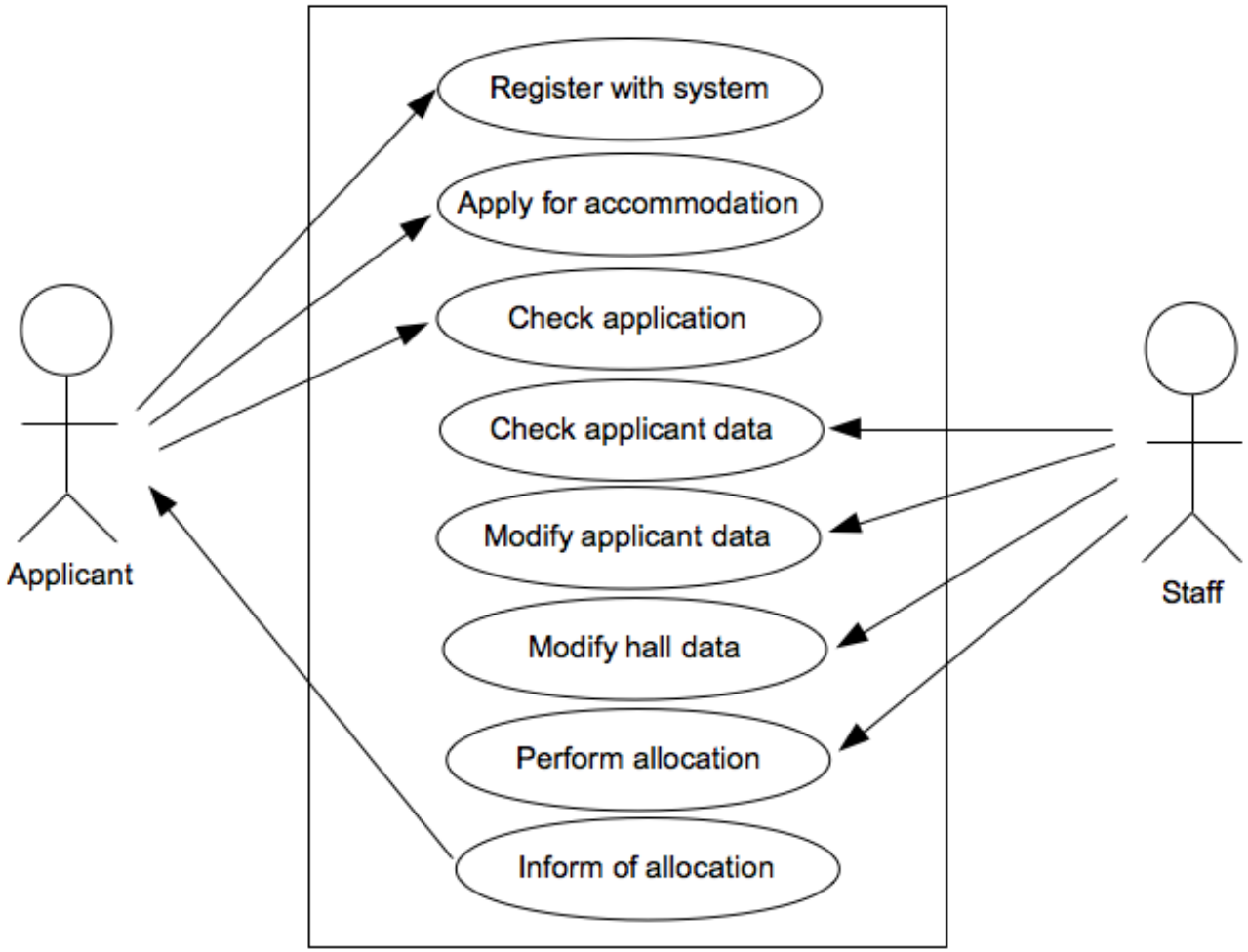
Use Case Diagrams
Example

Example

Draw a use case diagram to represent the following system.

- Over the summer holiday, university students can book college hall accommodation online. They must specify their name, student number, course, year, and identify three college residences as their preferences.
- The system makes an allocation of students to rooms before the start of the term, trying, where possible, to allocate students to a room in one of their preferred halls.

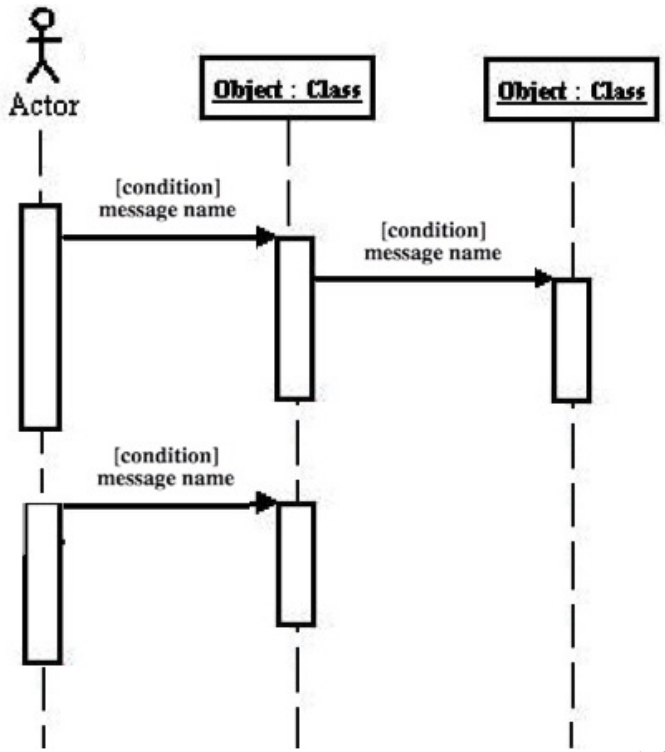
Use Case Diagrams
Example



Sequence Diagrams

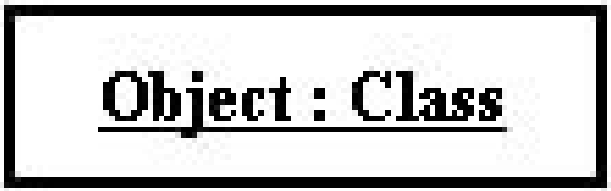
Definition (Sequence Diagram)

Sequence diagrams describe interactions among classes in terms of an exchange of messages over time.



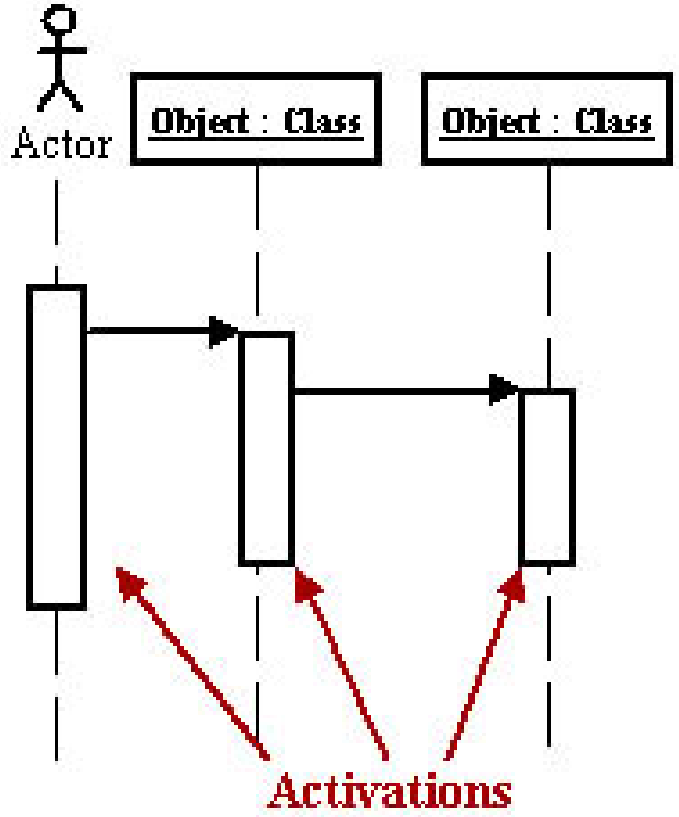
Sequence Diagrams
Class Roles

- **Class roles** describe the way an object will behave in context
- Use the UML object symbol to illustrate class roles, but don't list object attributes



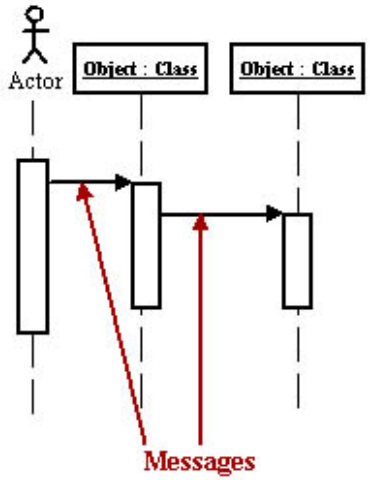
Sequence Diagrams
Activation

- **Activation** boxes represent the time an object needs to complete a task



Sequence Diagrams
Messages

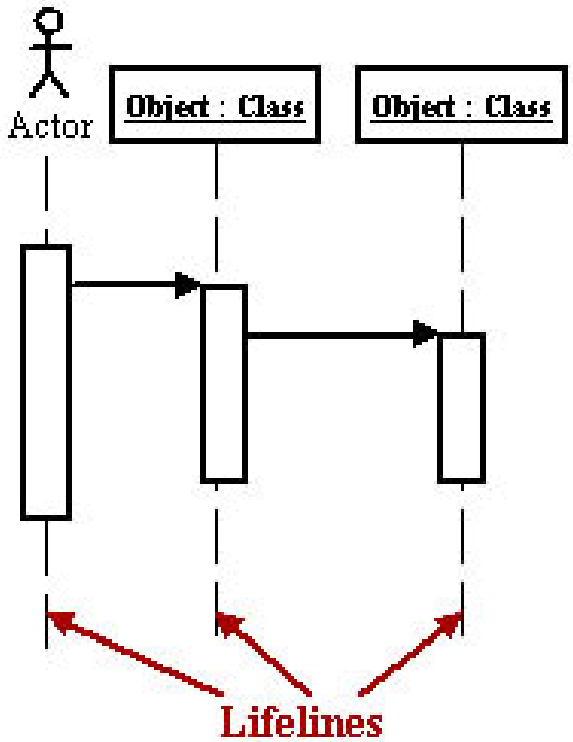
- **Messages** are arrows that represent communication between objects
- Use half-arrowed lines to represent asynchronous messages
- **Asynchronous messages** are sent from an object that will not wait for a response from the receiver before continuing its tasks



Arrow	Message type
→	Simple
→	Synchronous
→	Asynchronous
↱	Balking
⏲→	Time out

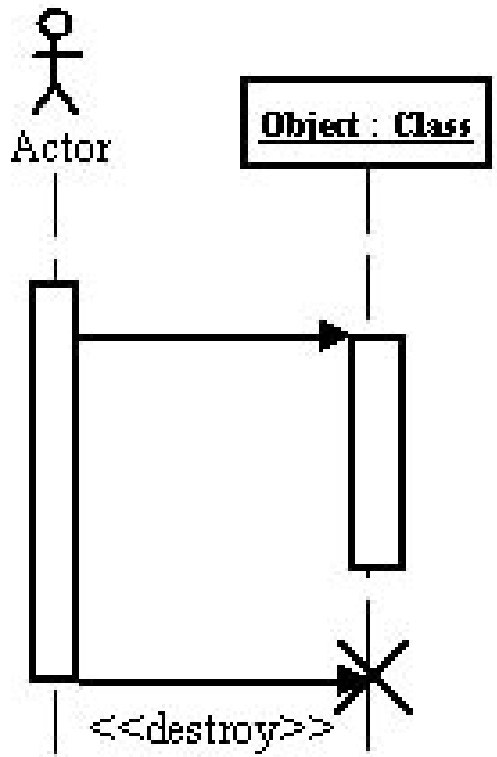
Sequence Diagrams
Lifelines

- **Lifelines** are vertical dashed lines that indicate the object's presence over time



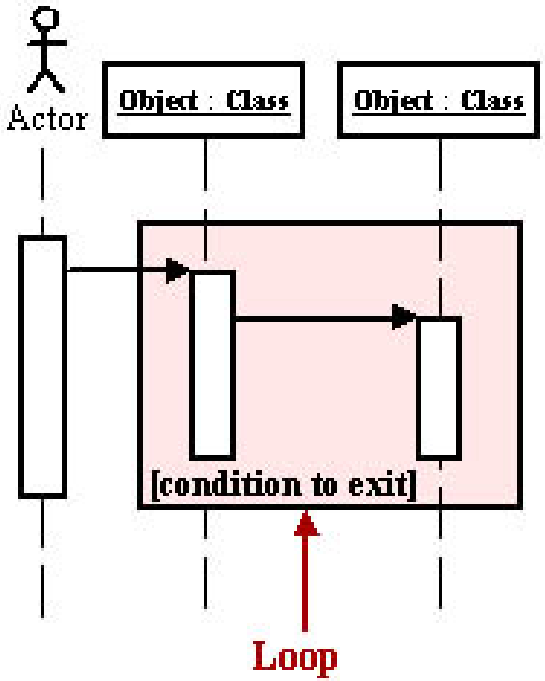
Sequence Diagrams
Destroying Objects

- Objects can be terminated early using an arrow labeled «destroy» that points to an ×



Sequence Diagrams
Loops

- A repetition or loop within a sequence diagram is depicted as a rectangle
- Place the condition for exiting the loop at the bottom left corner in square brackets [ ]

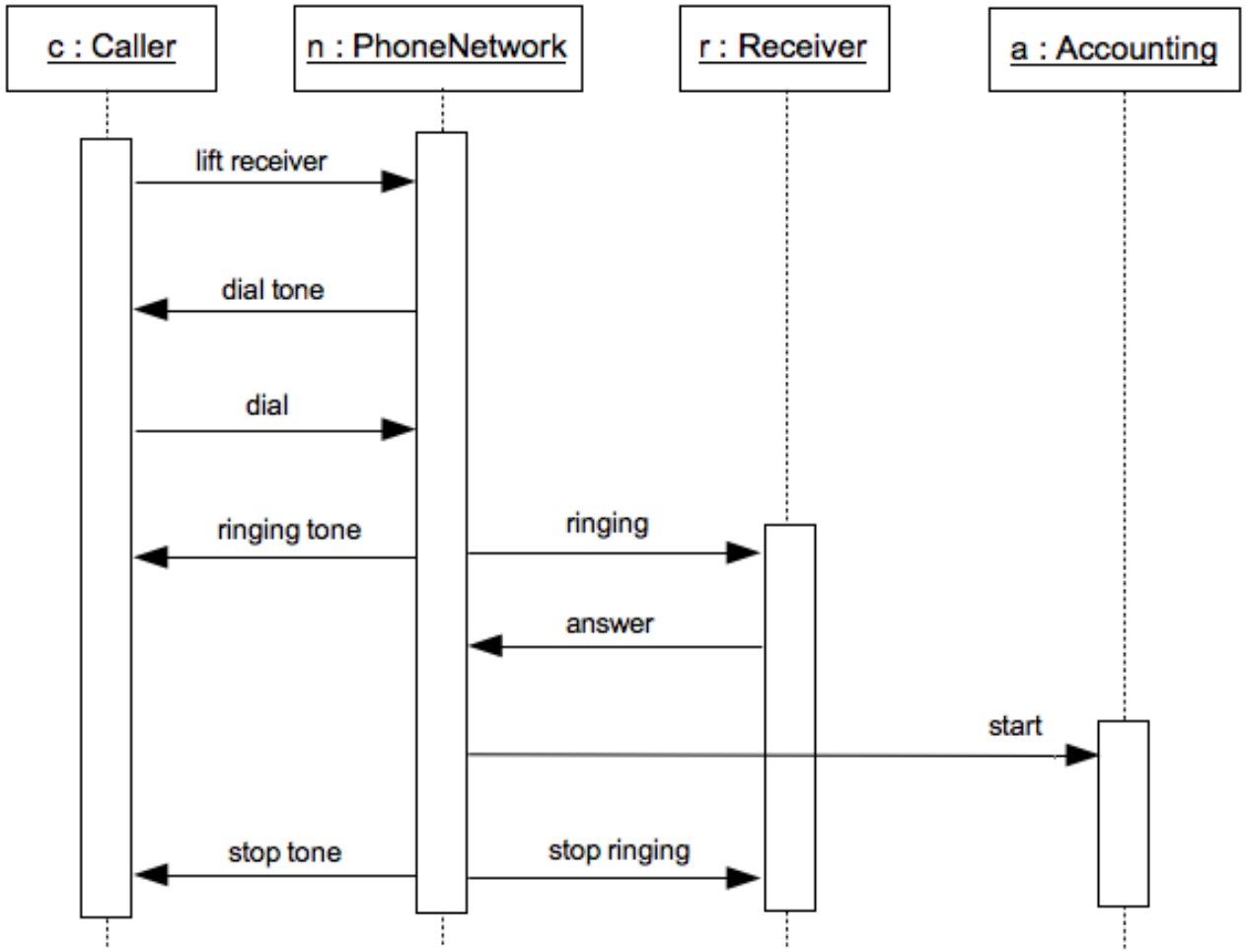


Sequence Diagrams
Example

Example

Draw a sequence diagram representing the process of making a phone call from a cell phone.
Hint*: The objects involved include the caller, the phone network, the receiver of the phone call, and the cell phone accounting department.

Sequence Diagrams
Example



Questions

- Questions?