Class: User

Parent Class: None

Subclasses: None

Responsibilities:

Manage user details including user\_id, user\_name, user\_password, and email.

Persist user data to the database using JPA annotations for easy mapping between the Java class and the database table.

Collaborators:

May interact with other classes related to user sessions, login validation, and possibly user roles in the future.

CRC CARD:

Class User

Responsibilities - Store and retrieve user details.

- Persist user data to the database.

Collaborators - Database connection.

- Classes for managing login sessions.

- Classes for handling password security.

OS: Compatible with any operating system that supports Java.

Language: Java

Database: MySQL

Frameworks: Spring Boot

Network: HTTP/HTTPS for web interactions

Dependencies:

JDK 11+

Jakarta Persistence API

Spring Boot Framework for project structuring

Overview: The system is organized into three main layers:

Presentation Layer: Contains frontend components (HTML/CSS/JavaScript) for displaying the user interface, as well as any RESTful controllers for handling HTTP requests and responses.

Application Layer: Contains the core business logic of the system, including user management, authentication, and session handling.

Data Access Layer: Responsible for interacting with the database, including reading from and writing to the User table.

Common Error Scenarios:

Invalid User Input: For example, if a user enters an invalid email or a weak password.

Solution: Validate input on both client and server sides. Return a descriptive error message to the user for correction.

Database Connection Failure:

Solution: If the database connection fails, the system will display an error message and log the error for troubleshooting. Attempts can be made to reconnect, or an error message will inform users of temporary unavailability.

Invalid Login Attempt: If a user enters an incorrect username or password.

Solution: Log the attempt, show an error message, and limit the number of retries to prevent brute-force attacks.

Network Issues:

Solution: Implement retry logic for network-related failures or display a "Network error. Please try again later" message.

External System Failures: If the system relies on third-party services (e.g., email service for registration confirmation).

Solution: Implement fallback mechanisms and notify the user if certain features are temporarily unavailable due to third-party issues.