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lasaris LAB OF SOFTWARE ARCHITECTURES AND INFORMATION SYSTEMS

Getting Dynamic, State Machine Diagram

PB007 Software Engineering I

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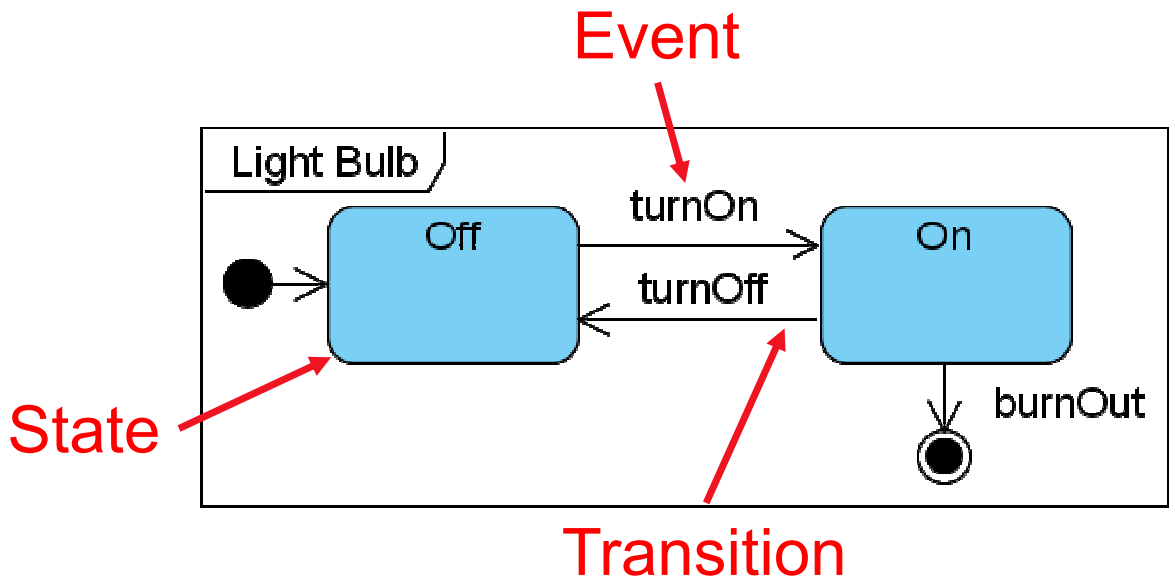
State Machine Diagram

- Models the dynamic behavior (life cycle) of one subject
  - Class instantiation (Object)
  - Use Case
  - System
  - Subsystem
  - Component
  - …
- Main components are:
  - States
  - Transitions
  - Events



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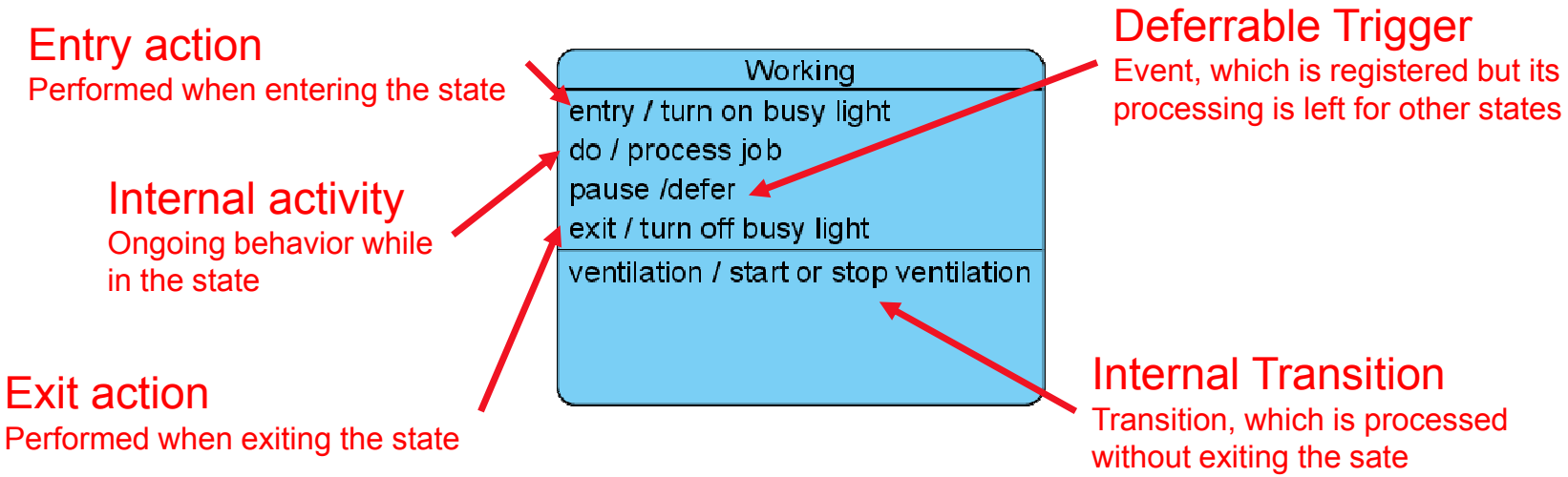
State Machine Diagram

States

- Represents semantically important situation
- In case of (OOP) object, it is determined by attribute values, relations with others, and performed activity.



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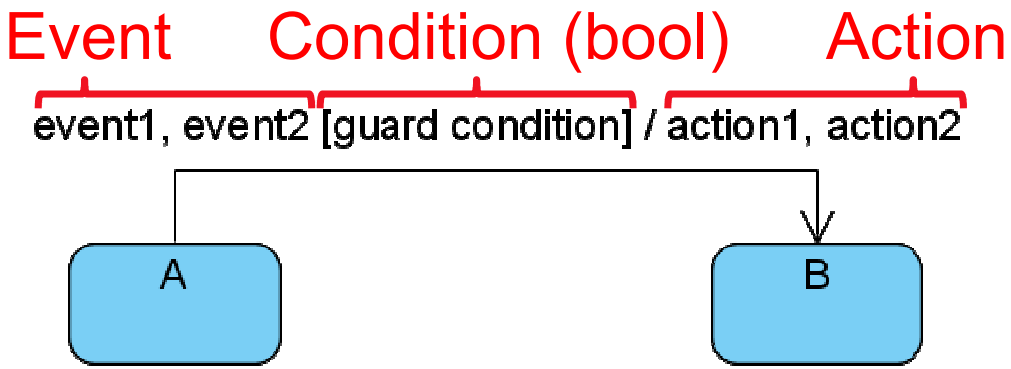
State Machine Diagram

Transitions

- Defines how to get from one state to another
- **Syntax**: *event [guard condition] / action*
- **Semantics**: At the occurrence of *event*, if the *guard condition* holds, perform *action* and go to the new state.



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State Machine Diagram

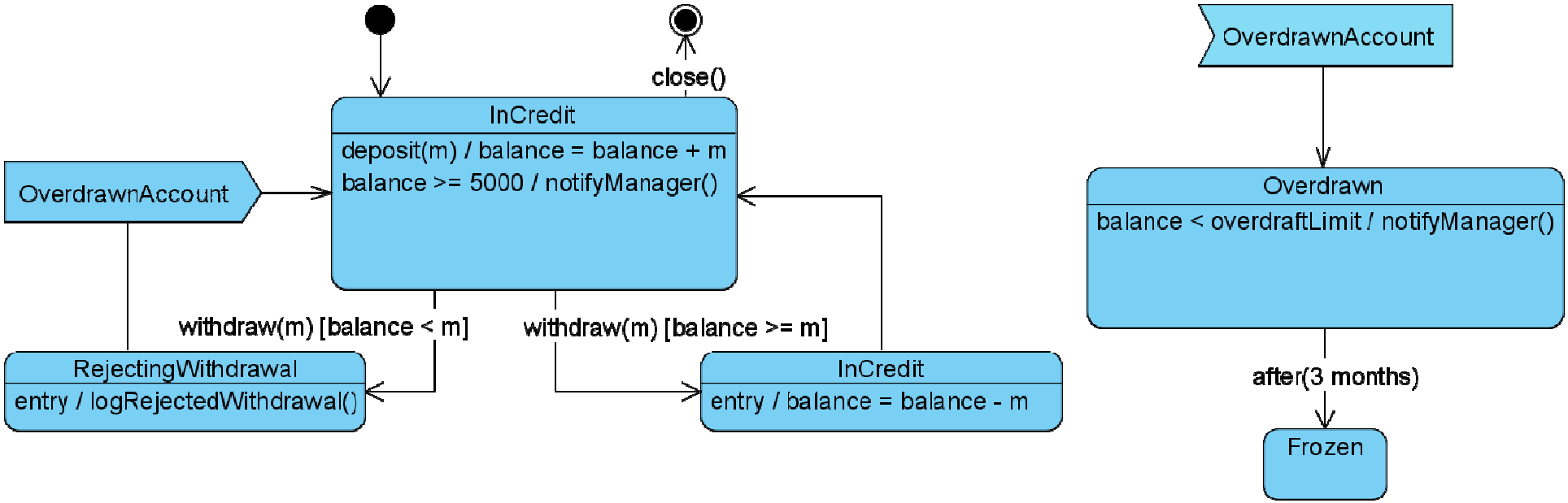
Events

- Stimulus on which the subject may react by changing the state or performing an operation.

- Types of events:
  - **Call event** – Calling operation of the subject.
  - **Signal event** – Asynchronous sending a receiving a signal between subjects
  - **Change event** – Boolean expression. The event occurs when the value is changed from false to true.
  - **Time event** – Event occur at a certain time t (*when(t)*) or after a certain time t (*after(t)*).

State Machine Diagram

Events



(excerpt from diagram)

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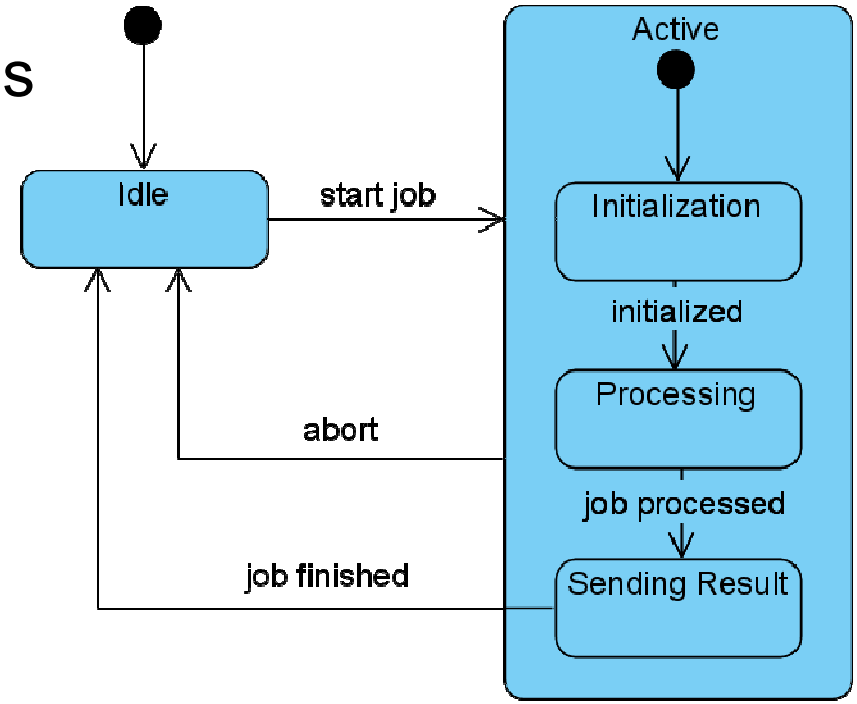
Composite States

Simple composite state

- Useful for simplifying the diagram
- Capturing inheritance between states
- Consist of a single region



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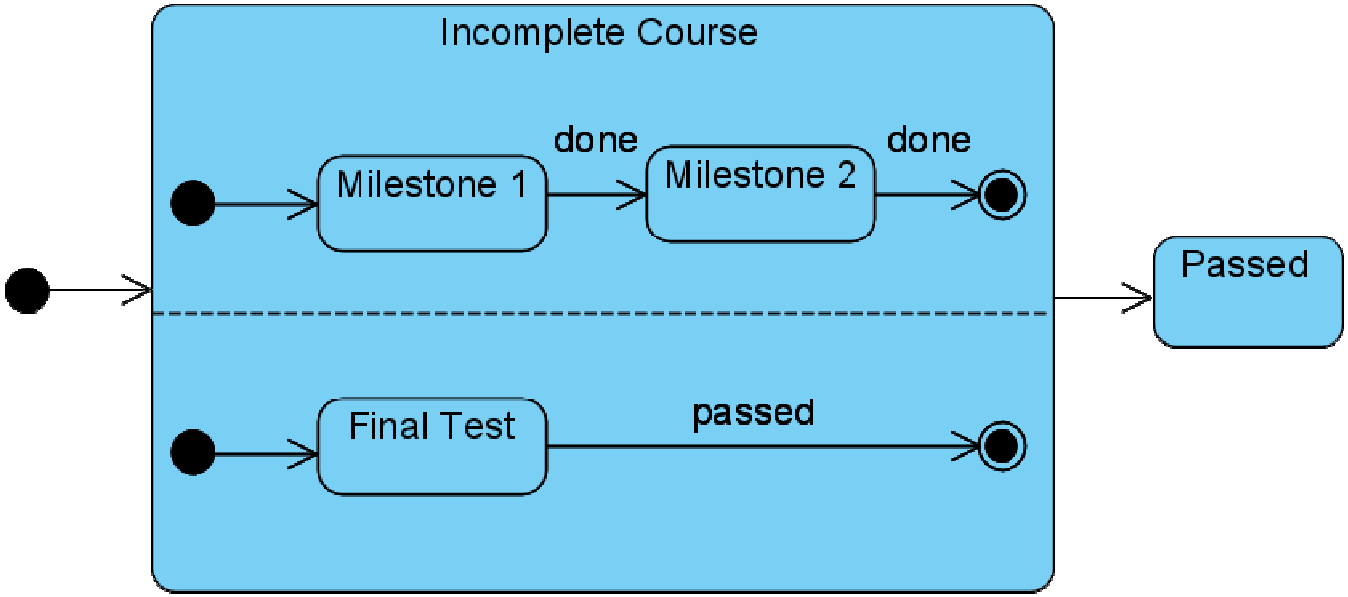
Composite States

Orthogonal composite state

- Capturing parallel behavior
- Consist of a two and more regions



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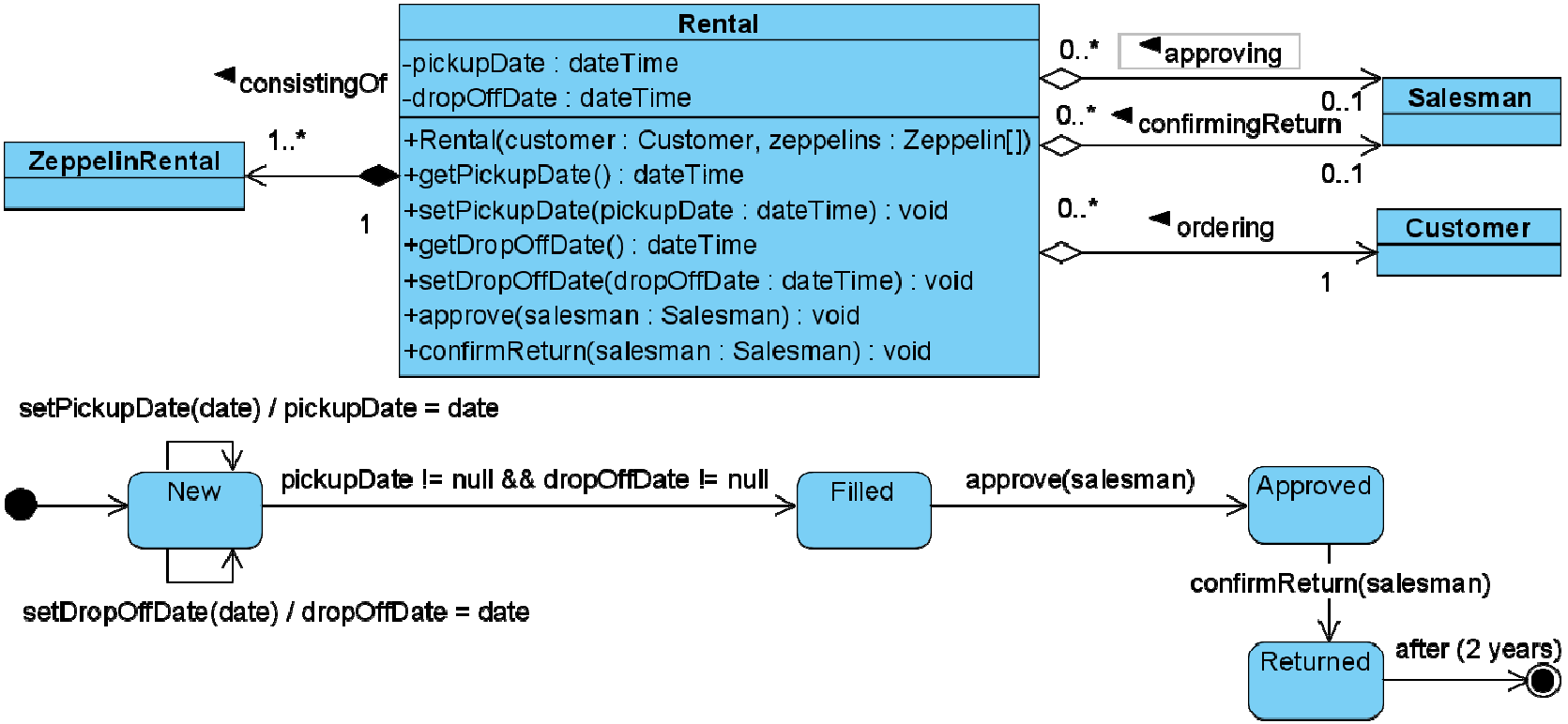
State Machine Diagram in OOP world

- In our case, state machine diagram is used to represent lifecycle of an object
- Context of the diagram is **only the instance** of a class from design class diagram
  - All methods and events must be supported by the design class diagram
- Initial transition means calling the constructor
- Final transition means deleting the object from system
- Object saves its state even outside main memory (persistence)

State Machine Diagram in OOP world



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Task for this week

You gotta do what you gotta do

- Process the feedback
- Choose a suitable object for modeling - ride
  - Something with non-trivial lifecycle
- Create a state machine diagram for this object
  - Revise design class diagram if needed