Week 3 Requirements

Software Development Cycle

- Waterfall Software Development Life Cycle
- Agile
- V-model
- Spiral

Modeling notations

Use Cases

Use cases are a **textual method** for specifying functional requirements, focusing on **the interactions between a system and its external entities (often users)**. They describe how a system behaves while responding to a request from one of its stakeholders, defining the sequence of interactions between the system and its actors.

UML (Unified Modeling Language): The most common notation for use cases is UML. UML is a standardized modeling language consisting of an integrated set of diagrams, designed to specify, visualize, construct, and document the artifacts of a software system. Within UML, use cases are represented by:

- **Use Case Diagrams:** These diagrams provide a graphical overview of the functionalities provided by the system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The primary elements are:
  - **Actors:** Represent roles played by human users, other systems, or hardware devices interacting with the system.
  - **Use Cases:** Depict the services or functions the system provides.
  - **Relationships:**
    associations (between actors and use cases)
    include (one use case includes another)

extend (one use case extends the behavior of another)
generalizations (among actors or use cases).

User Stories

User stories are **short, simple descriptions of a feature** told from the perspective of the end-user or customer. They are a more informal and natural way to capture functional requirements, focusing on value delivery to users.
While there's no standardized graphical notation for user stories, they are a key part of agile frameworks like Scrum and Kanban, and are often captured using:

Index Cards or Digital Tools: Traditionally, user stories are written on physical index cards or sticky notes, capturing the essence of a requirement in a concise format. Each card includes:

- A simple statement of the requirement in everyday language, often following the template: "As a [type of user], I want [some goal] so that [some reason]."
- Acceptance criteria that specify the conditions that must be met for the story to be considered complete.

Comparison

- **Use Cases:** More formal and structured, suitable for complex systems where detailed documentation of system behavior is necessary. **UML diagrams** provide a clear visual representation of system interactions.
- **User Stories:** More flexible and concise, focusing on delivering value to the user. They are **better suited for agile development processes where requirements can change frequently.**