IBM Software Group

Essentials of Visual Modeling with UML 2.0
Module 4: Use-Case Modeling

Rational. software

Objectives

- Describe system behavior and show how to capture it in a model.
- Demonstrate how to read and interpret:
  - A use-case diagram
  - An activity diagram

Where Are We?

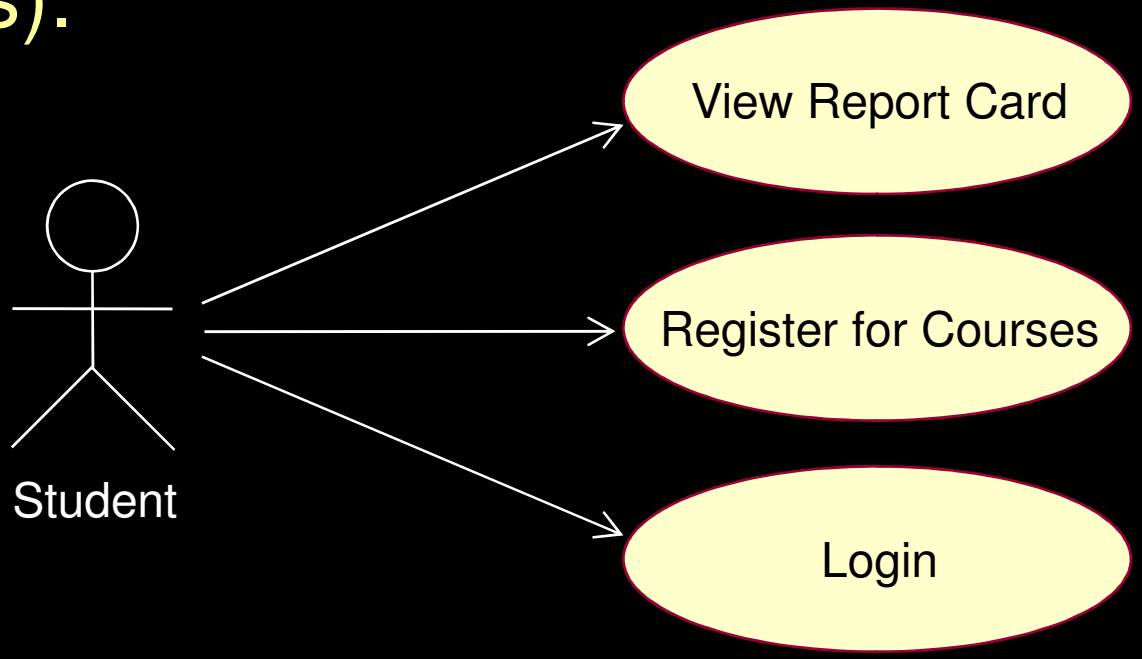
- ★ Concepts in use-case modeling
  - Use-case diagrams
  - Activity diagrams

What Is System Behavior?

- System behavior is how a system acts and reacts.
  - It comprises the actions and activities of a system.
- System behavior is captured in use cases.
  - Use cases describe the interactions between the system and (parts of) its environment.

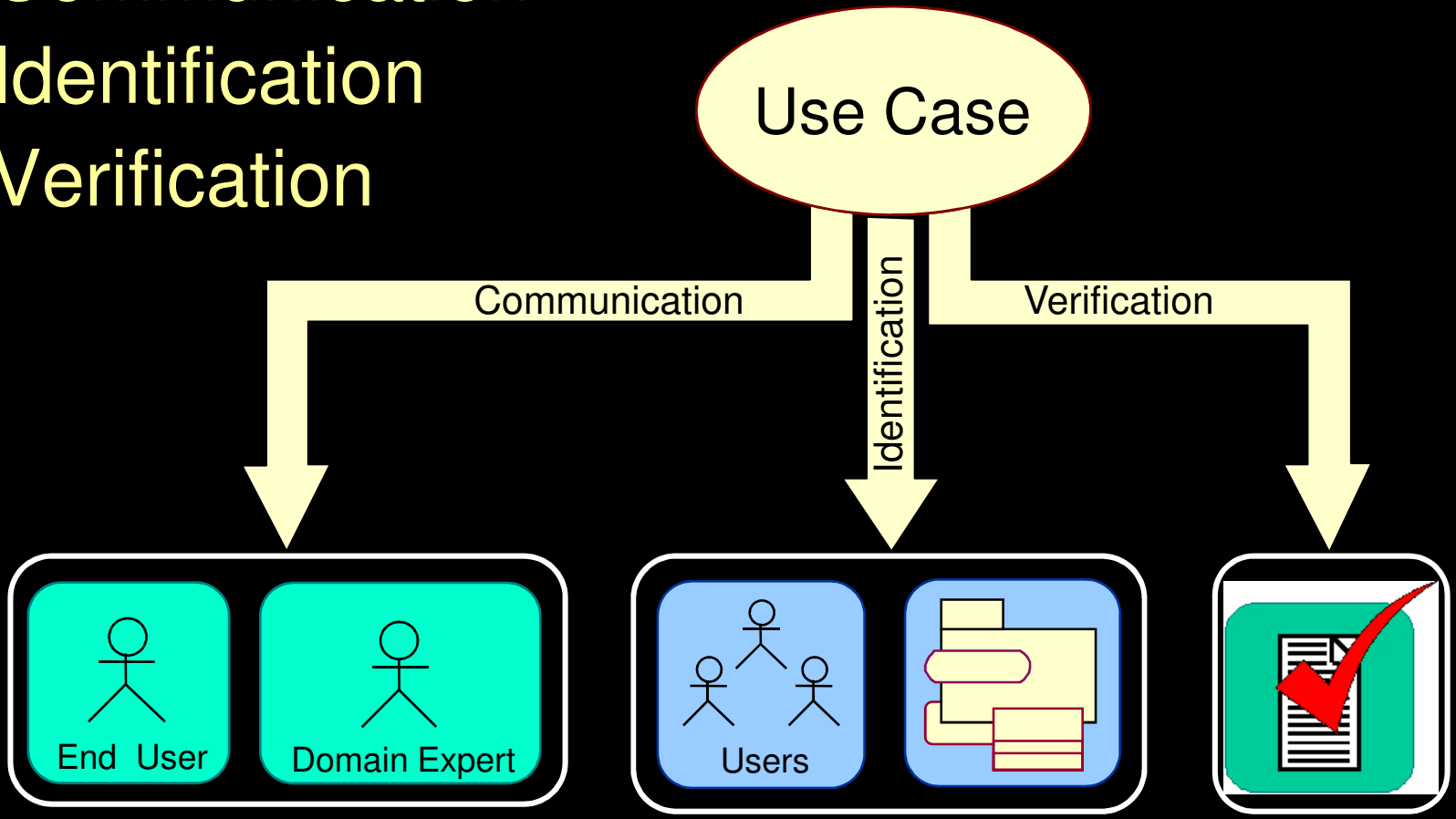
What Is a Use-Case Model?

- A model that describes a system's functional requirements in terms of use cases.
- A model of the system's intended functions (use cases) and its environment (actors).



What Are the Benefits of a Use-Case Model?

- Communication
- Identification
- Verification



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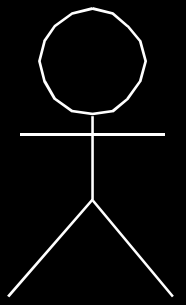
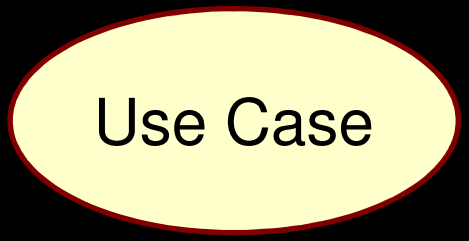
Major Concepts in Use-Case Modeling

- An actor represents anything that interacts with the system.



Actor

- A use case describes a sequence of events, performed by the system, that yields an observable result of value to a particular actor.

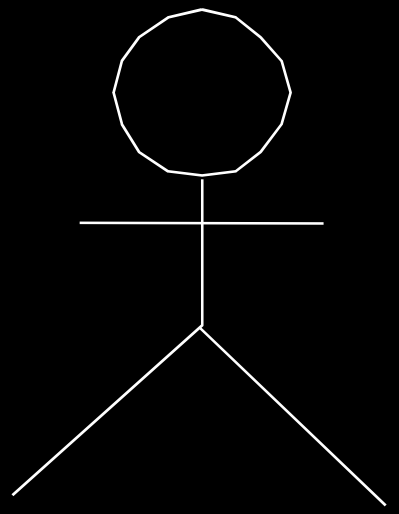


Where Are We?

- Concepts in use-case modeling
- ★ Use-case diagrams
- Activity diagrams

What Is an Actor?

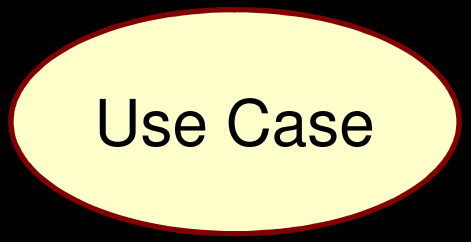
- Actors represent roles a user of the system can play.
- They can represent a human, a machine, or another system.
- They can actively interchange information with the system.
- They can be a giver of information.
- They can be a passive recipient of information.
- Actors are not part of the system.
  - Actors are EXTERNAL.



Actor

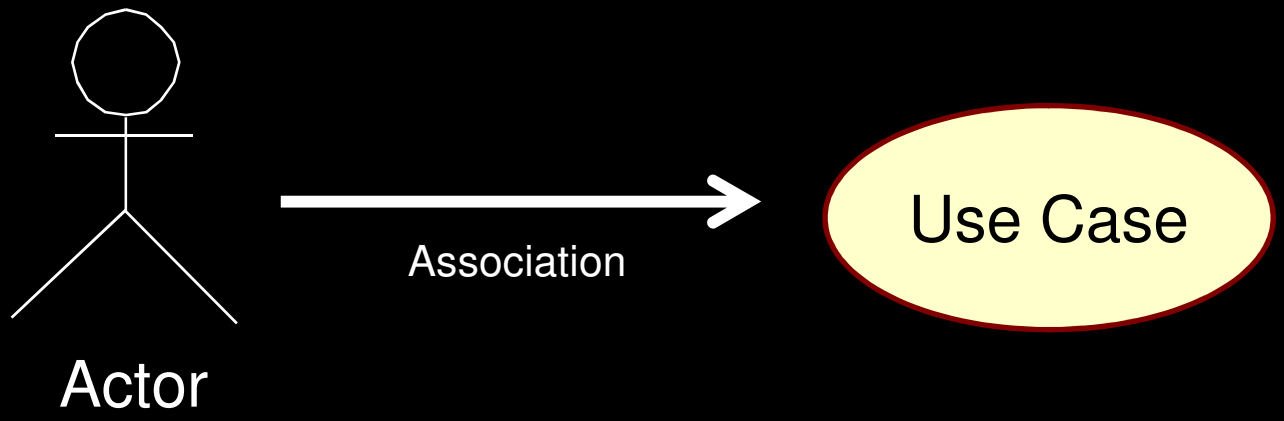
What Is a Use Case?

- Defines a set of use-case instances, where each instance is a sequence of actions a system performs that yields an observable result of value to a particular actor.
  - A use case models a dialogue between one or more actors and the system
  - A use case describes the actions the system takes to deliver something of value to the actor

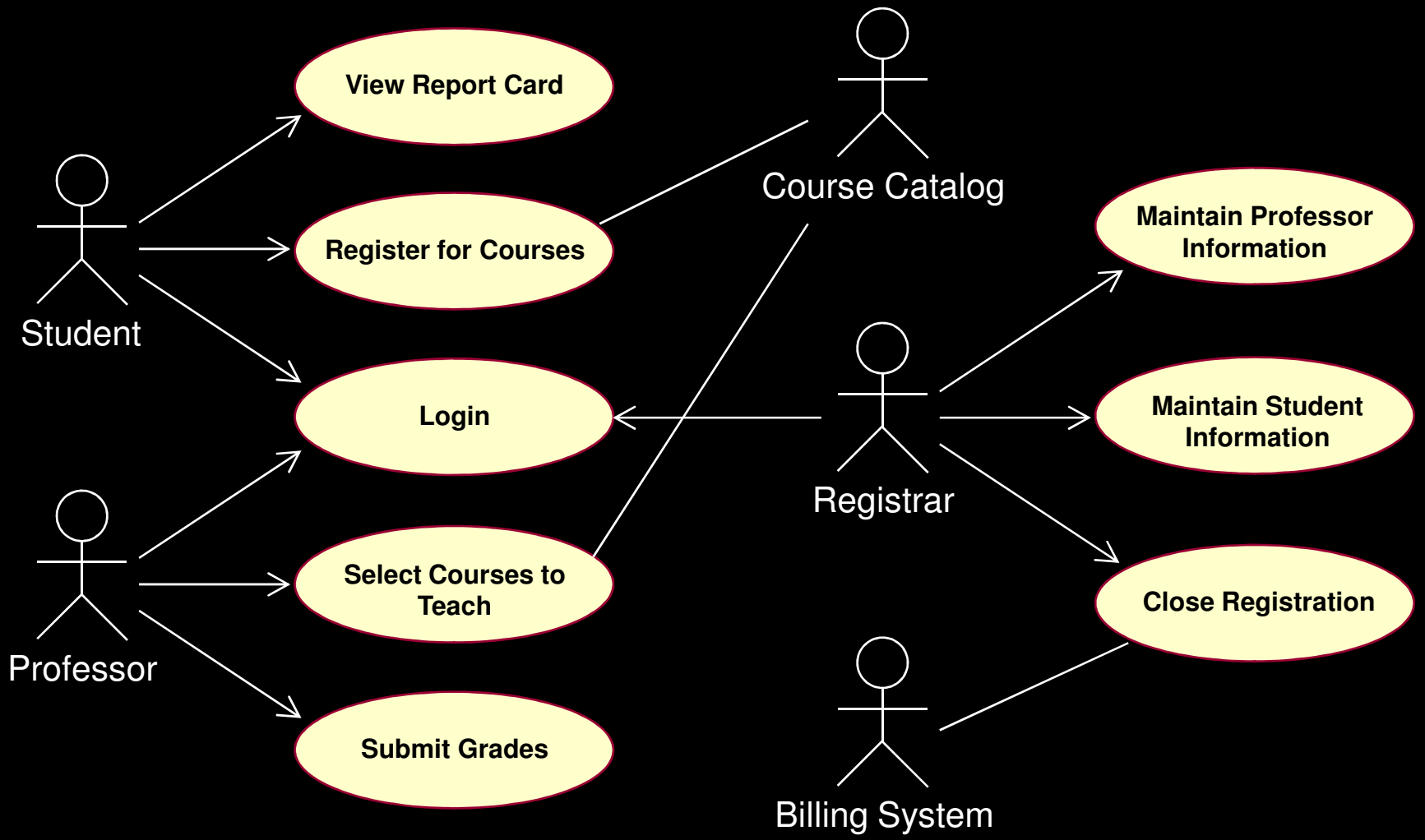


Use Cases and Actors

- A use case models a dialog between actors and the system.
- A use case is initiated by an actor to invoke a certain functionality in the system.



How Would You Read This Diagram?



Where Are We?

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What Is an Activity Diagram?

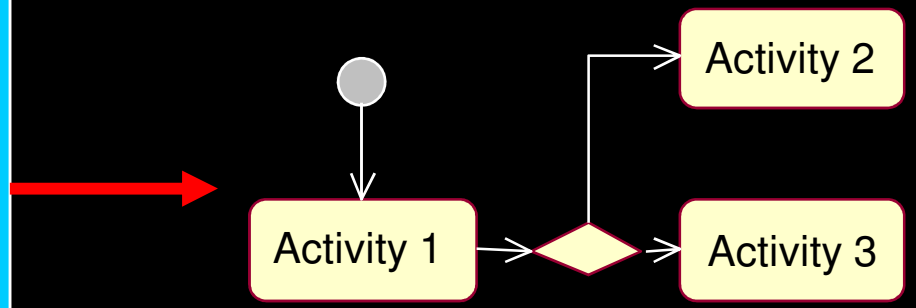
- An activity diagram in the use-case model can be used to capture the activities and actions performed in a use case.
- It is essentially a flow chart, showing flow of control from one activity or action to another.

Flow of Events

This use case starts when the Registrar requests that the system close registration.

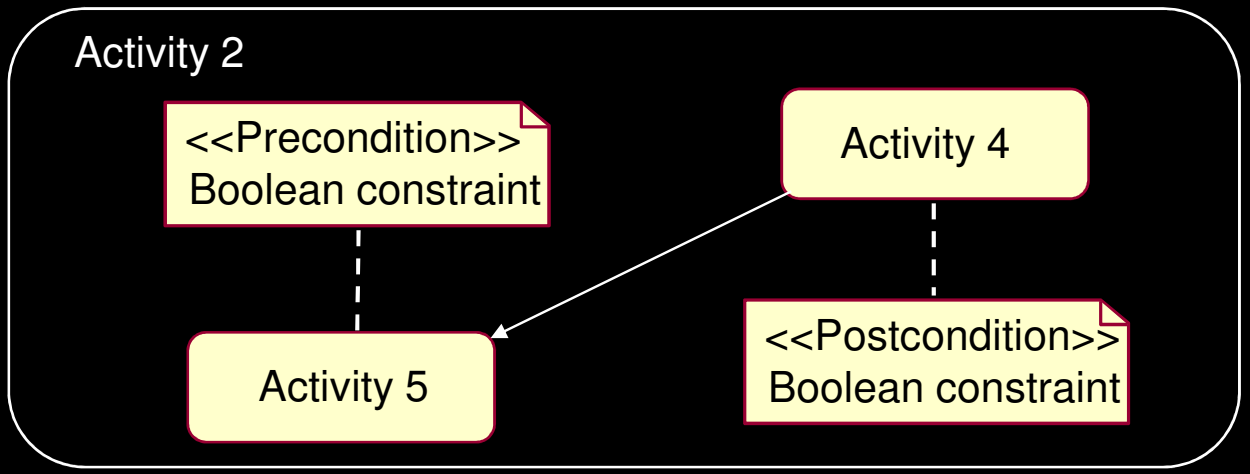
1. The system checks to see if registration is in progress. If it is, then a message is displayed to the Registrar and the use case terminates. The Close Registration processing cannot be performed if registration is in progress.

2. For each course offering, the system checks if a professor has signed up to teach the course offering and at least three students have registered. If so, the system commits the course offering for each schedule that contains it.

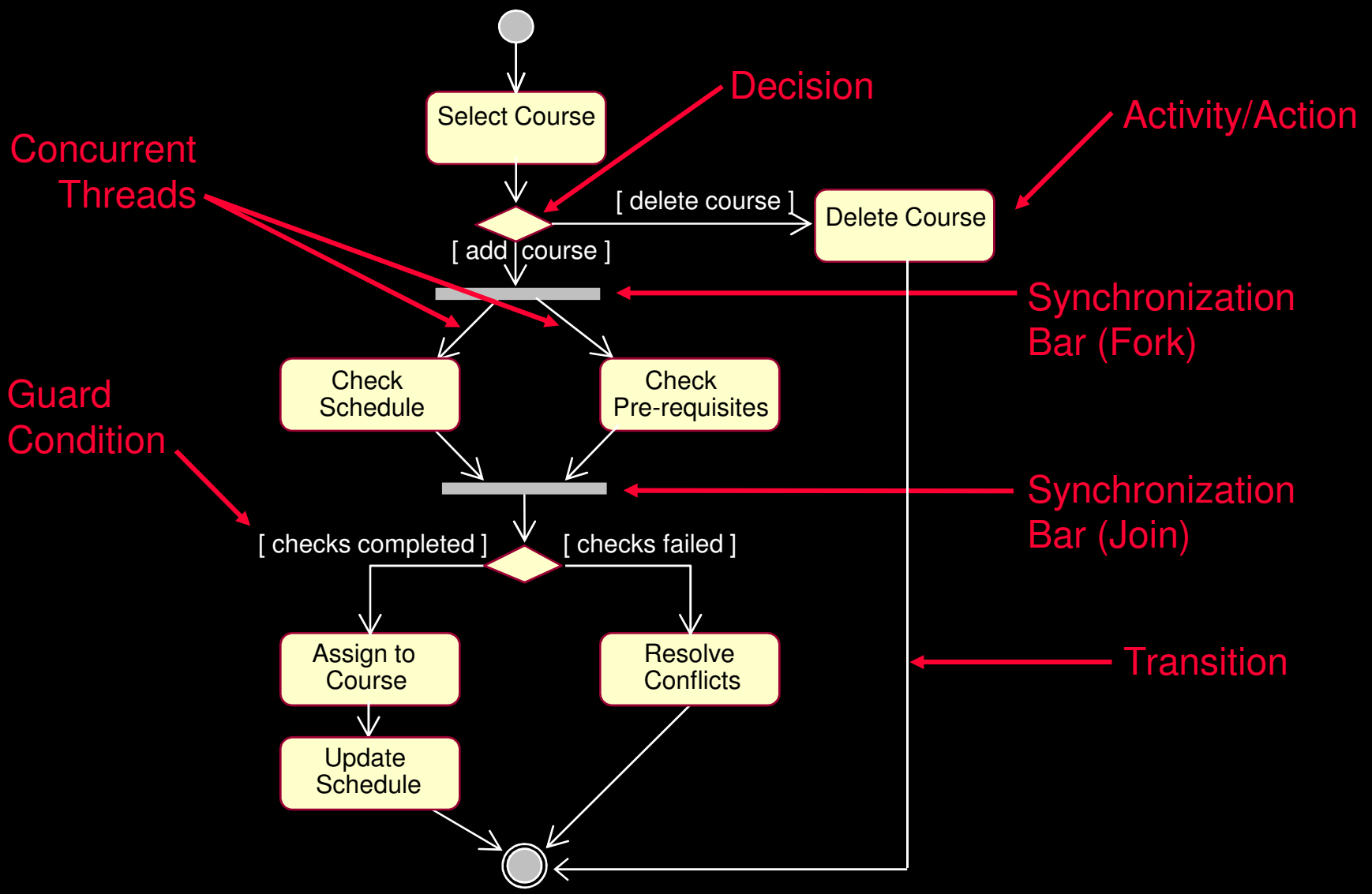


What Is an Activity?

- A specification of behavior expressed as a flow of execution via sequencing of subordinate units.
  - Subordinate units include nested activities and ultimately individual actions.
- May contain boolean expression constraints when the activity is invoked or exited



Example: Activity Diagram



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Review

- What is system behavior?
- What is a use-case model? What are its benefits?
- What is an actor? A use case?
- What is an activity diagram?

Exercise

- Given:
  - Use cases, actors and associations
- Draw:
  - A use-case diagram
- Given:
  - Action states and activity edges
- Draw:
  - An activity diagram