Software Engineering
Week 6

Lydie du Bousquet

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In collaboration with J.-M. Favre, I. Parissis, Ph. Lalanda, Y. Ledru

Schedule

- Come back on week 5
  - Homework/exercise
  - Requirement expression as UML diagrams

Week 5: Exercises/HomeWork

- Express / Find in the document some requirements about CyberVideo
  - Functional
  - Non-Functional

Week 5: Exercises/HomeWork

- Read and learn about requirement elicitation
- At the end of the work, you should be able to
  - cite several elicitation methods
  - explain the principle of a given elicitation method
  - give advantages/limits of a given elicitation method

Requirement Elicitation

- What is Ethnography?
- What type of methods is it?
  - Conversational
  - Observational
  - Analytic
  - Synthetic
- Which technique is useful when developing Human-computer interfaces?

Requirement specification

- Cyber-video informal description is incomplete, ambiguous.
- Express in UML
  - The list of functions as a use-case diagram
  - The states of a DVD with a state diagram
  - The location process as a sequence diagram

UML language

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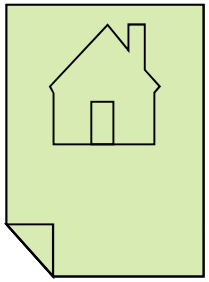
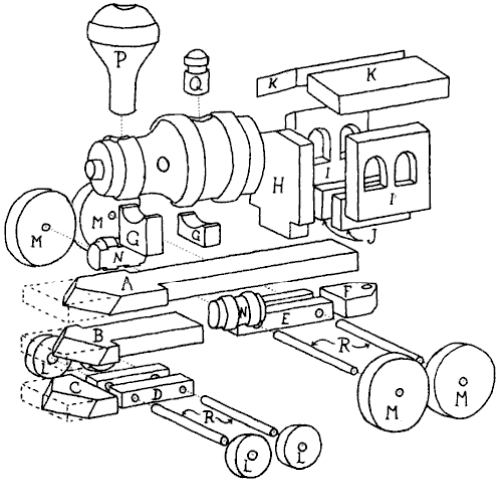
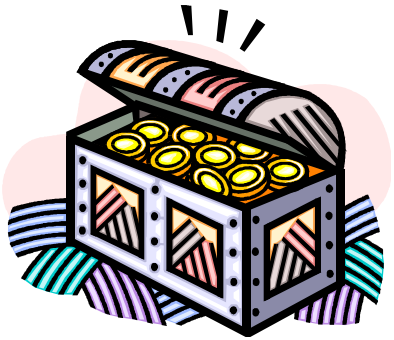
Need of representations to discuss, organize, build, document…







Models are

- A starting point to
  - abstract and to understand
  - support the discussion
  - organize, plan
- A way to design and detail
- Helping the end of development
  - To test
  - To document
  - To maintain





UML = Unified Modeling Language

- A **language**
- For **modeling**
  - at the analysis and the design stages (Object-oriented)
- **Unified**
  - To cover as many domains as possible
  - To cover as many notions as possible

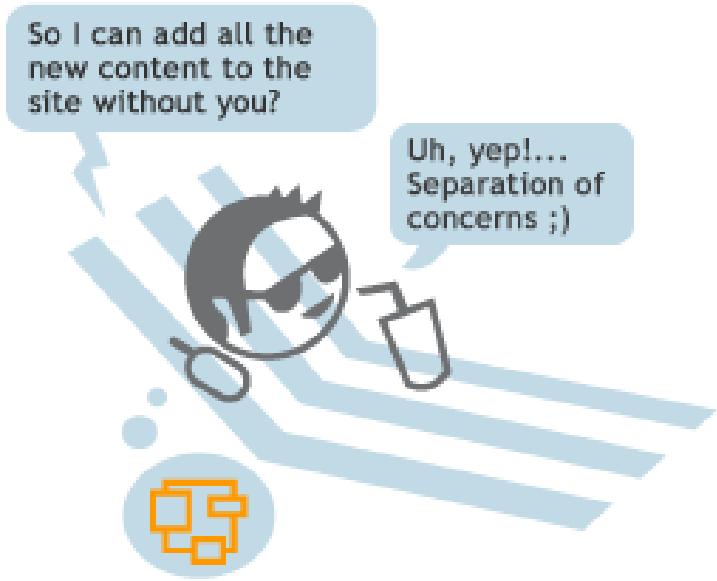
- Objective: different analysts can
  - Have a common language to discuss
  - Common tools

UML = standard

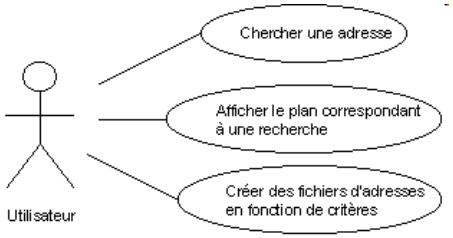
- International standard
  - Very large (many notions)
- More and more used in the industry
- Associated to several
  - methods
  - tools

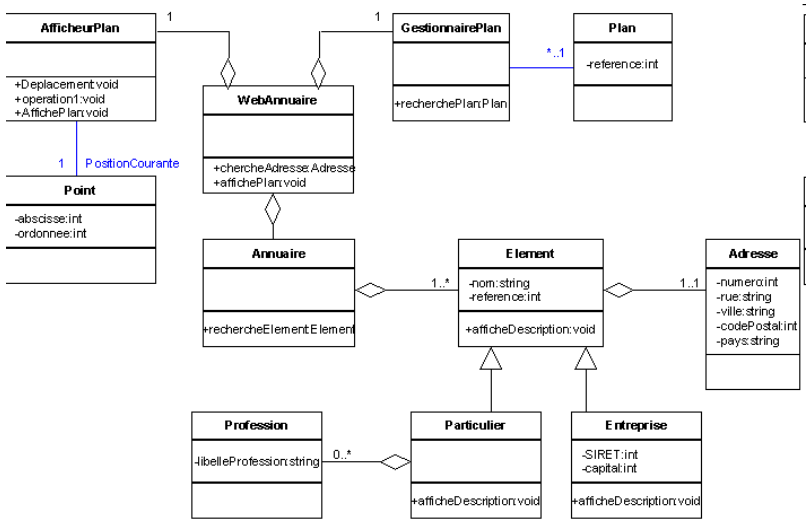
UML: a language, several views

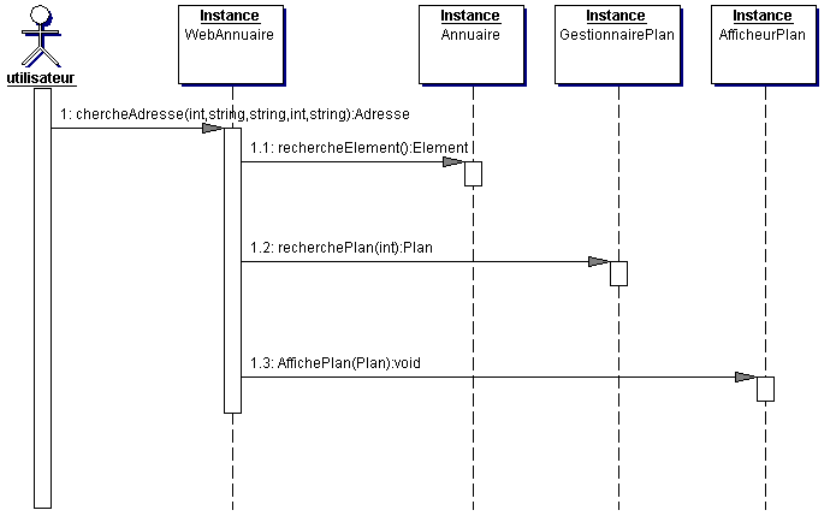
- Different needs
  - To model static or dynamical point of views
  - At different stage analysis, specification, design, …
- Using views
  - Separation of concerns



UML: a language, several views







13 diagrams in UML 2.0

- Structural UML diagrams
  - **Class diagram**
  - Object diagram
  - Component diagram
  - Composite structure diagram
  - Deployment diagram
  - Package diagram
  - Profile diagram
- Behavioral UML diagrams
  - **Use case diagram**
  - **State diagram**
  - **Sequence diagram**
  - Activity diagram
  - Communication diagram
  - Interaction overview diagram
  - Timing diagram

Exercise

- Cyber-video informal description is incomplete, ambiguous.
- Express in UML
  - The list of functions as a use-case diagram
  - The states of a DVD with a state diagram
  - The location process as a sequence diagram

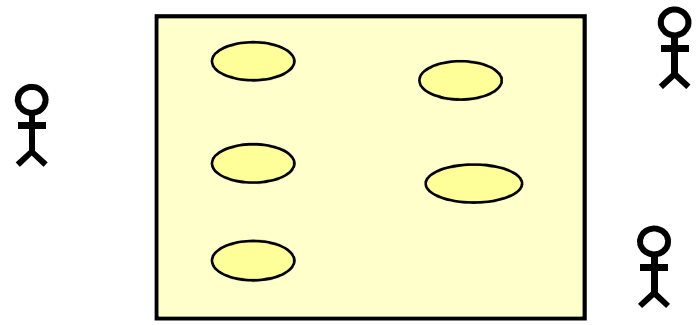
Express in UML the list of Cyber-video functions as a use-case diagram

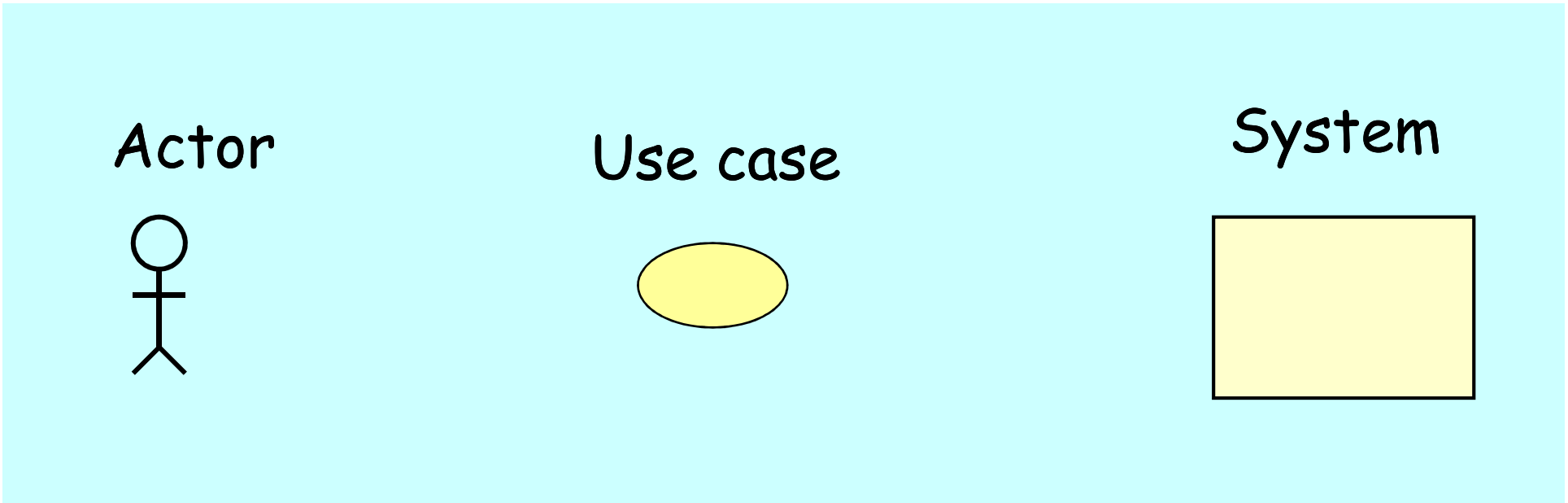
Use-case diagram

- Documents the system's intended behavior
- Representation of the **relationships** between **actors** and **use-cases**
- Arrows and lines are draw
  - between actors and use cases (by default «communicates»)
  - between use cases to show their relationships.

Express in UML the list of Cyber-video functions as a use-case diagram

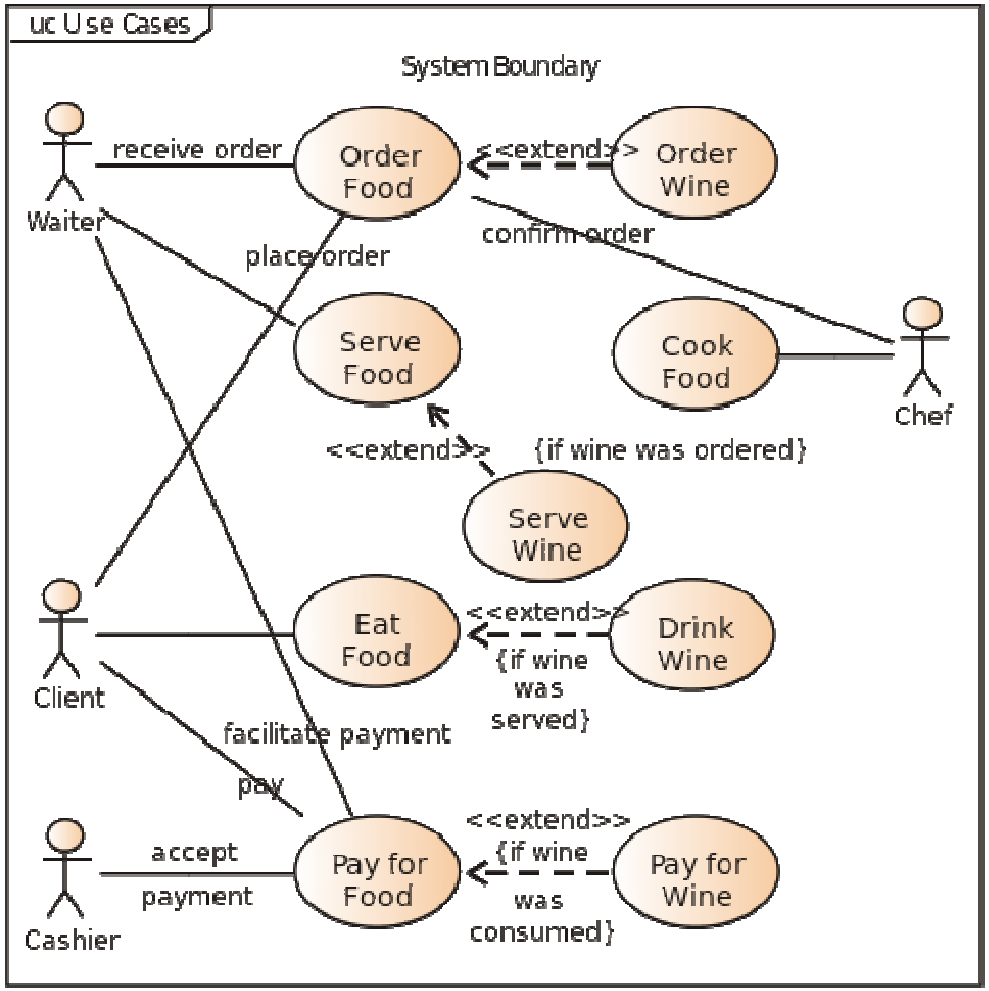
Use-case diagram





Express in UML the list of Cyber-video functions as a use-case diagram

Use-case diagram example

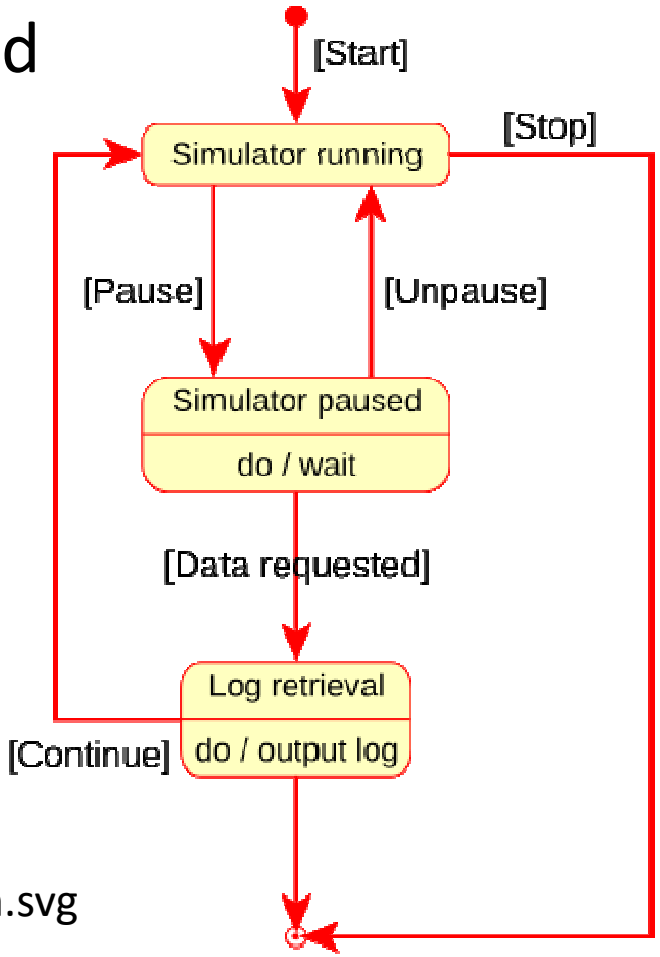


use case diagram for the interaction of a client (actor) within a restaurant (system)
https://en.wikipedia.org/wiki/Use_Case_Diagram

Express in UML the list of Cyber-video functions as a use-case diagram

UML State diagram (statechart)

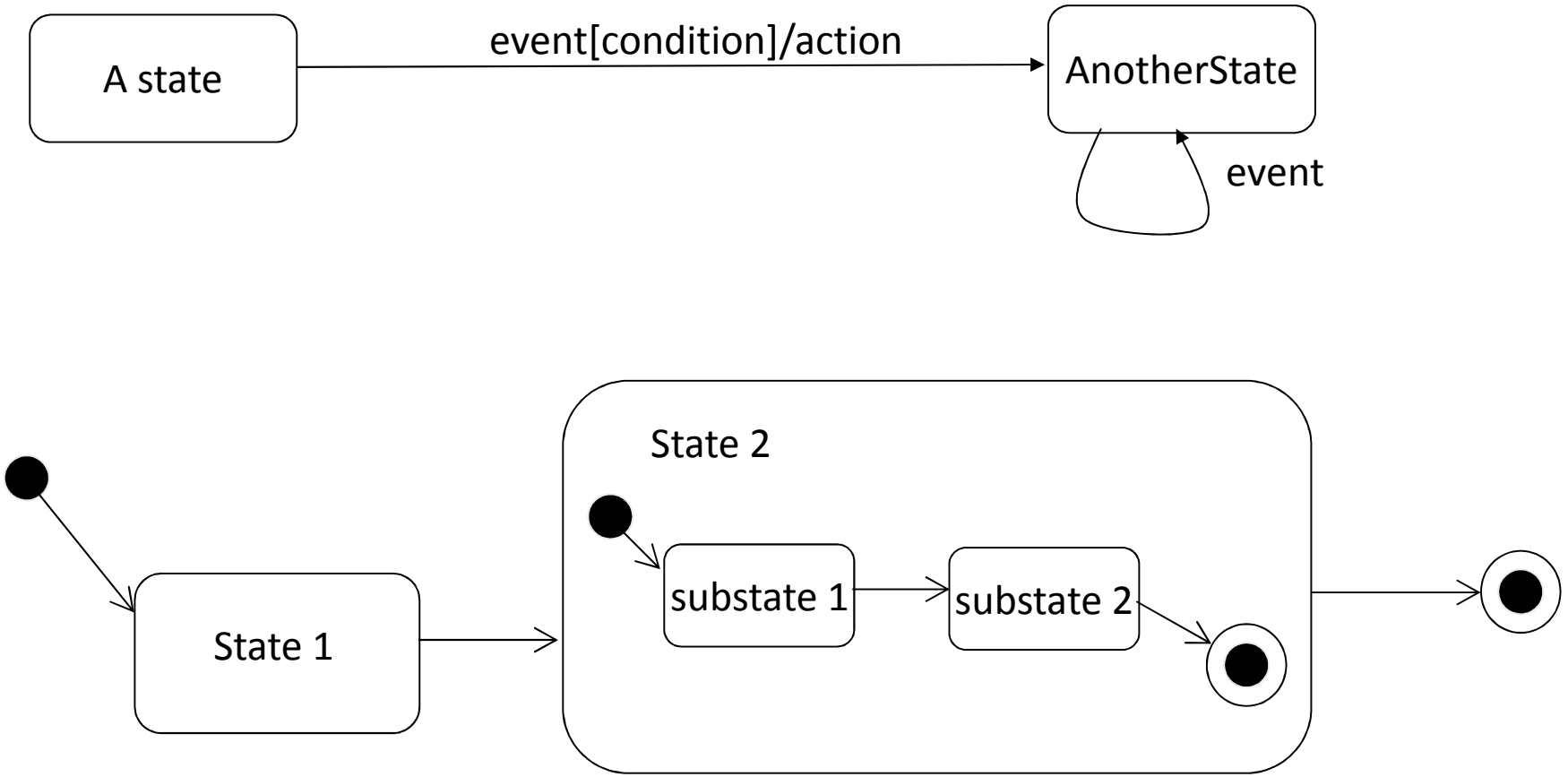
- Representation of finite automaton with
  - hierarchically nested states and
  - orthogonal regions
  - extended actions



https://en.wikipedia.org/wiki/File:UML_State_diagram.svg

Express in UML the states of a DVD with a state diagram

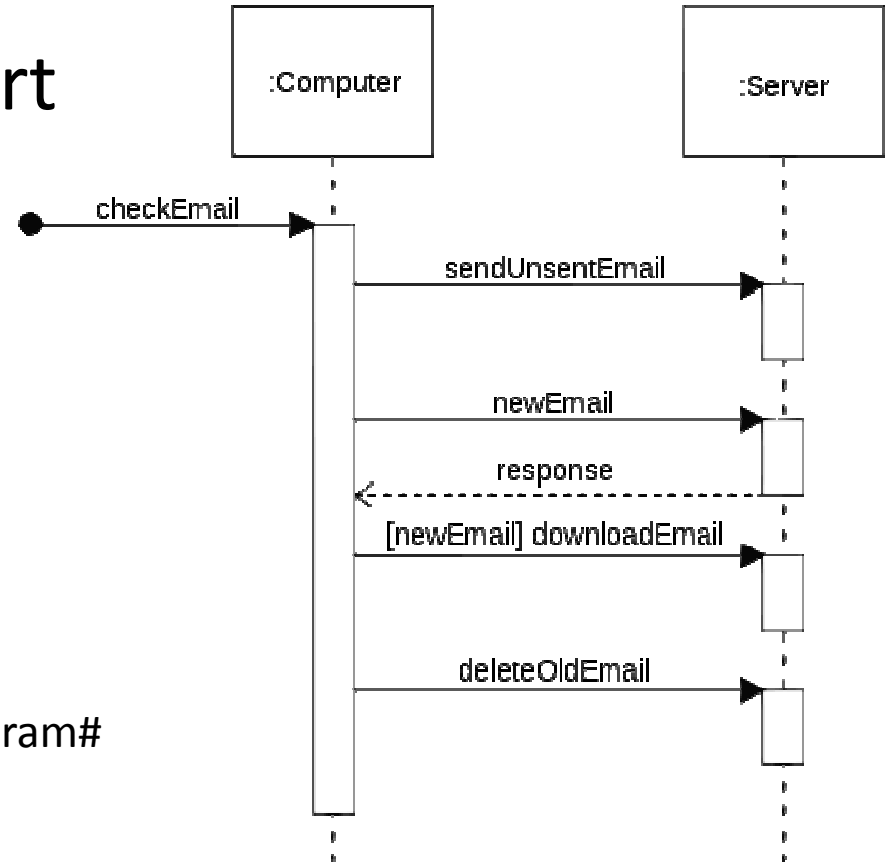
UML State diagram (statechart)



Express in UML the states of a DVD with a state-diagram (statechart)

UML sequence diagram

- Shows how processes operate with one another and in what order
- Message Sequence Chart



https://en.wikipedia.org/wiki/Sequence_diagram#/media/File:CheckEmail.svg

Express in UML the location process of Cyber-video as a sequence diagram