IBM Software Group

Essentials of Visual Modeling with UML

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?

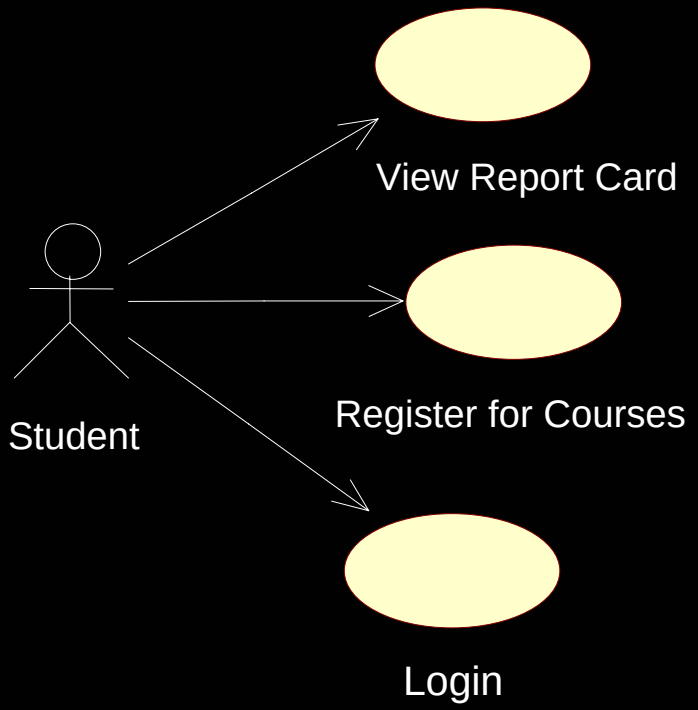
- ★ Concepts in use-case modeling
  - Use-case diagrams
  - Activity diagrams

What Is System Behavior?

- System behavior is how a system acts and reacts.
  - It is the outwardly visible and testable activity of a system.
- System behavior is captured in use cases.
  - Use cases describe the system, its environment, and the relationship between the system and its environment.

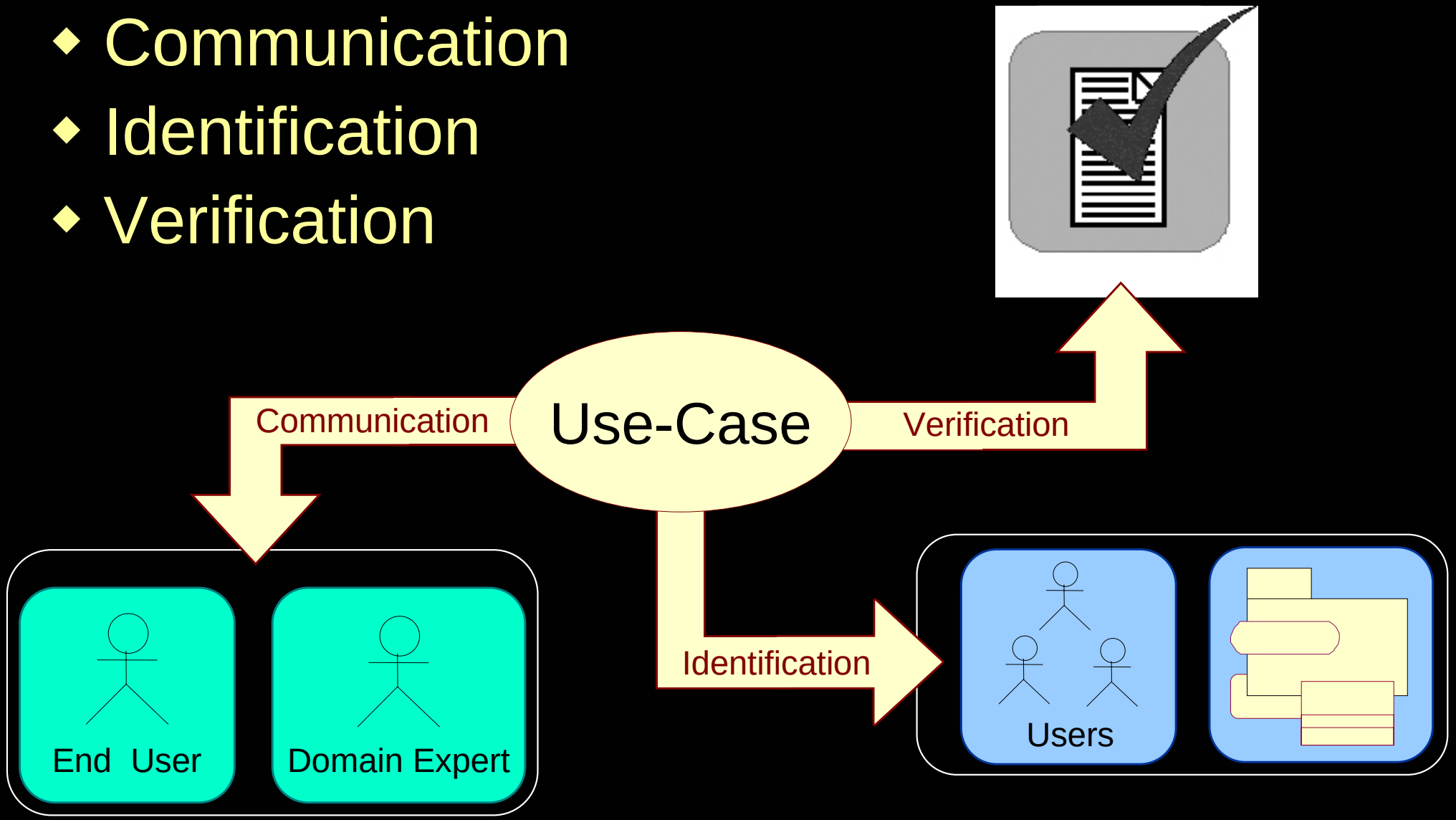
What Is a Use-Case Model?

- 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).



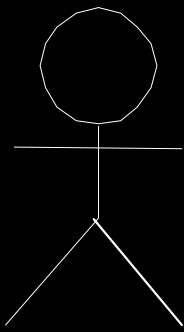
What Are the Benefits of a Use-Case Model?

- Communication
- Identification
- Verification



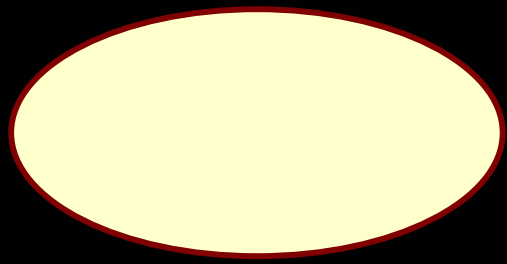
Major Concepts in Use-Case Modeling

- 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.



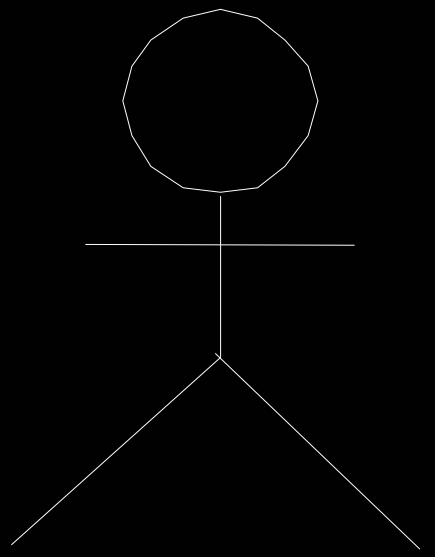
Use Case

Where Are We?

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

What Is an Actor?

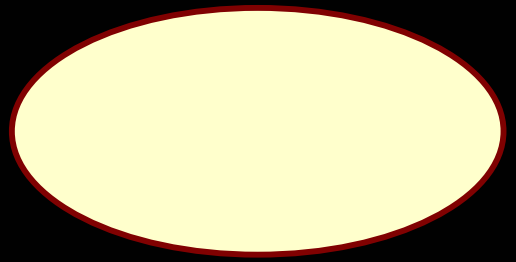
- Actors represent roles a user of the system can play.
- They can represent a human, a machine, or another system.
- They can actively interchange information with the system.
- They can be a giver of information.
- They can be a passive recipient of information.
- Actors are not part of the system.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



Actor

What Is a Use Case?

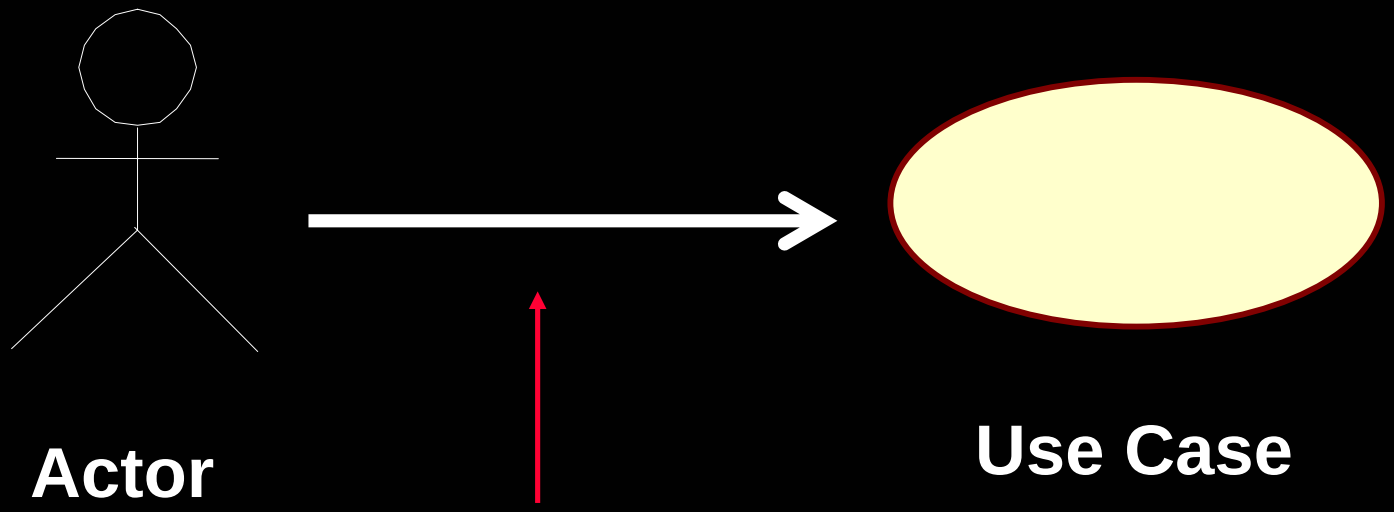
- Defines a set of use-case instances, where each instance is a sequence of actions a system performs that yields an observable result of value to a particular actor.
  - A use case models a dialogue between one or more actors and the system
  - A use case describes the actions the system takes to deliver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



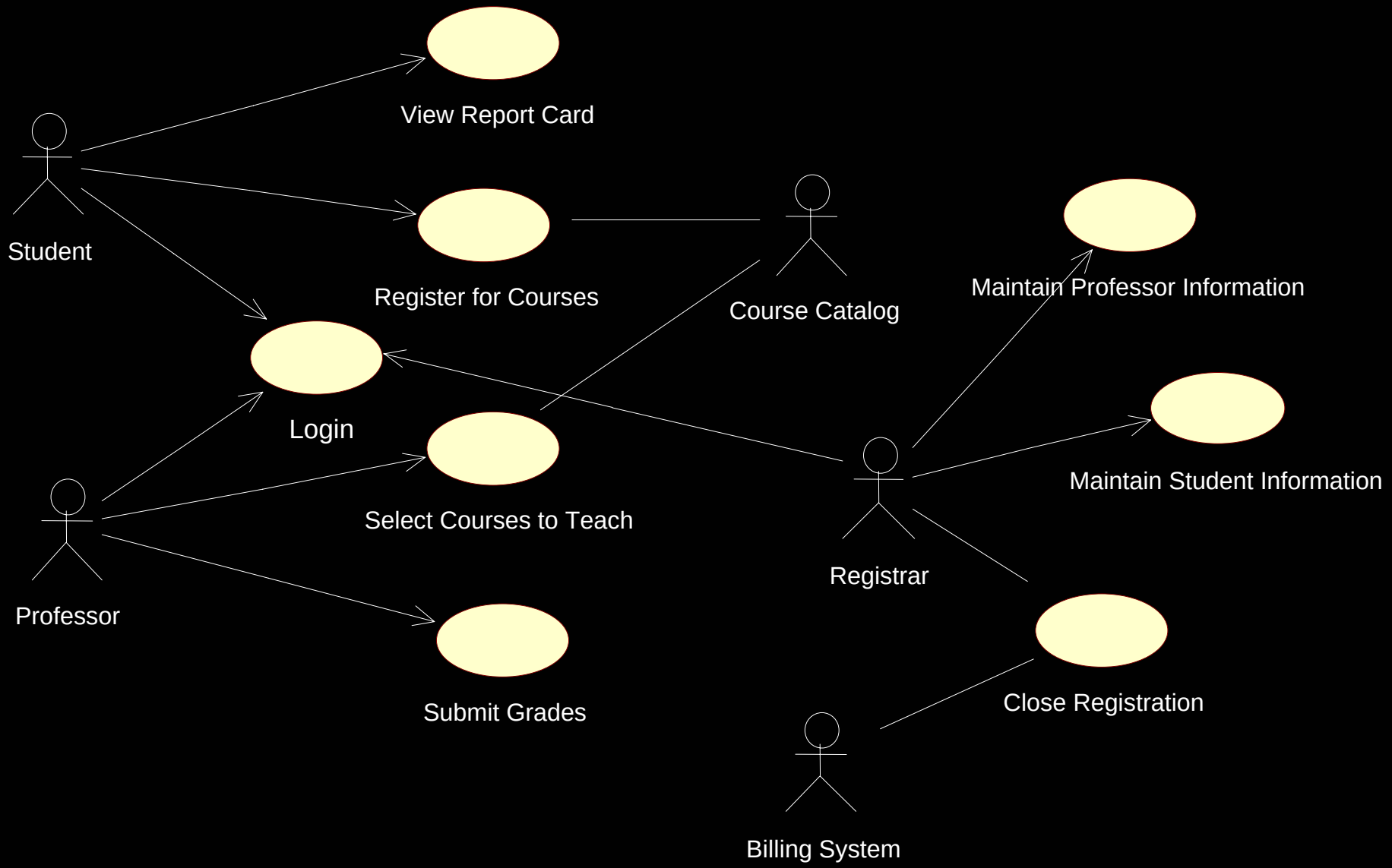
Use Case

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?

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

What Is an Activity Diagram?

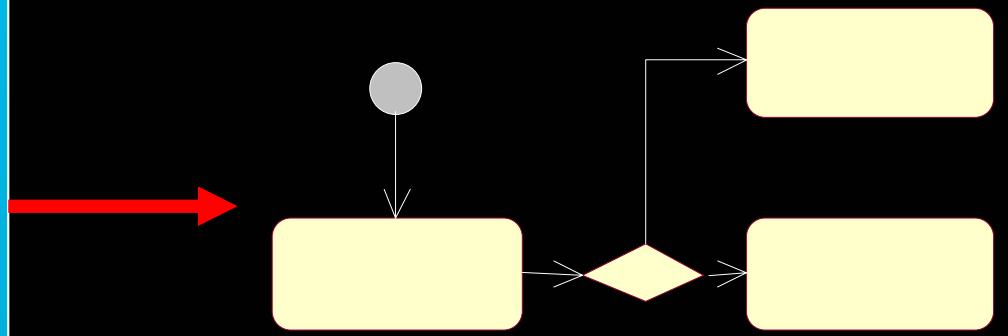
- An activity diagram in the use-case model can be used to capture the activities in a use case.
- It is essentially a flow chart, showing flow of control from activity to activity.

Flow of Events

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

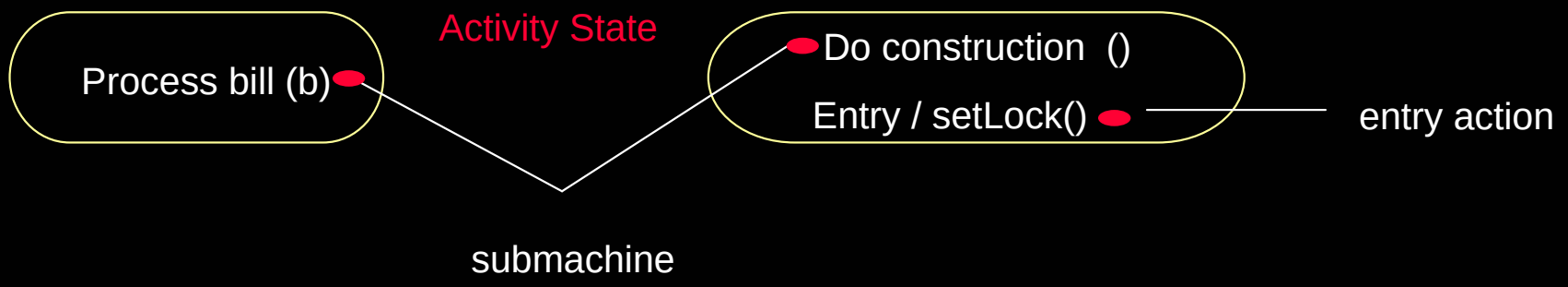
1. The system checks to see if registration is in progress. If it is, then a message is displayed to the Registrar and the use case terminates. The Close Registration processing cannot be performed if registration is in progress.

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.

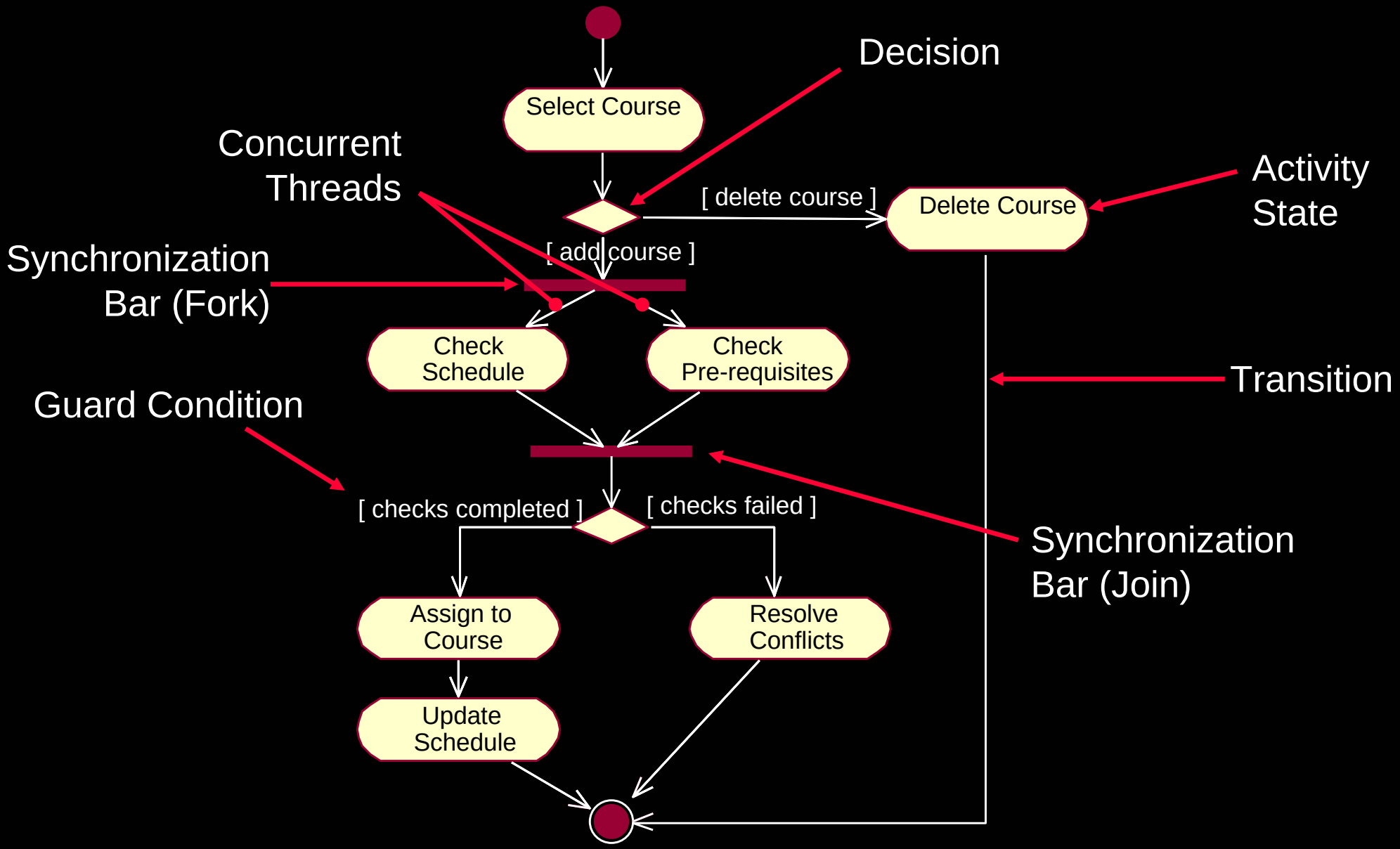


What Is an Activity State?

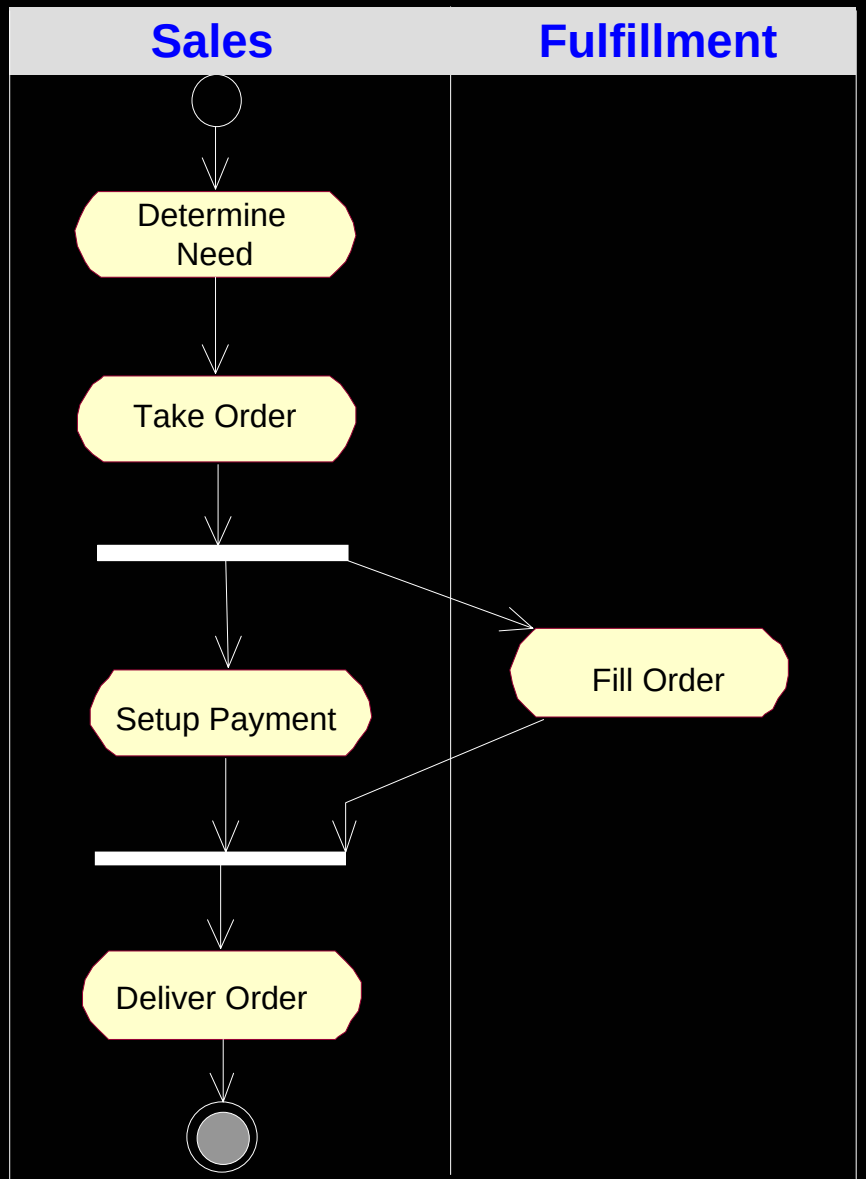
- The performance of an activity or step within the workflow.
- An activity is an operation that takes time to complete. It:
  - May have additional parts, such as entry and exit actions
  - Can have submachine specifications



Example: Activity Diagram



Swimlanes


Sales
Fulfillment
Determine Need
Take Order
Fill Order
Setup Payment
Deliver Order

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 communicate-associations
- Draw:
  - A use-case diagram
- Given:
  - Activity states and transitions
- Draw:
  - An activity diagram