IT342-G1
SYSTEMS INTEGRATION AND ARCHITECTURE 1

FUNCTIONAL REQUIREMENTS SPECIFICATION (FRS)

Project Title: Mini App – User Registration & Authentication

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Table of Contents

1. Introduction

1.1. Purpose
Describe the purpose of the system and the intended audience of this document.

1.2. Scope
Describe what the system will do and its boundaries.

1.3. Definitions, Acronyms, and Abbreviations
List and define important terms used in this document.

2. Overall Description

2.1. System Perspective
Describe how the system fits into a larger context or environment.

2.2. User Classes and Characteristics
Identify the different types of users and their characteristics.

2.3. Operating Environment
Specify the hardware, software, and tools required to operate the system.

2.4. Assumptions and Dependencies
List any assumptions and external dependencies that may affect the system.

3. System Features and Functional Requirements
Describe each major feature of the system and its functional requirements.

3.1. Feature 1:
Description:
Functional Requirements:
-
-
-

3.2. Feature 2:
Description:
Functional Requirements:
-
-
-

4. Non-Functional Requirements
Specify system quality attributes such as performance, security, usability, reliability, etc.

5. System Models (Diagrams)

Insert the necessary diagrams for the system:

5.1. ERD

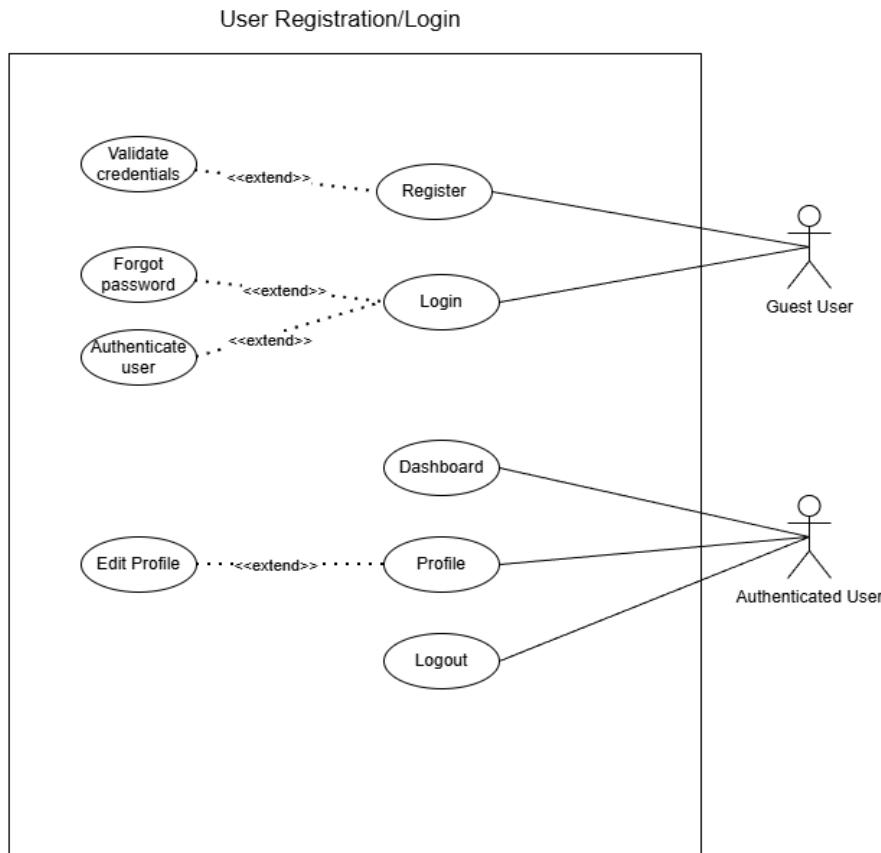| User	
PK	**userID**
	fName
	lName
	phone
	email
	password

Figure 5.1

5.2. Use Case Diagram

User Registration/Login

figure 5.2

5.3. Activity Diagram
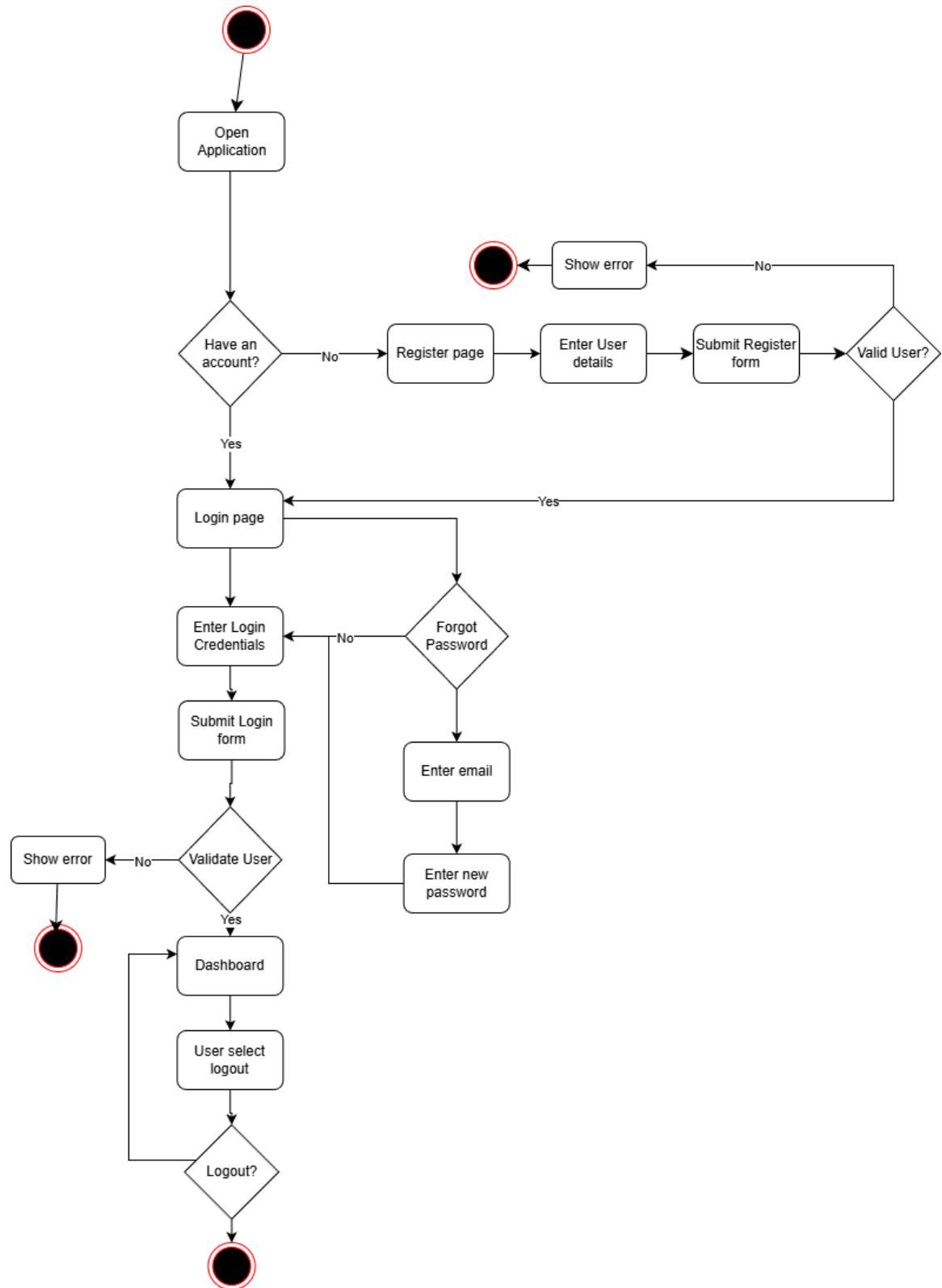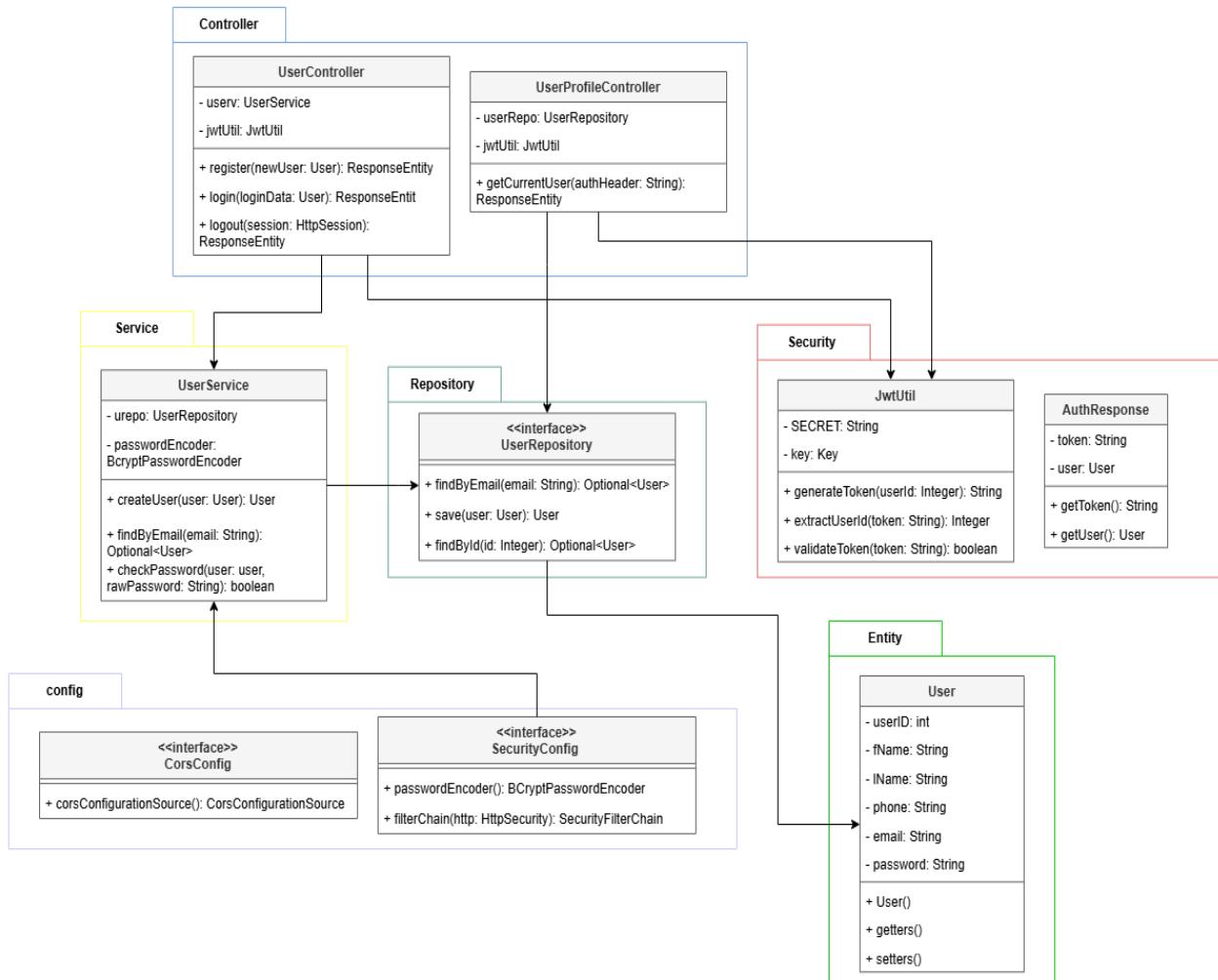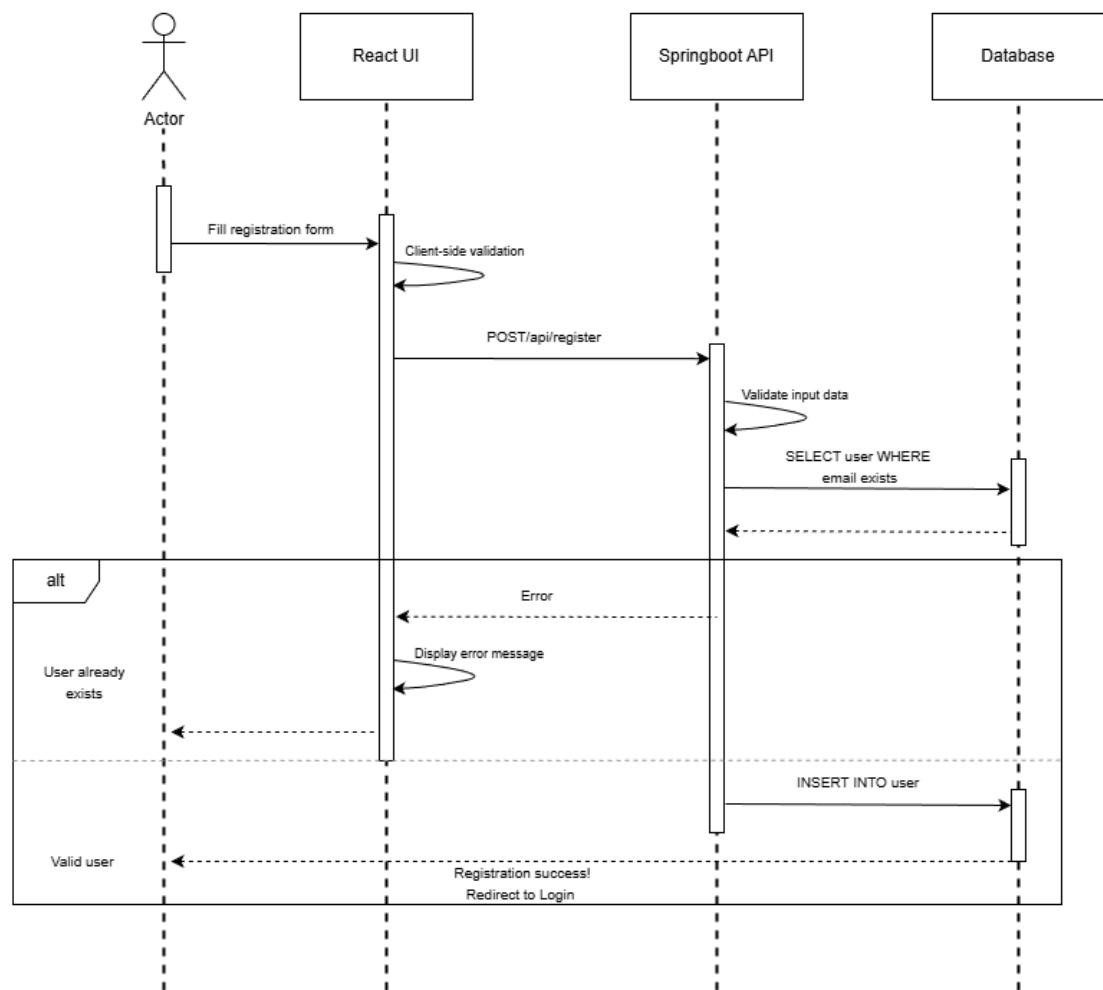
figure 5.3

5.4. Class Diagram

Controller

UserController

- userv: UserService
- jwtUtil: JwtUtil

+ register(newUser: User): ResponseEntity
+ login(loginData: User): ResponseEntit
+ logout(session: HttpSession): ResponseEntity

UserProfileController

- userRepo: UserRepository
- jwtUtil: JwtUtil

+ getCurrentUser(authHeader: String): ResponseEntity

Service

UserService

- urepo: UserRepository
- passwordEncoder: BcryptPasswordEncoder

+ createUser(user: User): User
+ findByEmail(email: String): Optional<User>
+ checkPassword(user: user, rawPassword: String): boolean

Repository

**<<interface>>
UserRepository**

+ findByEmail(email: String): Optional<User>
+ save(user: User): User
+ findById(id: Integer): Optional<User>

Security

JwtUtil

- SECRET: String
- key: Key

+ generateToken(userId: Integer): String
+ extractUserId(token: String): Integer
+ validateToken(token: String): boolean

AuthResponse

- token: String
- user: User

+ getToken(): String
+ getUser(): User

config

**<<interface>>
CorsConfig**

+ corsConfigurationSource(): CorsConfigurationSource

**<<interface>>
SecurityConfig**

+ passwordEncoder(): BCryptPasswordEncoder
+ filterChain(http: HttpSecurity): SecurityFilterChain

Entity

User

- userID: int
- fName: String
- lName: String
- phone: String
- email: String
- password: String

+ User()
+ getters()
+ setters()

5.5. Sequence Diagram

USER REGISTRATION FLOW

USER LOGIN FLOW

```
Actor          React UI          Springboot API          Database

  │  Fill login form  │                │                    │
  ├──────────────────>│                │                    │
  │                   │ Client-side    │                    │
  │                   │ validation     │                    │
  │                   │<──┐            │                    │
  │                   │   │            │                    │
  │                   │ POST/api/login │                    │
  │                   ├───────────────>│                    │
  │                   │                │ SELECT * FROM user │
  │                   │                │ WHERE email = ?    │
  │                   │                ├───────────────────>│
  │                   │                │<╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌┤
```
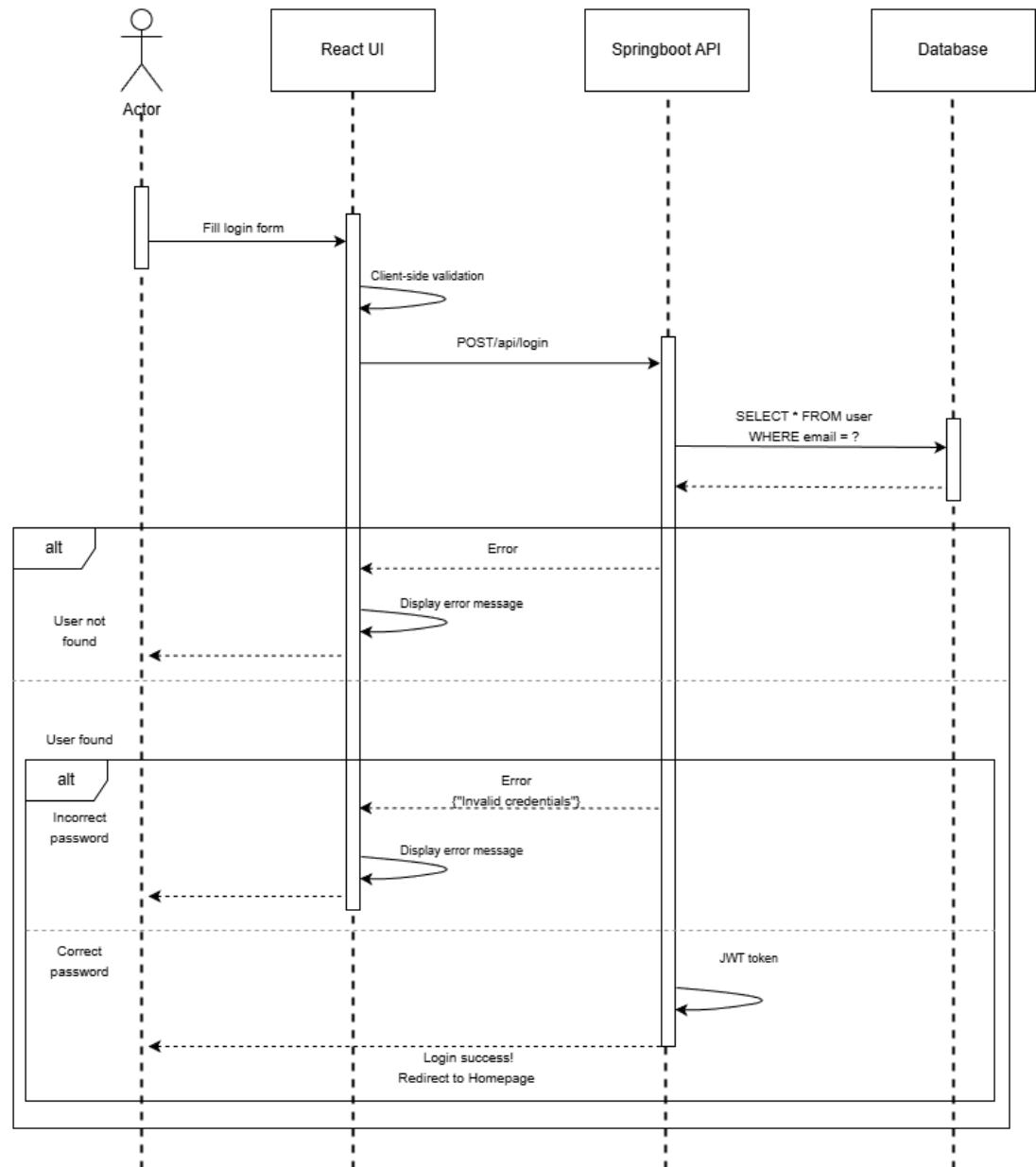
```
alt ┌──────────────────────────────────────────────────────────────┐
    │              Error                                             │
    │<╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌┤                                     │
    │ Display error message    │                                    │
    │<──┐                      │                                    │
 User not                      │                                    │
 found  │<╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌┤                                     │
────────┼─────────────────────────────────────────────────────────┤
 User found                                                         │
    ┌───────────────────────────────────────────────────────────┐  │
alt │              Error                                         │  │
    │          {"Invalid credentials"}                          │  │
 Incorrect│<╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌┤                  │  │
 password │ Display error message             │                  │  │
    │         │<──┐                           │                  │  │
    │<╌╌╌╌╌╌╌╌┤                              │                  │  │
────┼─────────────────────────────────────────────────────────┤  │
 Correct                                      │ JWT token         │  │
 password                                     │<──┐               │  │
    │<╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌╌┤                  │  │
    │         Login success!                                       │  │
    │         Redirect to Homepage                                 │  │
    └───────────────────────────────────────────────────────────┘  │
 └──────────────────────────────────────────────────────────────────┘
```
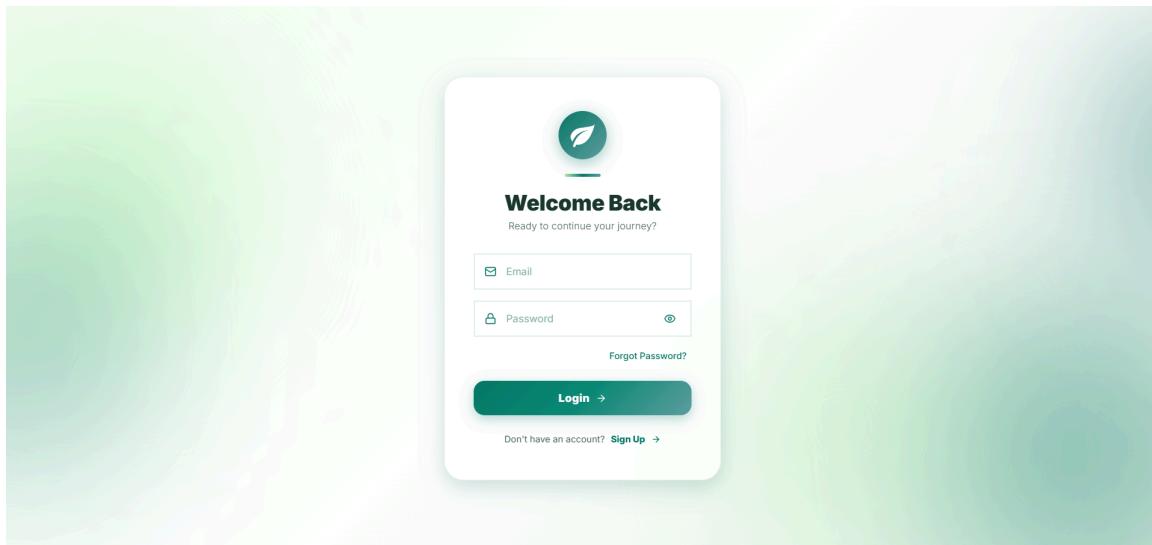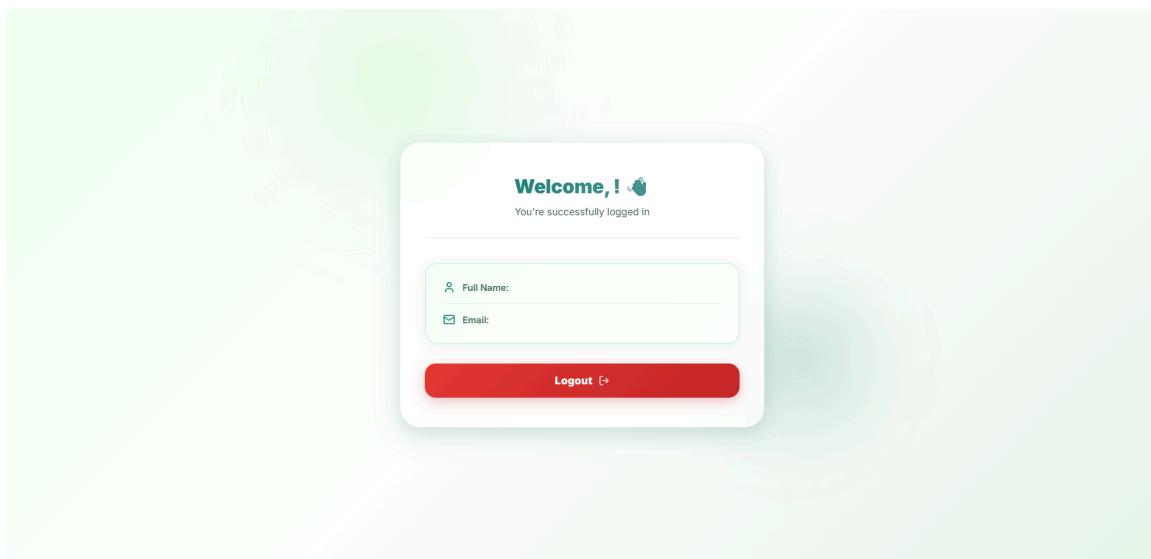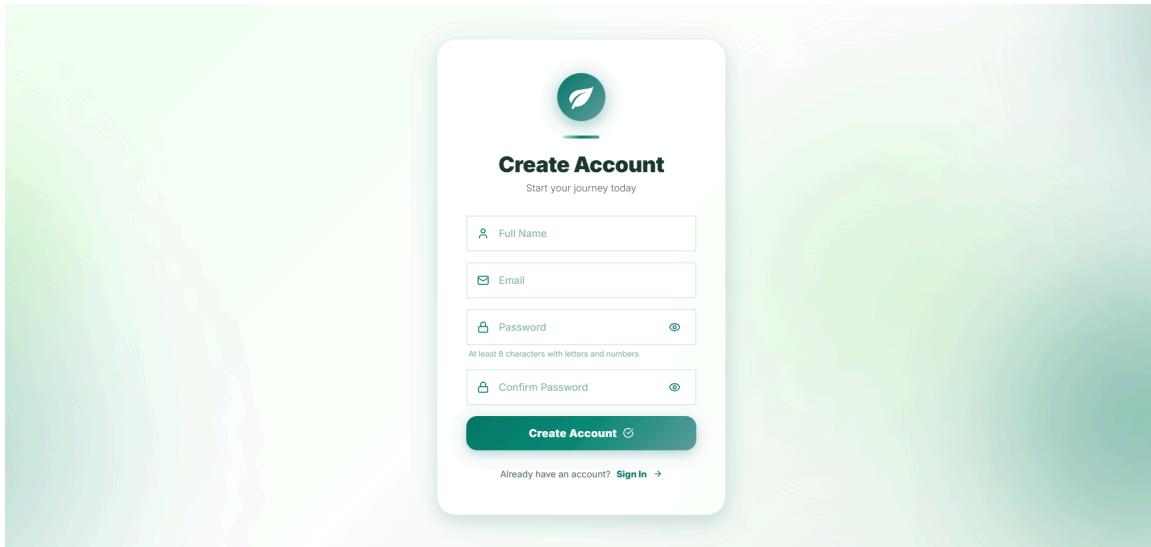
USER LOGOUT FLOW

6. Appendices

6.1. Web UI

Create Account

Start your journey today

👤 Full Name

✉ Email

🔒 Password 👁

At least 8 characters with letters and numbers

🔒 Confirm Password 👁

Create Account ⊘

Already have an account? **Sign In** →

Welcome, ! 👋

You're successfully logged in

👤 Full Name:

✉ Email:

Logout [→

6.2. Mobile UI

Screen 1

Welcome,
Jazpher Quirante

5
Borrowed

3
Lent

Recent Activity

Physics Textbook
Borrowed from Sarah · 2 days ago

Scientific Calculator
Lent to Mike · 5 days ago

Wireless Headphones
Borrowed from Alex · 1 week ago

Screen 2

Jazpher Quirante
jazpherquirante@gmail.com

📅 Member since Feb 2026

Account Settings

✏️ Edit Profile →

🔒 Change Password →

🔔 Notifications →

↪ **Logout**