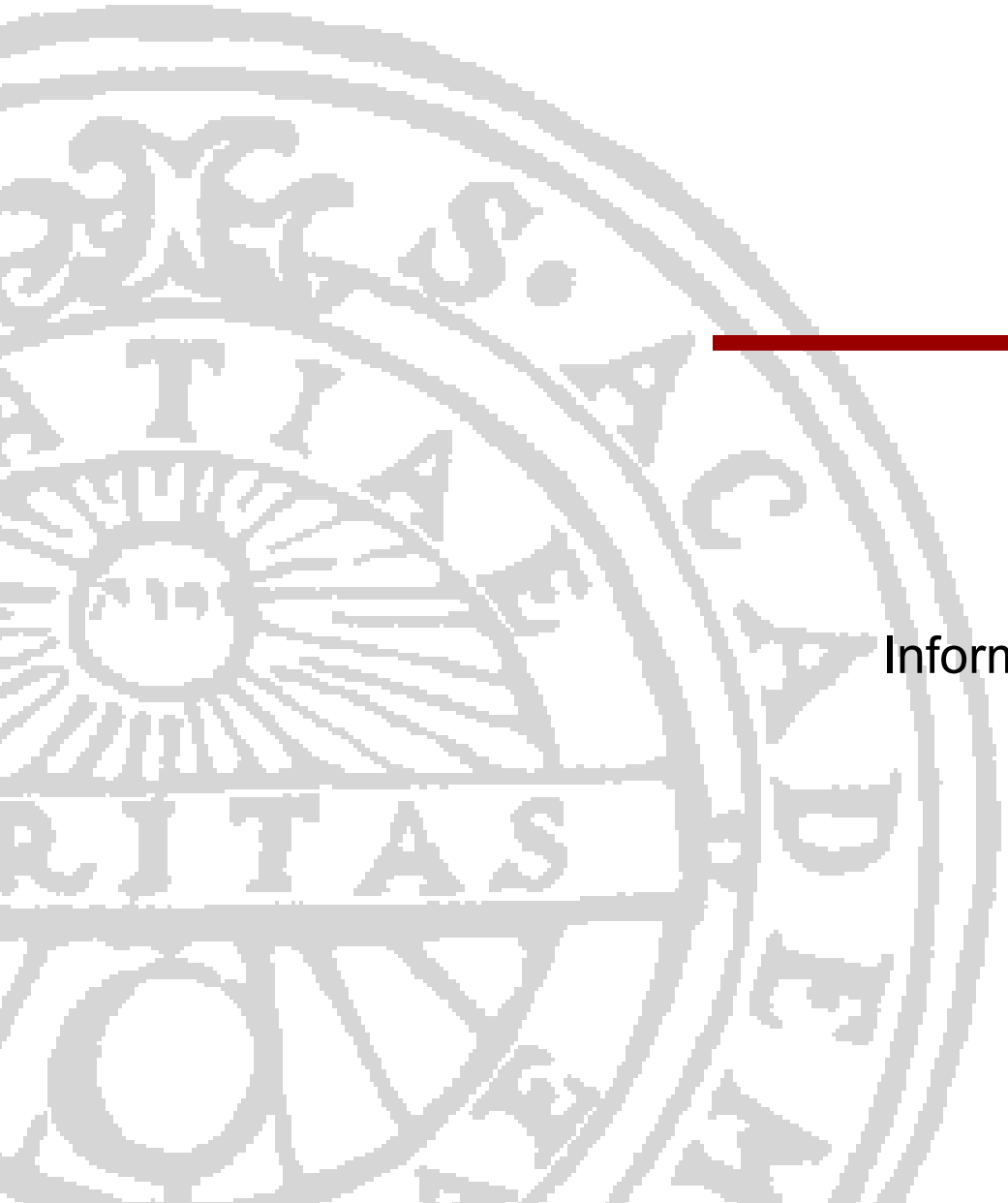

UML Tutorial

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Lecture Plan

- Use Case Diagrams
- Class Diagrams
- State Machine Diagrams (or Statecharts)
- Activity Diagrams
- Sequence Diagrams
- Communication Diagrams

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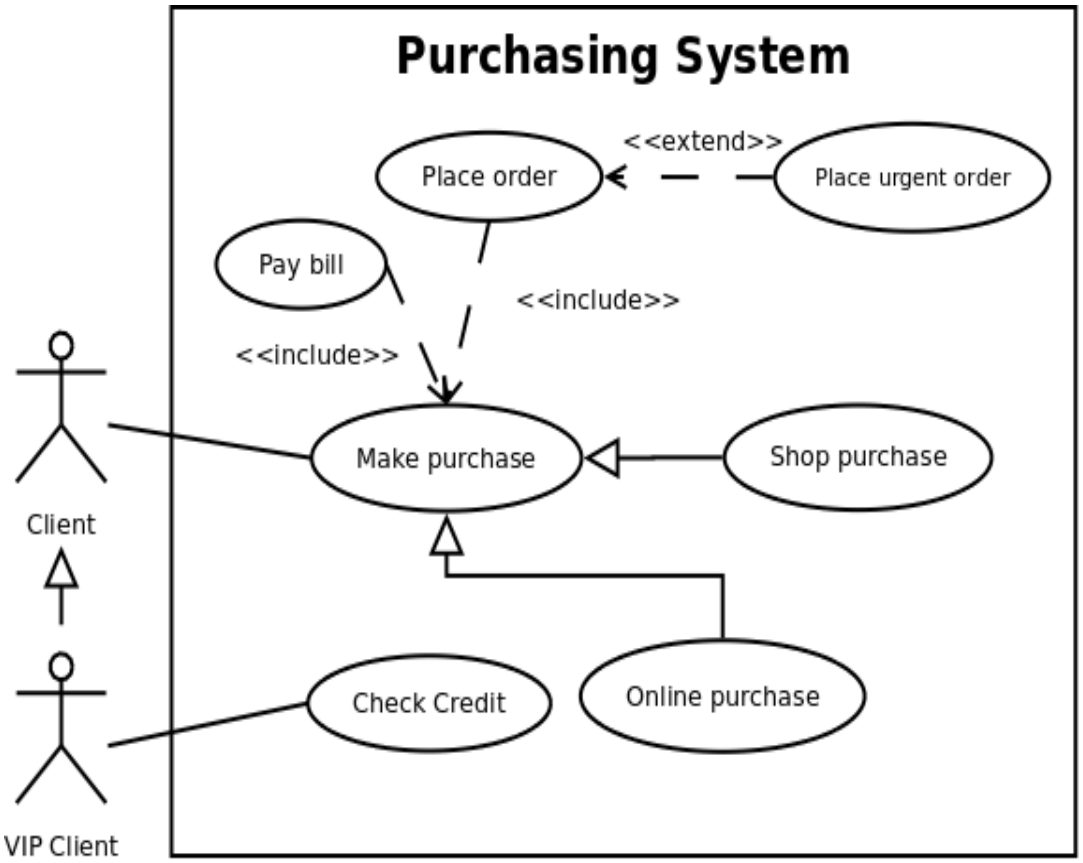
Use Case diagrams



When and why do we use usecase diagrams?

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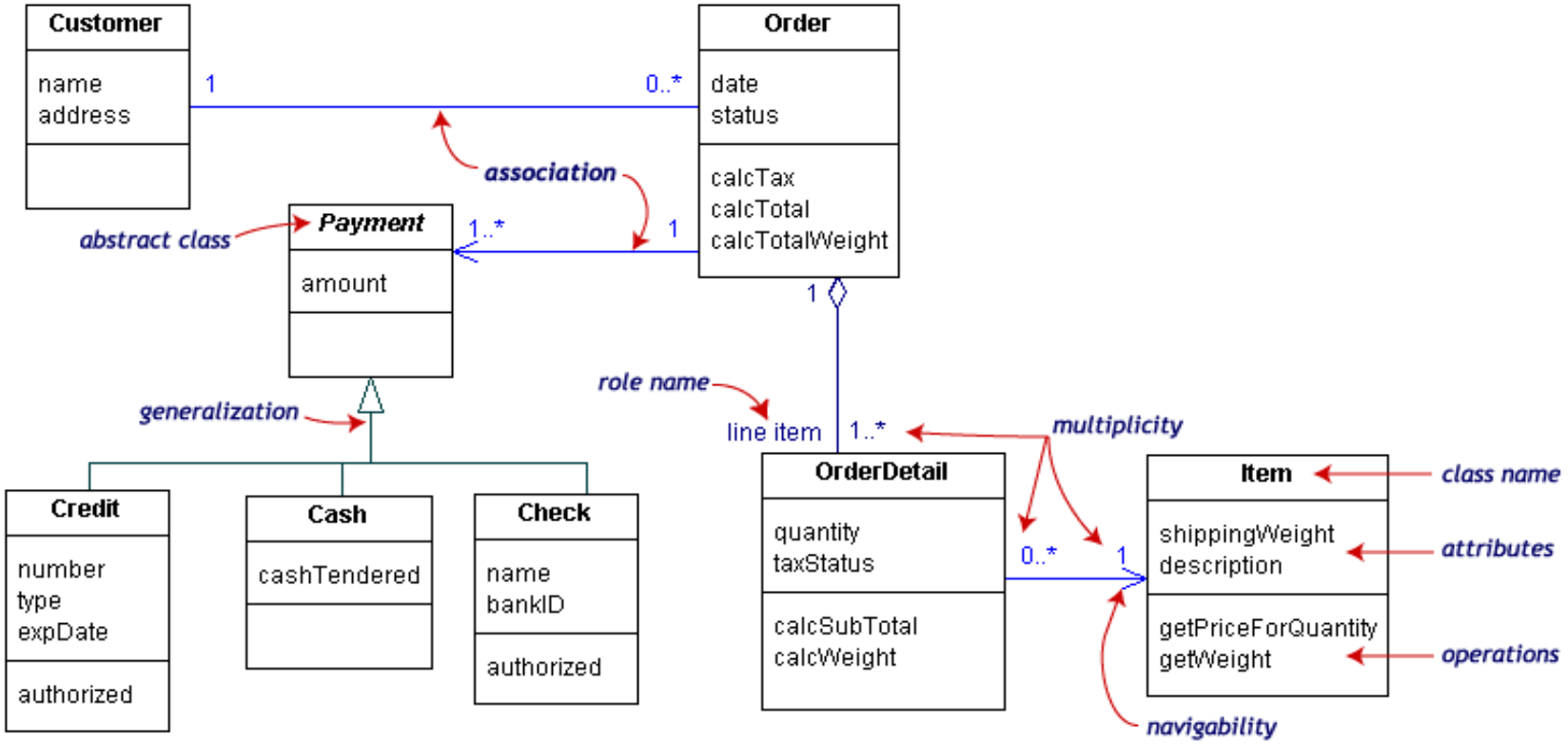
Use Case Diagram - notes

- Usage: Use case diagrams give an outsider's view of a system. It explains what system must do, but not how.
- Important modelling notes:
  - <<*include*>> specifies that task is a subtask for another one.
  - <<*extend*>> defines special behaviour that occurs under certain conditions
  - Actors MUST be outside System box

Class Diagrams



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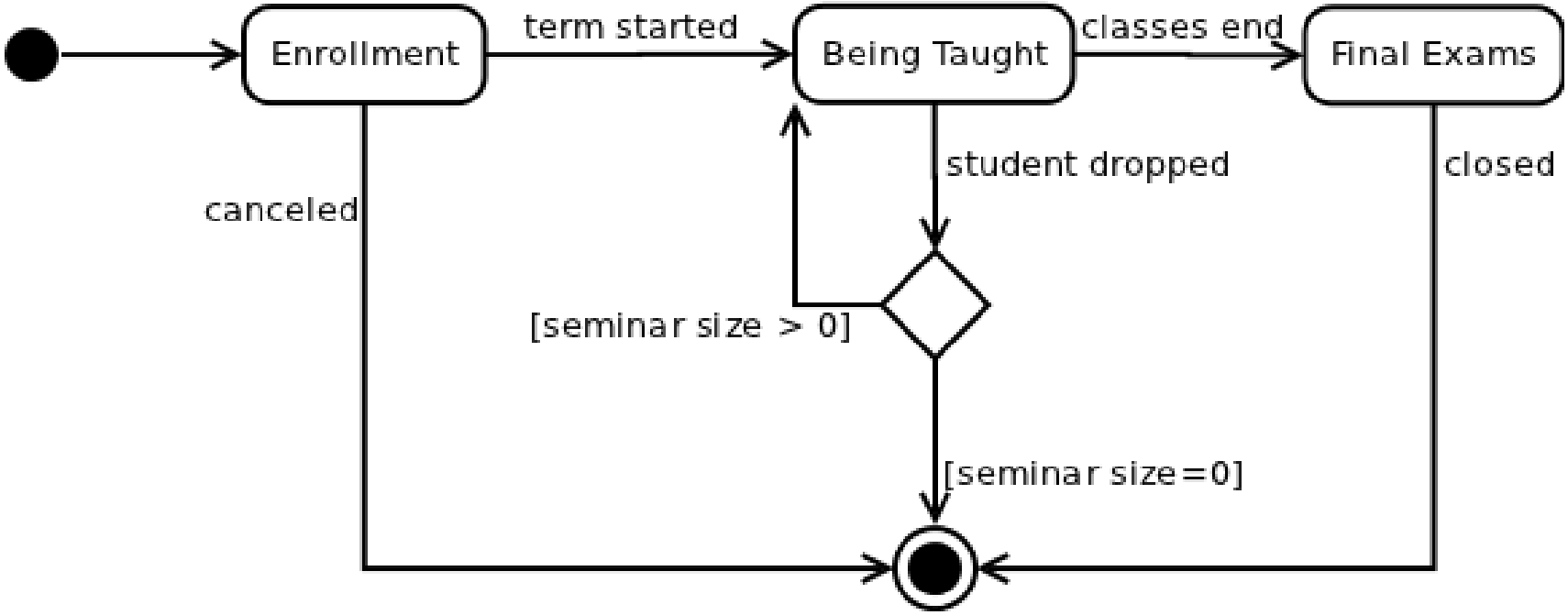
Class Diagrams - notes

- Usage: Diagram gives an overview of a system by showing its classes and the relationships among them.
- Important modelling notes:
  - association -- a relationship between instances of the two classes.
  - aggregation -- an association in which one class belongs to a collection.
  - generalization -- an inheritance link indicating one class is a superclass of the other.

Class Diagrams – notes II

- Relationship properties:
  - Name
  - Navigability
  - Multiplicity
- **BEWARE**: Some sources include dependency link and treat aggregation as association link

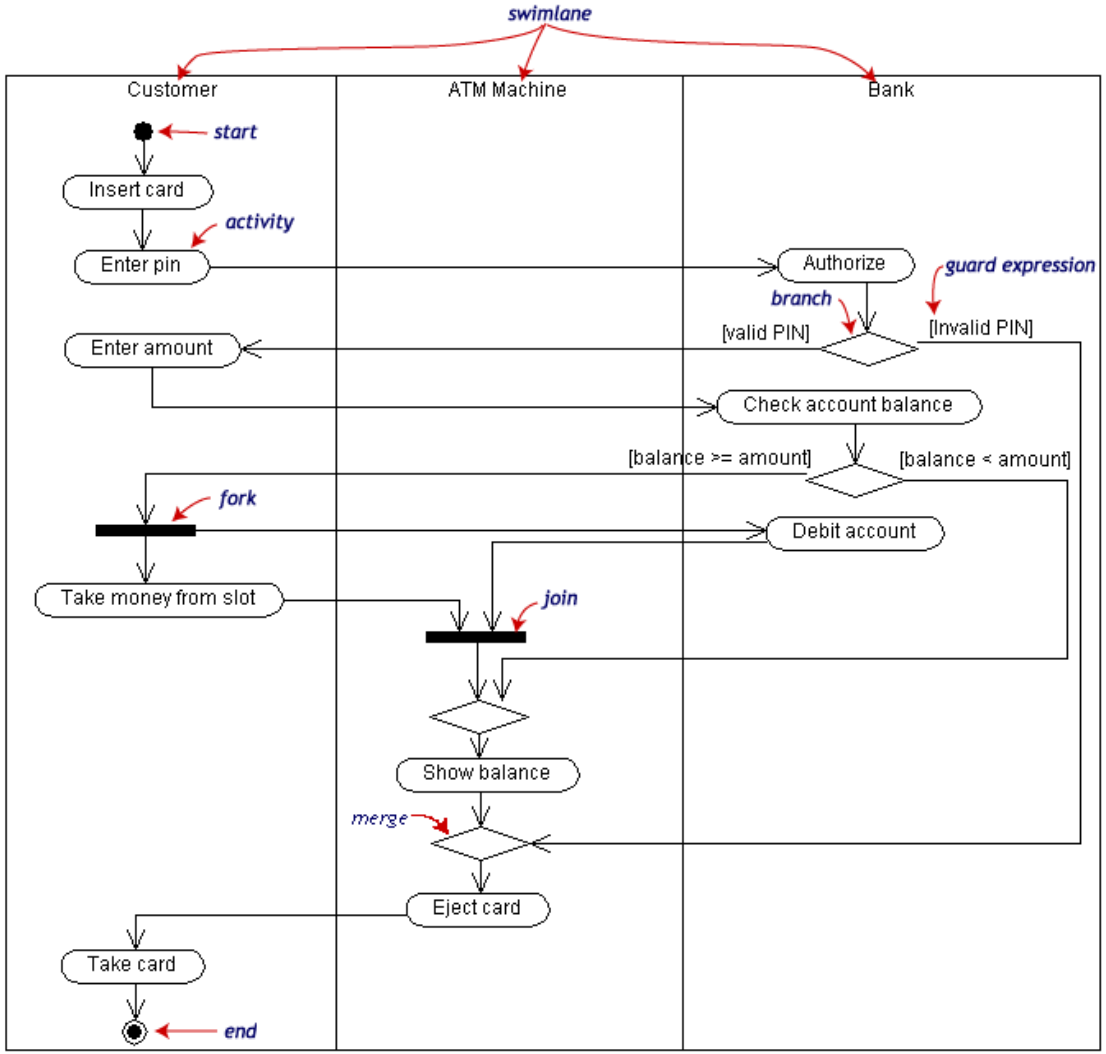
State Machine Diagrams (or Statecharts)



State machine Diagrams – notes

- Usage: To understand complex classes better.
- UML state machine diagrams depict the various states that an object may be in and the transitions between those states.

Activity Diagrams



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Activity Diagram - notes

- Usage: Showing workflows of stepwise activities and actions, with support for choice, iteration and concurrency.
  - Analysis or design of a business process or business rule
  - Design of the logic flow of a complex operation

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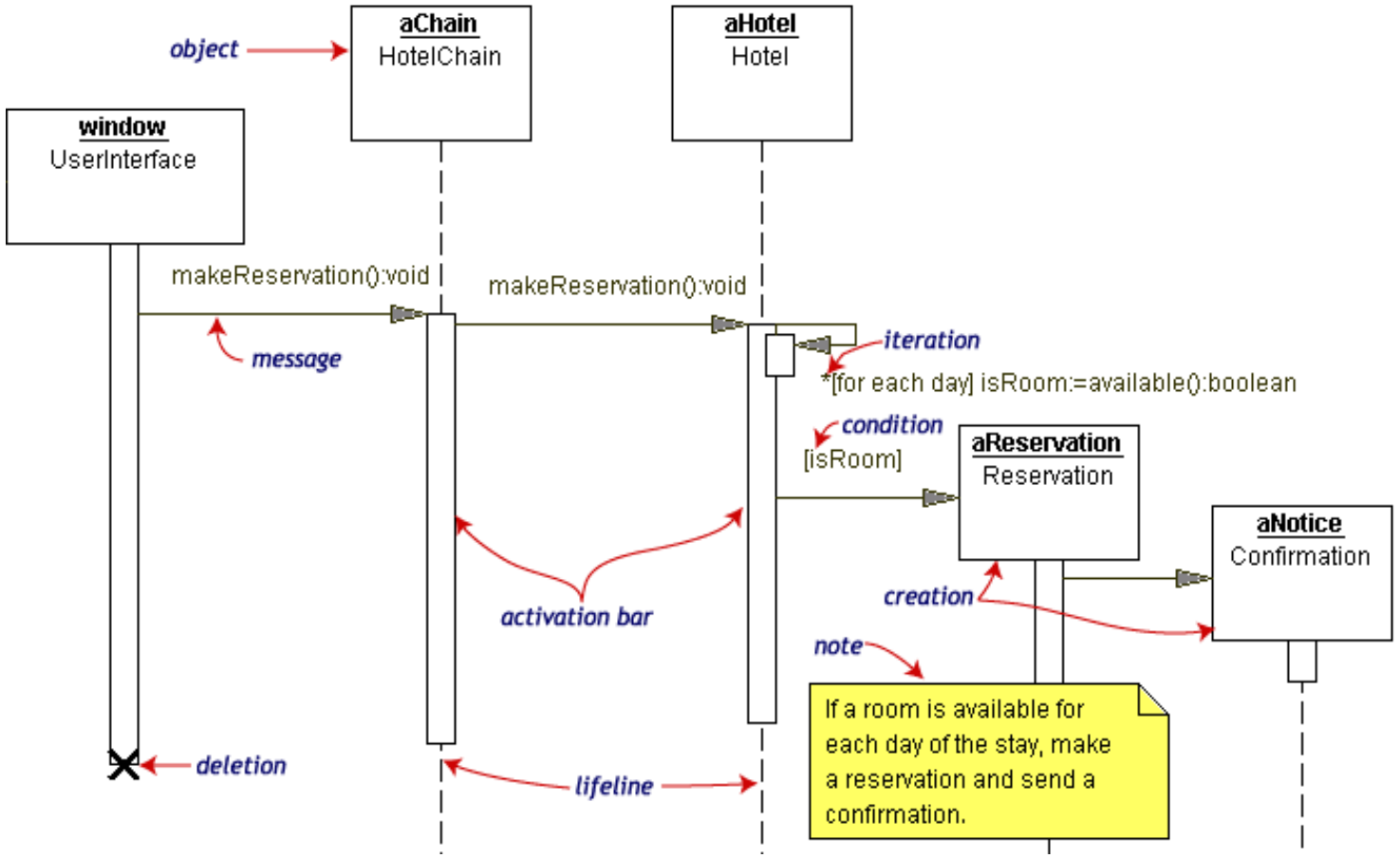
Sequence Diagrams

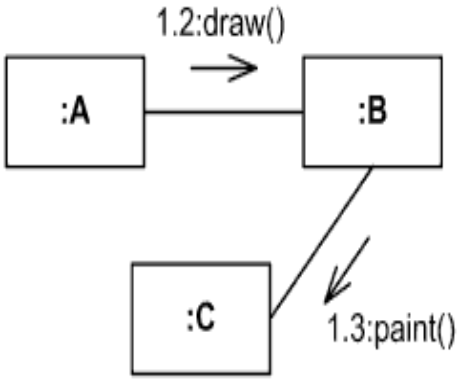


Sequence Diagram - notes

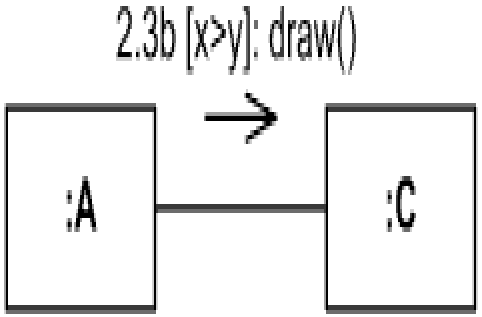
- Usage: Shows dynamic behaviour between objects. It can be used to model more complex interactions.
- Not so suitable for scenarios with many concurrent activities

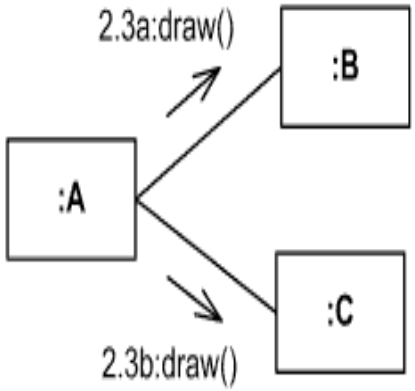
Communication Diagrams

Sequential Communication



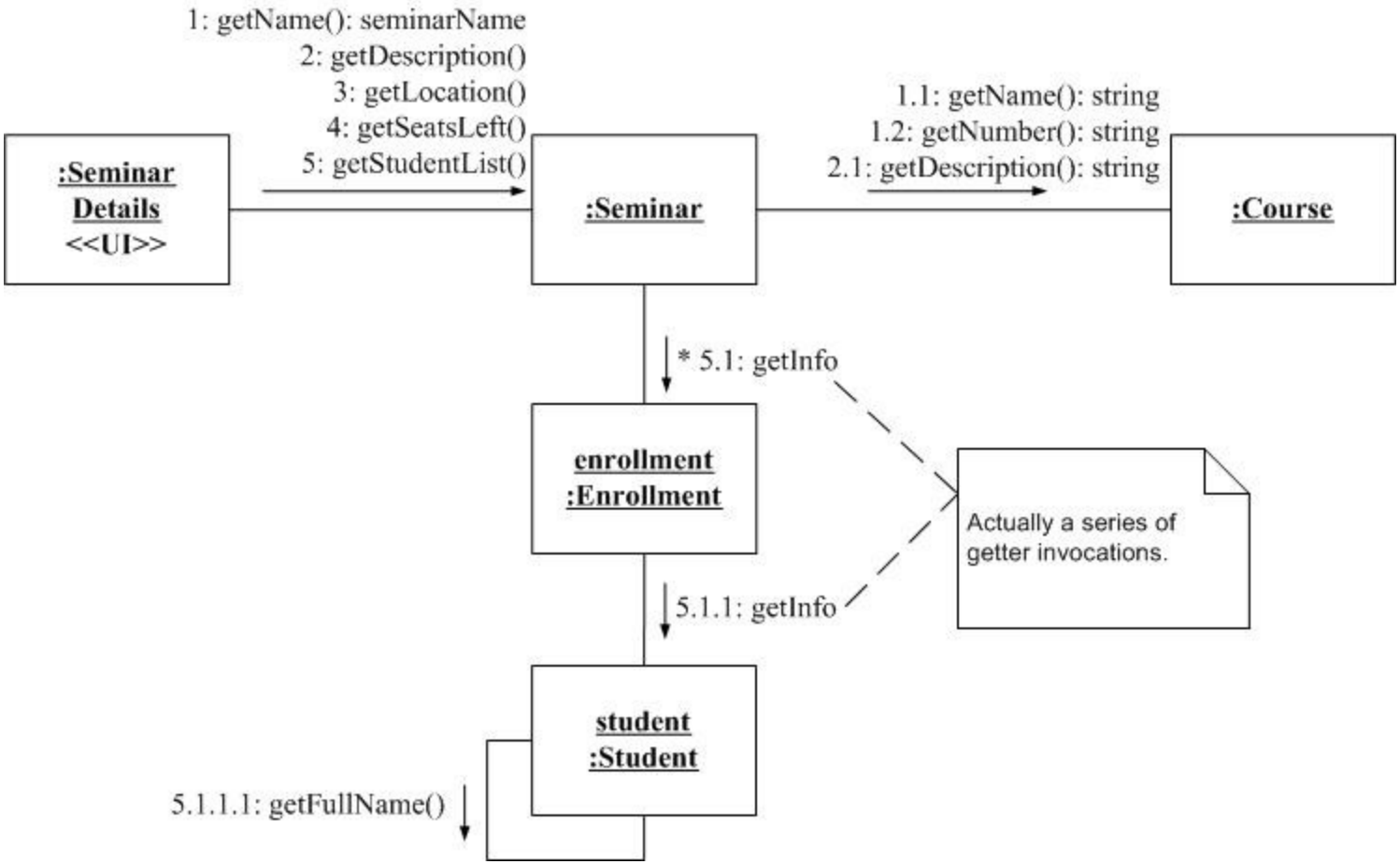
Communication Guard





Concurrent Communication

Communication Diagrams



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Communication Diagrams - notes

- Communication diagram shows interactions between objects and/or parts using sequenced messages in a free-form arrangement.