

DESIGN

SENG 401 - L01

Group: 18

Date: 2025-03-21

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1 ARCHITECTURE: LAYERED

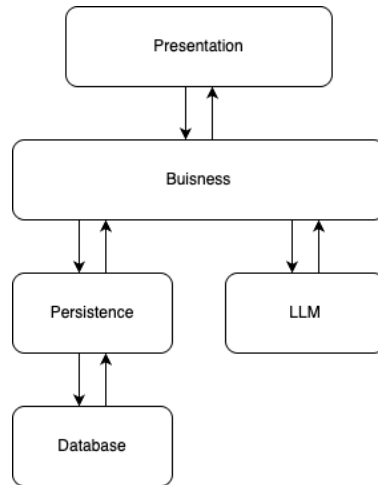


Figure 1: D-002 Layered Architecture Diagram

1.1 PRESENTATION LATER

- (1) The front end handles user interactions and presents the application's UI.
- (2) Communicates with the backend via APIs.
- (3) Technologies: React for dynamic user interfaces.

1.2 BUSINESS LAYER

- (1) Processes business logic and handles requests from the front end.
- (2) Manages data flow between the presentation layer and database layer.
- (3) Manages data flow between the presentation layer and the LLM layer.

1.3 PERSISTENCE LAYER

- (1) Manages data flow between the business layer and the database layer.

1.4 DATABASE LAYER

- (1) Stores and retrieves persistent data for the application.
- (2) Technologies: PostgreSQL for relational data management.

1.5 LLM LAYER

- (1) Processes data input by the user and returns an output.
- (2) Technologies: Gemini-2.0-flash

2 APPLICATION OF SOLID PRINCIPLES

2.1 SINGLE RESPONSIBILITY PRINCIPLES (SRP)

- (1) Each class and component will have a single responsibility, ensuring better maintainability and separation of concerns.
 - (a) The User class will handle user-related attributes and profile management, while the UserAuthentication class will handle authentication logic.
 - (b) Query generation is delegated to the QueryBuilder class, which has no other external functionality or dependencies.
 - (c) The LLMAdapter interface and the GeminiAdapter do not manage query generation or response parsing; their sole responsibility is managing LLM connections.

2.2 OPEN/CLOSED PRINCIPLE (OCP)

- (1) Classes will be open for extension but closed for modification, ensuring new functionality can be added without altering existing code.
 - (a) New types of users (e.g., AdminUser and GuestUser) will be implemented by extending the User base class. This will ensure that UserService interacts with the User class through an abstract interface rather than modifying its logic for each new type.

2.3 LISKOV SUBSTITUTION PRINCIPLE (LSP)

- (1) Substituting the LLMAdapter class with its concrete implementation, the GeminiAdapter, would not alter the program's correctness, as their interfaces are identical.

2.4 INTERFACE SEGREGATION PRINCIPLE (ISP)

- (1) Clients are not forced to implement any interface they do not use.

- (2) The LLMAdapter interface holds only methods related to query response generation, and subsequent Adapters implement no other unnecessary interfaces. The LLMConnection wrapper is responsible for switching the application's LLM.

2.5 DEPENDENCY INVERSION

- (1) High-level modules should not depend on low-level modules; both should depend on abstraction.
 - (a) The database connection will be managed through abstraction, ensuring the application is not tightly coupled to a specific database implementation. A singleton instance will maintain a single database connection throughout the application, reducing redundant connections and improving efficiency.
 - (b) LLM integration uses abstraction (a wrapper) instead of directly coupling to the LLM. The wrapper is initiated using a Builder Pattern, allowing flexible configuration while maintaining separation between the application and external dependencies.

3 UML DIAGRAMS

3.1 SEQUENCE DIAGRAMS

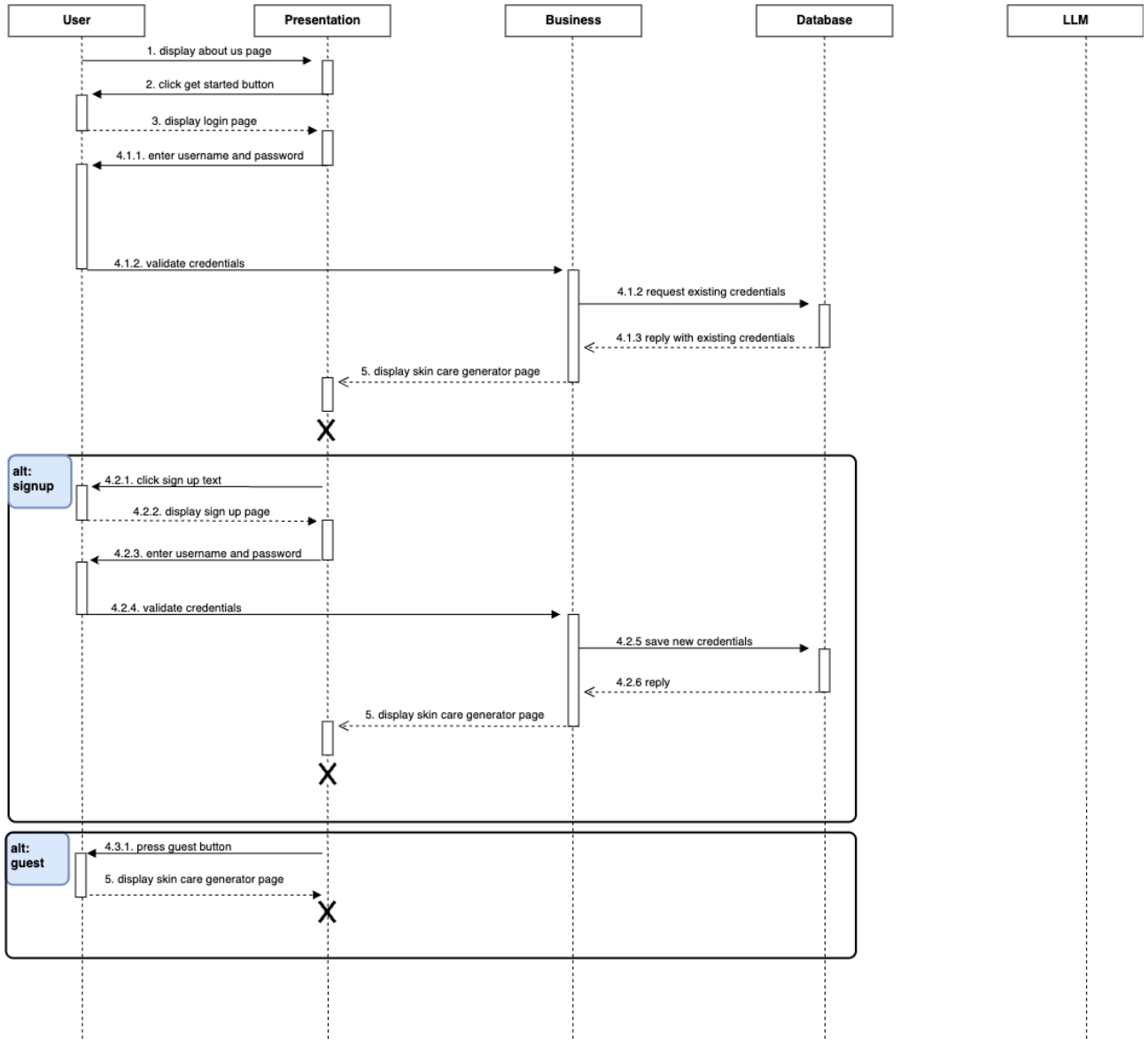


Figure 2: D-003 Credentials Sequence Diagram

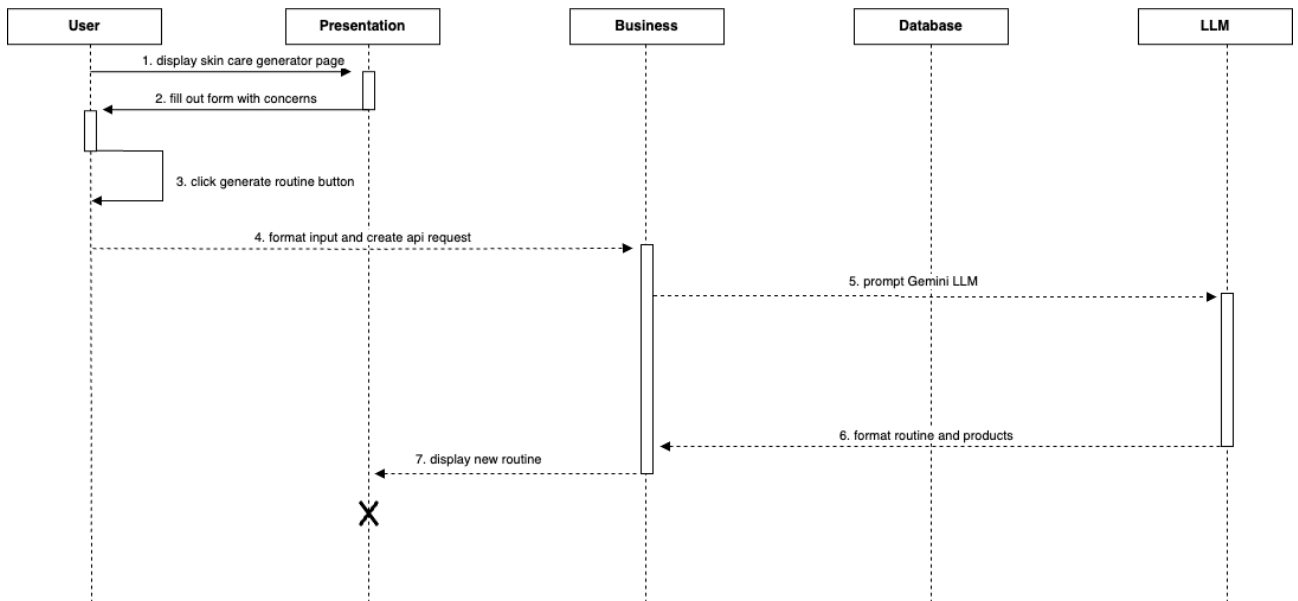


Figure 3: D-004 Use Generator Sequence Diagram

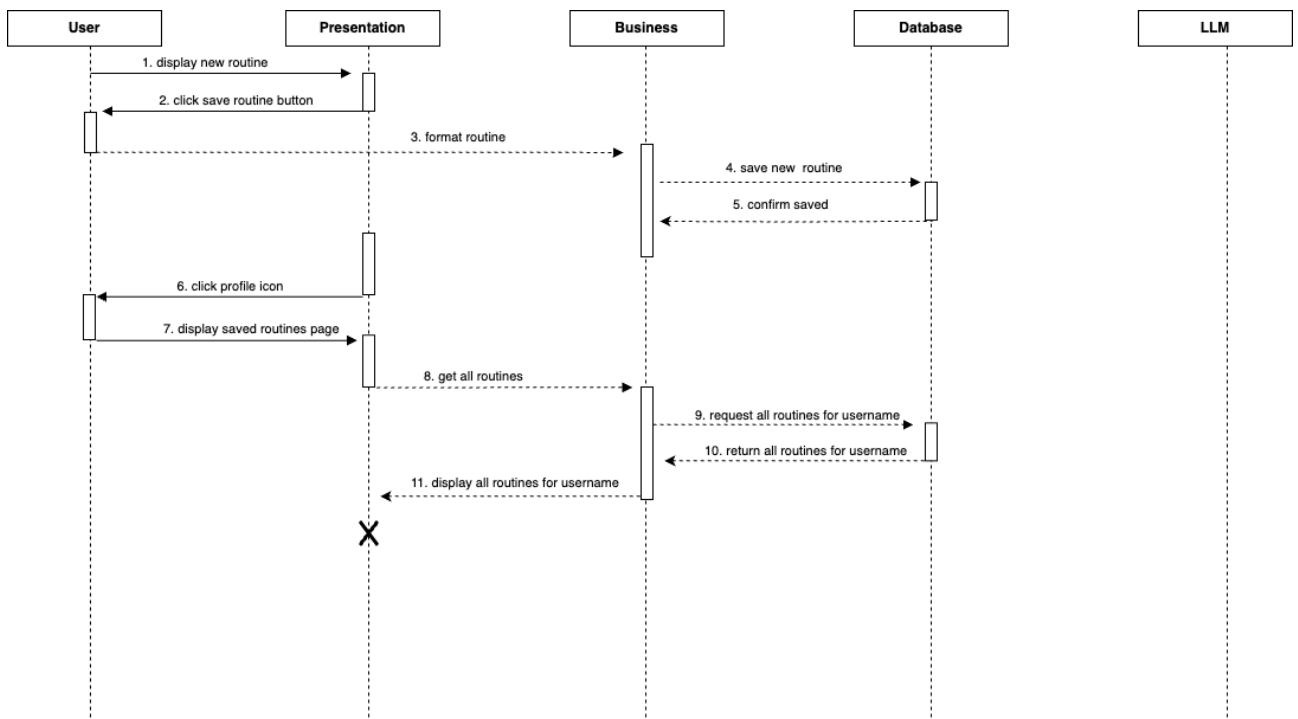


Figure 4: D-005 Save Routines Sequence Diagram

3.2 ACTIVITY DIAGRAMS

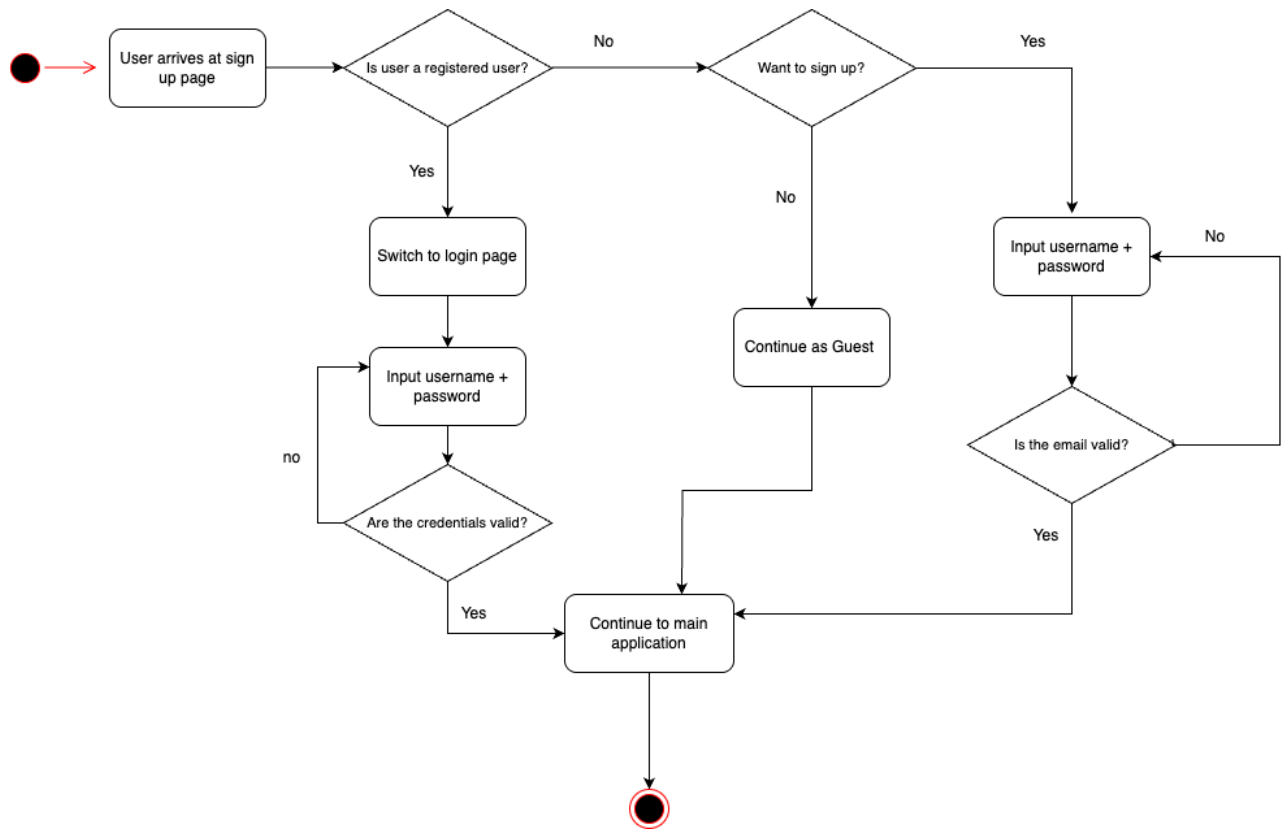


Figure 5: D-006 Become Registered User System Activity Diagram

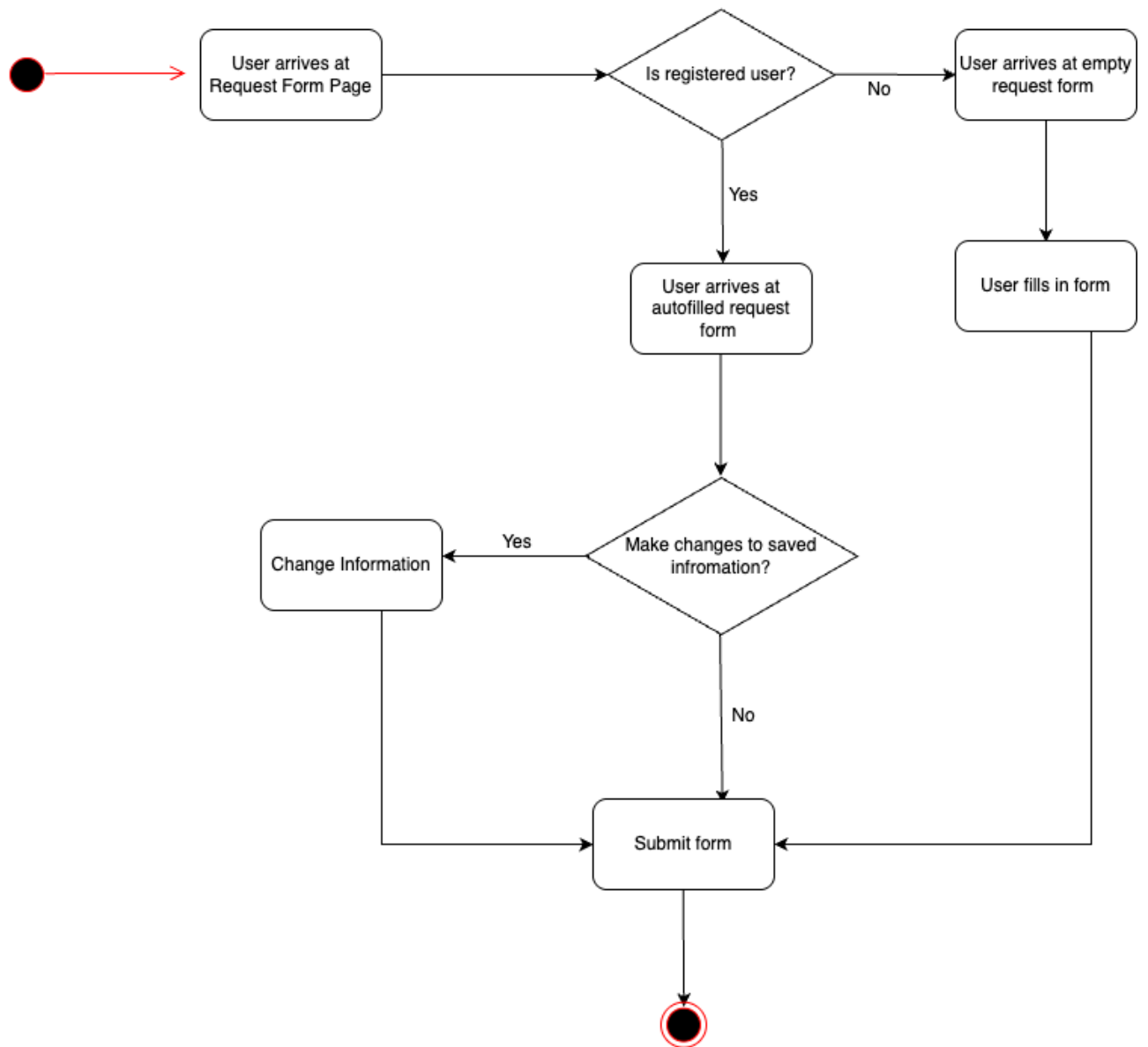


Figure 6: D-007 Submit Form System Activity Diagram

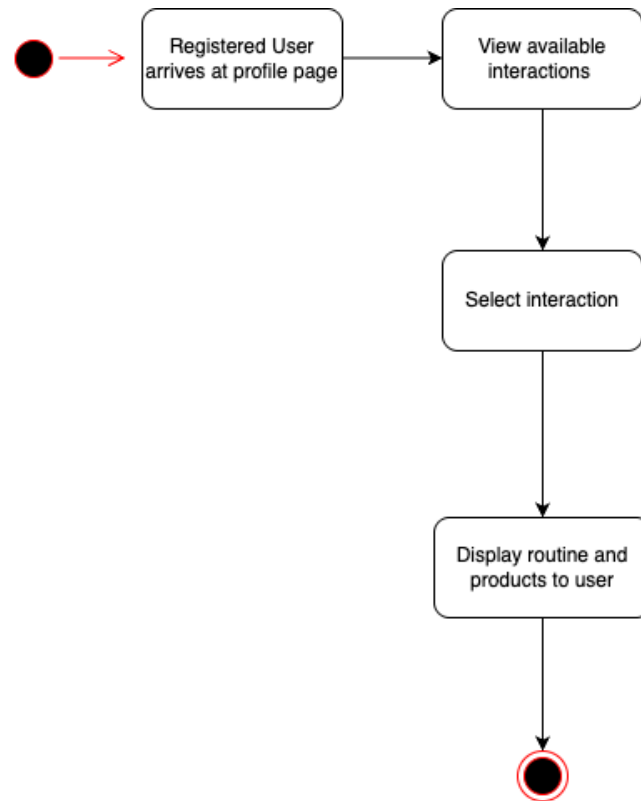


Figure 7: D-008 View Saved Routine System Activity Diagram

3.3 COMPONENT DIAGRAM

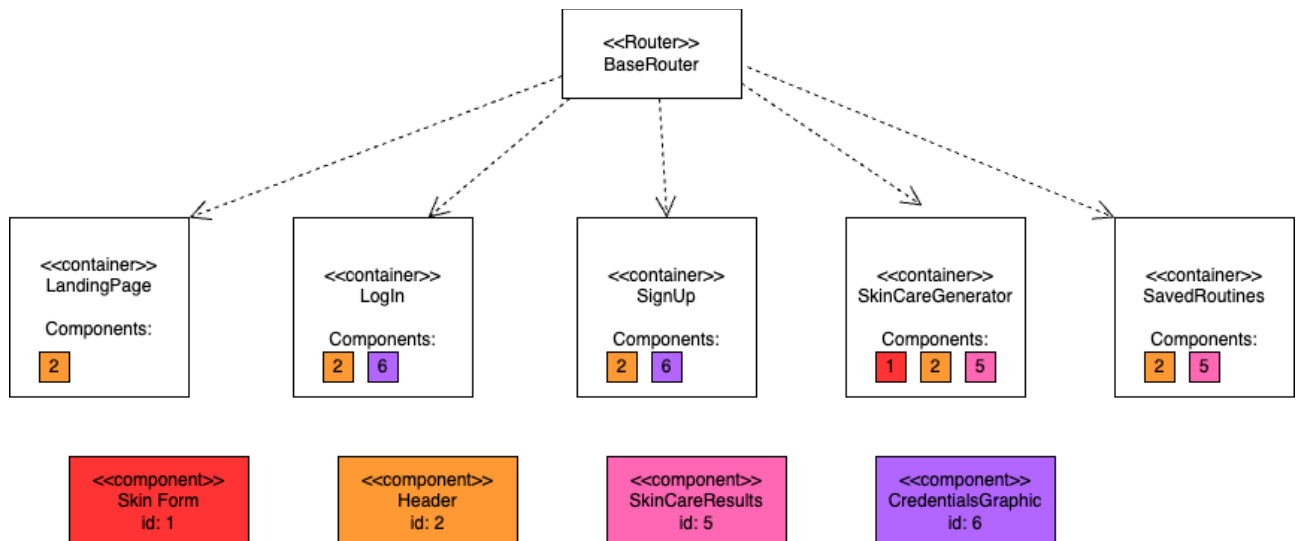


Figure 8: D-009 Component Diagram

3.4 RELATIONAL MODEL DIAGRAM

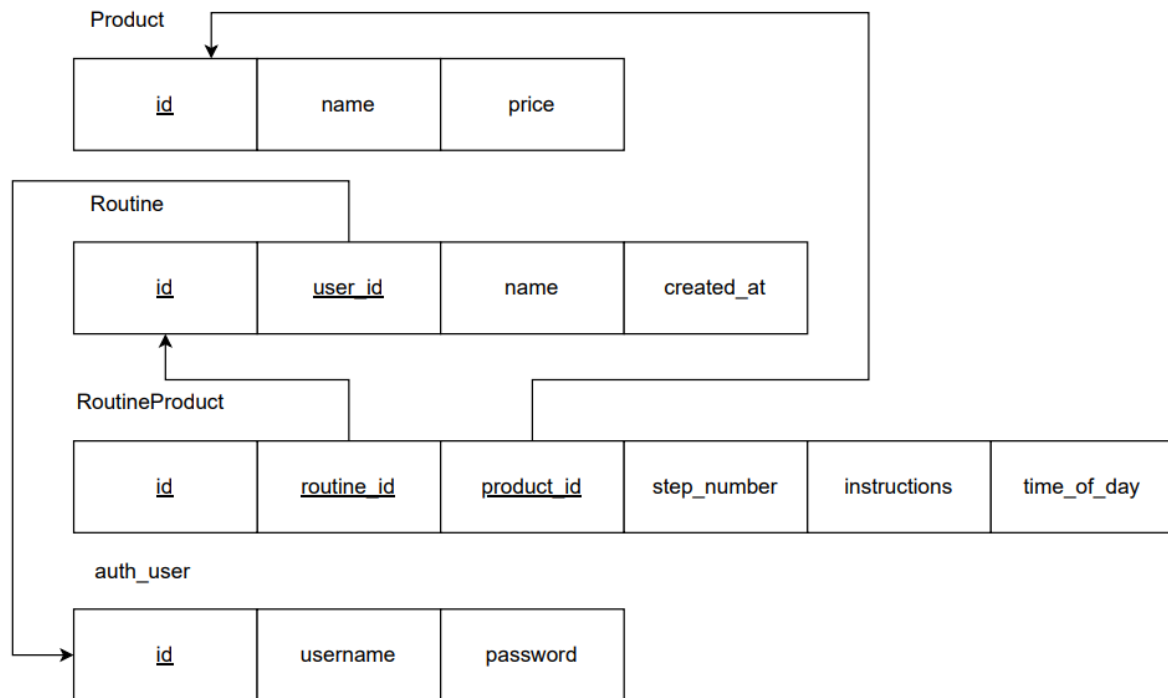


Figure 9: D-010 Relational Model Diagram

4 LAYOUT DESIGN

4.1 LANDING PAGE

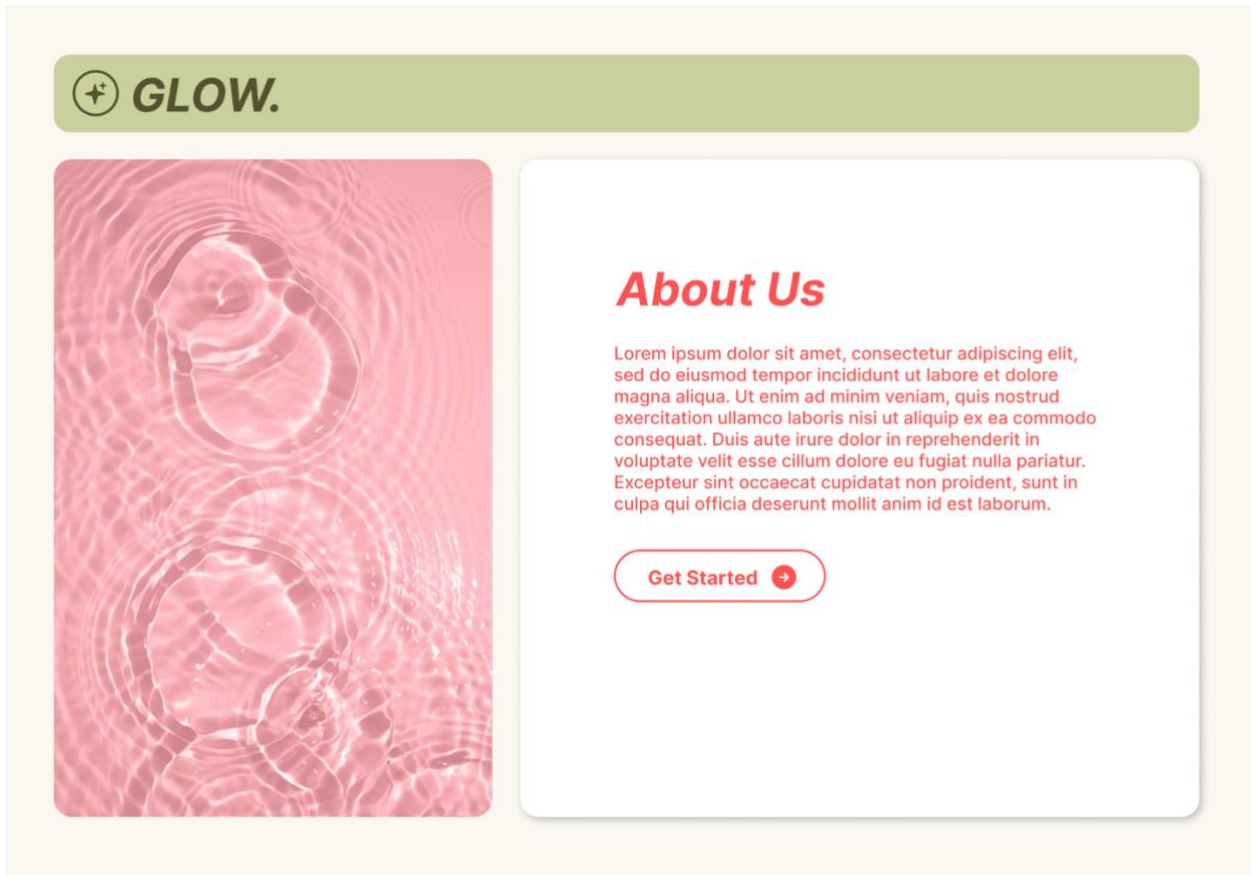


Figure 10: L-001 Landing Page (Desktop)

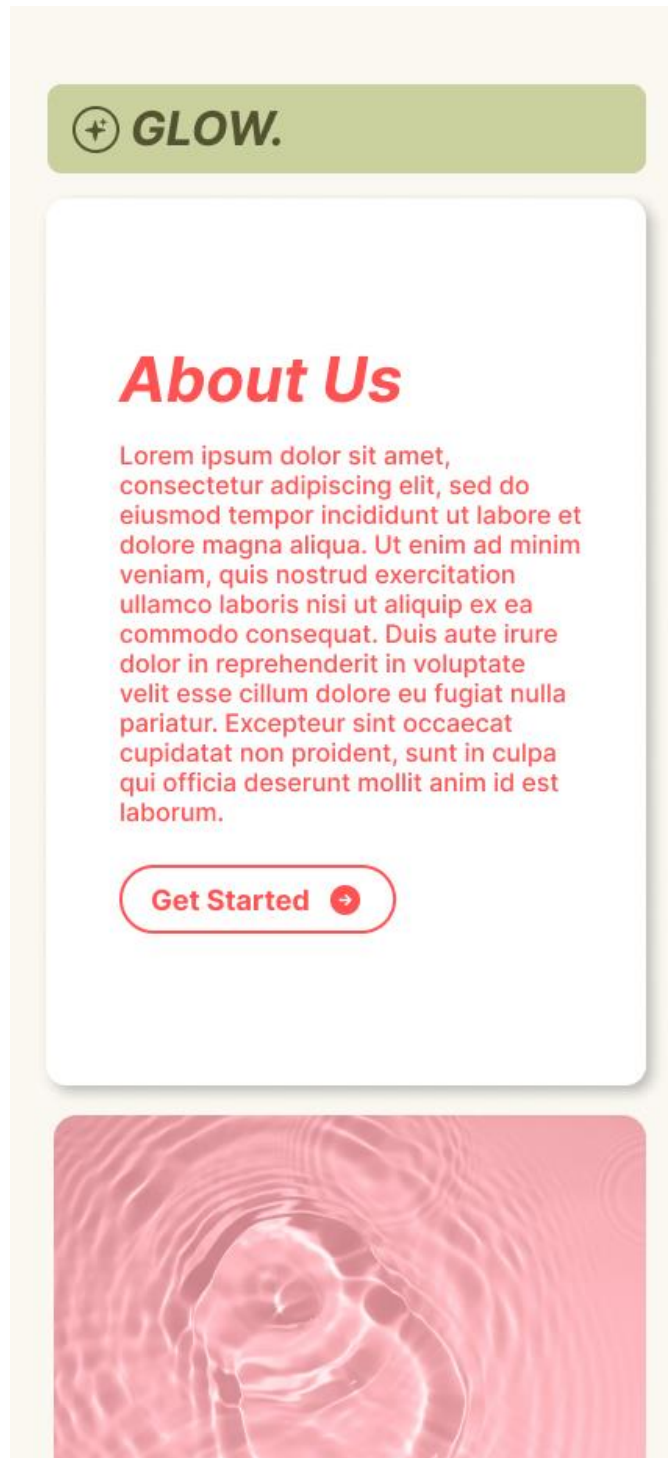




Figure 11: L-002 Landing Page (Mobile)

4.2 REGISTRATION PAGE





Welcome!

Sign up to Glow to save your skin care routines with ease

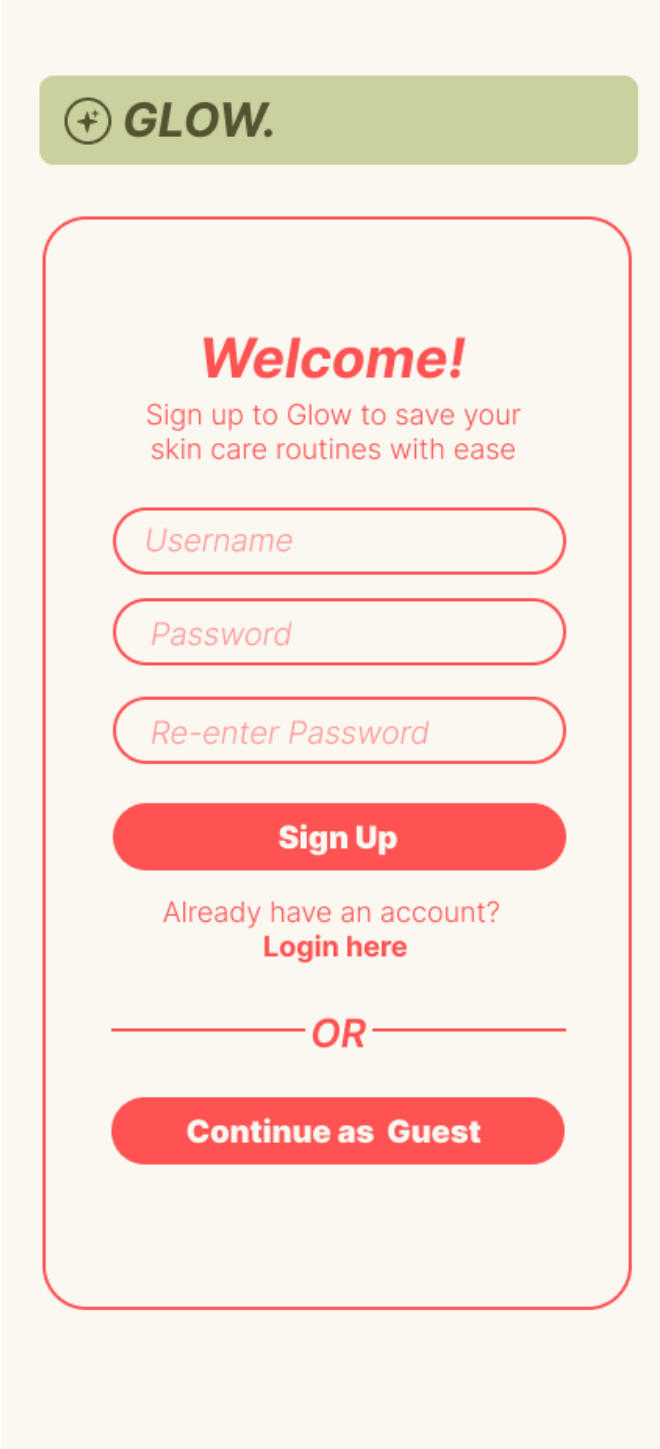
Sign Up

Already have an account? [Login here](#)

OR

Continue as Guest

Figure 12: L-003 Registration Page (Desktop)



The image shows a mobile registration page for 'GLOW'. At the top, there is a green header bar with a circular icon containing a plus sign and the word 'GLOW.' in bold. Below this, a large, rounded rectangular area with a red border contains the main content. It starts with the word 'Welcome!' in bold red, followed by the text 'Sign up to Glow to save your skin care routines with ease'. There are three input fields with red borders and placeholder text: 'Username', 'Password', and 'Re-enter Password'. Below these is a red button with the text 'Sign Up'. Under the button, it says 'Already have an account?' followed by 'Login here' in bold red. A horizontal line with the word 'OR' in the center separates this from the bottom section, which features a red button with the text 'Continue as Guest'.

GLOW.

Welcome!

Sign up to Glow to save your skin care routines with ease

Username

Password

Re-enter Password

Sign Up

Already have an account?
Login here

OR

Continue as Guest

Figure 13: L-004 Registration Page (Mobile)

4.3 LOGIN PAGE

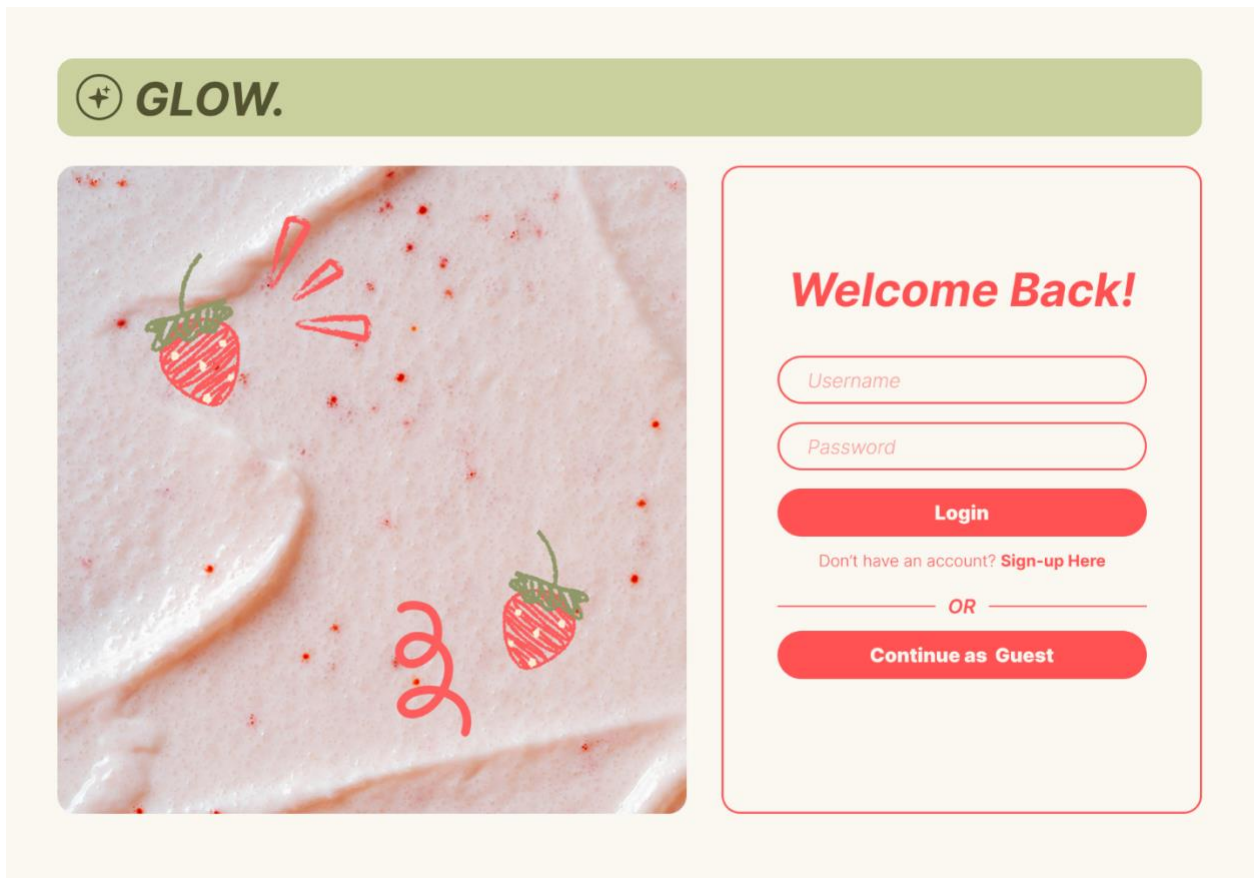
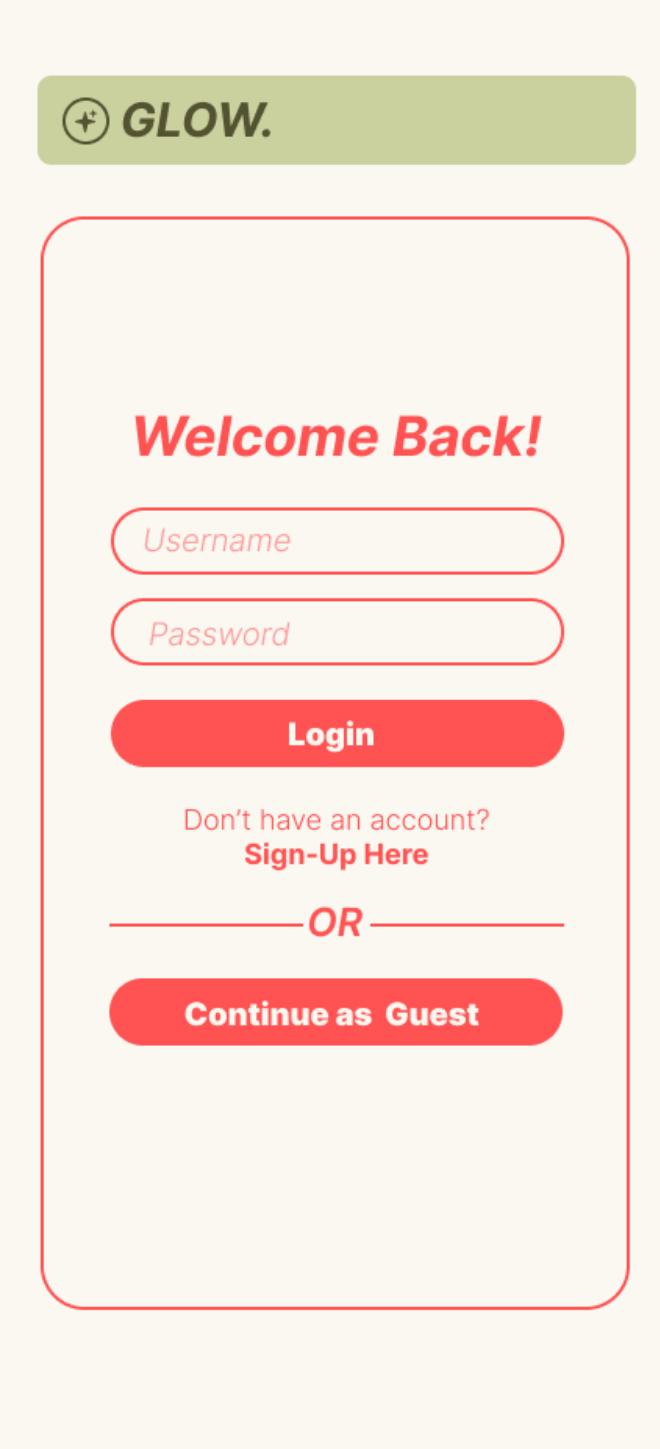



Figure 14: L-005 Login Page (Desktop)



 **GLOW.**

Welcome Back!

Username

Password

Login

Don't have an account?
Sign-Up Here

OR

Continue as Guest

Figure 15: L-006 Login Page (Mobile)

4.4 PROFILE



Figure 16: L-007 User Profile (Desktop)

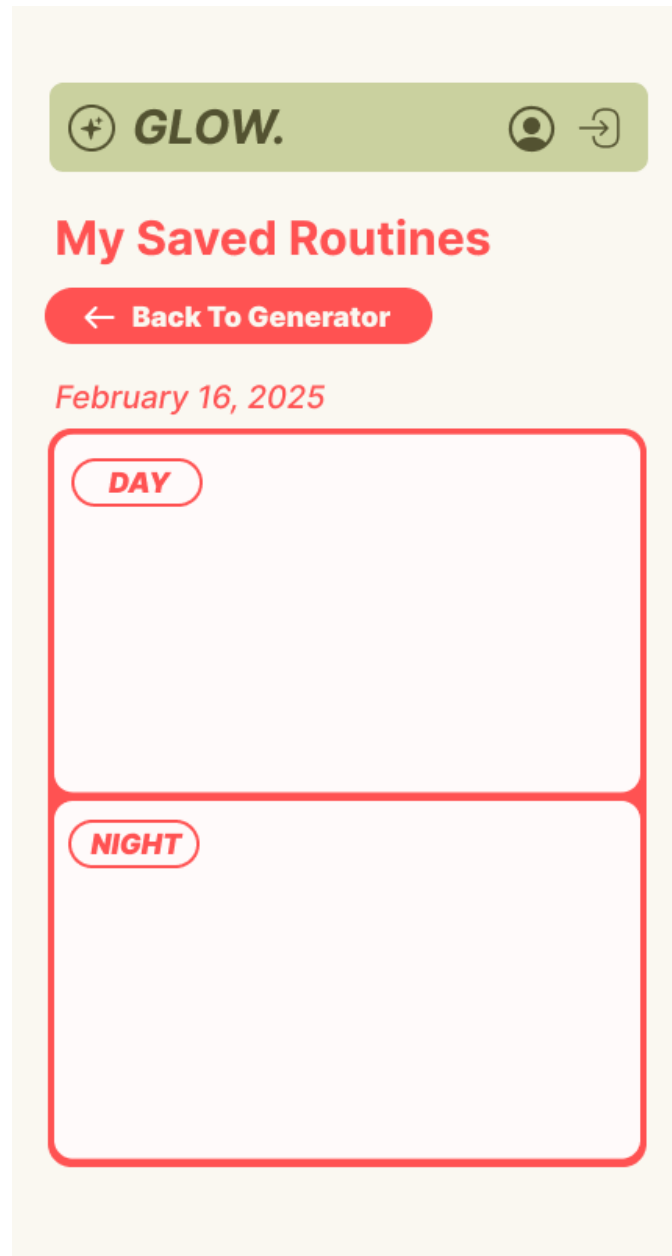



Figure 17: L-008 User Profile (Mobile)

4.5 ROUTINE SUBMISSION FORM

 **GLOW.**

Skin-Care Generator

Routine Criteria

Routine Type

Day

Skin Type

Combination

Skin Conditions

Enter Skin Conditions (comma separated)

Allergies

Enter Allergies (comma separated)

Skin Concerns

☐ Acne

☐ Hyperpigmentation

☐ Dehydrated

☐ Textured

☐ Enlarged Pores

☐ Congested Skin

☐ Redness

☐ Wrinkles

☐ Loss of Firmness

☐ Sun Damage

☐ Scarring

☐ Sensitive

☐ Dark Circles

☐ Puffy Eyes

☐ Aging

Product Criteria

Ingredient Preferences

☐ Fragrance-Free

☐ Alcohol-Free

☐ Paraben & Sulfate-Free

Ethical & Sustainability Concerns

☐ Cruelty-Free

☐ Vegan

☐ Eco-Friendly Packaging

☐ Sustainable Sourcing

Budget

Medium

Minimum Price

\$0

Maximum Price

\$100

Create Routine

Routine Generated. Scroll down to view!

Your Routine

DAY

Product 1 - \$18

Product 2 - \$18

Product 3 - \$18

NIGHT

Product 1 - \$18

Product 2 - \$18


Product 3 - \$18


Figure 18: L-009 Routine Submission Form Guests (Desktop)

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Group 18

 **GLOW.**

 Sign Out

Skin-Care Generator

Routine Criteria

Routine Type

Day

Skin Type

Combination

Skin Conditions

Enter Skin Conditions (comma separated)

Allergies

Enter Allergies (comma separated)

Skin Concerns

☐ Acne

☐ Hyperpigmentation

☐ Dehydrated

☐ Textured

☐ Enlarged Pores

☐ Congested Skin

☐ Redness

☐ Wrinkles

☐ Loss of Firmness

☐ Sun Damage

☐ Scarring

☐ Sensitive

☐ Dark Circles

☐ Puffy Eyes

☐ Aging

Product Criteria

Ingredient Preferences

☐ Fragrance-Free

☐ Alcohol-Free

☐ Paraben & Sulfate-Free

Ethical & Sustainability Concerns

☐ Cruelty-Free

☐ Vegan

☐ Eco-Friendly Packaging

☐ Sustainable Sourcing

Budget

Medium

Minimum Price

\$0

Maximum Price

\$100

Create Routine

Routine Generated. Scroll down to view!

Your Routine

DAY

Product 1 - \$18

Product 2 - \$18

Product 3 - \$18

NIGHT

Product 1 - \$18

Product 2 - \$18

Product 3 - \$18

Save This Routine

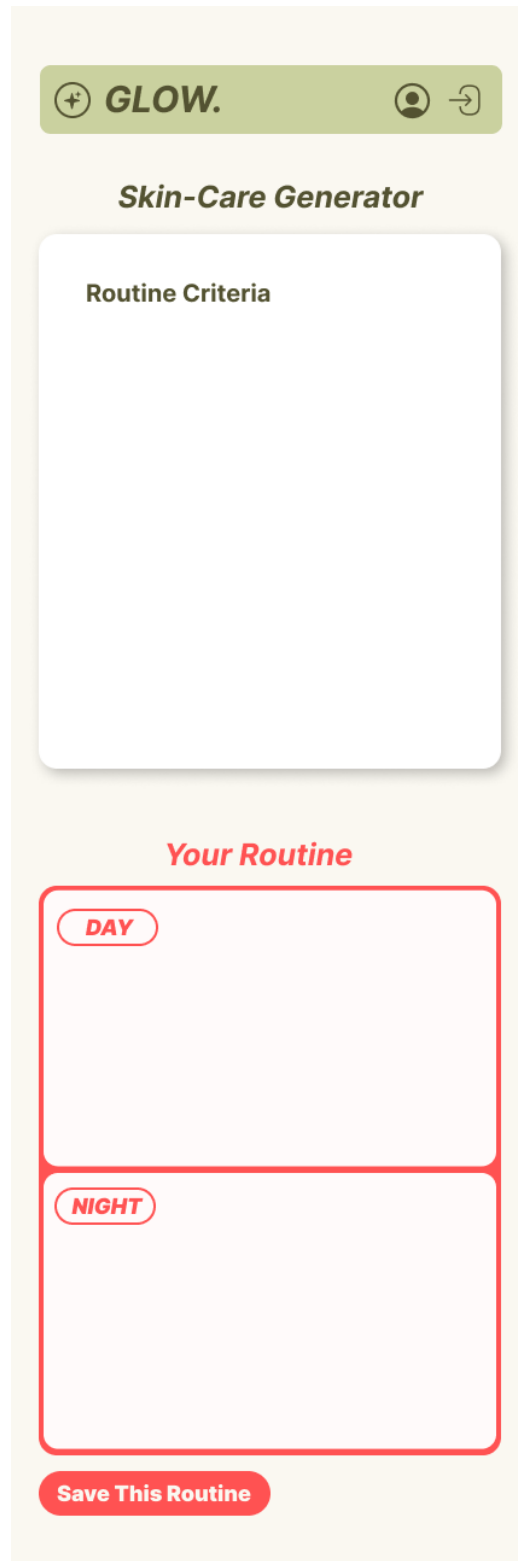
Routine Successfully Saved ✓

Figure 19: L-010 Routine Submission Form Users (Desktop)

SENG 401 - L01

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Group 18



The image shows a mobile app interface for a "Skin-Care Generator". At the top, there is a green header bar with a plus icon, the text "GLOW.", a user profile icon, and a share icon. Below the header, the title "Skin-Care Generator" is displayed. The main content area is divided into two sections. The first section, titled "Routine Criteria", is a large white box with a light gray border. The second section, titled "Your Routine", is a red-bordered box containing two sub-sections: "DAY" and "NIGHT". Each sub-section has a red-bordered box for input. At the bottom of the "Your Routine" section is a red button labeled "Save This Routine".

GLOW.

Skin-Care Generator

Routine Criteria

Your Routine

DAY

NIGHT

Save This Routine

Figure 20: L011 Routine Submission Form (Mobile)