Use Case Diagrams

Ashima Tyagi
Assistant Professor
School of Computer Science & Engineering

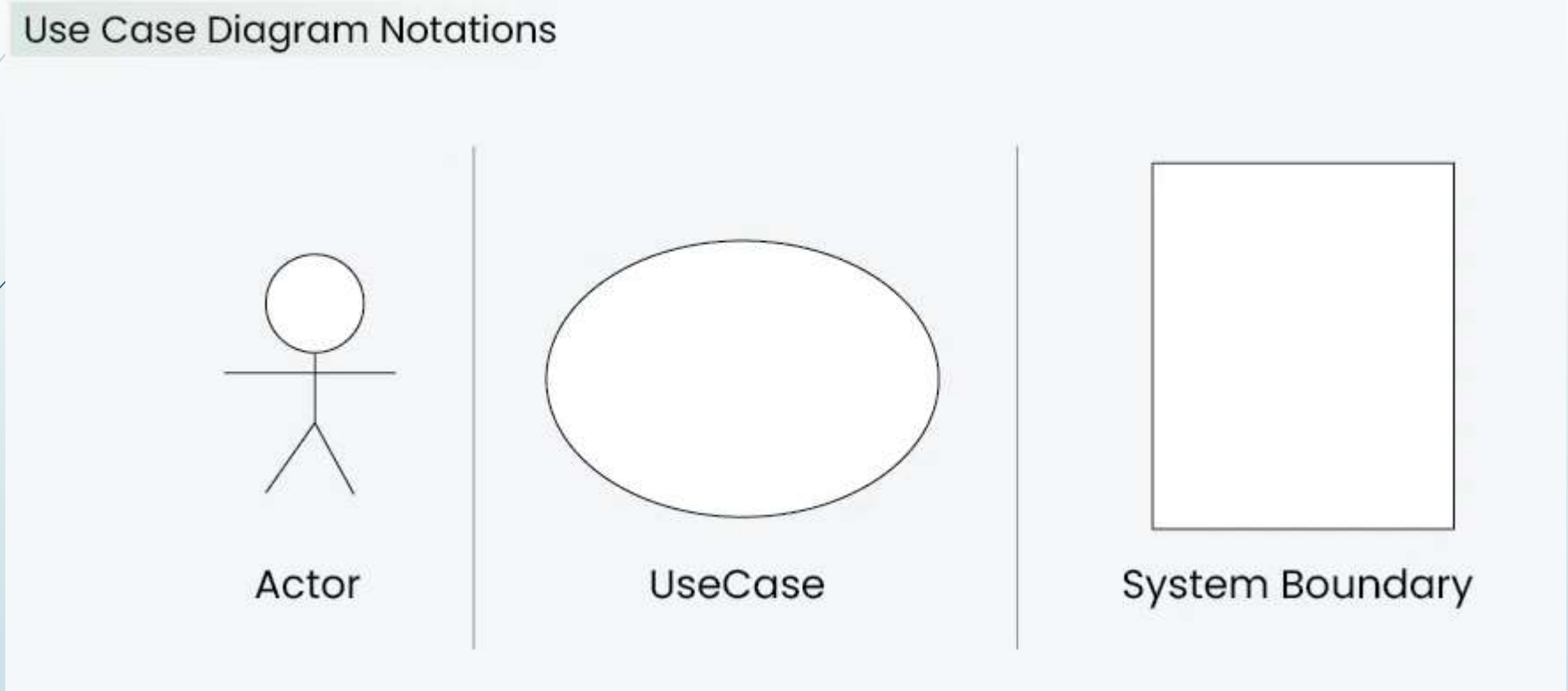
Use Case Diagrams

- A Use Case Diagram represents the interaction between actors (users or external systems) and a system under consideration to accomplish specific goals.
- It provides a high-level view of the system's functionality by illustrating the various ways users can interact with it.

Purpose:

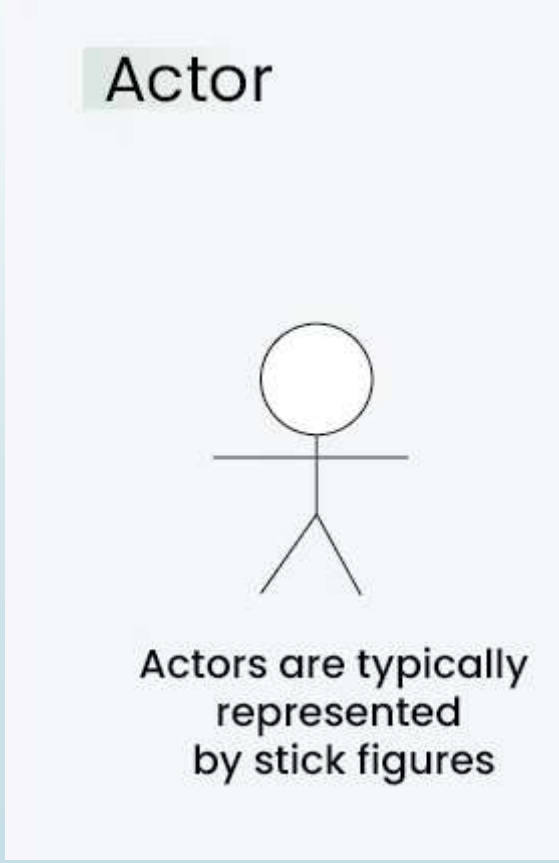
- It defines the dynamic aspect of a system.
- It gathers the system's needs.
- It depicts the external view of the system.
- It recognizes the internal as well as external factors that influence the system.
- It represents the interaction between the actors.

Notations in Use case diagrams



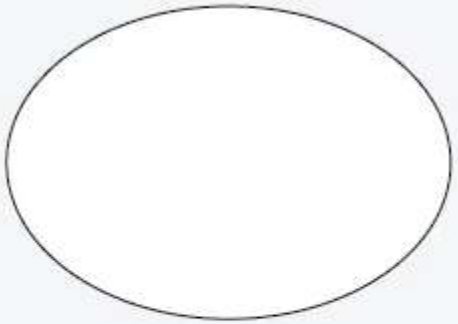
Actors:

- Actors are external entities that interact with the system. These can include **users**, other systems, or hardware devices.
- In the context of a Use Case Diagram, actors initiate use cases and receive the outcomes.
- Proper identification and understanding of actors are crucial for accurately modeling system behavior.



Use Cases:

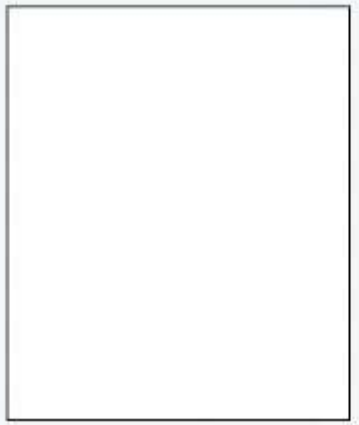
- Use cases are like scenes in the play.
- They represent specific activities your system can do.
- In the online shopping system, examples of use cases could be "Place Order," "Track Delivery," or "Update Product Information".
- Use cases are represented by ovals.



Use cases are represented by ovals.

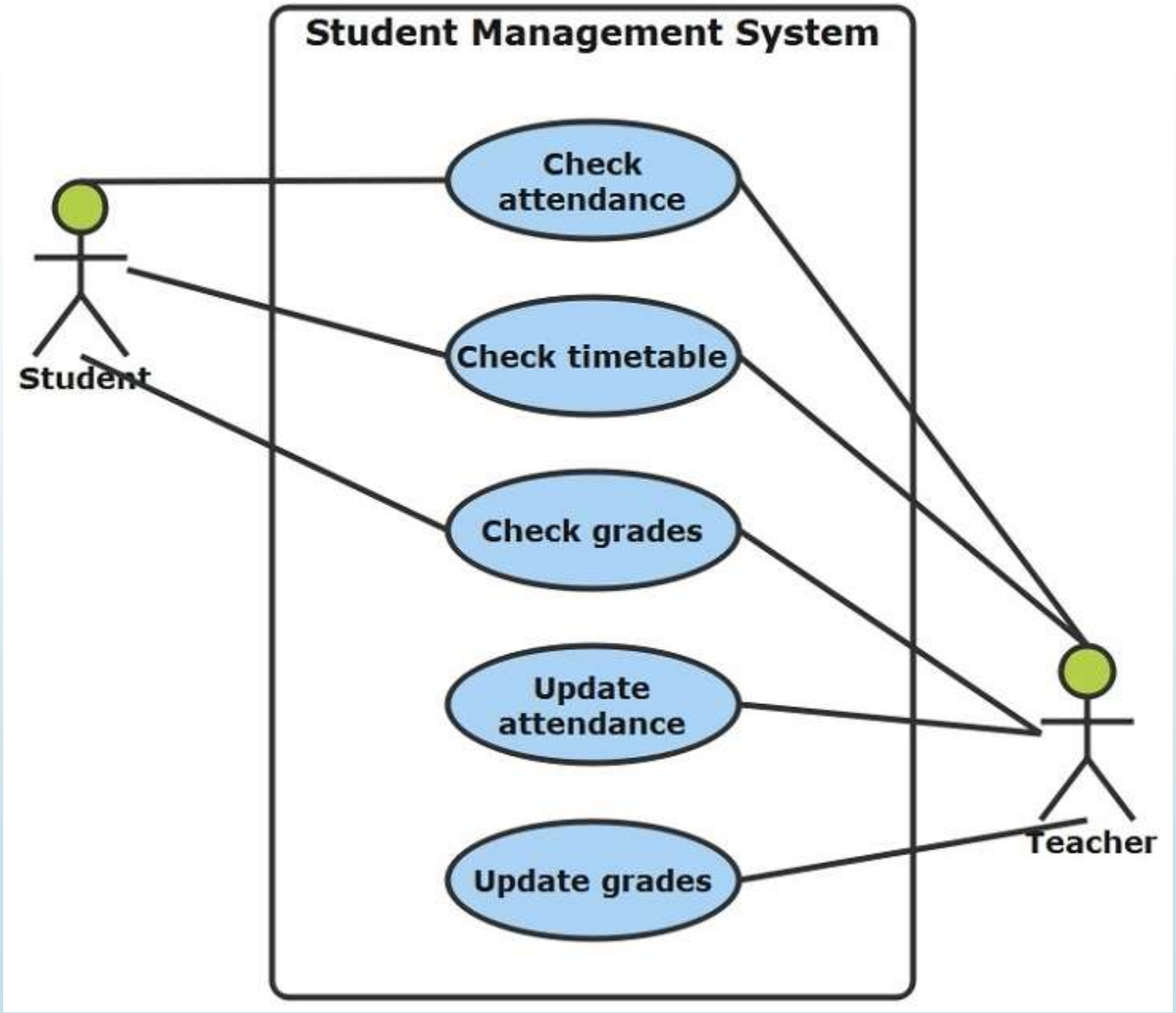
System Boundary:

- The system boundary is a visual representation of the scope or limits of the system you are modeling.
- It defines what is inside the system and what is outside.
- The boundary helps to establish a clear distinction between the elements that are part of the system and those that are external to it.
- The system boundary is typically represented by a rectangular box that surrounds all the use cases of the system.



System boundary is represented by a rectangular box.

- Example1:


Student Management System
Check attendance
Check timetable
Check grades
Update attendance
Update grades
Student
Teacher

Relationships in use case diagram:

The relationship between actor and the use case can be defined using:

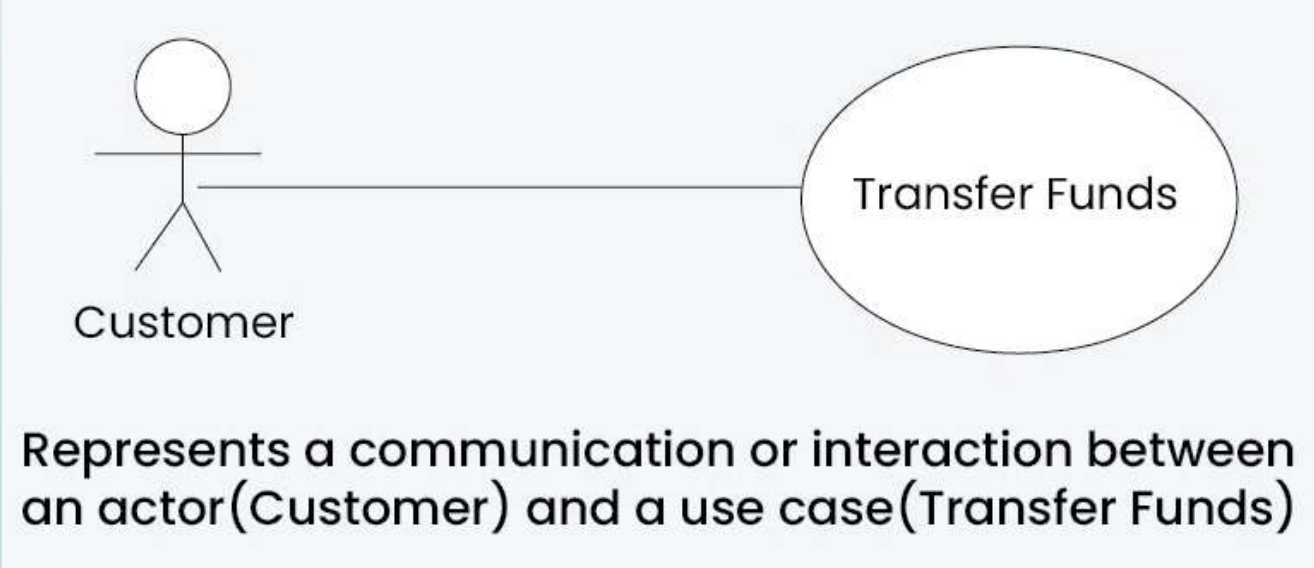
- Association
- Include
- Extend
- Generalisation

Association Relationship:

The Association Relationship represents a *communication or interaction between an actor and a use case.*

Example: Online Banking System

- Actor: Customer
- Use Case: Transfer Funds
- Association: A line connecting the "Customer" actor to the "Transfer Funds" use case, indicating the customer's involvement in the funds transfer process.

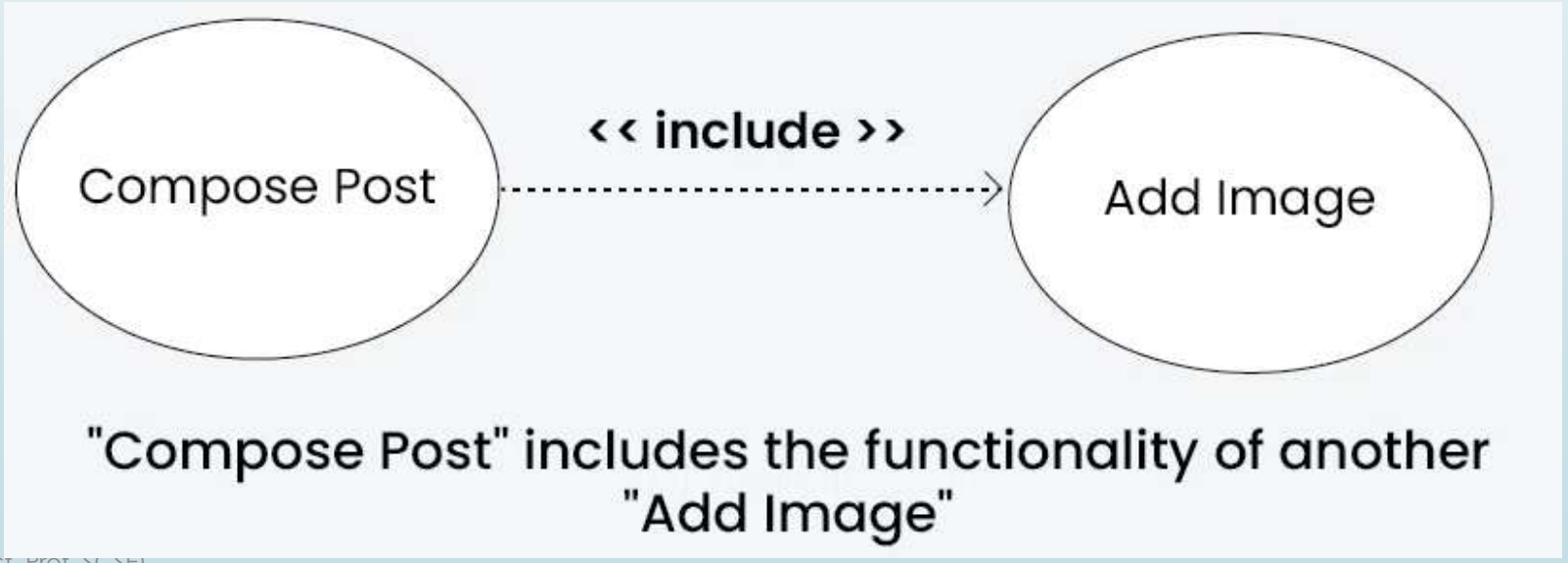


Include Relationship:

The Include Relationship indicates that *a use case includes the functionality of another use case.*

Example: Social Media Posting

- Use Cases: Compose Post, Add Image
- Include Relationship: The "Compose Post" use case includes the functionality of "Add Image." Therefore, composing a post includes the action of adding an image.

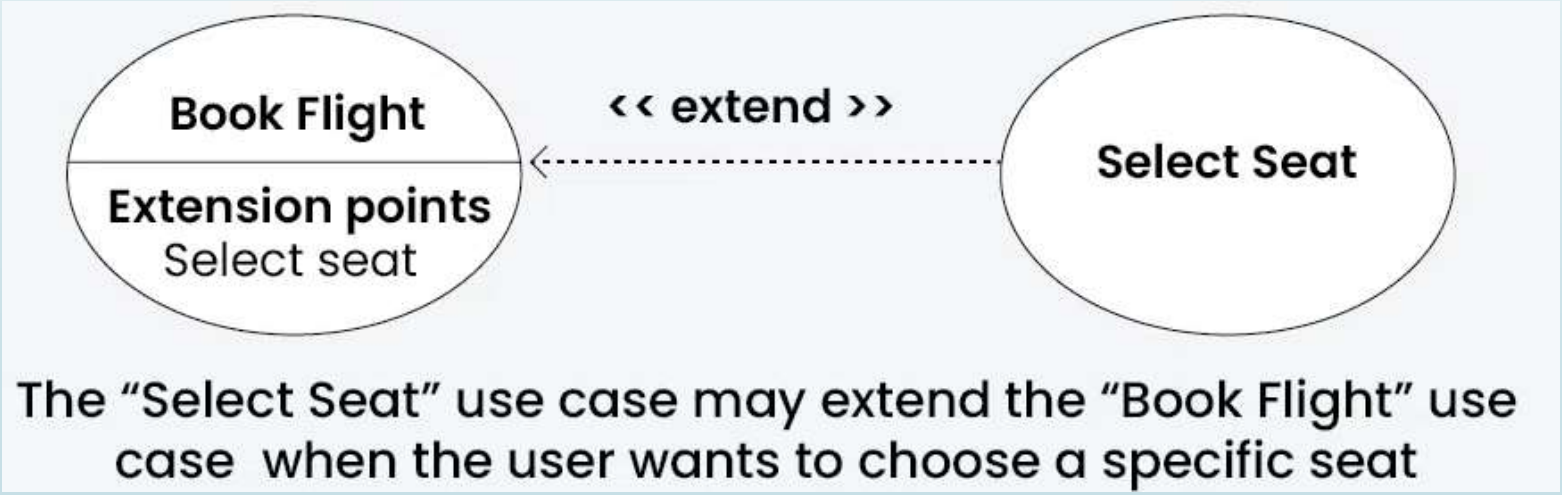


Extend Relationship:

The Extend Relationship illustrates that *a use case can be extended by another use case under specific conditions*. This relationship is useful for handling optional or exceptional behavior.

Example: Flight Booking System

- Use Cases: Book Flight, Select Seat
- Extend Relationship: The "Select Seat" use case may extend the "Book Flight" use case when the user wants to choose a specific seat, but it is an **optional step**.

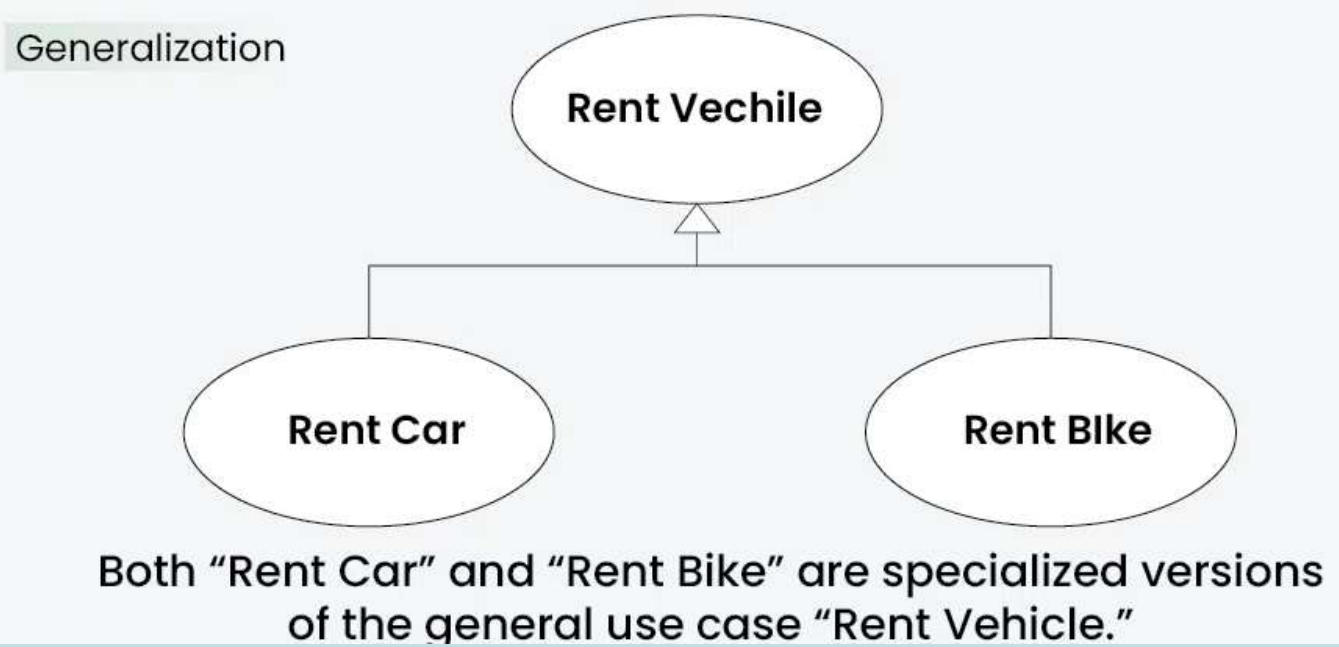


Generalization Relationship:

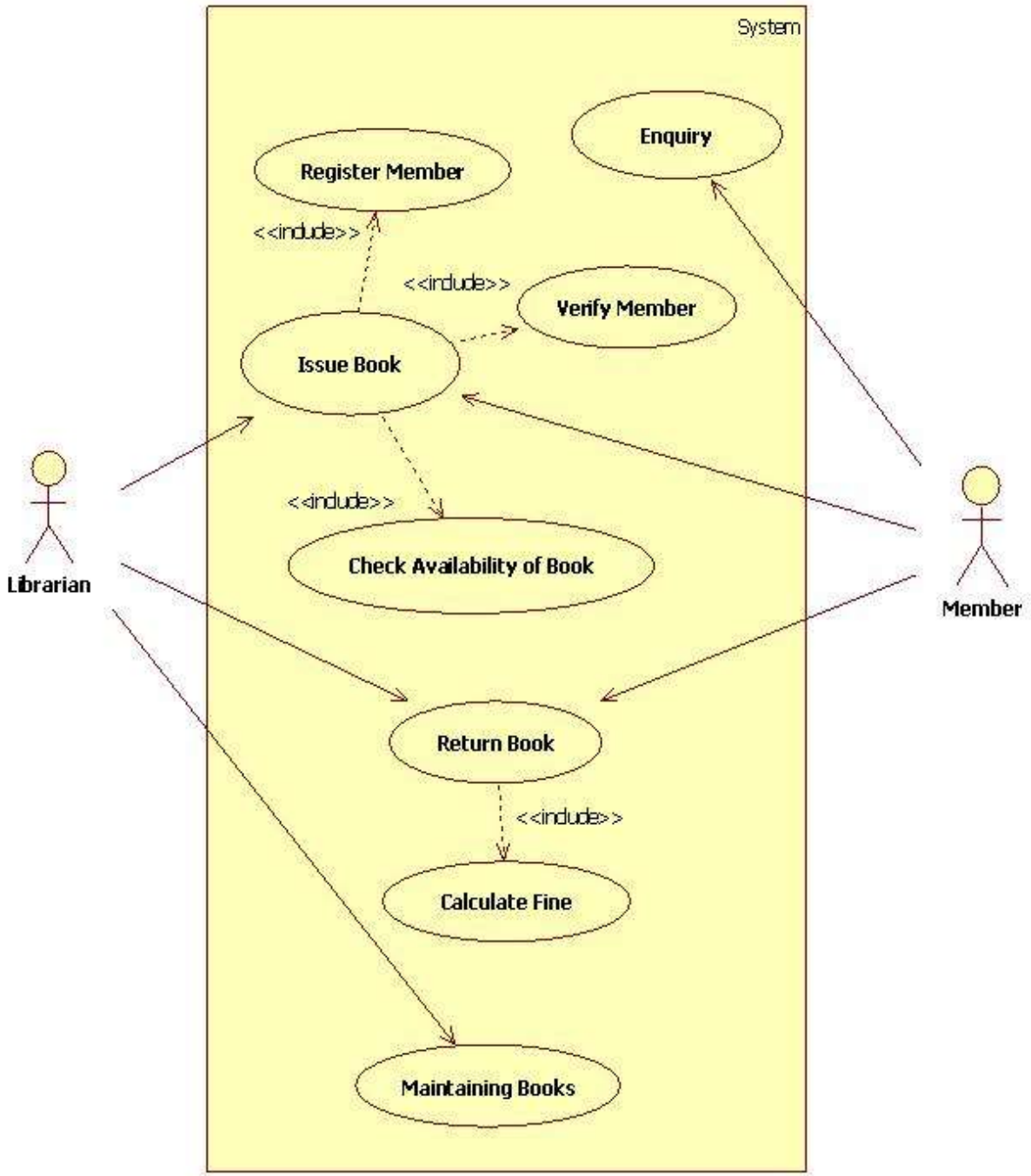
The Generalization Relationship establishes *an "is-a" connection between two use cases,* indicating that one use case is a specialized version of another.

Example: Vehicle Rental System

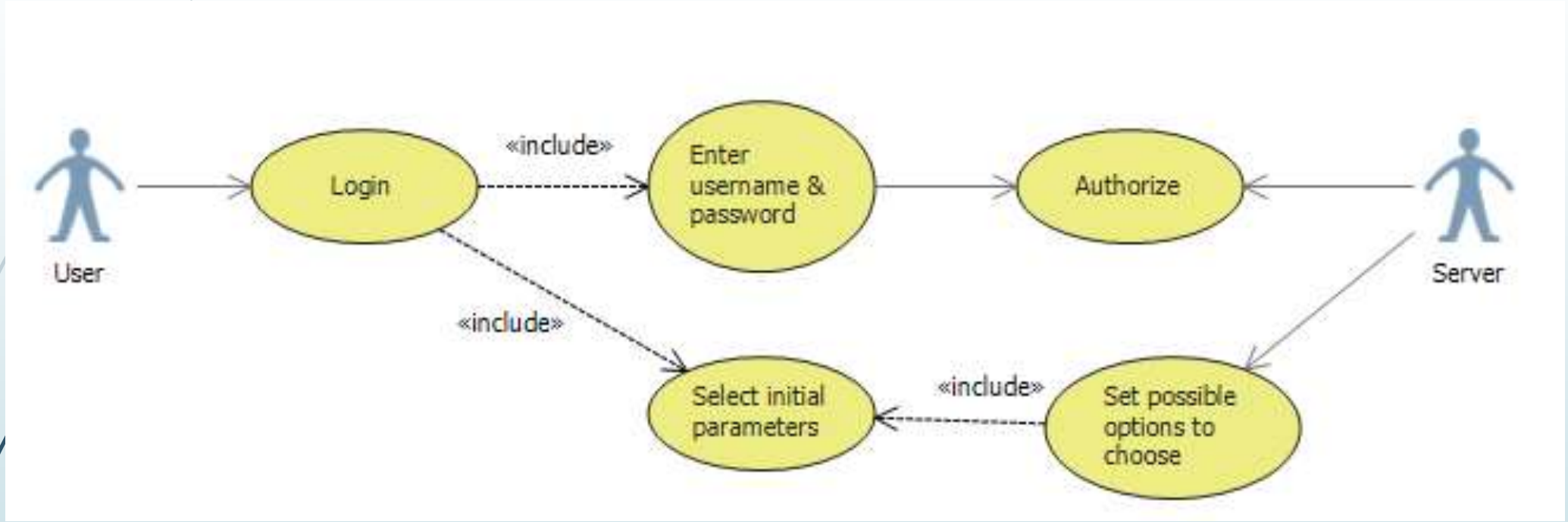
- Use Cases: Rent Car, Rent Bike
- Generalization Relationship: Both "Rent Car" and "Rent Bike" are specialized versions of the general use case "Rent Vehicle."



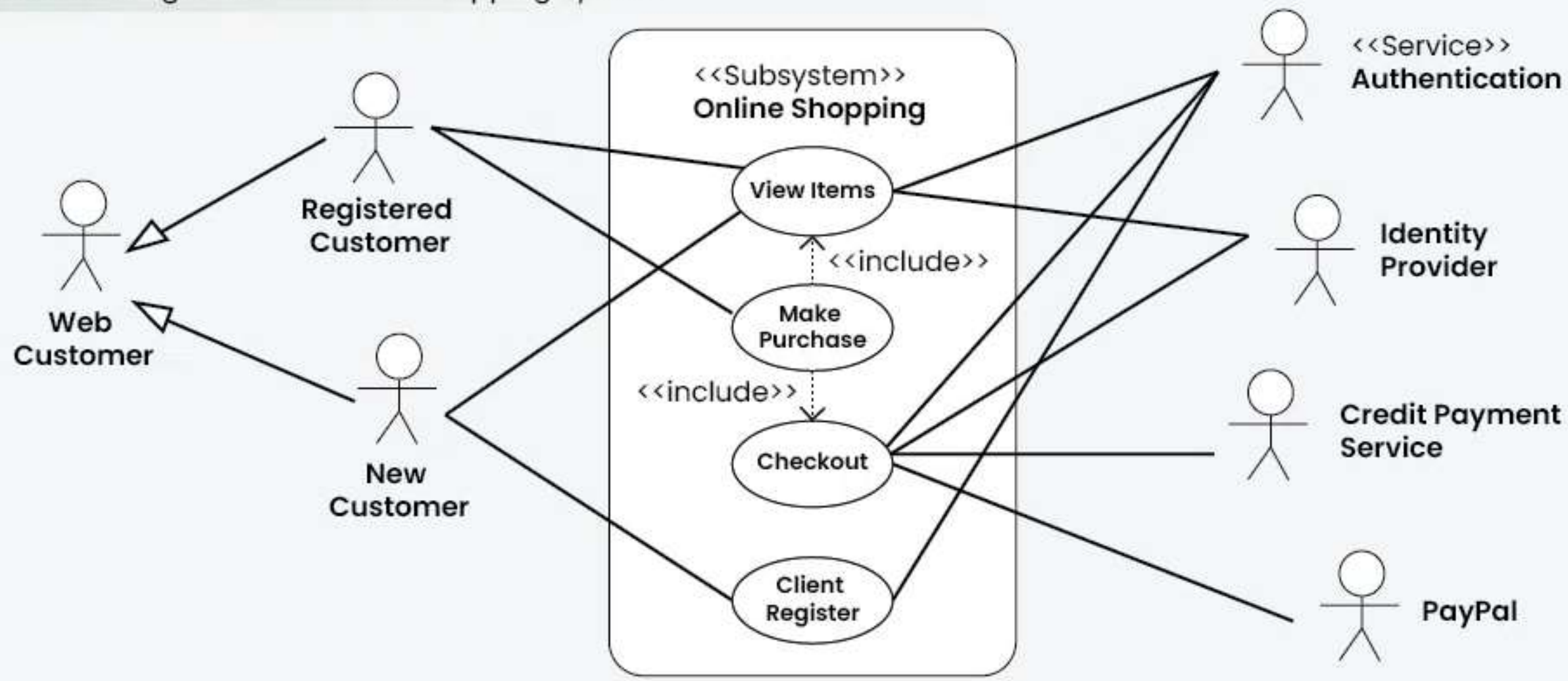
Library Management Use Case diagram



- **Use case diagram of user login**



Use Case diagram of an Online Shopping System



Thank You