Requirements Analysis

Overview

• Unified Modeling Language (UML)
• UML Use case diagram
• Case study: The ATM system
Unified Modeling Language (UML)

• Definition
  – A visual language for specifying, constructing, and documenting the artifacts of systems
  – Standard diagramming notation for drawing pictures related to software
  – Includes 13 types of diagrams

Two Categories of UML Diagrams

• Structural UML diagrams
  – Class diagram
  – Object diagram
  … …

• Dynamic UML diagrams
  – Use case diagram
  – Sequence diagram
  … …
We will discuss

- Use case diagram (Requirement)
- Class diagram (Requirement & Design)
- Sequence diagram (Requirement & Design)
- Package diagram (Design)

Use case diagram

- Definition
  - A representation of interactions between actors and the system
- It shows relationship between actors, use cases, and the system
  - the scope of the system
  - the external actors
  - how actors use the system
- It is secondary to text documentation
Legends

**Actor**: an entity that interacts with the system.

**Actor**: a computer system that interacts with the system under discussion

**Use case**: usage of a system

**Association**: relation between an actor and a use case

**Includes dependency**: a base use case includes a sub use case as component

**Extends dependency**: a use case extends the behavior of a base use case.

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What are the relations?

![Diagram showing relations between clean windows, clean a car, and clean Ford F-150](image-url)

- **Include** and **Extend** are used to show the relationships between the use cases.
Case study: POS system

- With a POS system,
  - a cashier can perform the following tasks (with help of the manager if necessary):
    - Process sale
    - Handle return
    - Register product specification
  - For each activity, the system may first authenticate the cashier or manager
- The POS system interfaces to third-party tax calculator and inventory control

Use Case Diagram

- What are the actors?
- What are the use cases?
- What is the relationship between use cases?
Use Case Diagram

Case study: ATM system

- With an ATM, a customer can perform the following activities:
  - check balance
  - transfer
  - withdraw cash
- For each activity, the system will first authenticate the customer
- Some fee may apply for withdrawing or transferring
Use Case diagram

• What are the actors?
• What are the use cases?
• What is the relationship between use cases?
Initial Project Presentation

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Content

• What are the functional requirements to include?
• What are the nonfunctional requirements?
• What are the biggest challenges?
  – Domain knowledge, new features
• Plan to solve the challenges?