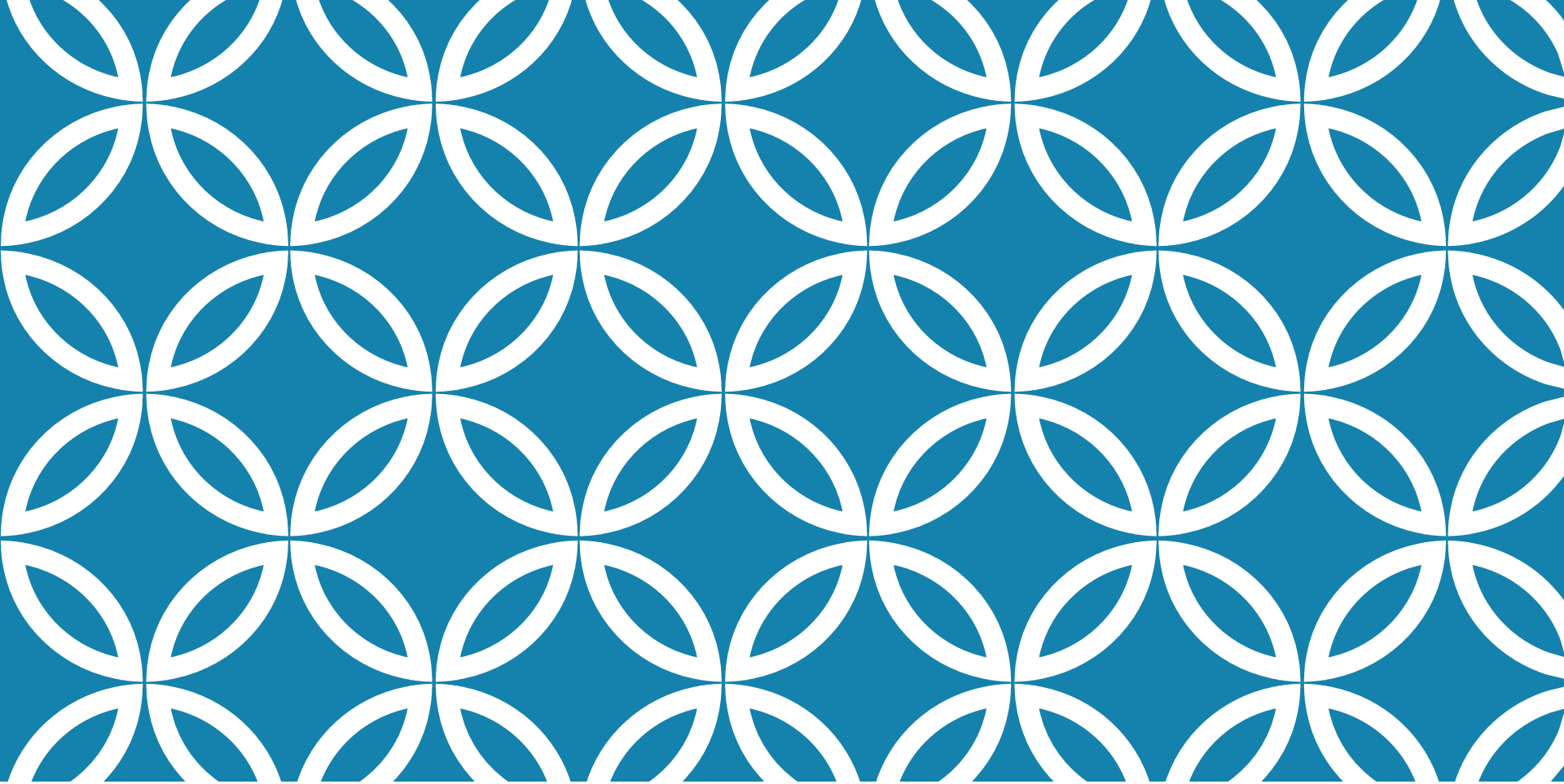


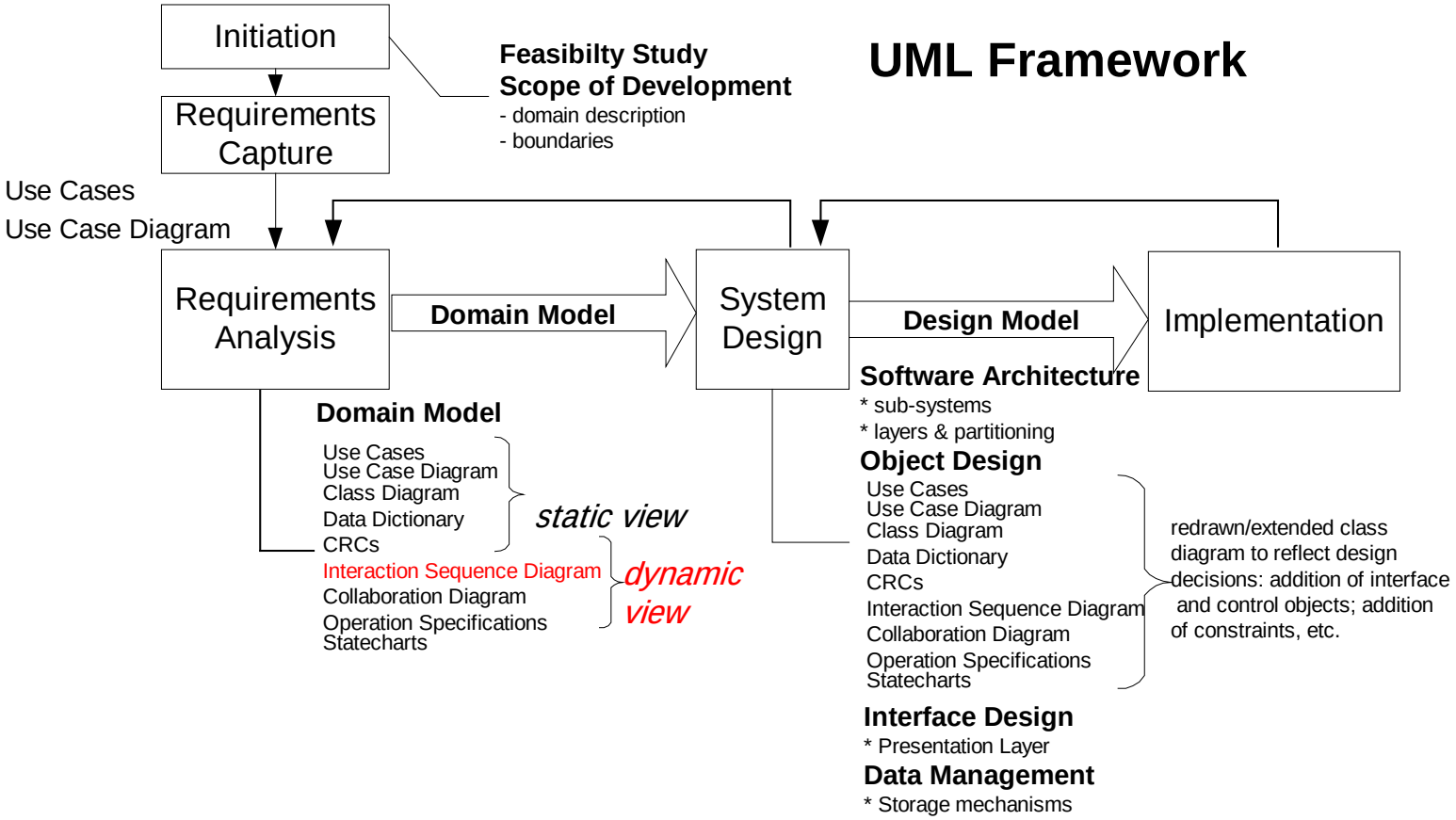
USE CASE MODELING

CSCE 4910

TODAY'S LECTURE

- What is a use case?
- How to draw a use case diagram?
- Relationships between Actors
- Use case stereotypes

UML FRAMEWORK



SYSTEM REQUIREMENTS

- Functional Requirements
  - What Systems do
  - Inputs, Outputs, Process
- Non-Functional Requirements
  - Constraints on system
  - Performance, Volume, Security etc
- Usability Requirements
  - User effectiveness, efficiency, comfort
- Use Cases Primarily Model Functional Requirements

TRADITIONAL APPROACH TO REQUIREMENTS

- Documentation detailing description of system
- Document forms “contract” with client
- Discussions focus upon document
- Result:
  - Large legalistic documents
  - Easy to misinterpret
  - Changes hard to manage
  - Easy to miss / omit requirements
- Modern approach – Model using UML
- Use cases are used to capture functional requirements

USE CASE MODELING

Models the '*actors*' outside a system and their interactions with that system

Every way that an '*actor*' uses a system is called a Use Case

Model:

- Desired functionality
- Constraints on functionality
- Hence build what client wants!

REASONS FOR USE CASES

No information system exists in isolation

Most systems interact with humans or other automated systems (*actors*) that use the system for some purpose

Actors expect the system to behave in a predictable way

Use Cases specify the behavior of the system

Helps visualize the system

USE CASE MODELLING

Use Case diagram

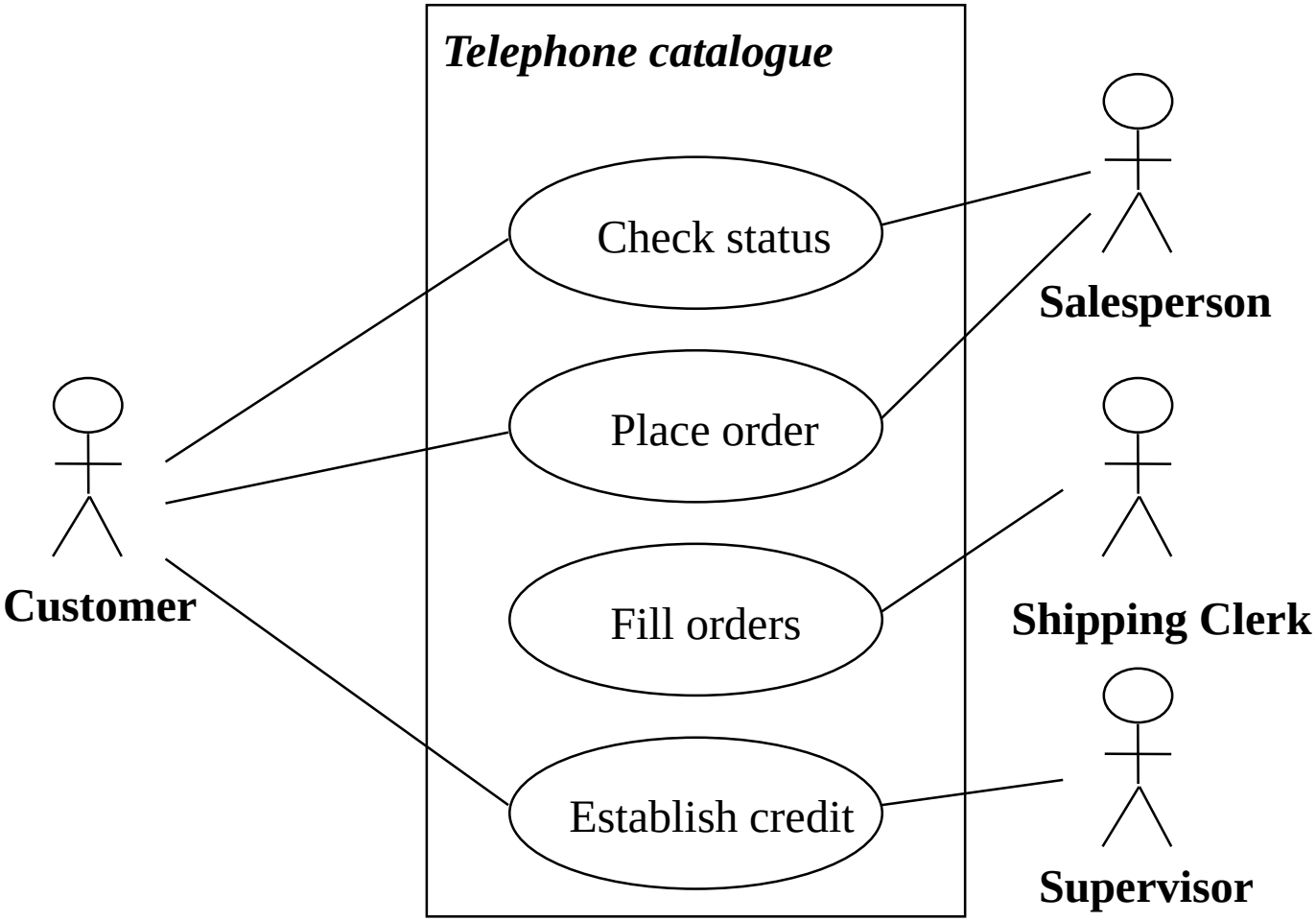
- Diagram illustrating
  - Actors
  - Use cases

  In the system

Use Case Description

- Specification of what happens in each use case
  - Textural description
  - Diagrams

EXAMPLE OF A USE CASE DIAGRAM



ELEMENTS OF USE CASE MODELS

- Use Case
- Actor
- Relationship
- Use Case Diagram
- Scenario
- System Boundary
- Use case description

USE CASE

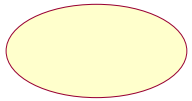
A Use Case is an interaction between the system and a person or another system to achieve a result

A required “bit” of functionality

It yields an observable result of value to an actor (and hence a developer)

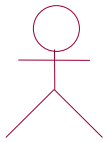
Typically named with a verb than a noun

- “Do something to something”

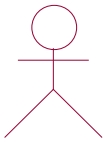


ACTORS

- A coherent set of roles that users of Use Cases play when interacting with Use Cases
- Roles not users or people
- User may have more than one role



Smith



Lecturer

RELATIONSHIPS

A semantic connection among elements

Used to show:

- A function required by an actor
- Relationships between actors
  - More later
- Relationships between use cases
  - More later

Some people also use external relationships

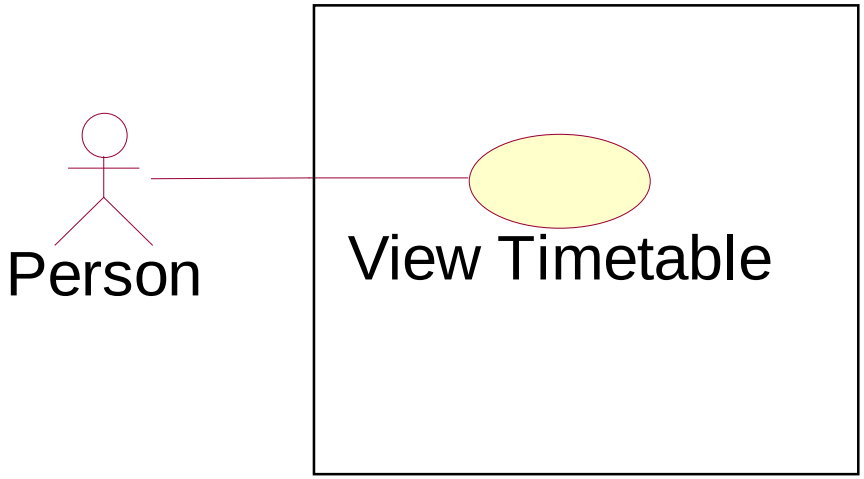
- Relationships between things that do not directly interact with the system – Out of scope?

USE CASE DIAGRAM

A diagram that shows a set of Use Cases and Actors and their relationships

Use Case diagrams address a user-centric view of a system

Show a required “bit” of functionality



SCENARIO / SYSTEM BOUNDARY

Scenario

- A single path through a Use Case
- Use case is usually a collection of scenarios
- Included as part of use case description
  - More next week

System Boundary

- A high level indication of the domain
- Limit to investigation
  - System
  - Part of system in focus

RELATIONSHIPS IN USE CASES

Between actor and use case

- Actor uses

Generalisation of actors

- Types of users

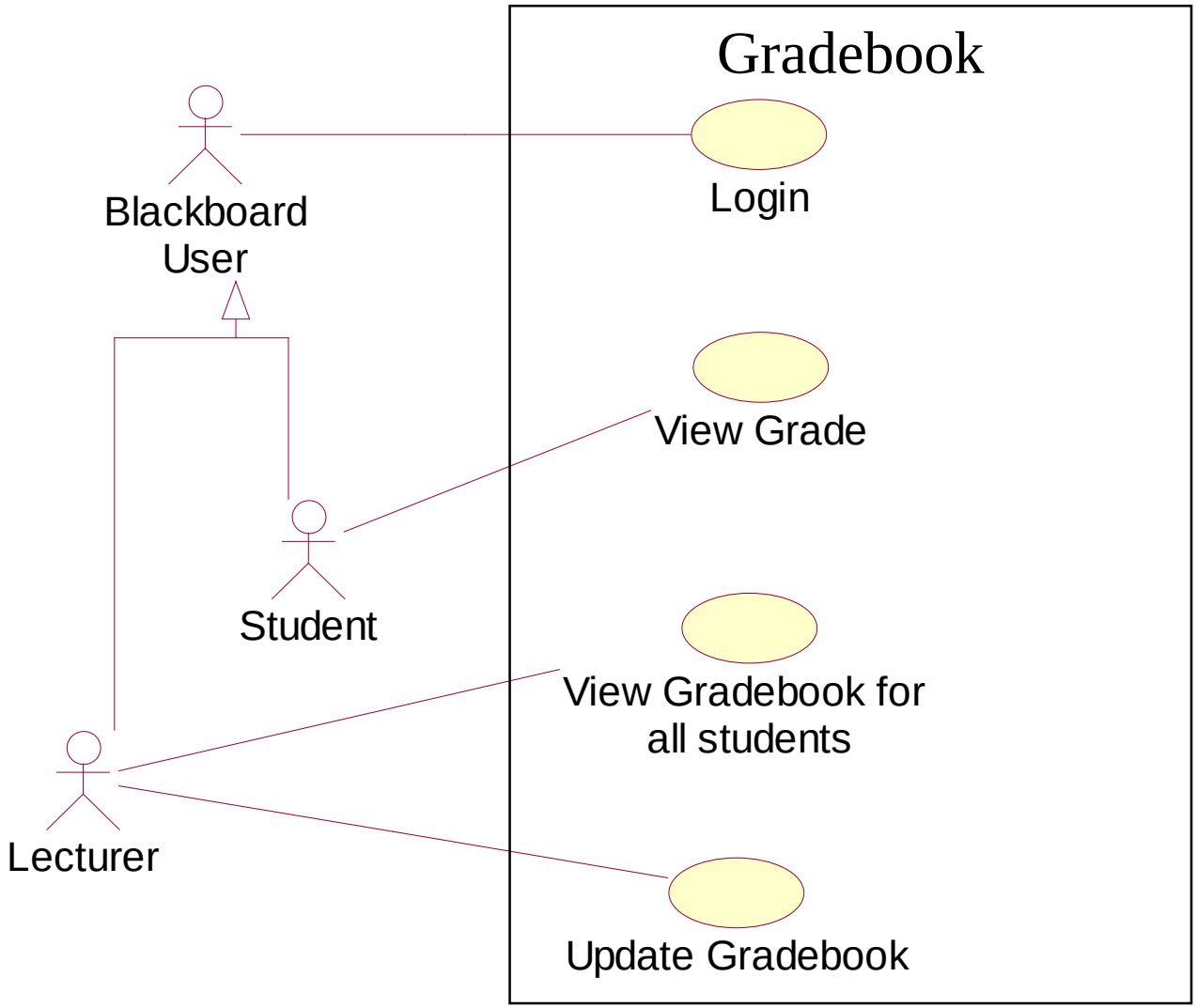
Use case stereotypes

- <<extend>>
  - Optional
- <<include>>
  - Mandatory

Stereotype is a UML extension mechanism to indicate a type of behaviour

GENERALISATION OF ACTORS

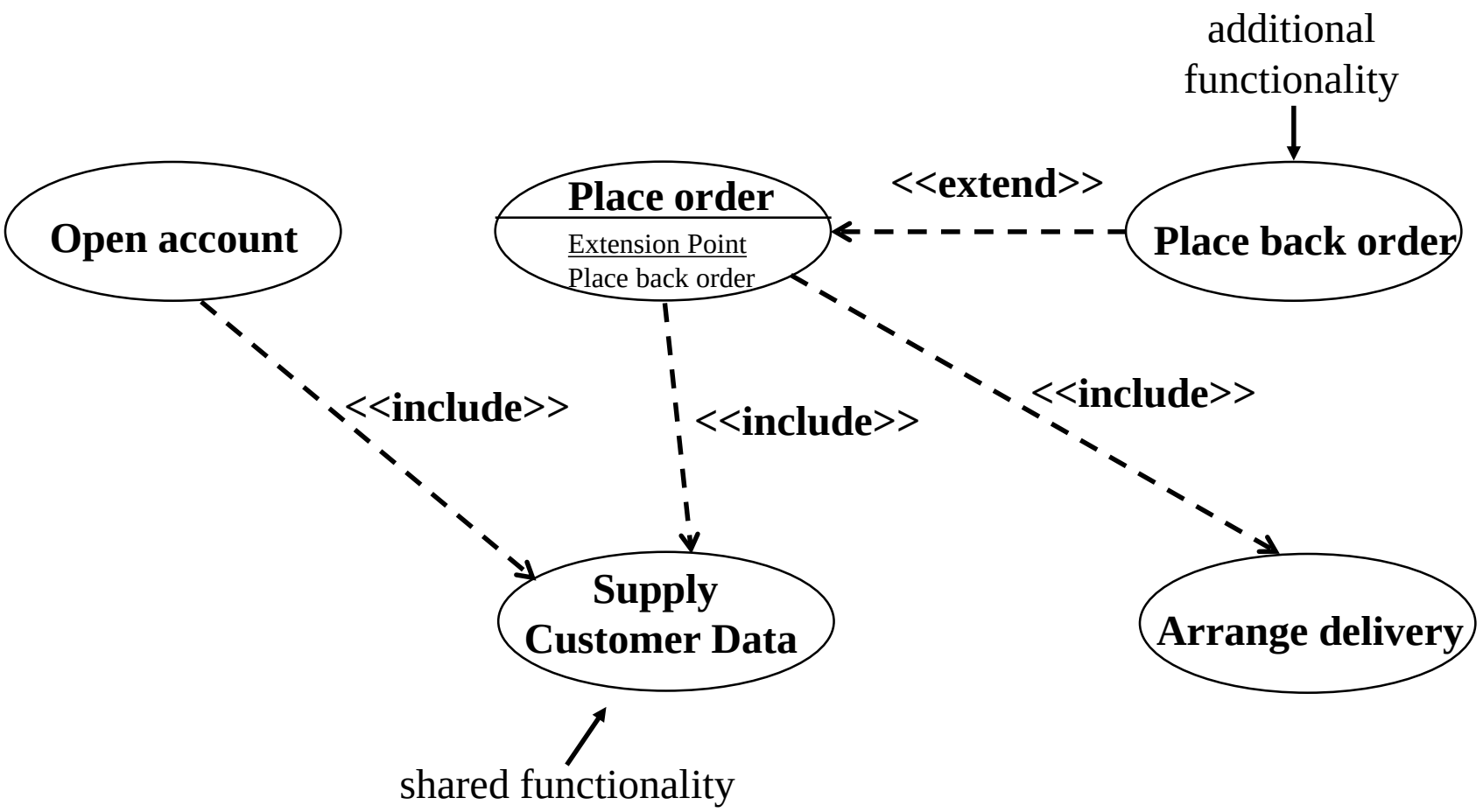
Question:
Is Login part of this system?



USE CASE VARIANTS : INCLUDE AND EXTEND

- *include* relationship occurs when you have a chunk of behavior that is similar across more than one Use Case
  - use in two or more separate Use Cases to avoid repetition
  - a significant part of a use case
  - <<*include*>>
- *extend* relationship where you have one Use Case which adds functionality to another Use Case
  - any Use Case can have more than one extend
  - use when describing a variation on or in addition to normal behavior
  - OPTIONAL BEHAVIOUR
- Otherwise part of use case or
- <<include>>
  - <<extend>>

EXAMPLE OF USE CASE VARIANTS



SUMMARY

What is a use case

How to draw a use case diagram

Use case stereotypes

Relationships between Actors