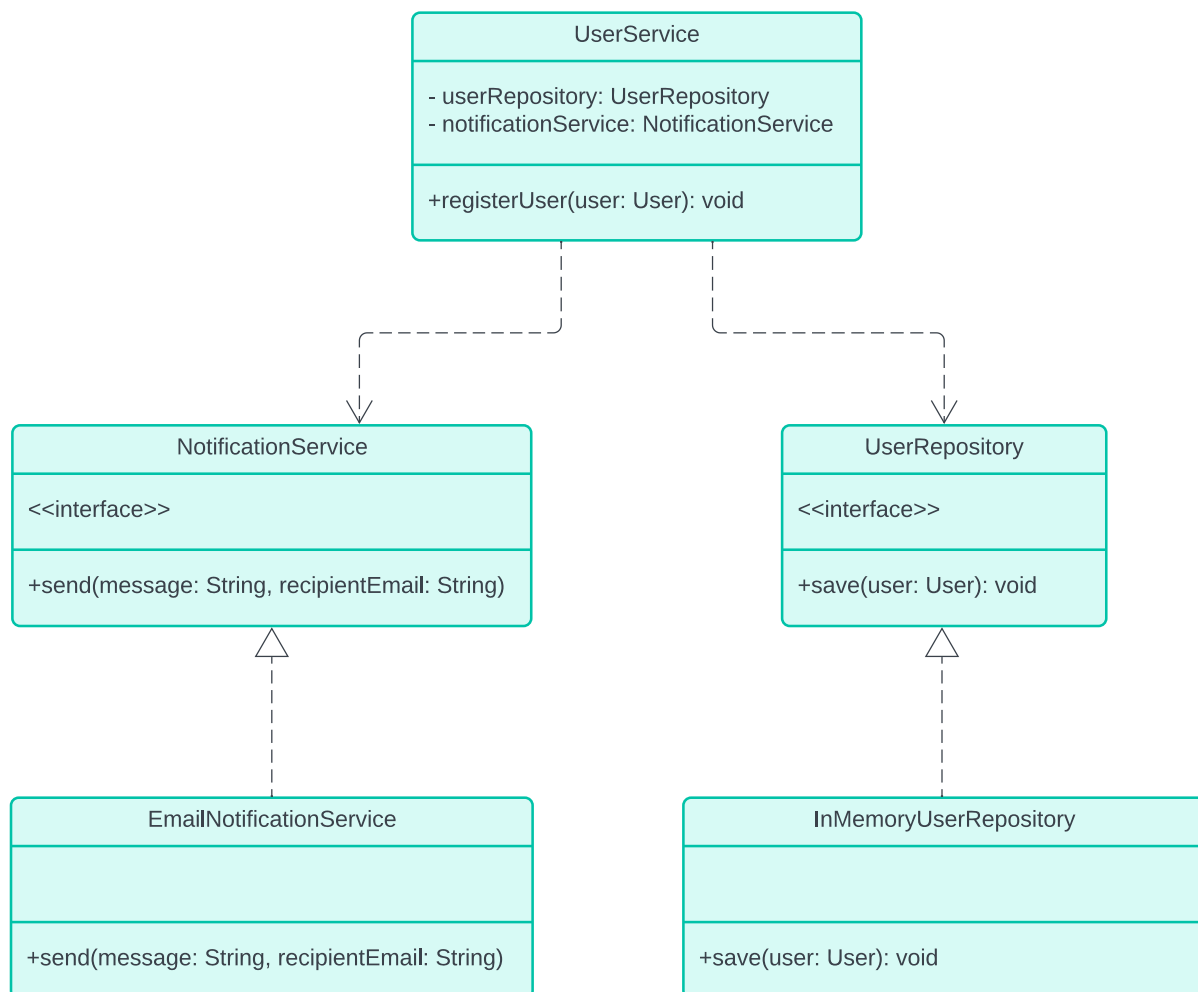


Exercise: Implementing a User Registration Service

In this exercise, you will design and implement a User Registration Service that allows users to register by providing their name, email, and password. The system will save the user in a repository and simulate sending a notification to the user after registration. The mail server settings (such as host and port) for sending notifications should be configurable via the `application.properties` file. This is a simulation, and no actual emails will be sent.

Class Diagram



Steps

1. Define the User class:

- Attributes:
 - id (Long)
 - email (String)
 - password (String)
 - name (String)

2. Implement the UserRepository interface:

- Define the UserRepository interface with a single method
 - save(User user): void
- Implement the UserRepository interface in a class called InMemoryUserRepository. Use a HashMap to store users in memory, with the email address as the key and the User object as the value.

3. Implement the NotificationService interface:

- Define a NotificationService with a method:
 - send(String message, String recipientEmail): void
- Create an EmailNotificationService that implements this interface and simulates sending an email by printing to the console.
- The mail server settings (such as host and port) should be read from the application.properties file and printed as part of the simulated email sending process.

4. Design the UserService class:

- The UserService should:
 - Register a new user using the UserRepository.
 - Send a confirmation notification using the NotificationService.
- Ensure that UserService can work with any implementation of NotificationService, making the notification method easily replaceable.

5. Test the registration system:

- In your main method, create an instance of UserService and call the registerUser() method.
- Verify that the user is saved and a confirmation message is printed to the console simulating an email notification.

6. Bonus step: Handle duplicate user registration.