

Software Requirements Specification

for

Nutrigains

Version 1.7 Approved

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Revision History

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Tan Liang Meng	15 Apr 2024	Initial write up	1.1
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Zheng Ruixiao	20 Apr 2024	Edit and finalise document	1.7
Ansh Singh	20 Apr 2024	Edit and finalise document	1.7
Adithya Samudrala	20 Apr 2024	Edit and finalise document	1.7

1. Introduction

1.1. Purpose

The purpose of this Software Requirement Specification (SRS) is to serve as a documentation of a web application, Nutrigains. To facilitate the development process among the relevant stakeholders, this SRS document describes the detailed requirements specifications of Nutrigains, including but not limited to web application features, functional and non-functional requirements, interface design and limitations.

1.2. Document Conventions

This Software Requirements Specification (SRS) document follows standard typographical conventions to ensure clarity and consistency. Text in bold represents GUI elements, user inputs, or other emphasis. Text in italics denotes newly introduced terms, important notes, or areas requiring special attention.

Software Requirement Specification Standard: IEEE 830-1998. Priorities of higher level requirements are inherited by detailed level requirements.

Font: Times New Roman

Heading1: Size 18, Bold

Heading2: Size 14, Bold

Heading3: Size 12, Bold

Heading4: Size 11, Bold

Content: Size 11

Spacing in content: 1 line spaced

Further conventions on special terms used throughout this document are described in Appendix A: Data Dictionary.

1.3. Intended Audience and Reading Suggestions

This Software Specification Requirement (SRS) document is designed to cater to the needs of various stakeholders of Nutrigains, including the development team, project managers, marketing team, testers, documentation writers, and end-users.

While it is advisable for all stakeholders to go through the entire document to gain a holistic understanding of the project, we have identified key sections that are particularly relevant to each group:

Developers: Should focus on the overall system design and architecture as well as the detailed requirement specifications to understand the technical implementation of Nutrigains.

Project Managers: Should review the entire document, with special focus on the product scope, objectives, and high-level requirements to ensure alignment with project goals.

Marketing Staff: Should concentrate on the product scope and user interface sections to better develop marketing strategies that match the product's features and capabilities effectively.

Users: Highly suggested to read the overview and user interaction sections to familiarise themselves with the application functionalities and user interface.

Testers: Should pay close attention to the specific requirements and how exceptions are handled in order to create thorough test plans that cover all aspects of the system.

Documentation Writers: May utilise the entire document as a resource for crafting user manuals and help documentation.

External Developers: Can review the overall system architecture and detailed documentation for Nutrigains' API endpoints

1.4. Product Scope

Nutrigains is an innovative web application designed to revolutionise nutrition management by integrating chatbot functionality. The core features of Nutrigains include biometric-based calculation of users' daily nutritional needs, personalised meal planning based on user's dietary preferences, and interactive meal searching through browsing or direct chatbot interaction.

Key Features:

Personalised Meal Recommendations via Chatbot: Nutrigains features an interactive chatbot interface powered by **Gemini API**. Users engage with the chatbot to receive personalised meal plans tailored to their health goals and dietary preferences. Through conversation, users can specify their objectives, such as ingredients or general well-being, and the chatbot adapts meal recommendations accordingly.

Interactive Meal Searching: In addition to chatbot interaction, Nutrigains provides a browsing interface for users to search for meals. Users can explore a database of recipes and save favourite meals for future reference.

Meal Tracking Feature: Nutrigains includes a tracking feature that allows users to monitor meal consumption over the past 30 days. Users can view a comprehensive log of meals consumed each day, enabling them to track their dietary habits, identify patterns, and make adjustments as needed to achieve their health goals.

1.5. References

- I. *Gemini API: Quickstart with Python.* (n.d.). Google AI for Developers.
https://ai.google.dev/tutorials/python_quickstart?_gl=1*v0n3oz*_up*MQ..&gclid=CjwKCAjww_iwBhApEiwAuG6ccIfNznhtIcScH1Oi1JTP17Djlrzo1O6VcxD5yjq5OCWjbJ7hFWIS5xoCY1kQAvD_BwE
- II. *SQLAlchemy Documentation — SQLAlchemy 2.0 documentation.* (n.d.).
<https://docs.sqlalchemy.org/en/20/>
- III. Urbansky, D. (n.d.). *spoonacular recipe and food API.*
<https://spoonacular.com/food-api/docs>
- IV. *Welcome to Flask — Flask Documentation (2.3.x).* (n.d.).
<https://flask.palletsprojects.com/en/2.3.x/>

2. Overall Description

2.1. Product Perspective

The Nutrigains application represents a new, self-contained product that serves as meal recommendation and nutrition management software. It is not a replacement for existing systems nor a follow-on member of a product family.

While Nutrigains operates as a standalone product, it interacts with other components or systems within the broader context of health and wellness technology. For example, Nutrigains interfaces with external recipe databases and APIs like Spoonacular and Gemini to provide users with diverse meal options and nutritional information.

Detailed system models that show the major components of the overall system, subsystem interconnections, and external interfaces are included in this report under [Appendix B](#).

2.2. Product Function

Nutrigains' features can be summarised under 3 main categories: User account management, Meal recommendations and Nutrition tracking. This section provides a summary of the system features contained in the web application.

2.2.1. User account management

- I. Account Registration
- II. User login
- III. Profile updates
- IV. Change password

2.2.2. Meal recommendations

- I. Query for meal through browse bar
- II. Get personalised recommendations through chatbot interaction

2.2.3. Nutrition tracking

- I. Meal history of the past 30 days
- II. Nutrition consumption of the day
- III. Daily nutrition needs calculated based on user's characteristics

2.3. User Classes and Characteristics

2.3.1. General User

Aspect	Description
Characteristics	General audience of the application who will utilise its features for meal recommendations and nutrition tracking
Frequency of use	Regular usage for meal planning and nutrition tracking
Technical Expertise	Varied, ranging from novice to experienced users.
Experience	May have varying levels of experience with nutrition management apps

2.3.2. Health Enthusiasts

Aspect	Description
Characteristics	Users who are particularly focused on maintaining or improving their health through nutrition management
Frequency of use	Regular usage for tracking meals, analysing nutrition data, and adhering to dietary goals
Technical Expertise	Moderate to experienced in using health and fitness apps
Experience	Likely have used similar apps before and have specific health goals in mind

2.3.3. Fitness Professionals

Aspect	Description
Characteristics	Trainers, nutritionists, or coaches who use the application to support their clients' health and fitness goals.
Frequency of use	Regular usage to monitor clients' progress, provide recommendations, and adjust meal plans as needed.
Technical Expertise	Experienced in using nutrition and fitness software and providing guidance to clients.
Experience	Extensive experience in the health and fitness industry, with a strong understanding of client needs and goals.

2.4. Operating Environment

Nutrigains software operates within a web-based environment, accessible through modern web browsers on various hardware platforms. This section covers the production and development environment of Nutrigains web application and usage platform.

2.4.1. Hardware Platform

Nutrigains is designed to operate on various hardware platforms, including desktop computers, laptops, tablets, and smartphones. It is compatible with hardware configurations

commonly found in modern computing devices, ensuring accessibility across a wide range of devices.

2.4.2. Operating System and versions

Nutrigains is platform-independent in terms of operating system compatibility. It can run on different operating systems, including but not limited to:

Windows: 11

macOS: 14

Mobile Operating Systems: iOS and Android for smartphones and tablets

2.4.3. Web browsers

Nutrigains is primarily accessed through modern web browsers, ensuring compatibility with the latest web technologies and standards. Supported web browsers include:

- I. Google Chrome
- II. Mozilla Firefox
- III. Safari
- IV. Microsoft Edge

2.4.4. Development Environment

Development Environment	Description
Front-end Development	<p>Framework: Nutrigains utilises React.js for front-end development. React.js is a popular JavaScript library for building user interfaces, known for its component-based architecture and efficient rendering.</p> <p>Version: The development environment is configured with React.js version 18.2.0, ensuring compatibility with the latest features and enhancements.</p>
Back-end Development	<p>Framework: Nutrigains employs Python Flask for back-end development. Flask is a lightweight and flexible web framework for Python, suitable for building RESTful APIs and web applications.</p> <p>Version: The development environment is set up with Python Flask version 3.0.3, providing developers with access to the latest</p>

	improvements and bug fixes.
Database	<p>Management System: Nutrigains utilises MySQL as its database management system. MySQL is an open-source relational database known for its reliability, scalability, and robust feature set, making it an excellent choice for storing and managing application data.</p> <p>Version: Mysql 8.0. By leveraging the latest version of MySQL 8.0, Nutrigains ensures efficient data management and scalability, as well as enhanced security features to protect user's information.</p>

2.5. Design and Implementation Constraints

2.5.1. Integration with Third-Party APIs:

Nutrigains requires seamless integration with third-party APIs to access meal recommendations, nutritional information, and chatbot capabilities. Specifically, the application needs to interface with APIs that provide meal recommendation services and nutritional data, as well as a chatbot API to enhance user interactions and generate personalised plans.

These integrations pose significant constraints on the design and implementation of Nutrigains.

2.5.2. Specific Technologies, Tools, and Databases

Nutrigains is built using specific technologies, tools, and databases, including React.js for the front end, Python Flask for the back end, and AWS Cloud Database for database management. Developers are constrained by the features, limitations, and compatibility of these chosen technologies.

2.6. User Documentation

2.6.1. General User Queries

1. What is NutriGains?

Nutrigains is a personalised meal planning and nutrition management platform available exclusively on the web. It's designed to help users make informed dietary choices and achieve their health and wellness goals through features such as meal recommendations, nutritional tracking, recipe suggestions, and more.

2. How does Nutrigains work?

Nutrigains works by utilising user-provided information such as age, gender, weight, height, and activity level to calculate personalised nutritional needs. It then offers meal recommendations, tracks nutritional intake, and provides access to a database of recipes tailored to individual preferences and dietary requirements, all within a web-based interface.

3. How can I sign up for Nutrigains?

Signing up for Nutrigains is easy! Simply visit our website and click on the "Sign Up" button. Follow the on-screen instructions to create your account by providing the required information, and you'll be ready to start using Nutrigains right away, directly from your web browser.

4. Is Nutrigains available as a mobile app?

No, Nutrigains is currently available exclusively as a web-based platform. While there is no mobile app available, users can still access all the features and functionalities of Nutrigains through their web browser on any device, including desktops, laptops, tablets, and smartphones.

5. How are my macro goals calculated in Nutrigains?

In Nutrigains, daily goal values for essential nutrients such as calories, proteins, carbohydrates, and fats are calculated using the Mifflin St. Jeor equation. This equation considers user attributes like weight, height, and gender, ensuring that the nutritional goals are personalised and tailored to each user's specific health requirement.

6. Can I track my progress with Nutrigains?

The 'View Nutrition Intake' feature enables users to monitor and review their daily nutritional intake within the Nutrigains system. This feature provides valuable insights into dietary habits, allowing users to track their consumption of essential nutrients and make informed adjustments to their diet. The system presents this information in graphical bars, enhancing the visibility and tracking experience.

7. How can I get support if I have questions or issues?

If you have any questions or encounter any issues while using Nutrigains, our customer support team is here to help. You can reach out to us through the contact form on our website or send us an email at support@nutrigains.com. We're committed to providing you with the assistance you need to make the most out of your Nutrigains experience.

8. Are there any subscription fees to use Nutrigains?

No, Nutrigains is currently available to users for free. There are no subscription fees or hidden charges associated with using the platform. Simply sign up for an account and start exploring the features and functionalities of Nutrigains at no cost.

2.7. Assumptions and Dependencies

2.7.1. Continuous availability of Third-Party APIs:

Nutrigains relies on external APIs for meal recommendations, nutritional information, and chatbot capabilities. An assumption is made that these APIs will remain accessible and functional throughout the development and operation of the application. Any changes to API availability or functionality could impact Nutrigains' features and performance.

2.7.2. Development Framework Stability

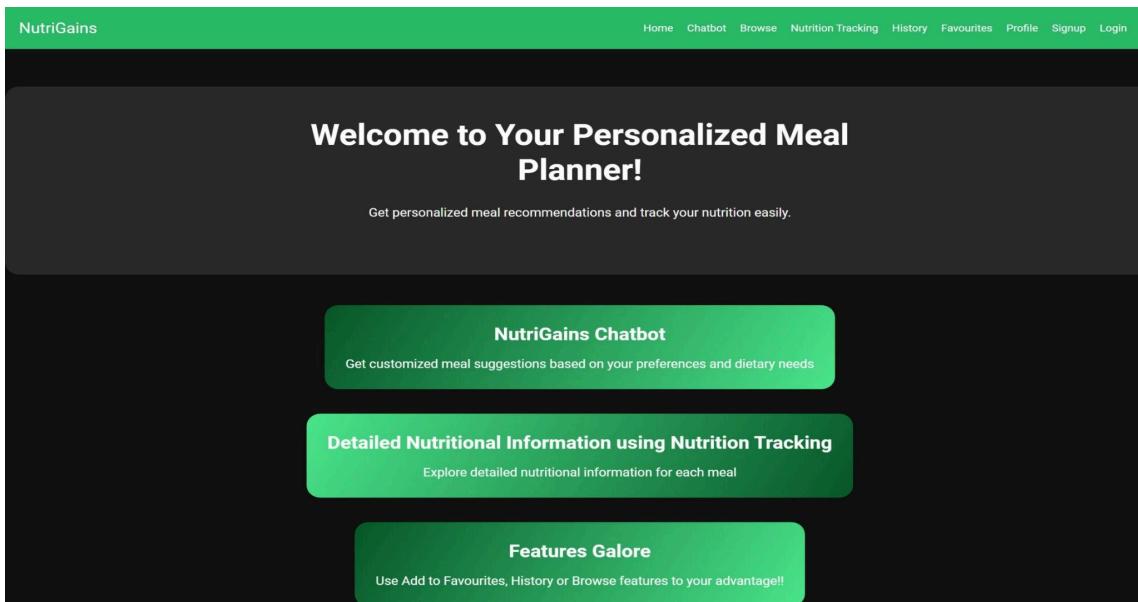
Nutrigains depends on the stability and reliability of development frameworks like React.js for the front end and Python Flask for the back end to ensure smooth functioning and maintainability of the application.

3. External Interface Requirement

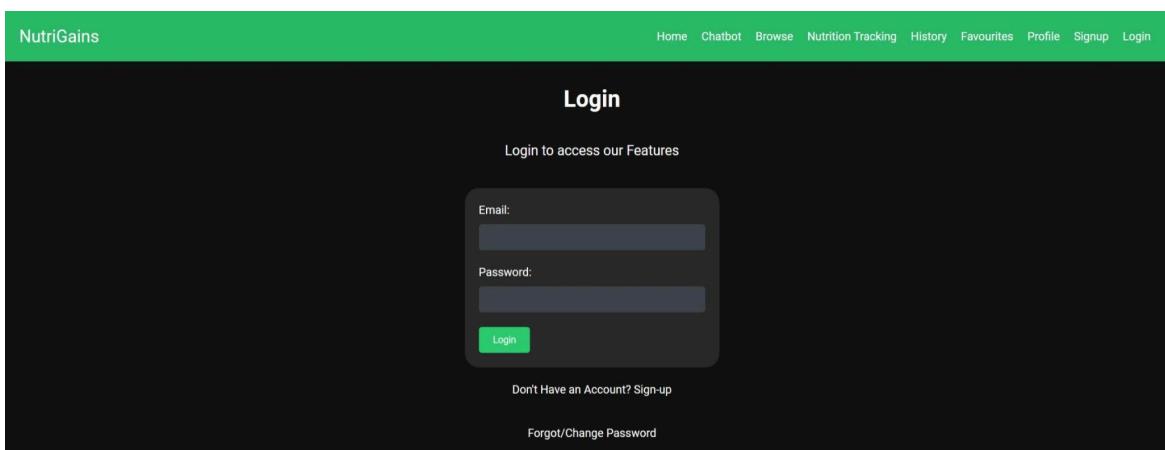
3.1. User interfaces

Nutrigains is designed to be viewed with an aspect ratio which matches a desktop browser. On top of that, the operating environment must satisfy the requirements as indicated in section [2.4 Operating environment of Nutrigains](#).

3.1.1. Landing Page



3.1.2. Login Page



3.1.3. SignUp page

Sign-up

Email:

Full Name:

Date of Birth: dd/mm/yyyy

Gender: Select

Current Weight:

Height:

Goal: Select

Activity Level: Select

New Password:

Confirm Password:

[Verify Email](#)

[Enter OTP](#)

[Register](#)

[Back to Login Page](#)

3.1.4. Forgot/Change password page

Forgot Password

Enter Email:

[Send OTP](#)

OTP:

New Password:

Confirm New Password:

[Change Password](#)

[Back to Login Page](#)

3.1.5. User profile page

The screenshot shows the NutriGains profile edit page. At the top, there is a green header bar with the NutriGains logo and a navigation menu with links: Home, Chatbot, Browse, Nutrition Tracking, History, Favourites, and Profile. Below the header is a large form field containing user profile information. The fields include:

- Email (not editable): liangmeng011006@yahoo.com
- Full Name: Tan Liang Meng
- Date of Birth: 06/18/2001
- Gender: Male
- Current Weight: 65
- Height: 175
- Goal: Gain Muscle
- Activity Level: Very Active

At the bottom of the form are two buttons: "Edit" (highlighted in green) and "Save Changes". Below the form is a green footer bar with the "Sign Out" button.

3.1.6. Browse page

Empty browse page

The screenshot shows the NutriGains browse page. At the top, there is a green header bar with the NutriGains logo and a navigation menu with links: Home, Chatbot, Browse, Nutrition Tracking, History, Favourites, and Profile. Below the header is a search bar with the placeholder "Browse..." and a "Search" button. A message "No meals to display. Use the search bar to find meals." is displayed below the search bar.

Browse page after searching

NutriGains

Home Chatbot Browse Nutrition Tracking History Favourites Profile

pasta


Pasta With Tuna
Calories: 422.67
Proteins: 24.32g
Carbs: 52.44g
Fats: 10.32g


Pasta Margherita
Calories: 809.76
Proteins: 34.41g
Carbs: 85.08g
Fats: 34.39g


Pasta On The Border
Calories: 496.76
Proteins: 23.13g
Carbs: 48.91g
Fats: 19.9g


Pasta Vegetable Soup
Calories: 180.58
Proteins: 8.12g
Carbs: 26.96g
Fats: 3.52g


Pasta With Italian Sausage
Calories: 886.1
Proteins: 32.08g
Carbs: 67.87g
Fats: 48.95g


Pasta With Gorgonzola Sauce
Calories: 377.42
Proteins: 10.91g
Carbs: 27.34g
Fats: 24.58g

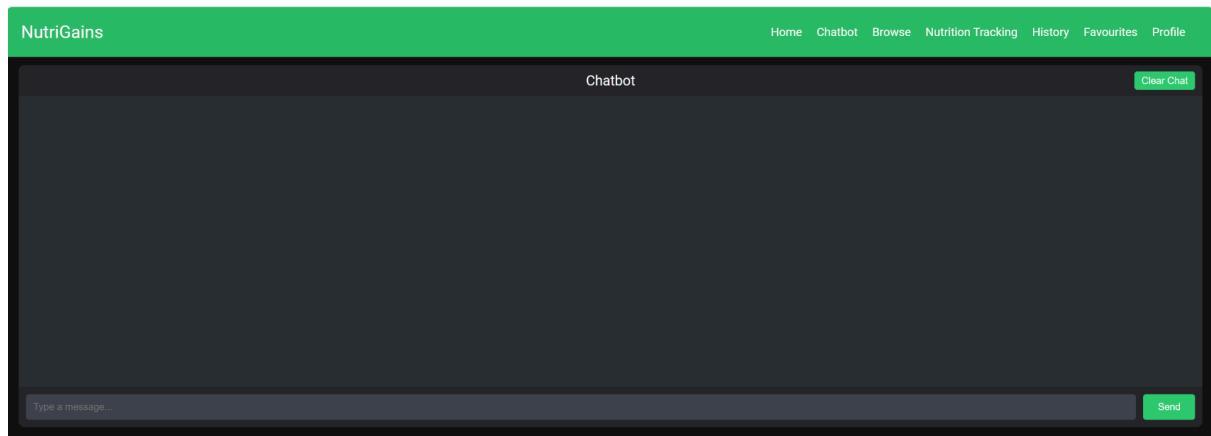

Pasta With Salmon Cream Sauce
Calories: 438.64
Proteins: 23.37g
Carbs: 48.62g
Fats: 14.55g


Pasta With Chickpeas and Kale
Calories: 609.1
Proteins: 23.73g
Carbs: 101.74g
Fats: 7.46g

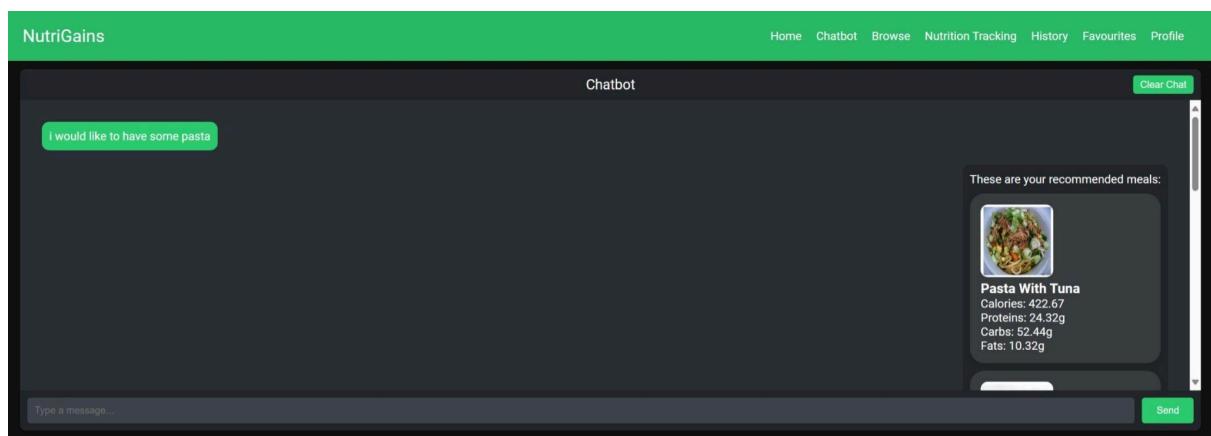

Pasta With Chicken and Broccoli
Calories: 429.3
Proteins: 25.62g
Carbs: 22.65g
Fats: 24.14g

3.1.7. Chatbot

Empty chatbot

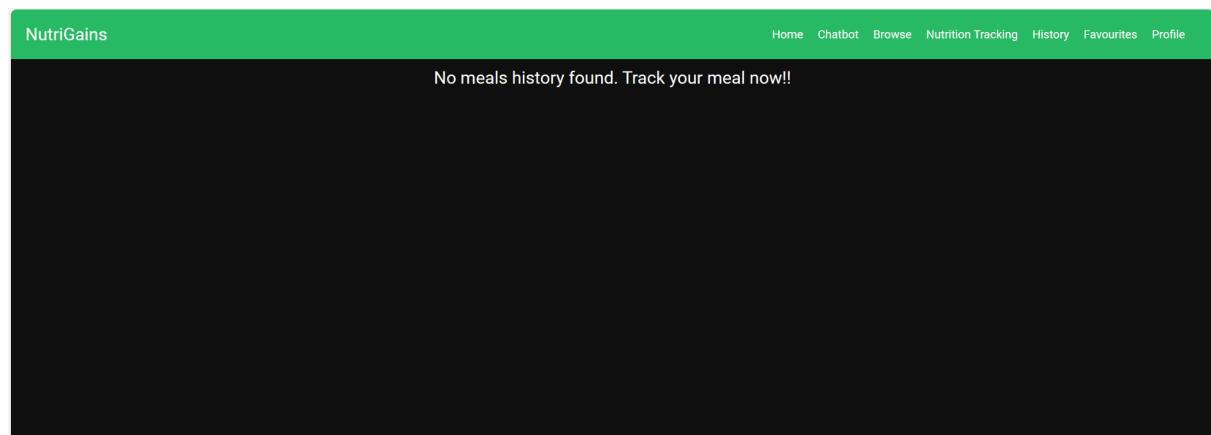


Chatbot with conversations



3.1.8. History page

Empty history page



History page with meal history

Date: 19/04/2024

Pasta With Tuna

Calories: 422.67
Proteins: 24.32g
Carbs: 52.44g
Fats: 10.32g

Pasta Margherita

Calories: 809.76
Proteins: 34.41g
Carbs: 85.08g
Fats: 34.39g

3.1.9. Nutrition tracking page

Current Day Intake

Nutrient	Intake	Total
Calories	1232.43 / 1561 kcal	
Carbohydrates	137.52 / 195.13 g	
Fats	44.71 / 52.03 g	
Proteins	58.73 / 78.05 g	

Today's Meals

Pasta With Tuna

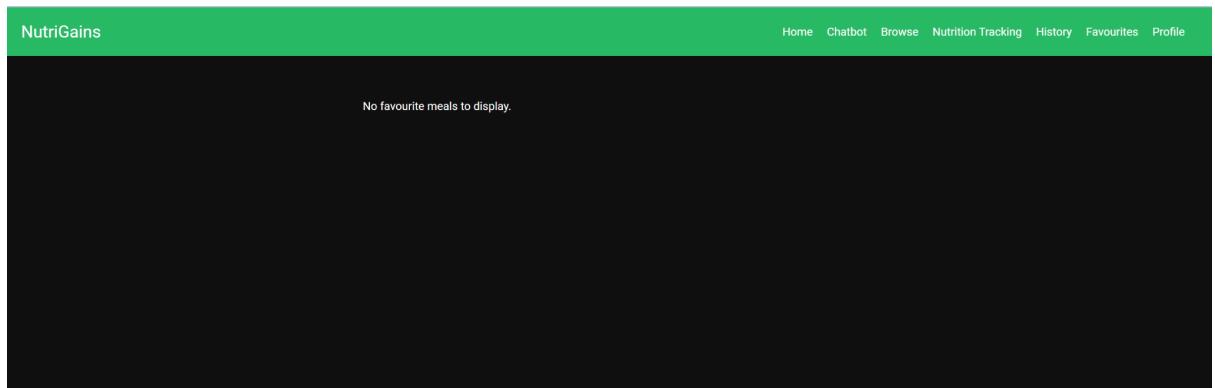
Calories: 422.67
Proteins: 24.32g
Carbs: 52.44g
Fats: 10.32g

Pasta Margherita

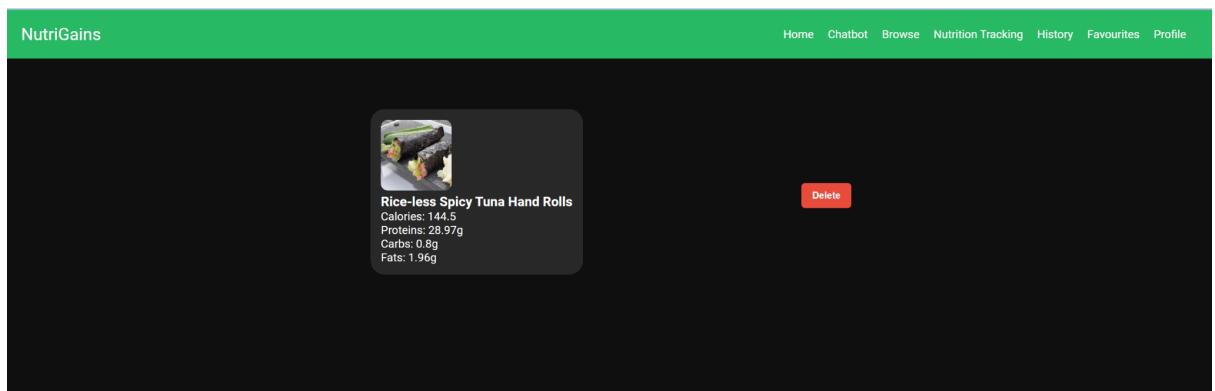
Calories: 809.76
Proteins: 34.41g
Carbs: 85.08g
Fats: 34.39g

3.1.10. Favourites page

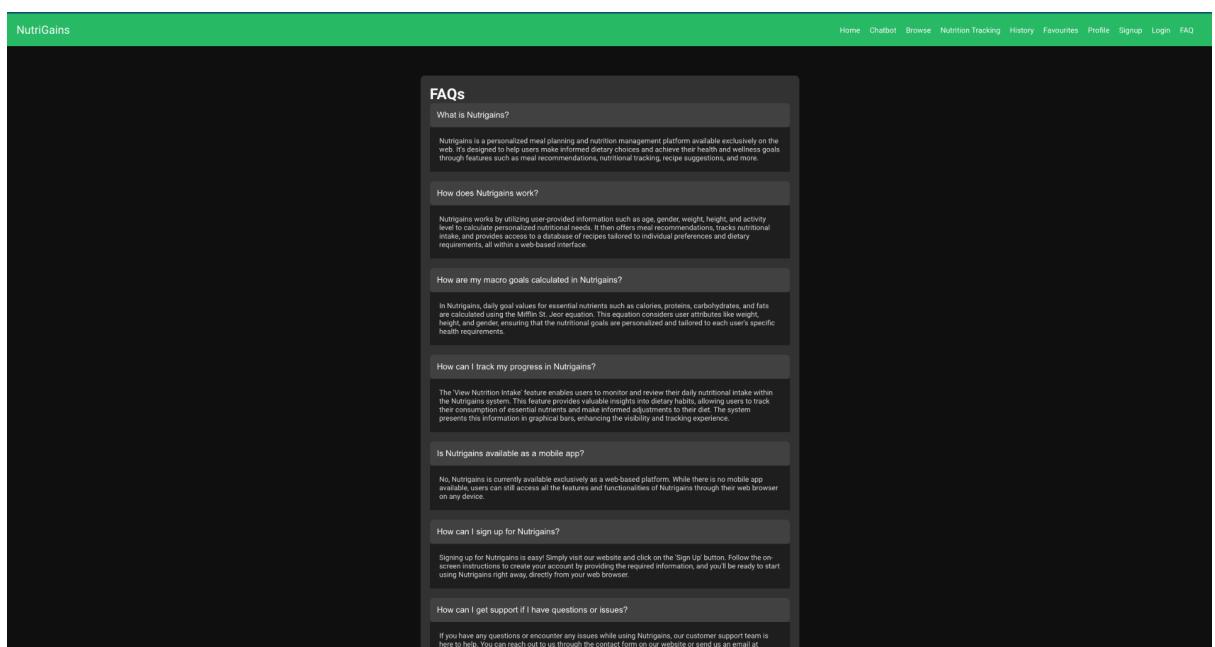
3.1.10.1.1. Empty favourites page



3.1.10.1.2. Favourites page with meal



3.1.11. FAQ page



3.2. Hardware Interfaces

This section covers all hardware interface requirements for the Nutrigains web application to achieve all of its desired functionalities. The requirements are divided into client-side requirements and server-side requirements to facilitate easier reading for the respective stakeholders.

3.2.1. Client-side Requirements

The Nutrigains web application supports all desktop computers and laptops. The device must support the usage of a desktop browser which fulfils the requirements as indicated in section [2.4 Operating Environment of Nutrigains](#).

3.2.2. Server-side Requirements

The Nutrigains backend server needs to be hosted and operated on a server computer. This server will carry out Create, Read, Update, Delete (CRUD) tasks on the backend database, which also needs to be hosted and operated on a server computer

3.3. Software Interfaces

3.3.1. Operating Systems

- Windows 11
- macOS 14

3.3.2. Tools

- React.js
- Python

3.3.3. Third-Party libraries:

- SQLAlchemy
- Flask

3.3.4. APIs

- Spoonacular API
- Gemini API

3.4. Communication Interfaces

A reliable internet connection is necessary to retrieve data from the API and user database, as communication involves HTTP GET, POST and DELETE methods. Without this connection, data retrieval from APIs and user databases will fail, resulting in incomplete website functionality.

All communication must adhere to a REST-styled API offered by the backend server, and each request must be transmitted securely over HTTPS.

4. System Features

4.1. Account Registration

4.1.1. Description and Priority

New users of Nutrigains can register for an account. Upon registration, the user's email address, name, and password are stored in the database. Additionally, biometric information such as gender, height, weight, activity levels, and goals will be recorded in the database. These details will serve as references for calculating the user's daily nutritional needs.

Any subsequent updates made by the user, such as adding meals to favourites or viewing history, will be associated with this registered account.

Overall Priority	High
------------------	------

4.1.2. Stimulus/Response Sequences

Use Case ID:	001		
Use Case Name:	Signup		
Created By:	Ansh Singh	Last Updated By:	Tan Liang Meng
Date Created:	22/02/2024	Date Last Updated:	18/04/2024

Actor:	User and Database
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Description:	The “Signup” use case facilitates user access to the Nutri Gains website by registering a new account. The process collects essential information for account creation. The outcome is authenticated access to the website, enabling personalised and secure use of its features.
Preconditions:	The user has accessed the Nutri Gains website via a web browser.
Postconditions:	The user gains access to their personalised dashboard.
Priority:	High
Frequency of Use:	Low App User is only required to register for an account once
Flow of Events:	<ol style="list-style-type: none"> 1. The user launches the Nutri Gains website. 2. For Signup, the user provides required information (e.g., name, email, password), which the system uses to create a new account. 3. The system sends an OTP. 4. The user fills in OTP. 5. The system verifies OTP. 6. Upon successful Signup, the user is directed to the login page.
Alternative Flows:	N/A
Exceptions:	<ol style="list-style-type: none"> 1. If the email or username is already in use then the user will be prompted to sign up with another email 2. If the OTP does not match, the user will be prompted to re-enter the correct OTP 3. If user failed to provide the correct OTP in 3 attempts, the process will be terminated
Includes:	NA
Special Requirements:	Security: The credential retrieval process must be secure to prevent unauthorised access.
Assumptions:	<ol style="list-style-type: none"> 1. Users have immediate access to their registered email. 2. The email service delivers the reset instructions without delay.
Notes and Issues:	Contingencies for account recovery need to be robust to help users regain access if they forget their credentials.

4.1.3. Functional Requirement

1. Users must be able to register for an account with the system.

1.1. System provides eleven input fields for users to input information.

1.1.1. One of the input fields must be an email address.

1.1.2. One of the input fields must be username.

1.1.3. One of the input fields must be gender.

- 1.1.4. One of the input fields must be height.
- 1.1.5. One of the input fields must be weight.
- 1.1.6. One of the input fields must be goal.
- 1.1.7. One of the input fields must be activity level.
- 1.1.8. One of the input fields must be password.
- 1.1.9. One of the input fields must be confirm password.
- 1.1.10. One of the input fields must be OTP.

- 1.2. System must ensure that the user fills in all the input fields before allowing registration.

- 1.3. System must verify all input information when the user clicks on verify.
 - 1.3.1. System must verify that the email address is not taken.
 - 1.3.2. System must verify that the email address is valid.
 - 1.3.3. System must verify that the password matches with the confirm password.
 - 1.3.4. System must notify the user on which field is left empty if there is any.

- 1.4. System must send OTP to user's email address upon successful verification of signup credentials
 - 1.4.1.1. System must verify that all of the input fields are filled and valid before sending OTP to user
 - 1.4.1.2. The OTP field must become active once OTP is sent to user's email

- 1.5. System must create an account for user once verification is completed

- 1.6. System must redirect the user to the login page upon successful registration.

4.2. User login

4.2.1. Description and Priority

Existing users may log in to their account by inputting their username and password as verification during the login process. User must login prior to accessing all the features provided by the Nutrigains

Overall Priority	High
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4.2.2. Stimulus/Response Sequences

Use Case ID:	002		
Use Case Name:	Login		
Created By:	Ansh Singh	Last Updated By:	Tan Liang Meng
Date Created:	22/02/2024	Date Last Updated:	19/04/2024

Actor:	User
Description:	The "Login" use case facilitates user access to the Nutri Gains website by accessing an existing account (Login).
Preconditions:	The user has accessed the Nutri Gains website via a web browser.
Postconditions:	For Login, the user gains access to their personalised dashboard.
Priority:	High
Frequency of Use:	Each user will typically keep performing this action till they login.
Flow of Events:	<ol style="list-style-type: none"> 1. The user launches the Nutri Gains website and reaches the landing page. 2. User clicks on “login” 3. User is then redirected to login page 4. For Login, the user enters their email and password for the system to verify before granting access. 5. Upon successful Login, the user is directed to their personalised dashboard.
Alternative Flows:	N/A
Exceptions:	<ol style="list-style-type: none"> 1. Login failure due to incorrect credentials. 2. The system informs the user of the incorrect login attempt and provides the option to reset the password or try again. 3. The system alerts the user and provides guidance to resolve the issue.
Includes:	N/A
Special Requirements:	The system must securely handle user credentials and personal data.
Assumptions:	<ol style="list-style-type: none"> 1. Users are familiar with standard login/signup processes. 2. Users have access to a stable internet connection for account verification.
Notes and Issues:	Contingencies for account recovery need to be robust to help users regain access if they forget their credentials.

4.2.3. Functional Requirement

2. App User must be able to login to their account with the System
 - 2.1. System must provide two input fields for user

- 2.1.1. One of the input fields must be email address.
- 2.1.2. One of the input fields must be password
- 2.2. System must ensure that user fills in all the input fields before allowing login
- 2.3. System must verify all input information
 - 2.3.1. System must verify that email address exist in the database
 - 2.3.2. System must verify that the password matches the password of the user stored in the database.
 - 2.3.3. System must provide error message when login is unsuccessful
- 2.4. System must redirect user to the home page upon successful login.

4.3. Change/Forgot password

4.3.1. Description and Priority

Existing users of Nutrigains who forgot about their password can reset their credentials using this functionality. User is required to input their registered email address and enter the OTP sent to that email address. User can then proceed to reset their username and password accordingly

Overall Priority	Low
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4.3.2. Stimulus/Response Sequences

Use Case ID:	003		
Use Case Name:	Change Password		
Created By:	Adithya Samudrala	Last Updated By:	Zeng Ruixiao
Date Created:	22/02/2024	Date Last Updated:	16/04/2024

Actor:	User and Database
Description:	The "Change Password" use case allows the user to change their account password for enhanced security or in case the old password is forgotten or compromised.

Preconditions:	The user must not be logged in. The current password must be known or a password reset option should be available.
Postconditions:	The user's password is updated in the system.
Priority:	Low
Frequency of Use:	This use case is likely to be executed as many times as user the wants
Flow of Events:	<ol style="list-style-type: none"> 1. The user selects the “forget password” option on the login page to change their password. 2. User enter the registered email address 3. The user is then sent an otp to their email which they input back on to the change password page 4. The new password section becomes active upon sending of OTP 5. User then input their new password and click on change password 6. System verify OTP and passwords 7. Upon successful validation, the system updates the password.
Alternative Flows:	<ol style="list-style-type: none"> 1. If invalid email is entered, system prompt user to re-enter the email 2. If email doesn't exist in database, system prompt user to re-enter the email 3. If passwords do not match, system prompt user to re-enter the passwords
Exceptions:	<ol style="list-style-type: none"> 1. Invalid email 2. Invalid OTP 3. New passwords do not match. 4. New password does not meet security requirements.
Includes:	<p>Extends</p> <p>“Login” Use case</p>
Special Requirements:	The system should enforce strong password standards.
Assumptions:	The user has access to their current credentials or to their email for a password reset link.
Notes and Issues:	<p>Consider implementing multi-factor authentication for additional security during the password change process.</p> <p>Monitor for multiple failed attempts to prevent brute force attacks.</p>

4.3.3. Functional Requirement

3. App User must be able to retrieve access to lost account with the System.
 - 3.1. System must provide an input field for user to input registered email address.
 - 3.2. System must ensure that user fills in the registered email address before allowing authentication.
 - 3.3. System must verify that the email address exists in the database.
 - 3.3.1. System must provide an error message to user if the email address is not found.
 - 3.4. System must provide an input field for App User to input OTP.
 - 3.4.1. System must verify that the OTP is valid.
 - 3.4.2. System must provide an error message to user if OTP is invalid.
 - 3.5. System must provide two password input fields for user
 - 3.5.1. One for entering the new password.
 - 3.5.2. One confirming the new password.
 - 3.6. Upon successful validation of the email address and OTP, and successful entry of the new password, the system must redirect the app user to the login page.

4.4. Profile Update

4.4.1. Description and Priority

The Profile Update feature allows users to modify and update their personal information stored within the Nutrigains system. Users can access this feature to make changes to details such as their name, email address, password, dietary preferences, and any other relevant profile information. Profile updates ensure that user data remains accurate and up-to-date, reflecting any changes in the user's circumstances or preferences.

Overall Priority	Medium
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4.4.2. Stimulus/Response Sequences

Use Case ID:	004		
Use Case Name:	Profile Update		
Created By:	Ansh Singh	Last Updated By:	Adithya Samudrala
Date Created:	22/02/2024	Date Last Updated:	18/04/2024

Actor:	User and Database
Description:	The "Profile Update" use case allows the user to change their information associated with their account.
Preconditions:	The user must be logged in.
Postconditions:	The user's information is updated in the system.
Priority:	Medium
Frequency of Use:	This use case is likely to be executed as many times as user the wants
Flow of Events:	<ol style="list-style-type: none"> 1. User navigate to the profile page 2. User click on “Edit” 3. The input fields become active upon clicking 4. User proceed to edit information in any of the field 5. User click on save changes 6. New user information is stored in the system 7. User’s daily nutritional needs are recalculated and updated in the nutrition tracking page
Alternative Flows:	<ol style="list-style-type: none"> 1. If any of the fields is left blank, system must prompt the user to fill in the field before saving changes. 2. If any of the fields is having invalid input format, system must send an error message to user.
Exceptions:	<ol style="list-style-type: none"> 1. Blank input field 2. Invalid input format
Includes:	NA
Special Requirements:	NA
Assumptions:	NA
Notes and Issues:	NA

4.4.3. Functional Requirement

4. User Profile Modification:
 - 4.1. Users must have the ability to change their profile information.
5. Activation of Input Fields:
 - 5.1. All input fields must become active when the user clicks on the "Edit" button.
6. Restriction on Email Address Modification:
 - 6.1. Users are not permitted to change their registered email address.
 - 6.2. The email field must remain inactive throughout the entire profile modification process.

4.5. Browse Meal

4.5.1. Description and Priority

The "Browse Meal" feature allows users to explore and search for various meal options available within the Nutrigains system. This feature enables users to discover new recipes, plan their meals, and make informed dietary choices based on their preferences and nutritional needs.

Overall Priority	High
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4.5.2. Stimulus/Response Sequences

Use Case ID:	005		
Use Case Name:	Browse		
Created By:	Ansh Singh	Last Updated By:	Tan Liang Meng
Date Created:	22/02/2024	Date Last Updated:	19/04/2024

Actor:	User
Description:	The "Browse" use case allows the user to view and select from a variety of meal options within the Nutri Gains website.
Preconditions:	The user must be registered and logged into the Nutrigains website.
Postconditions:	The user will be able to view multiple meals and their nutritional information
Priority:	High
Frequency of Use:	This use case is likely to be executed multiple times a day as users plan their meals
Flow of Events:	<ol style="list-style-type: none"> 1) The user navigates to the Browse page of the website. 2) The user type keywords of the meal into the browse bar 3) User then click on search 4) System then display a list of relevant meals

Alternative Flows:	1. System is unable to find any meals based on the keyword, system displays the message “No result found” to the user
Exceptions:	1. The system cannot retrieve meal data due to an API failure which is caused due to a network/system failure. eg:- The system displays an error message and suggests trying again later
Includes:	"Select Meal" - enables users to select and view additional information about a meal.
Special Requirements:	Performance Requirements: The system should retrieve meal information and update the user's dashboard in less than 2 seconds.
Assumptions:	It is assumed that the external API is reliable and provides accurate, up-to-date nutritional information.
Notes and Issues:	The reliability of the external nutrition information system needs to be monitored.

4.5.3. Functional Requirement

- 5. User must be able to search for meals based on the input keywords
 - 5.1. System must provide an input field for user to input search keyword
 - 5.2. System must query the meal API to retrieve all items which match the search keyword
 - 5.3. System must display the meals queried to user.
 - 5.3.1. System must display information about each meal to user.
 - 5.3.1.1. Information must contain the meal name.
 - 5.3.1.2. Information must contain the meal nutritional content.
 - 5.3.1.3. Information must contain the meal ingredients
 - 5.3.1.4. Information must contain the meal recipe.

4.6. Chatbot

4.6.1. Description and Priority

The "Chatbot" feature integrates an interactive chatbot interface within the Nutrigains system, allowing users to engage in conversations to receive personalised assistance related to nutrition and meal recommendations. Users can interact with the chatbot to ask questions, seek guidance on meal planning, inquire about nutritional information, and receive tailored recommendations based on their preferences and dietary goals.

Overall Priority	High
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4.6.2. Stimulus/Response Sequences

Use Case ID:	006		
Use Case Name:	Chatbot		
Created By:	Ansh Singh	Last Updated By:	Adithya Samudrala
Date Created:	22/02/2024	Date Last Updated:	16/04/2024

Actor:	User
Description:	The "Chatbot" use case facilitates an interactive conversation between the user and an AI-powered chatbot within the Nutri Gains website. It allows the user to describe a custom meal based on their needs.
Preconditions:	The user must be registered and logged into the Nutri Gains website.
Postconditions:	The user has received answers to their queries.
Priority:	High
Frequency of Use:	This use case is likely to be executed multiple times a day as users plan their meals.
Flow of Events:	<ol style="list-style-type: none"> 1. The user initiates a conversation with the chatbot in the chatbot page. 2. The chatbot processes the prompt and generates a reply. 3. The user continues the conversation, asks another question, or ends the chat session.
Alternative Flows:	<ol style="list-style-type: none"> 1. User input is irrelevant to meal recommendations and nutrition advice, chatbot will reply with "This query is not relevant"
Exceptions:	<p>The chatbot is unable to understand the user's query.</p> <ol style="list-style-type: none"> 1) The system cannot retrieve meal data due to an API failure which is caused due to a network/system failure. eg:- The system displays an error message and suggests trying again later
Includes:	<ol style="list-style-type: none"> 1) "Select Meal" - enables users to select and view additional information about a meal.
Special Requirements:	Responsiveness: The chatbot should respond to user queries within a few seconds.
Assumptions:	The chatbot has access to a comprehensive database of nutritional information and user data to provide accurate advice.

Notes and Issues:	Privacy concerns related to user interactions with the chatbot need to be addressed.
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4.6.3. Functional Requirement

- 6. Functional requirements for the Chatbot feature in Nutrigains includes:
 - 6.1. User Interaction:
 - 6.1.1. Allow users to interact with the chatbot via a chat interface.
 - 6.1.2. Support natural language processing powered by Gemini API to understand user queries and commands.
 - 6.2. Information Retrieval:
 - 6.2.1. System must have access to external API to retrieve and provide information related to nutrition, meal recommendations.
 - 6.3. Personalization:
 - 6.3.1. The chatbot must provide personalised meal suggestions and dietary plans according to user preferences mentioned in the chat.
 - 6.4. Real-time Responses:
 - 6.4.1. System must ensure timely and accurate responses to maintain user engagement and satisfaction.
 - 6.5. Error Handling:
 - 6.5.1. Chatbot must handle errors gracefully and provide clear error messages when it encounters invalid input or cannot fulfil a user request.

4.7. Add to favourites

4.7.1. Description and Priority

The "Add to Favourites" feature allows users to save specific meals or recipes to their personal favourites list within the Nutrigains system for quick and easy access in the future.

Overall Priority	Medium
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4.7.2. Stimulus/Response Sequences

Use Case ID:	007		
Use Case Name:	Add to Favourites		
Created By:	Ansh Singh	Last Updated By:	Ansh Singh
Date Created:	22/02/2024	Date Last Updated:	22/02/2024

Actor:	User and Database
Description:	The “Add to Favourites” use case allows the user to tag certain selected meals as “favourite”, which ultimately allows the user to come back and view the meal at any point later in time.
Preconditions:	The user must be registered and logged into the Nutri Gains website.
Postconditions:	The user's selected meal is added to their “favourites” on the tracking page.
Priority:	Medium
Frequency of Use:	This use case may be used as needed by the user
Flow of Events:	<ol style="list-style-type: none"> 1. The user navigates to a selected meal 2. The user puts the meal, by selecting the add to favourites option, into a list of meals which they can refer to later 3. The data is stored in the tracking page and the database
Alternative Flows:	N/A
Exceptions:	The user doesn't select any meal as their favourite.
Includes:	Extends "Select Meal" - enables users to select and view additional information about a meal.
Special Requirements:	N/A
Assumptions:	Users are knowledgeable about the nutritional content of the meals they are adding.
Notes and Issues:	The process for entering and storing custom meal information should be streamlined to encourage consistent use.

4.7.3. Functional Requirement

7. System must provide functionalities for user to manage their favourite list
 - 7.1. System must allow users to add items to their favourite list by selecting the “Add to Favourites” option in a selected meal.

4.8. View Favourites

4.8.1. Description and Priority

The "View Favourites" feature enables users to access and browse their list of favourite items within the Nutrigains system. Users can conveniently view all items they have marked as favourites, such as meals, recipes, or food items, in the favourite page.

Overall Priority	Medium
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4.8.2. Stimulus/Response Sequences

Use Case ID:	008		
Use Case Name:	View Favourites		
Created By:	Ansh Singh	Last Updated By:	Tan Liang Meng
Date Created:	22/02/2024	Date Last Updated:	19/4/2024

Actor:	User and Database
Description:	The “View Favourites” use case allows the user to go to the favourite page and view the list of meals that they had selected as “Favourites”.
Preconditions:	The user must be registered and logged into the Nutrigains website.
Postconditions:	User can view the list of meals that they had saved as favourites
Priority:	Medium
Frequency of Use:	The use case may be initiated by the user as often as needed.
Flow of Events:	<ol style="list-style-type: none"> 1. The user goes to the favourite page 2. User views the list of meals for reference
Alternative Flows:	<ol style="list-style-type: none"> 1. The user does not have any favourite meals, system display: “No History found” Track your meal now!!!”
Exceptions:	N/A
Includes:	N/A
Special Requirements:	System should be able to store a large number of users and their favourites without performance degradation
Assumptions:	It is assumed that there is a persistent storage system in place to store the users' favourites.
Notes and Issues:	There may be limitations on the number of items a user can add to their favourites, depending on the system's capacity.

4.8.3. Functional Requirements

8. System must provide functionalities for user to view and access their favourite list

- a. System must display the correct list of favourite meals collected by the user.
- b. Present the list in a clear and organised manner, allowing users to easily browse and navigate through their favourite meals.
- c. User must be able to view detailed information for each favourite meal, such as the meal name, nutritional content, and any other relevant details after selecting a specific meal.

4.9. Delete Favourites

4.9.1. Description and Priority

The "Delete Favourites" feature allows users to remove specific items from their favourites list within the Nutrigains system. Users may want to delete items that are no longer of interest or relevance to them, ensuring that their favourites list remains up-to-date and reflects their current preferences accurately.

Overall Priority	Medium
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4.9.2. Stimulus/Response Sequences

Use Case ID:	009		
Use Case Name:	Delete Favourites		
Created By:	Zeng Ruixiao	Last Updated By:	Zeng Ruixiao
Date Created:	18/04/2024	Date Last Updated:	18/04/2024

Actor:	User and Database
Description:	The “Delete Favourites” use case allows the user to go to the tracking page and delete meals that they had selected as “Favourites”.
Preconditions:	<ol style="list-style-type: none"> 1. The user must be registered and logged into the Nutrigains website. 2. User must be in favourite page to delete favourite meals
Postconditions:	Selected meal is deleted from the list
Priority:	Medium
Frequency of Use:	The use case may be initiated by the user as often as needed.
Flow of Events:	<ol style="list-style-type: none"> 1) The user navigate to the favourite page 2) The user click the “Delete” button beside the meal they wants to remove 3) The selected meal deleted from user’s favourite list

Alternative Flows:	N/A
Exceptions:	N/A
Includes:	N/A
Special Requirements:	The system should be capable of deleting the correct meal from the favourite list, even in scenarios where the user has a large number of favourite meals, without experiencing performance degradation.
Assumptions:	N/A
Notes and Issues:	N/A

4.9.3. Functional Requirements

9. User must be able to remove a meal from their favourite list if they wish to
 - 9.1. System must provide a mechanism, such as a delete button for users to initiate the deletion process.
 - 9.2. System must immediately update the favourites list to reflect the deletion of the selected meal.

4.10. Track Meal

4.10.1. Description and Priority

The "Add to Tracking" feature enables users to include specific meals or food items in their tracking log within the Nutrigains system. By adding items to their tracking log, users can monitor their dietary intake, track nutritional information, and maintain a record of their eating habits over time.

Overall Priority	Medium
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4.10.2. Stimulus/Response Sequences

Use Case ID:	010
Use Case Name:	Track meal
Created By:	Ansh Singh

Date Created:	22/02/2024	Date Last Updated:	16/04/2024
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Actor:	Database
Description:	The "Add Meal to Tracking" use case enables the user to add a selected meal to their personal meal tracking page within the Nutrigains website.
Preconditions:	The user must be registered and logged into the Nutri Gains website.
Postconditions:	The tracking page and history page is updated to include the newly added meal.
Priority:	Medium
Frequency of Use:	The use case will likely be executed multiple times a day as users add meals to their tracking page.
Flow of Events:	<ol style="list-style-type: none"> 1. User get meal recommendation either through browsing or chatbot interaction 2. User selects a meal 3. User click on “save to nutrition tracking” to add the meal to their tracking list. 4. System stores the selected meal in user’s tracking list 5. The history page is updated to include the newly added meal 6. The nutrition tracking page is updated to include the newly added meal and recalculate the user's daily nutritional intake.
Alternative Flows:	<ol style="list-style-type: none"> 1. N/A
Exceptions:	<p>The system encounters an error while adding the meal (e.g., database update failure).</p> <ol style="list-style-type: none"> 1. The system notifies the user of the error and suggests trying again.
Includes:	<p>Extends</p> <p>"Select Meal" - enables users to select and view additional information about a meal.</p>
Special Requirements:	The meal addition process should be intuitive and require minimal steps to encourage regular use.
Assumptions:	Users are familiar with basic navigation within the website.
Notes and Issues:	There might be a need for a tutorial or help feature to guide new users through the meal tracking process.

4.10.3. Functional Requirements

10. System must allow user to add a selected meal to their personal meal tracking page within the Nutrigains website.
 - 10.1. System must allow users to select a meal from the available options, either through browsing or chatbot interaction
 - 10.2. System must provide a clear option, such as a "save to nutrition tracking" button, for users to add the selected meal to their tracking page.

- 10.3. System must store the selected meal in the user's tracking page, ensuring that it is recorded accurately.

4.11. View meal history

4.11.1. Description and Priority

The "View Meal History" feature allows users to access and review their past meal consumption records within the Nutrigains system. By providing users with the ability to view their meal history, this feature enables them to track their dietary habits, monitor nutritional intake over time, and make informed decisions about their eating patterns.

Overall Priority	Medium
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4.11.2. Stimulus/Response Sequences

Use Case ID:	011		
Use Case Name:	View Meal History		
Created By:	Adithya Samudrala	Last Updated By:	Tan Liang Meng
Date Created:	22/02/2024	Date Last Updated:	19/04/2024

Actor:	User and Database
Description:	The "View Meal History" use case allows the user to review their past meal entries within the Nutrigains website. Users can view all the meals that they have had in the past 30 days.
Preconditions:	The user must be registered and logged into the Nutrigains website.
Postconditions:	Recorded meals list is displayed to the user
Priority:	Medium
Frequency of Use:	User may access meal history as frequent as the wish
Flow of Events:	<ol style="list-style-type: none"> 1. The user navigates to the history page 2. The system retrieves data from the database 3. The system displays the user's meal history of the past 30 days, group by date.
Alternative Flows:	<ol style="list-style-type: none"> 1. The user selects a specific meal entry to view more detailed nutritional information. 2. User does not have any meal history
Exceptions:	The system is unable to retrieve the meal history due to a database error.

	1. The system notifies the user of the issue and the option to try again later.
Includes:	N/A
Special Requirements:	The system must handle a potentially large volume of data efficiently to ensure quick access to historical data.
Assumptions:	Meal data is accurate and consistently logged by the user
Notes and Issues:	Consideration must be given to whether users can archive or delete old data.

4.11.3. Functional Requirements

- 11. Users must be able to access their meal history in the history page.
 - 11.1. The system must accurately display meal history for the past 30 days, grouped by date to provide a chronological overview of past consumption.
 - 11.2. Each meal entry in the history includes detailed nutritional content and the date of consumption.
 - 11.3. Users must be able to interact with individual meal entries to access more detailed information and review their past dietary habits

4.12. Delete from tracking

4.12.1. Description and Priority

The "Delete from Tracking" feature allows users to remove specific meals or food items from their personal meal tracking page within the Nutrigains system. By providing users with the ability to delete items from their tracking log, they can maintain an accurate record of their dietary intake and adjust their tracking data as needed.

Overall Priority	Medium
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4.12.2. Stimulus/Response Sequences

Use Case ID:	012		
Use Case Name:	Delete tracking		
Created By:	Zeng Ruixiao	Last Updated By:	Tan Liang Meng
Date Created:	16/04/2024	Date Last Updated:	19/04/2024

Actor:	User and Database
Description:	The “Delete tracking” use case allows users to delete meals that they had tracked in the system.
Preconditions:	<ol style="list-style-type: none"> 1. The user must be registered and logged into the Nutrigains website. 2. The user must have added at least one meal to their tracking page
Postconditions:	1. Selected meal is deleted from user's tracking list
Priority:	Medium
Frequency of Use:	The use case may be initiated by the user as often as needed.
Flow of Events:	<ol style="list-style-type: none"> 1. The user navigate to the tracking page 2. The user click on the “Delete” button beside the meal that he wants to remove 3. System remove the selected meal from the tracking list 4. The daily nutritional intake of user is recalculated and displayed based on the updated tracking data
Alternative Flows:	N/A
Exceptions:	N/A
Includes:	N/A
Special Requirements:	The system should be capable of deleting the correct meal from the tracking list, even in scenarios where the user has a large number of tracked meals, without experiencing performance degradation.
Assumptions:	N/A
Notes and Issues:	N/A

4.12.3. Functional Requirements

12. System must allow user to remove a selected meal from the tracking page.
- 12.1. System must allow users to select a meal from the available options, either through browsing or chatbot interaction
- 12.2. System must provide a clear option, such as a "Delete" button, for users to remove a specific meal from their tracking list.
- 12.3. The system should be capable of deleting the correct meal from the tracking list, even in scenarios where the user has a large number of tracked meals, without experiencing performance degradation.
- 12.4. Upon deletion, the meal must be shown in both tracking page and history page
- 12.5. After deletion, the system should update the user's nutritional intake to accurately reflect the removed meal

4.13. Select meal

4.13.1. Description and Priority

The "Select Meal" feature enables users to choose and view detailed information about a specific meal within the Nutrigains system. By providing users with the ability to select meals, they can access essential details to facilitate informed dietary choices.

Before users can add a meal to their tracking or favourite list within the Nutrigains system, they must first select a meal from the available options.

Overall Priority	High
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4.13.2. Stimulus/Response Sequences

Use Case ID:	013		
Use Case Name:	Select Meal		
Created By:	Ansh Singh	Last Updated By:	Adithya Samudrala
Date Created:	22/02/2024	Date Last Updated:	16/04/2024

Actor:	User
Description:	The “Select Meal” use case allows the user to select meals and view additional information.
Preconditions:	The user must be registered and logged into the Nutri Gains website.
Postconditions:	Upon selecting a meal, users can immediately access detailed information about it. They are then able to proceed with adding the meal to their tracking or favourite list
Priority:	High
Frequency of Use:	Multiple times a day, depending on the user's meal planning habits.
Flow of Events:	<ol style="list-style-type: none"> 1. User obtain meal recommendations either by browsing or chatbot interaction 2. The user selects a meal from the list. 3. System immediately display meal information upon selection
Alternative Flows:	<ol style="list-style-type: none"> 1. User add meal to favourite list 2. User add meal to tracking list

Exceptions:	1) There's an error in retrieving meal information from the API due to network failure
Includes:	N/A
Special Requirements:	Nutritional information must be accurate and up-to-date.
Assumptions:	The meals listed are based on the user's preferences or dietary restrictions if any are set
Notes and Issues:	Ensure there are measures to handle API downtime or unavailability

4.13.3. Functional Requirements

- 13. The system should enable users to select a meal from the available options.
 - 13.1. Meal frame within the system must be responsive to user clicks.
 - 13.2. Upon clicking on a meal item, the frame should expand to display detailed information about the selected meal.
 - 13.3. The system should respond to user clicks on meal frames within milliseconds to ensure a seamless and responsive user experience.
 - 13.4. The detailed information displayed upon clicking on a meal frame should be accurate and up-to-date.

4.14. View Nutrition intake

4.14.1. Description and Priority

The "View Nutrition Intake" feature enables users to monitor and review their daily nutritional intake within the Nutrigains system. This feature provides users with valuable insights into their dietary habits, allowing them to track their consumption of essential nutrients such as calories, proteins, carbohydrates, and fats. Daily goal values are calculated using the Mifflin St. Jeor equation which takes into account the attributes of the user, such as weight, height, gender etc.

Overall Priority	High
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4.14.2. Stimulus/Response Sequences

Use Case ID:	014		
Use Case Name:	View Nutrition Intake		
Created By:	Ansh Singh	Last Updated By:	Tan Liang Meng
Date Created:	22/02/2024	Date Last Updated:	19/04/2024

Actor:	User
Description:	The “View Nutrition Intake” use case allows the user to view how many calories, fats, carbohydrates and protein they have consumed throughout the day.
Preconditions:	The user must be registered and logged into the Nutrigains website.
Postconditions:	The user can view their daily nutritional intakes
Priority:	High
Frequency of Use:	Multiple times a day, depending on the user's meal planning habits.
Flow of Events:	<ol style="list-style-type: none"> 1. The user navigates to the nutrition tracking page. 2. System retrieves and displays the user's nutritional intake data stored in the database which is calculated using the Mifflin St. Jeor equation 3. The user reviews the information on the tracking page in the form of graphical bars
Alternative Flows:	N/A
Exceptions:	<ol style="list-style-type: none"> 1. The system encounters an error when calculating the nutritional intake (e.g., missing data). 2. The system notifies the user of the error and prompts them to re-select that meal option.
Includes:	N/A
Special Requirements:	N/A
Assumptions:	All the nutritional information on the meals is accurate and up-to-date
Notes and Issues:	Ensure there are measures to handle database/API downtime or unavailability

4.14.3. Functional Requirements

14. System must accurately display user's nutritional intake data in the nutrition tracking page
 - 14.1. The system should have a recalculation mechanism in place that accurately computes the user's daily nutritional intake based on the meals added or removed from the tracking list
 - 14.2. The system should present the user's nutritional intake information in the form of graphical bars, visually representing each nutrient category:
 - Calories
 - Proteins
 - Carbohydrates
 - Fats

5. Other Nonfunctional Requirements

5.1. Performance Requirements

5.1.1. System Response Time

System should respond to user interactions, such as searching for meals or chatbot queries within a second to ensure a smooth user experience. The maximum response time recorded from our app for chatbot and browsing is 8 seconds and 2 seconds respectively.

5.1.2. Scalability

System should be able to handle increasing user loads without a significant degradation in performance. This can be done by using cloud computing resources and methods of horizontal and vertical scaling of backend servers to meet user loads.

5.2. Safety Requirements

5.2.1. Data verification

Nutrigains must ensure the accuracy and integrity of meal data obtained from external API, validating incoming data for completeness, correctness, and consistency before processing or displaying it to users.

5.3. Security Requirements

5.3.1. Enforced Login Requirement

- 5.3.1.1. System must ensure user is logged in prior to accessing any functionalities provided within the app. User must be logged in using their registered username and password

5.4. Software Quality Attributes

5.4.1. Correctness

- 5.4.1.1. System must ensure that the correct meals are returned to the user based on the keywords entered into the chatbot or browse bar.
- 5.4.1.2. System must ensure that the user's account information is always accurately displayed.
- 5.4.1.3. System must ensure that the user's favourite meal list is always accurately displayed.
- 5.4.1.4. System must ensure that the tracked meals are always accurately displayed in both nutrition tracking and history pages.
- 5.4.1.5. System must ensure that the user's daily nutritional needs are accurately calculated based on the information stored in their profile, such as age, gender, weight, height, and activity level.
- 5.4.1.6. System must ensure that the user's daily calories intake is always accurately calculated based on the meal they consumed

5.4.2. Extensibility

System must always be ready to accept new functionality. System design should adopt modular programming concept using the open-closed principle.

5.4.3. User-Friendliness

5.4.3.1. Navigation

- 5.4.3.1.1. System must provide quick navigation at appropriate pages.
1. Navigation bar exists in every page
 - a. Navigation bar consists of links to all pages of the web application, including Home page, Chatbot page, Nutrition tracking page, History page, User profile, Signup and Login page.
 - b. The Signup and Login page is only visible in the navigation bar when a user is not logged in.
 - c. Users can access the main features only after logging in.
 2. On the signup page, there is a navigation link leading to the login page.
 3. On the login page, there is a navigation link leading to the signup page.
 4. On the login page, there is a navigation link leading to the forgot password page.
 5. On the forgot password page, there is a navigation link leading to the login page.

5.4.3.2. User flow

1. User is redirected to login page upon successful signup
2. User is redirected to home page upon successful login
3. When clicked on a meal from chatbot recommendation or browse, User is redirected to the info page of that meal.

5.4.3.3. System must provide a FAQ page.

1. The FAQ page must contain general potential enquiries of a user.

Test Cases

1. Account Registration

Test Scenario ID	Registration-1		Test Case ID	Registration-1A			
Test Case Description	Register- Positive Test Case		Test Priority	High			
Pre-Requisite	Stable internet connection		Post-Requisite	NA			
Test Execution Steps:							
S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test Comment
1	Launch	[Nutrigains url]	Login Page	Login Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:31 PM] : Launch Successful
2	Navigate to Sign Up page	Click on “Sign Up” on the navigation bar	Redirect to sign-up page	SignUp page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:31 PM] : Navigate to SignUp page successful

3	Input valid email, matched passwords and all the necessary details, then click on “register”	<ol style="list-style-type: none"> 1. Valid email 2. Full Name 3. Date of birth 4. Gender 5. Current weight 6. Height 7. Goal 8. Activity level 9. New Password 10. Confirm password 	OTP sent to user, OTP column becomes active for input	OTP sent to user, OTP column becomes active for input	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:31 PM] : OTP send successful
3	Enter Valid OTP from Email, click on “register”	Valid OTP	Sign up successful	Sign up successful	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:32 PM] : Sign up Successful

Test Scenario ID	Register-2	Test Case ID	Register-2A
Test Case Description	Register - Negative Test Case	Test Priority	High
Pre-Requisite	Stable internet connection	Post-Requisite	NA
Test Execution Steps:			

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test Comment
1	Launch	[Nutrigains url]	Login Page	Login Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:29 PM] : Launch Successful
2	Navigate to Sign Up page	Click on "Sign Up"	Sign Up page	Sign Up page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:29 PM] : Navigate to sign up page successful
3	Invalid email and all the necessary credentials	1. Invalid email 2. Full Name 3. Date of birth 4. Gender 5. Current weight 6. Height 7. Goal 8. Activity level 9. New Password 10. Confirm password	Error message: Invalid email	Error message: Invalid email	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:29 PM] : Invalid email

4	Email that already exists and all the necessary details	1. Invalid email 2. Full Name 3. Date of birth 4. Gender 5. Current weight 6. Height 7. Goal 8. Activity level 9. New Password 10. Confirm password	Error message:Email already exists	Error message:Email already exists	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:29 PM] : Email already exists
5	Valid email and all the necessary details but confirm password doesn't match	1. Valid email 2. Full Name 3. Date of birth 4. Gender 5. Current weight 6. Height 7. Goal 8. Activity level 9. New Password 10. Unmatched password	Error message: Password doesn't match	Error message: Password doesn't match	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:29 PM] : Password doesn't match

2. User Login

Test Scenario ID	Login-1			Test Case ID	Login-1A		
Test Case Description	Login - Positive Test Case			Test Priority	High		
Pre-Requisite	Stable internet connection			Post-Requisite	NA		
Test Execution Steps:							
S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test Comment
1	Launch	[Nutrigains url]	Login Page	Login Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:40 PM] : Launch successful
2	Enter valid username and password	Valid username and password	Redirect to home page	Redirect to home page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:29 PM] : login successful

Test Scenario ID	Login-2	Test Case ID	Login-2A
Test Case Description	Login–Negative Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and navigate to login page	[Nutrigains url], click on login	Login Page	Login Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:39 PM] : Navigate to login page successful
2	Enter a valid email but wrong password	Valid email with wrong password	Wrong password	Wrong password	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:39 PM] : Wrong Password

3	Enter an invalid email and password	Invalid Email and password	Account doesn't exists	Account doesn't exists	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:39 PM] : Account doesn't exists
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3. Forget / Change Password

Test Scenario ID	ChangePassword-1	Test Case ID	ChangePassword-1A
Test Case Description	Change password - Positive Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and navigate to login page	[Nutrigains url], click on login	Login Page	Login Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM] : Navigate to login page successful

2	Click on “forget/change password”	“forget/change password”	Change/Forgot Password page	Change/Forgot Password page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: Navigate to forget password page successful
3	Enter a valid email address and click on “Send OTP”	Valid email address	OTP sent to user	OTP sent to user	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: OTP send successful
4	Enter valid OTP and passwords that match	OTP , password, confirmation password	Password successfully changed	Password successfully changed	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: Password change successful

Test Scenario ID	ChangePassword-2	Test Case ID	ChangePas sword-2A
Test Case Description	Change password - Negative Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:							
S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and navigate to login page	[Nutrigains url], click on login	Login Page	Login Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM] : Navigate to login page successful
2	Click on “forget/change password”	“forget/change password”	Change/Forgot Password page	Change/Forgot Password page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: Navigate to forget password page successful
3	Enter an invalid email address and click on “Send OTP”	Invalid email address	Invalid email	Invalid email	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: Invalid email
4	Enter an unregistered email	Unregistered email	Account doesn't exist	Account doesn't exist	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: Account doesn't exist

5	Enter an invalid OTP	Invalid OTP	Invalid OTP error	Invalid OTP error	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:45 PM]: Invalid OTP
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4. Edit Profile

Test Scenario ID	EditProfile-1	Test Case ID	EditProfile-1 A
Test Case Description	Edit profile	Test Priority	High
Pre-Requisite	Stable Internet Connection and a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:50 PM]: Login successful
2	Navigate to user profile	Click on “Profile” on the navigation bar	User Profile	User Profile	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:50 PM]: Navigate to profile page successful
3	Click on “edit”	edit	None	None	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:50 PM]: successful

4	Change information and click on “Save changes”	Info to be updated in the system	Profile Updated	Profile Updated	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:50 PM]: Edit successful
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5. Browse Meal

Test Scenario ID	BrowseMeal-1	Test Case ID	BrowseMeal-1A
Test Case Description	Browse Meal - Positive Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection and a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:51 PM]: Login successful

2	Search for meal in the search bar	“Pasta”	A list of pasta	A list of pasta	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:50 PM]: Browse meal successful
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Test Scenario ID	BrowseMeal-2	Test Case ID	BrowseMeal-2A
Test Case Description	Browse Meal– Negative Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection and a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:55 PM]: Login successful
2	Empty Search Test	Press the “Search” icon without typing	No meals to display	No meals to display	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:55 PM]:

		anything in the browse bar					No meals to display
3	Random Entry Test	Random text with no actual meaning	No meals to display	No meals to display	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:55 PM]: No meals to display

6. ChatBot

Test Scenario ID	Chatbot-1	Test Case ID	Chatbot-1 A
Test Case Description	Chat with the chatbot to get personalised plan- Positive Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment

1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:58 PM]: Login successful
2	Navigate to chatbot page	Press on “chatbot” on the navigation bar	Chatbot page	Chatbot page	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:58 PM]: Navigate to chatbot page successful
3	Input relevant text that describe user’s meal preferences	I would like to have some pasta	List of pasta	List of pasta	Chrome	Pass	[Tan Liang Meng 10/4/2024 3:58 PM]: Chatbot querying successful

Test Scenario ID	Chatbot-1	Test Case ID	Chatbot-1 A
Test Case Description	Chat with the chatbot to get personalised plan- Negative Test Case	Test Priority	High

Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA
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Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:00 PM]: Login successful
2	Navigate to chatbot page	Press on “chatbot” on the navigation bar	Chatbot page	Chatbot page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:00 PM]: Navigate to chatbot page successful
3	Enter random text with no actual meaning	Random text	“This query is not relevant	“This query is not relevant”	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:00 PM]: Chatbot random string test successful

7. View meal history

Test Scenario ID	ViewMealHistory-1		Test Case ID	ViewMealHistory-1A			
Test Case Description	View Meal History – Positive Test Case			Test Priority	High		
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains			Post-Requisite	NA		
Test Execution Steps:							
S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:02 PM]: Login successful
2	Navigate to history page	Press on “History” on the navigation bar	History Page with list of tracked meal	History Page with list of tracked meal	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:02 PM]: Navigate to history page successful

3	View meal details	Click on a meal in the list	Display meal info	Display meal info	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:02 PM]: View meal details successful
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Test Scenario ID	ViewMealHistory-2	Test Case ID	ViewMealHistory-2A
Test Case Description	View Meal History – Negative Test Case(user without tracking history)	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:02 PM]: Login successful
2	Navigate to history page	Press on “History” on the navigation bar	“No meal to display”	“No meal to display”	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:02 PM]: View meal details successful

							PM]: Empty history page test successful
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8. View nutrition history

Test Scenario ID	ViewNutritionHistory-1	Test Case ID	ViewNutritionHistory-1A
Test Case Description	View Meal History – Positive Test Case	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:03 PM]: Login successful

2	Navigate to Nutrition Tracking page	Press on “Nutrition Tracking” on the navigation bar	Nutrition Tracking Page with accurate daily intake progress bar	Nutrition Tracking Page with accurate daily intake progress bar	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:03 PM]: Navigate to nutrition tracking page successful
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Test Scenario ID	ViewNutritionHistory-2	Test Case ID	ViewNutritionHistory-2A
Test Case Description	View Nutrition History – Positive Test Case(user without tracking history)	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
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1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:03 PM]: Login successful
2	Navigate to Nutrition Tracking page	Press on “Nutrition Tracking” on the navigation bar	Nutrition Tracking Page with empty progress bar on daily intakes	Nutrition Tracking Page with empty progress bar on daily intakes	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:03 PM]: Empty progress bars test successful

9. Add Meal to Tracking

Test Scenario ID	AddMealoTracking-1	Test Case ID	AddMealoTracking-1A
Test Case Description	User attempt add a selected meal to tracking list	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment

1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Login successful
2	Get meal recommendation through: Browse bar Search/ ChatBot interaction	Pasta	List of Pasta	List of Pasta	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Get meal recommendation successful
3	Select meal	Click on a meal in the list	Meal info	Meal info displayed	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Select meal successful
4	Add Meal to Tracking	Click on “Save to nutrition tracking”	Meal added and is shown in the history page and nutrition tracking page	Meal added and is shown in the history page and nutrition tracking page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Add Meal to Tracking successful

10. Add Meal to favourite

Test Scenario ID	AddMealoFavourites-1	Test Case ID	AddMealoFavourites-1A
Test Case Description	User attempt to add a selected meal to favourites list	Test Priority	High
Pre-Requisite	Stable Internet Connection & a valid account in Nutrigains	Post-Requisite	NA

Test Execution Steps:

S. No	Action	Inputs	Expected Output	Actual Output	Test Browser	Test Result	Test comment
1	Launch and Login	[Nutrigains url], email and password	Home Page	Home Page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:10 PM]: Login successful
2	Get meal recommendation through: Browse bar Search/ ChatBot interaction	Relevant text	List of meal recommendations	List of meal recommendations	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Get meal recommendation successful

3	Select meal	Click on a meal in the list	Meal info	Meal info displayed	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Select meal successful
4	Add Meal to favourites	Click on “Add to favourites”	Meal added and is shown in the favourites page	Meal added and is shown in the favourites page	Chrome	Pass	[Tan Liang Meng 10/4/2024 4:07 PM]: Add Meal to Favourites successful

Appendix A: Data Dictionary

Created By:	Tan Liang Meng	Last Updated By:	Tan Liang Meng
Date Created:	22/2/2024	Date Updated:	19/4/2024

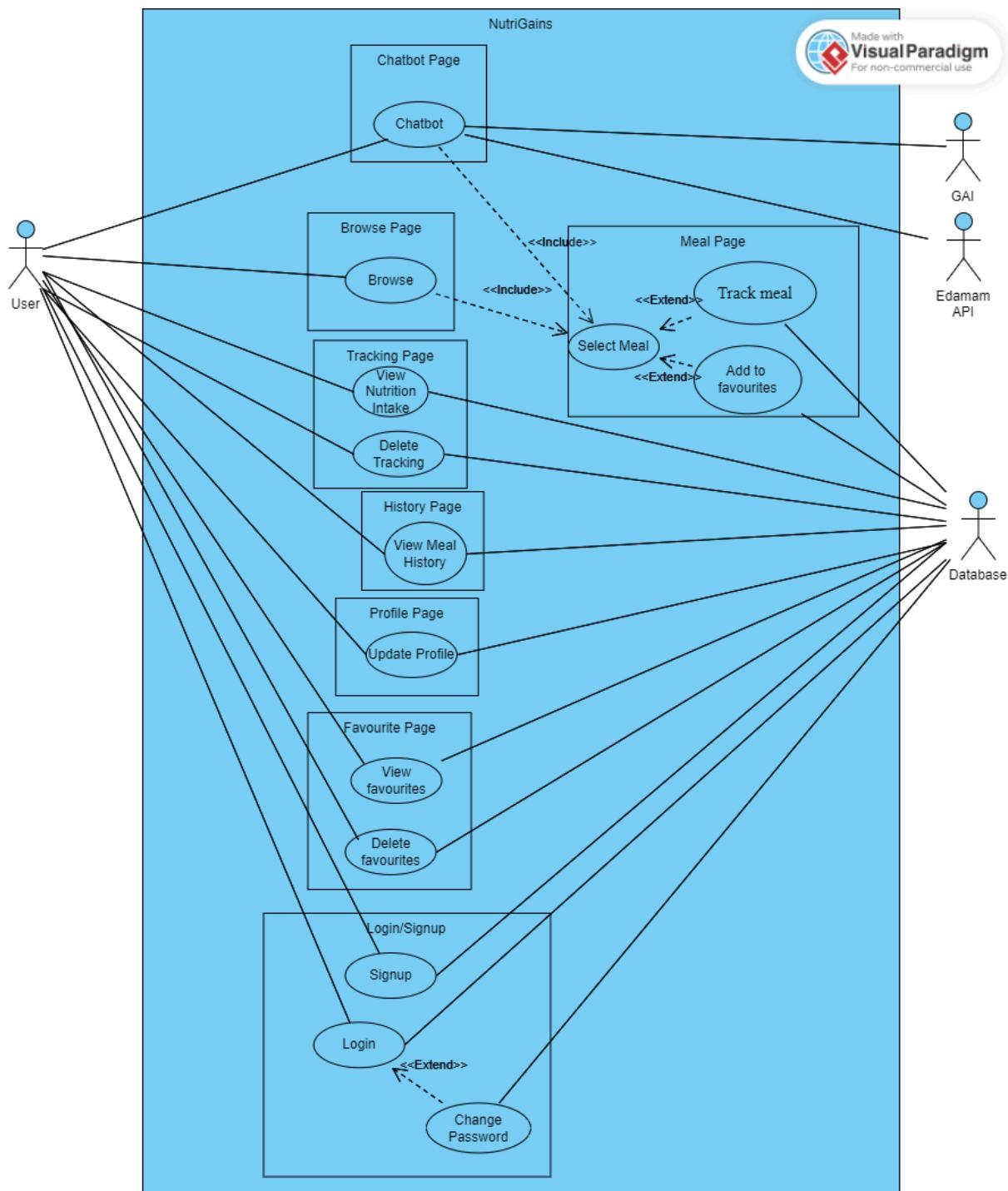
Term	Definition
User	An individual who formally registered an account with Nutrigains. They interacts with the system to receive personalised meal recommendations, track their nutritional intake, and manage their dietary preferences and goals
Chatbot	Chatbot in the system is a conversational interface powered by Gemini API that enables users to input their dietary preferences, requirements through natural language interactions. The primary function of the chatbot is to collect user input related to meal preferences to generate personalised meal plans.
Meal Plan	A personalised schedule of meals and snacks, uniquely crafted by combining recipes retrieved from API and user preferences. Utilising GAI, the system generates this plan to align precisely with the user's tastes, dietary restrictions, and goals.
Daily nutritional needs	Daily nutritional needs refer to nutritional targets that our system sets for the users for their daily consumption of calories, proteins, carbohydrates, and fats. These goals are personalised based on individual attributes like age, gender, weight, height, and activity level. They help users manage their diet, track their nutritional intake, and achieve their health objectives.
Individual attributes	In the context of Nutrigains, "individual attributes" refers to personal characteristics such as age, gender, height, weight, activity level and dietary preferences. These attributes are used to calculate user's daily nutritional needs and personalise nutritional recommendations.
Tracked list	A curated list of meals and snacks that a user has chosen to track or monitor within the system. This list, stored for up to 30 days and grouped by date, includes items such as the names of the meals or snacks, their nutritional information and serving size

Favourite list	In Nutrigains, users have the ability to create a "Favourite List" where they can add meals for future reference. This feature allows users to save and easily access meals that they enjoy or frequently consume, streamlining the process of meal selection and tracking over time.
OTP	The "One-Time Password" (OTP) sent to the user's email during account sign-up and password change serves as a temporary code for authentication purposes. It provides an additional layer of security by verifying the user's identity before allowing them to proceed with account creation or password modification.

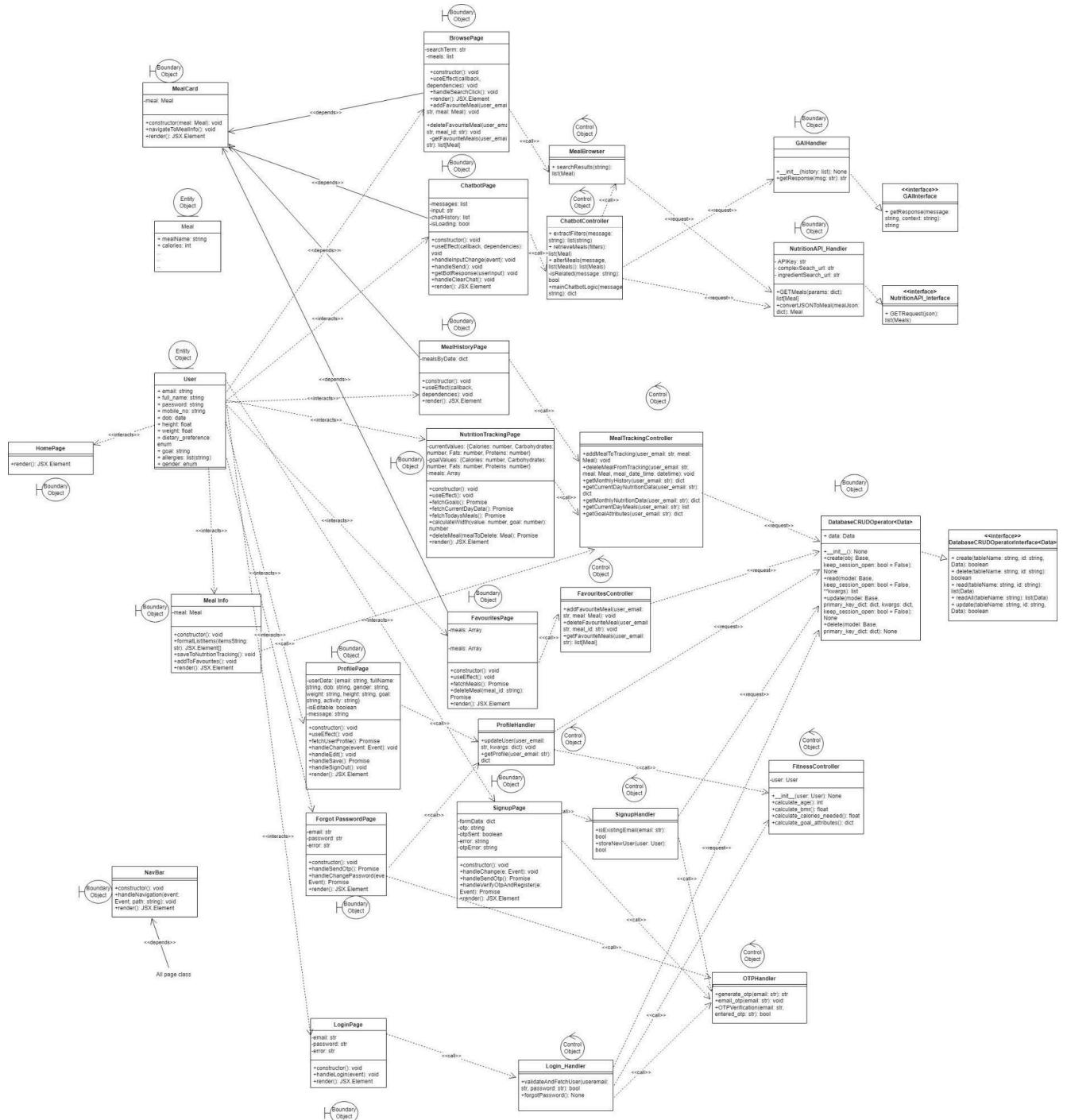
Appendix B: Analysis Models

This section includes various analysis models of Nutrigains, providing a comprehensive understanding of its structure, behaviour, and interaction flow. The models included are use case model, entity class diagram, dialog map, system architecture model and sequence diagrams. **Full quality images are included in the “Diagrams” folder in Lab 5 Deliverables.**

Use Case Model

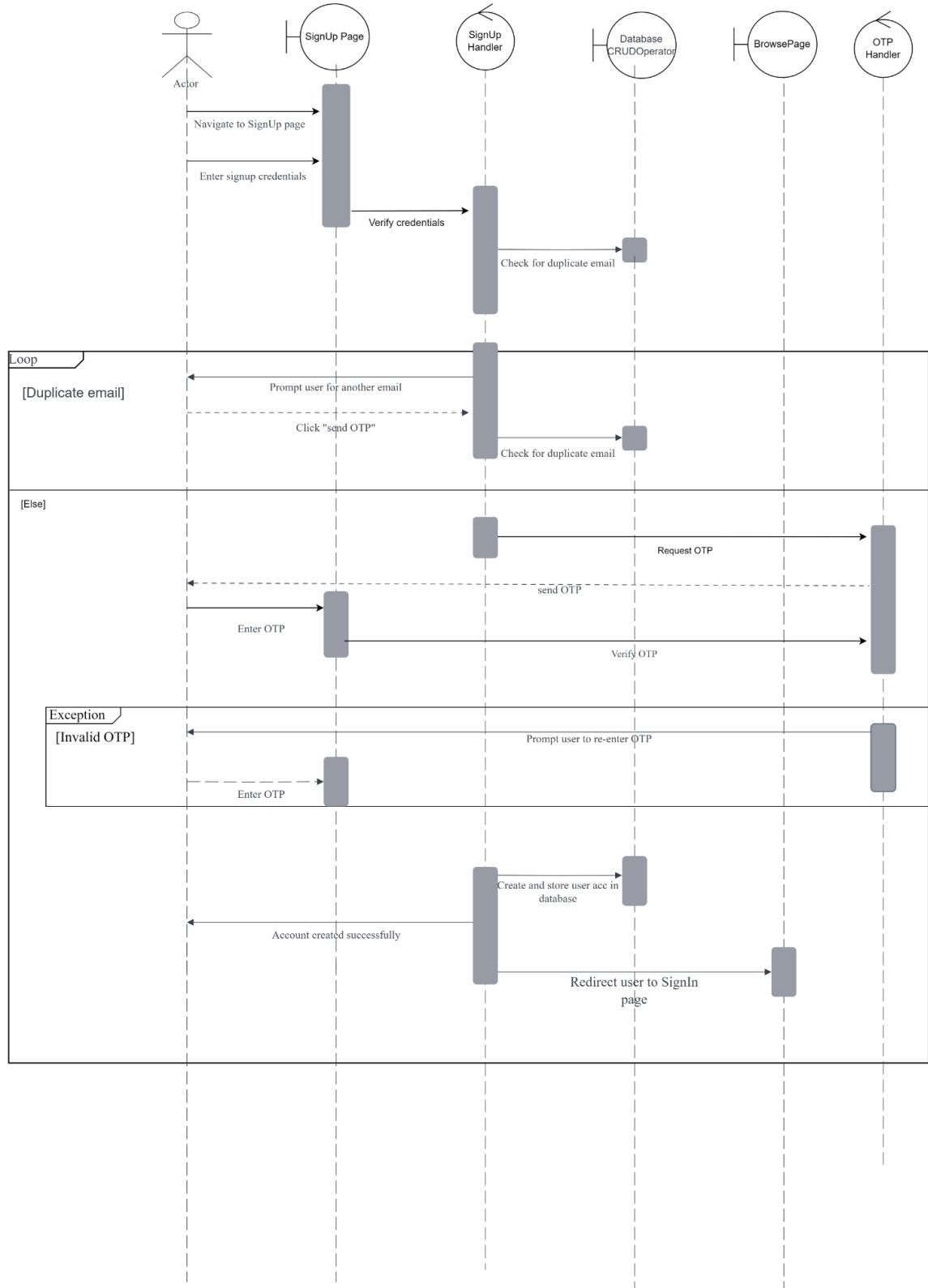


Entity Class Diagram

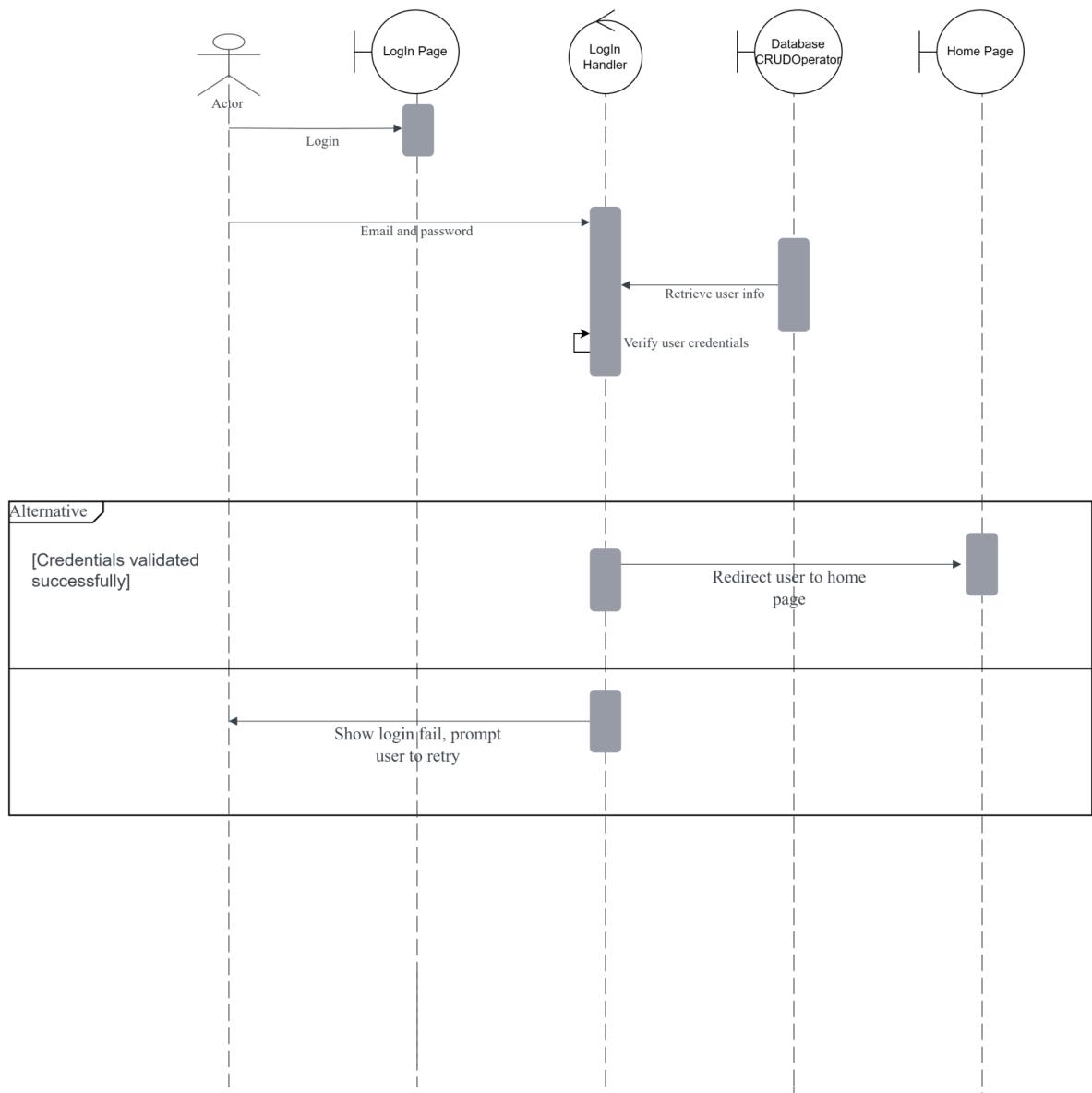


Sequence Diagrams

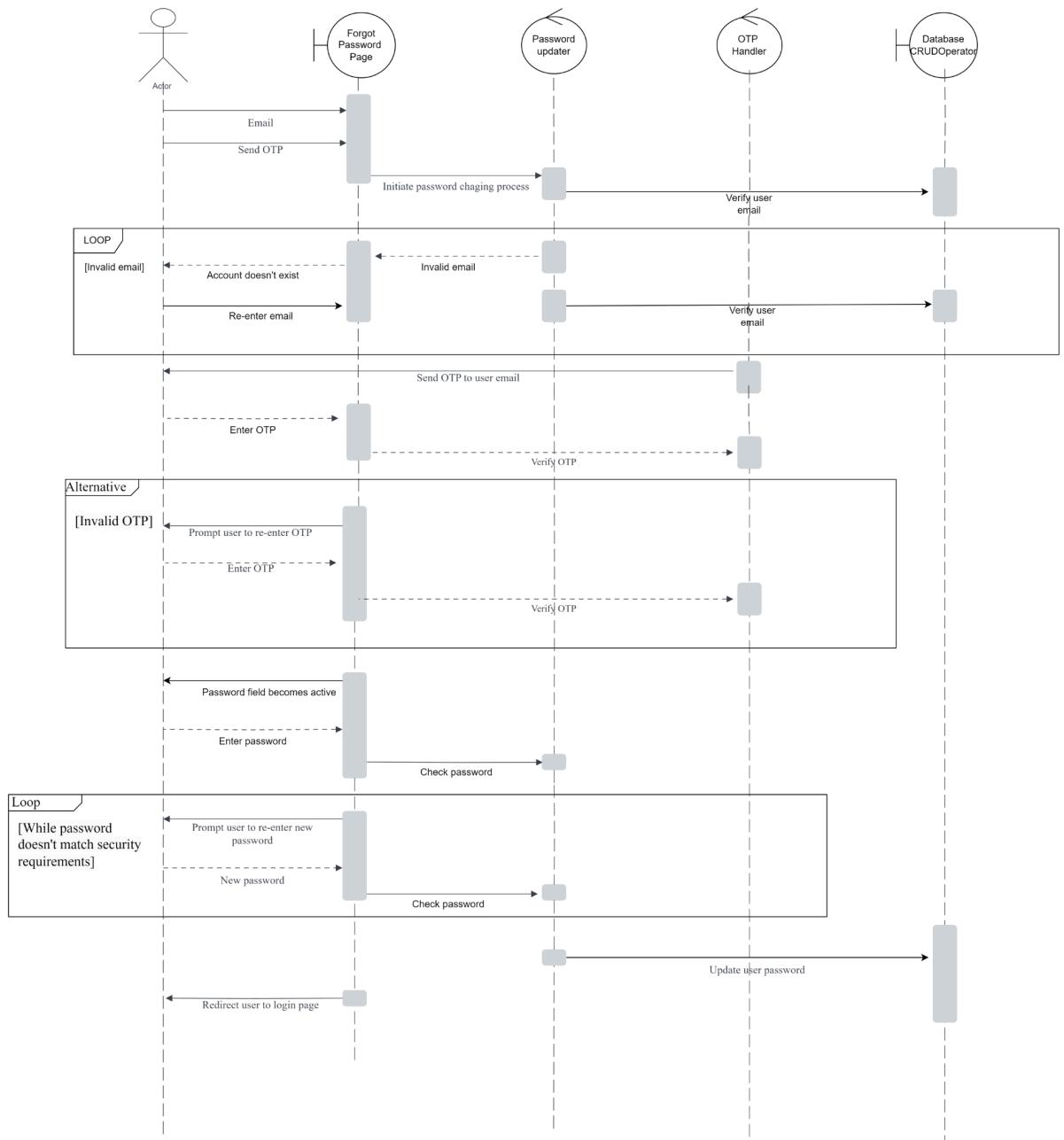
1. Account Registration



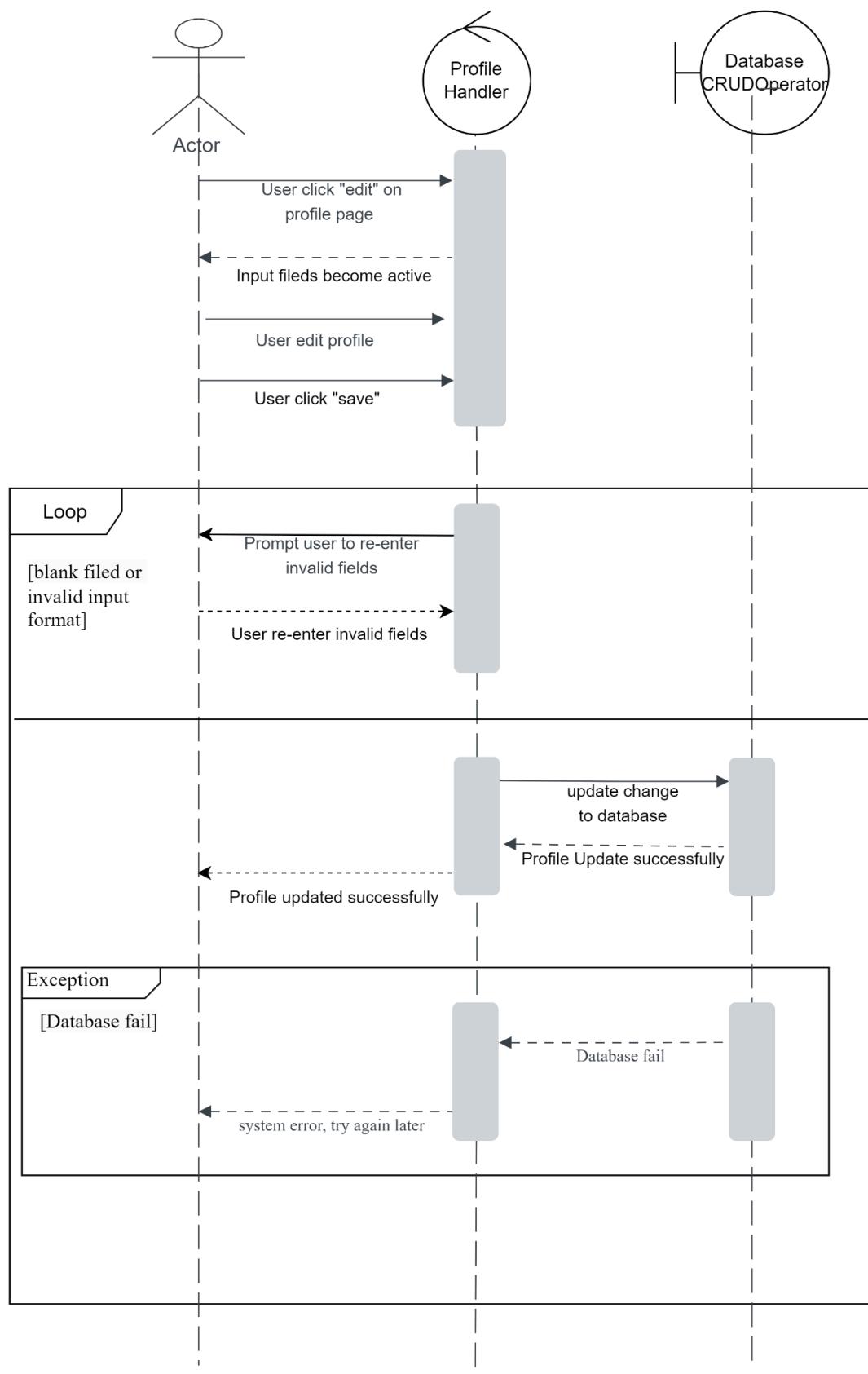
2. User login



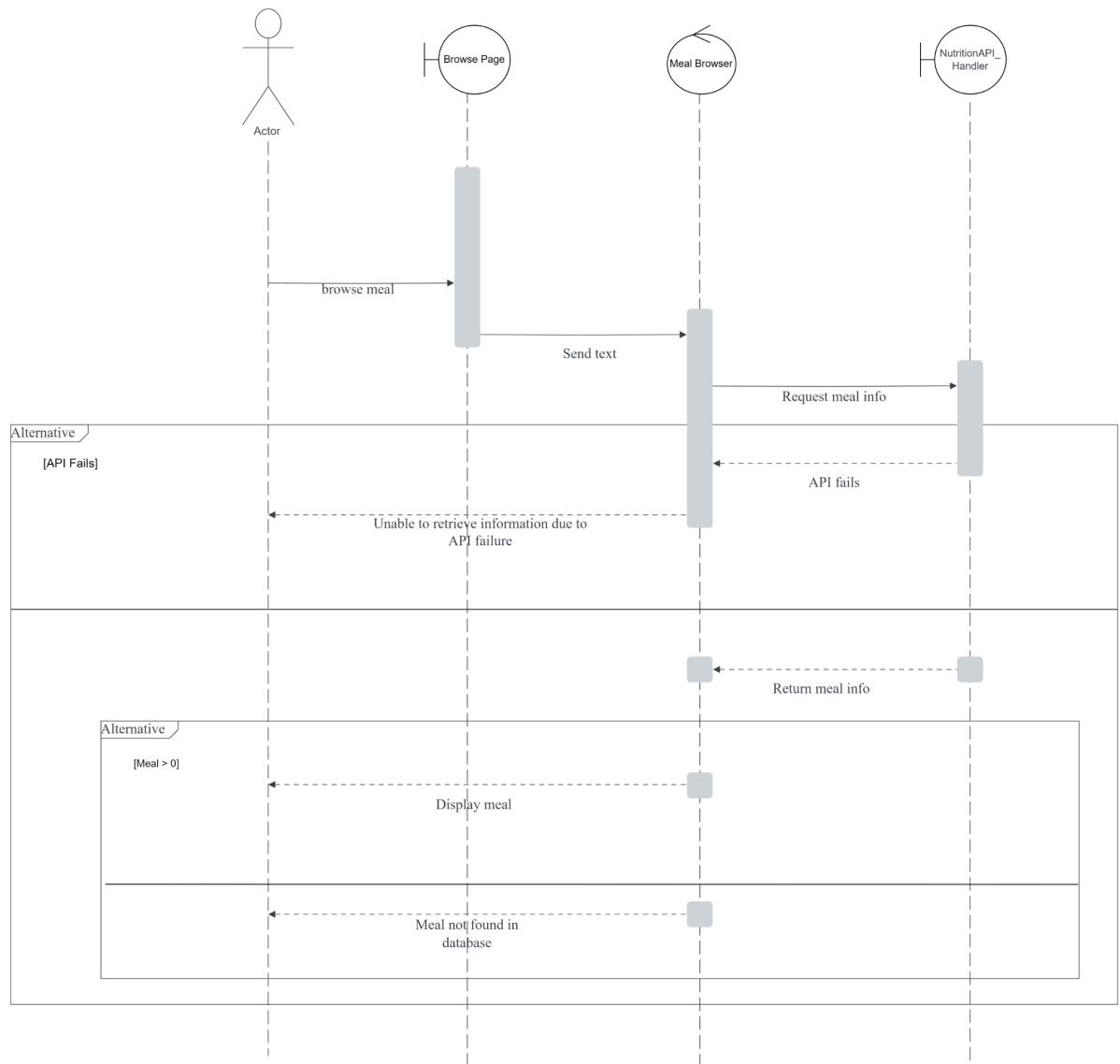
3. Change/Forgot password



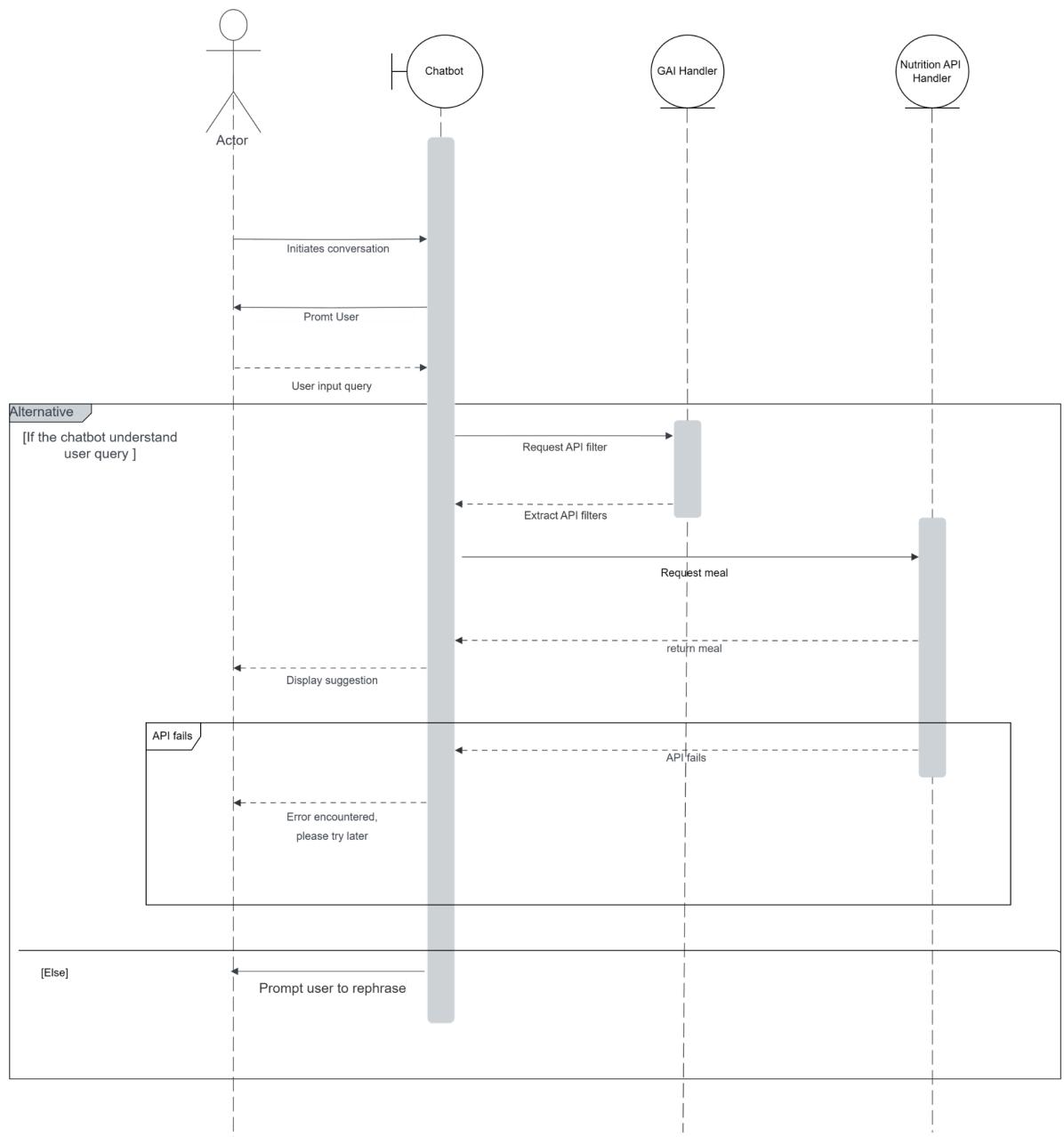
4. Profile Update



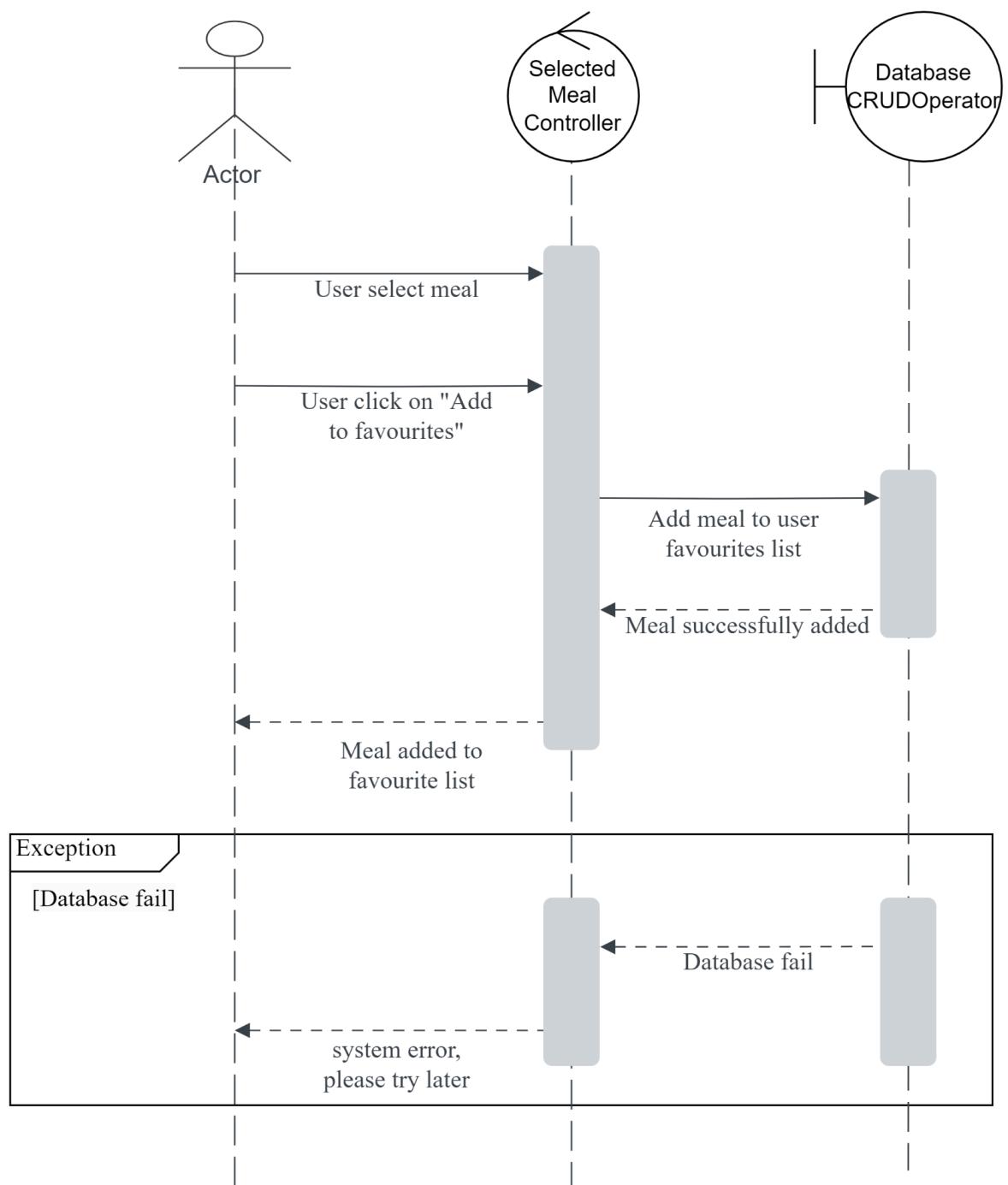
5. Browse meal



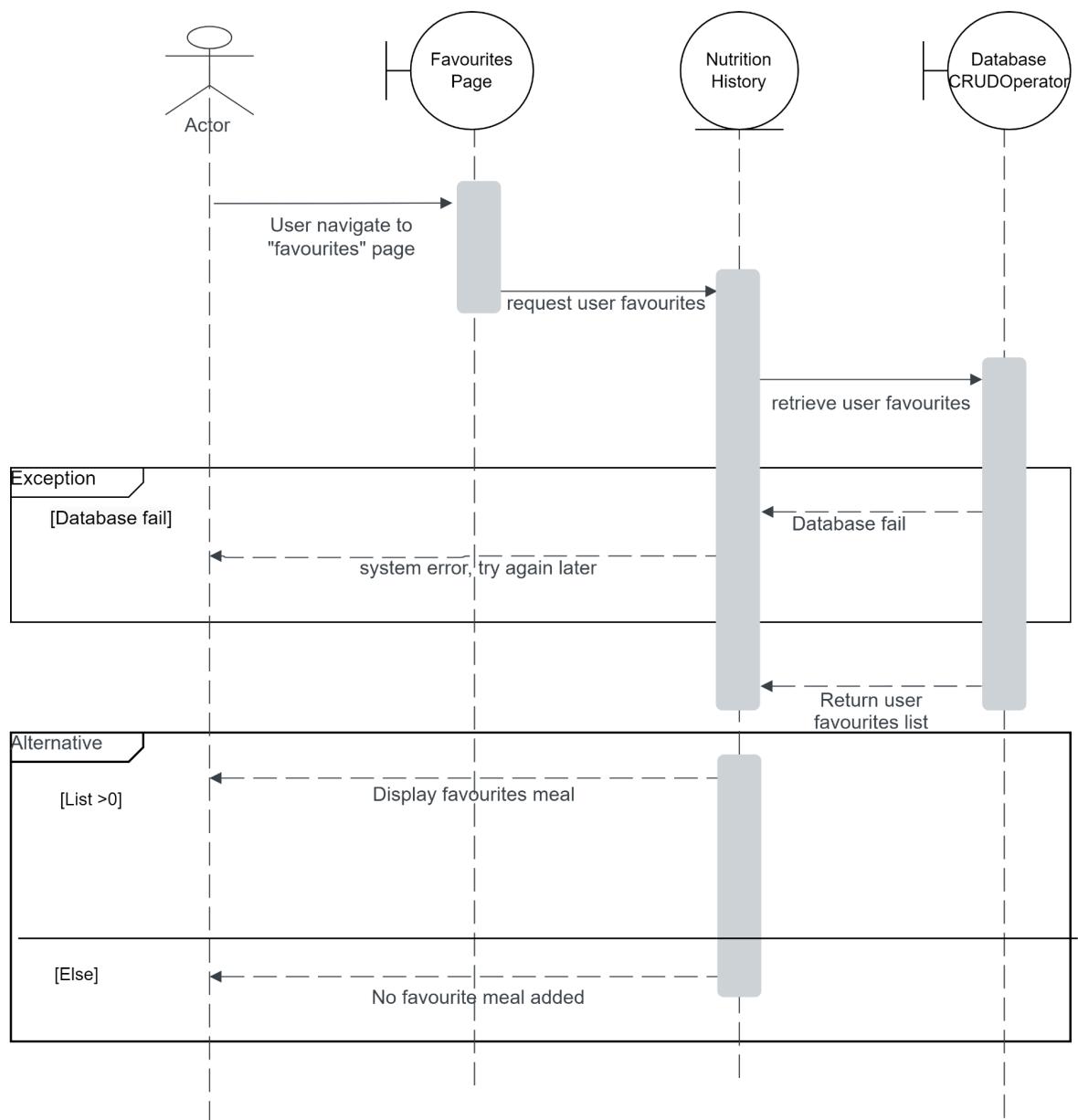
6. Chatbot



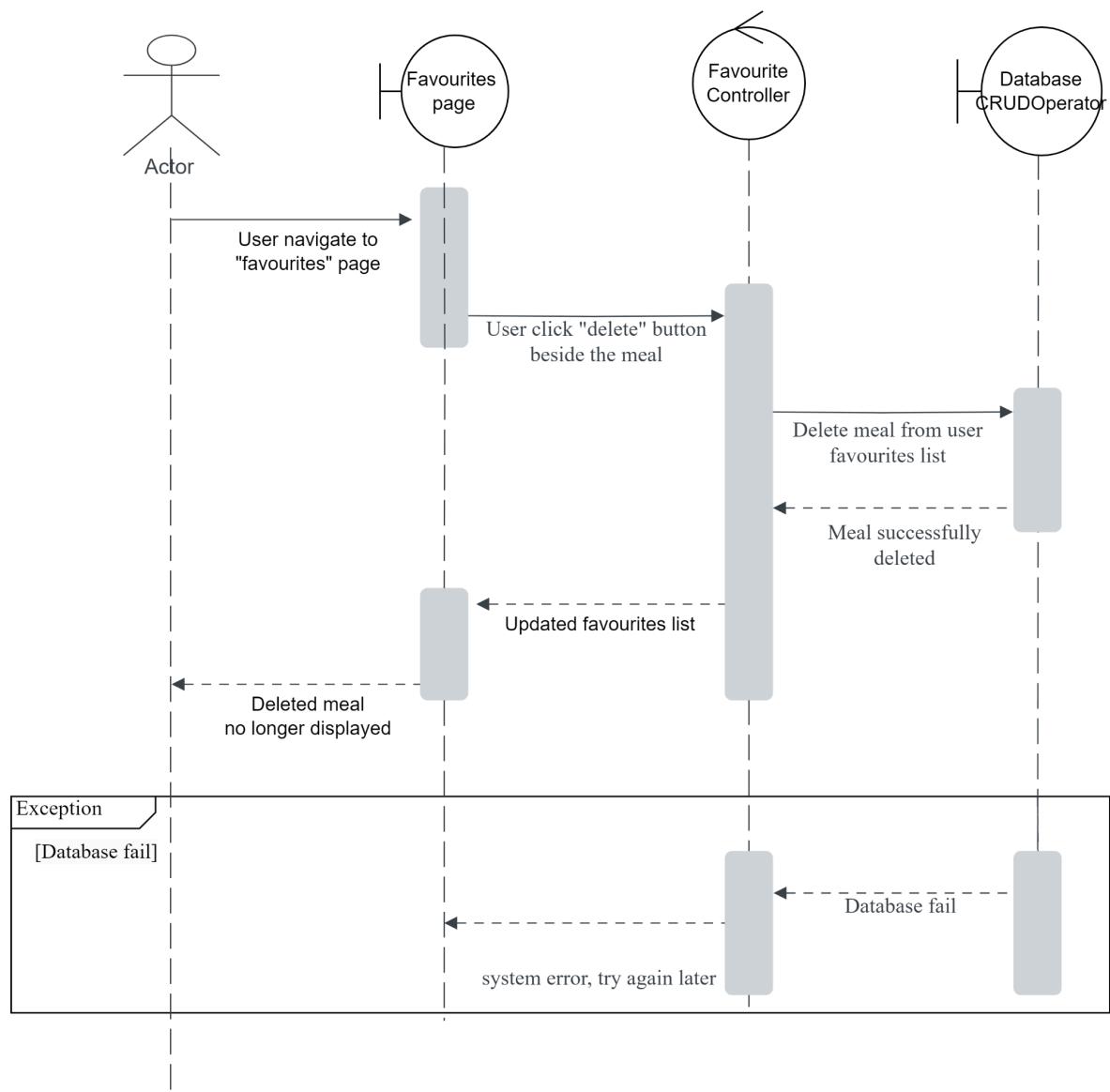
7. Add to favourites



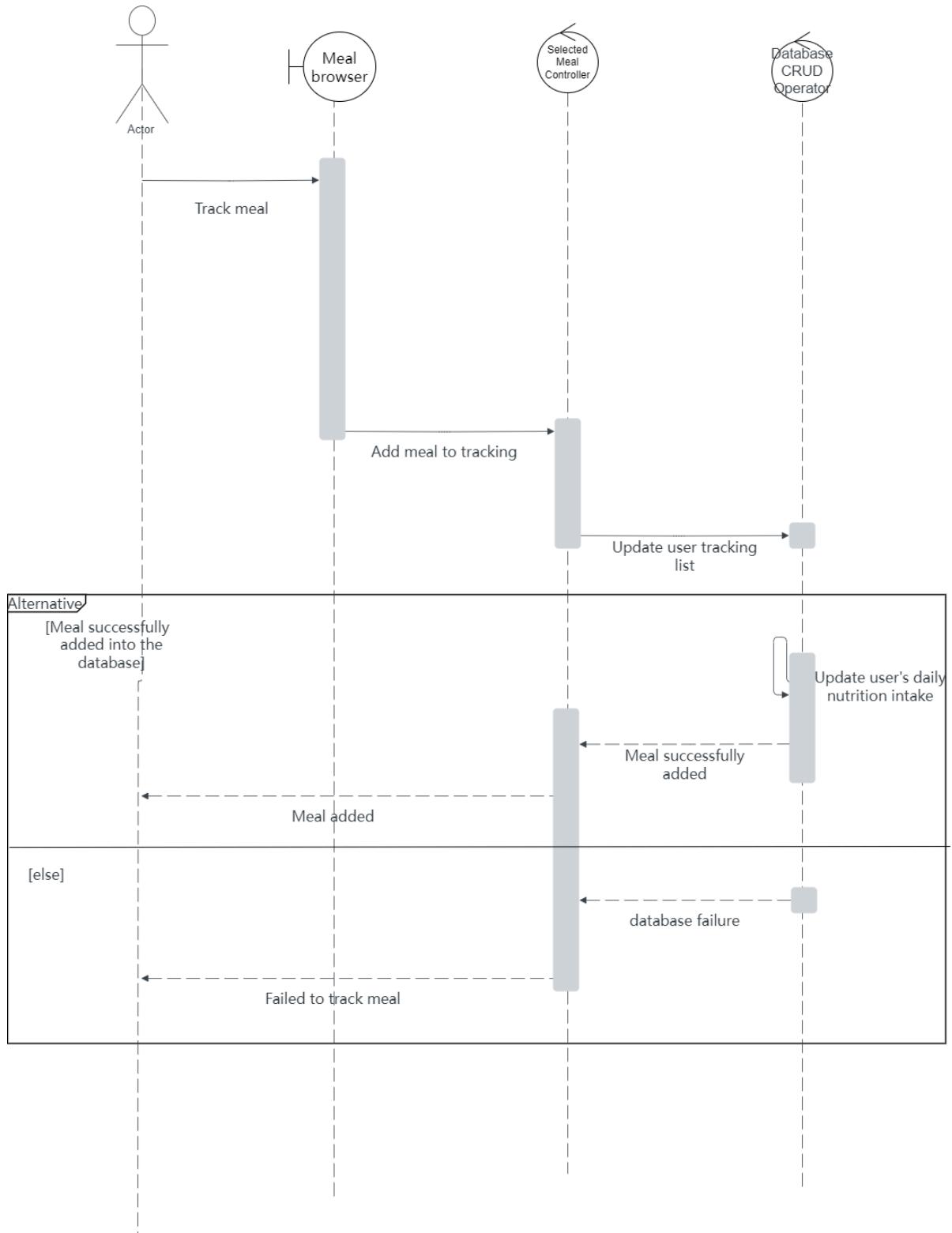
8. View favourites



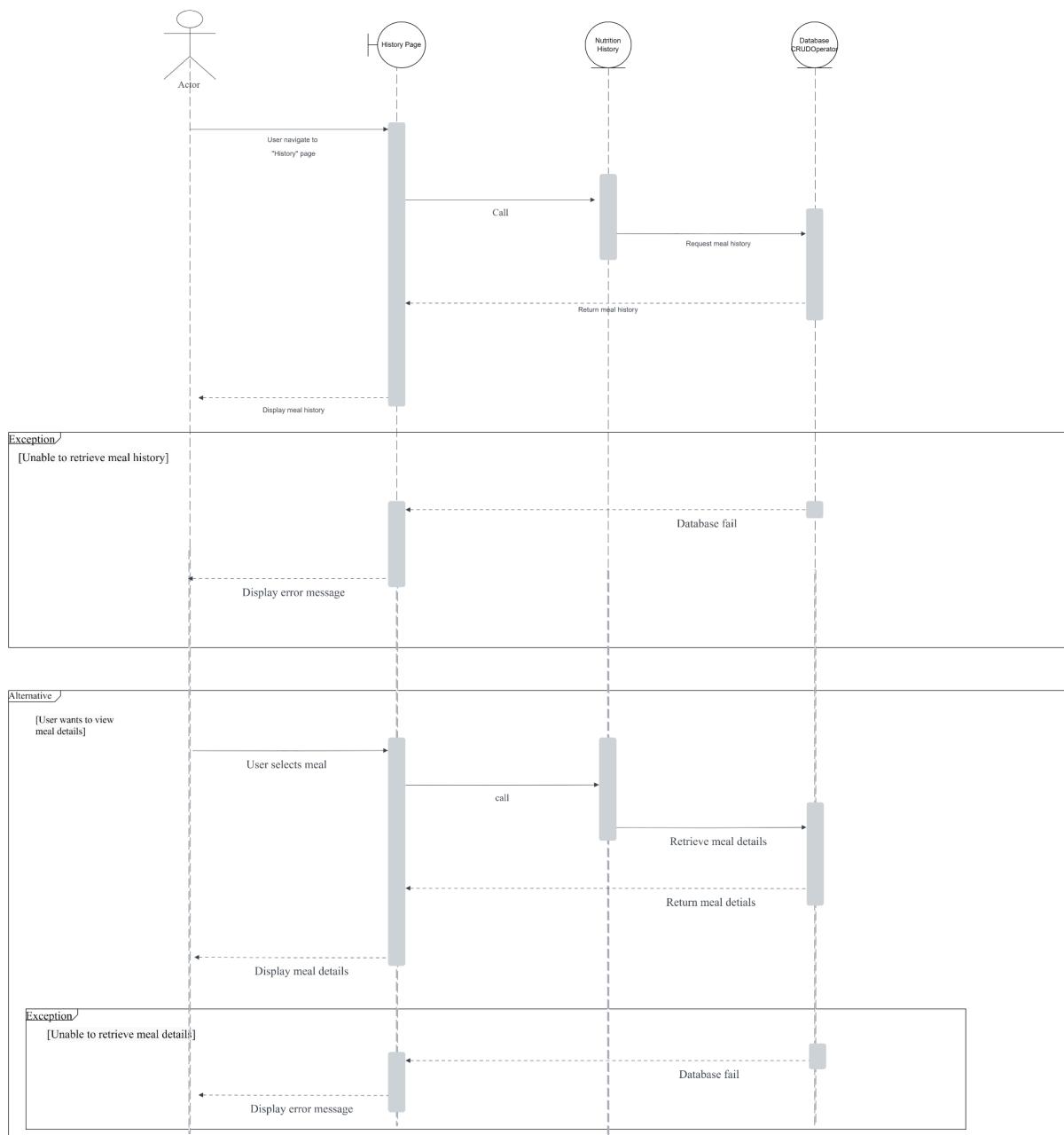
9. Delete favourites



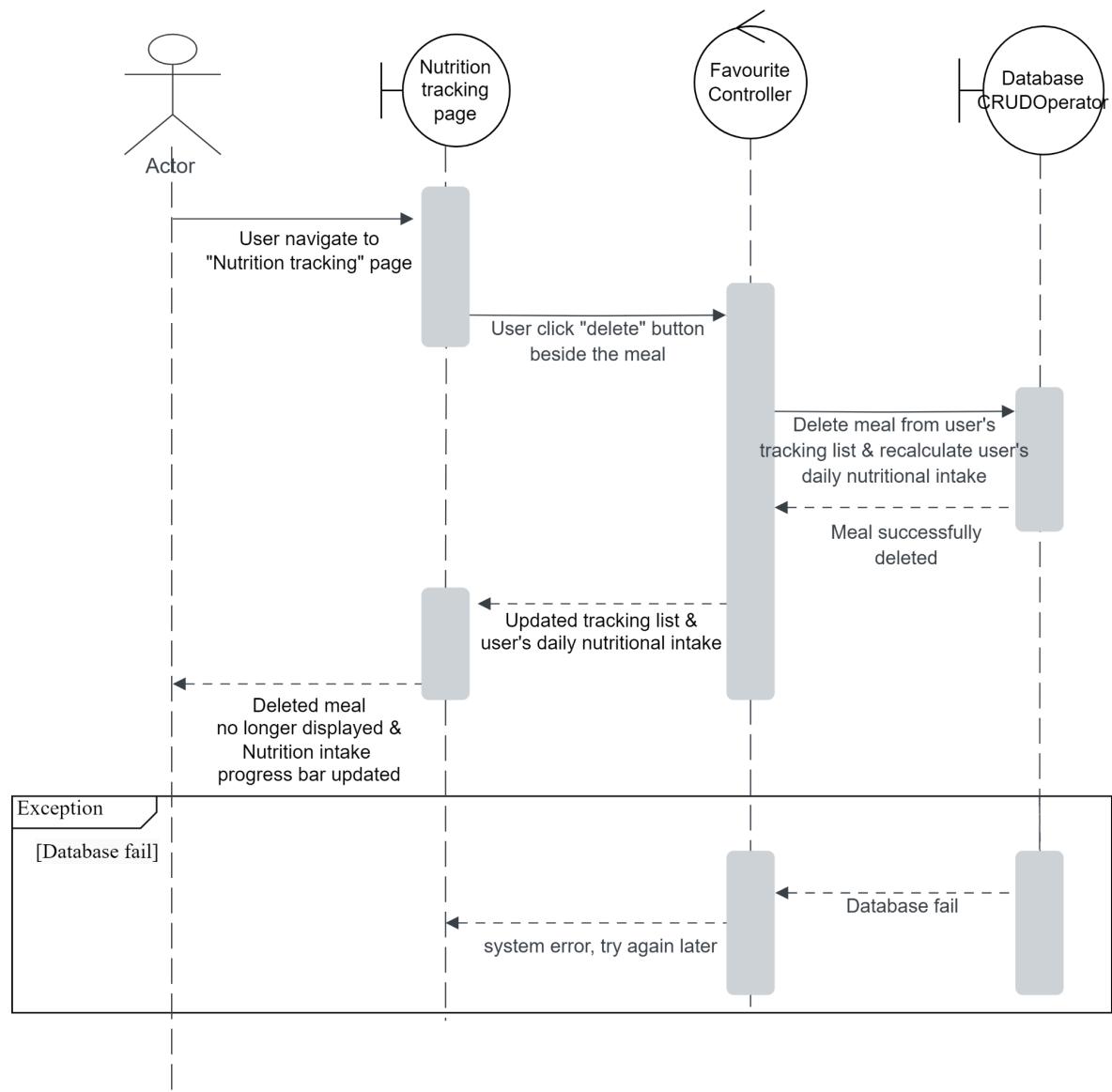
10. Track meal



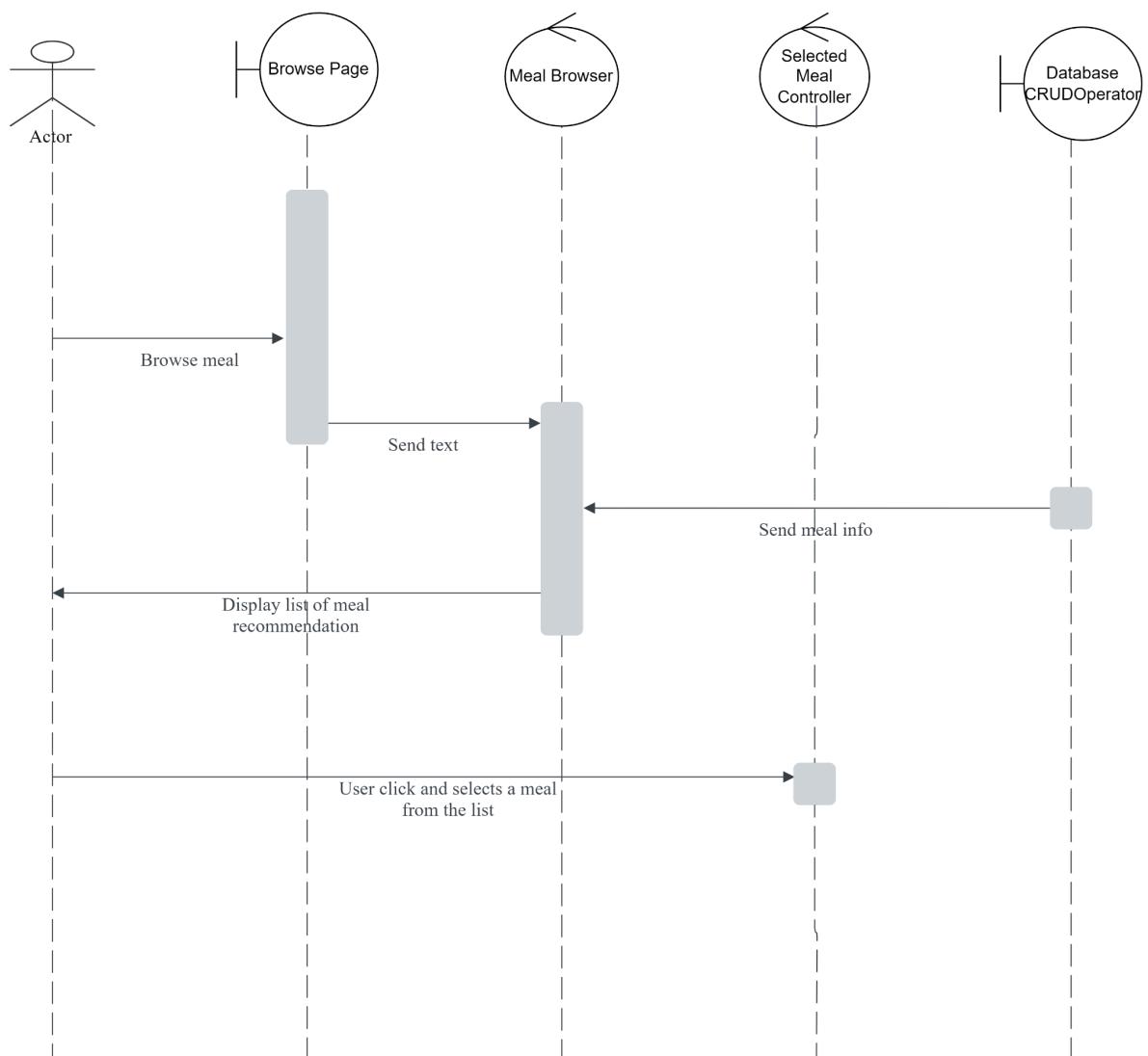
11. View meal history



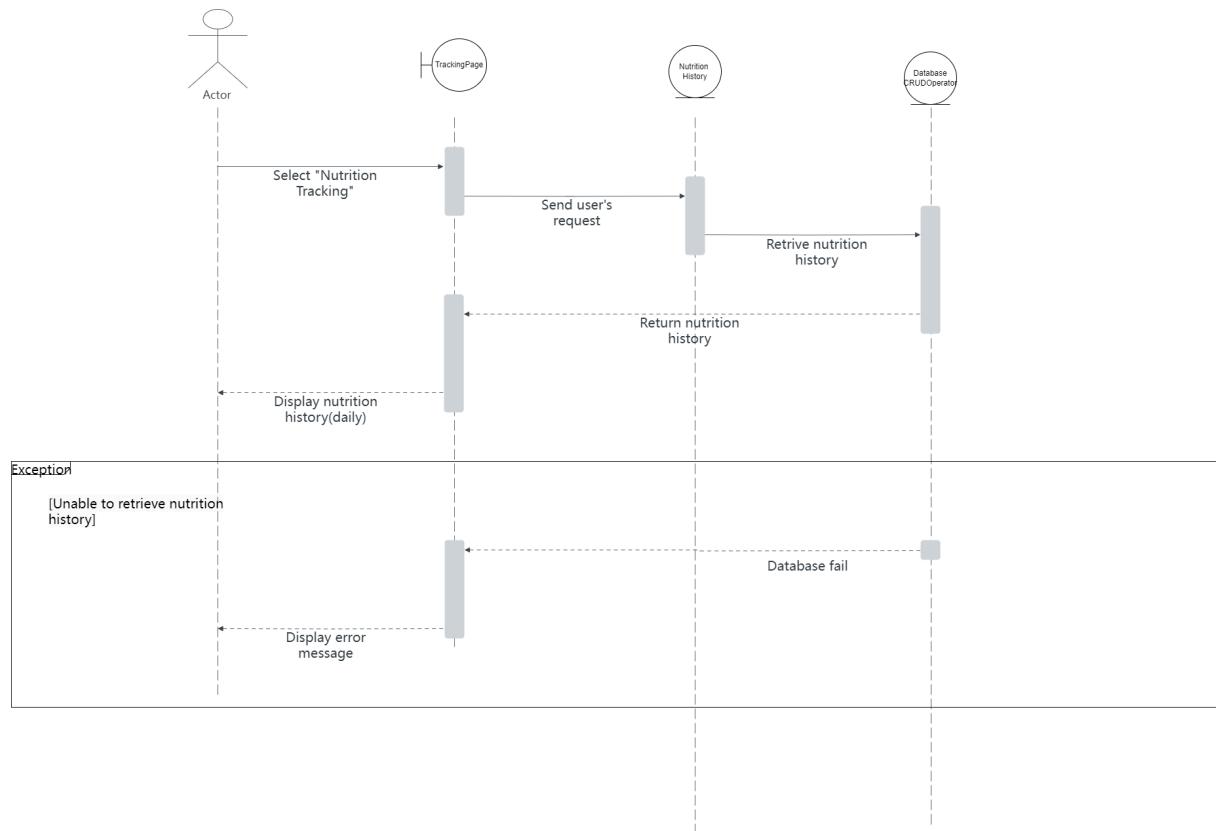
12. Delete from tracking



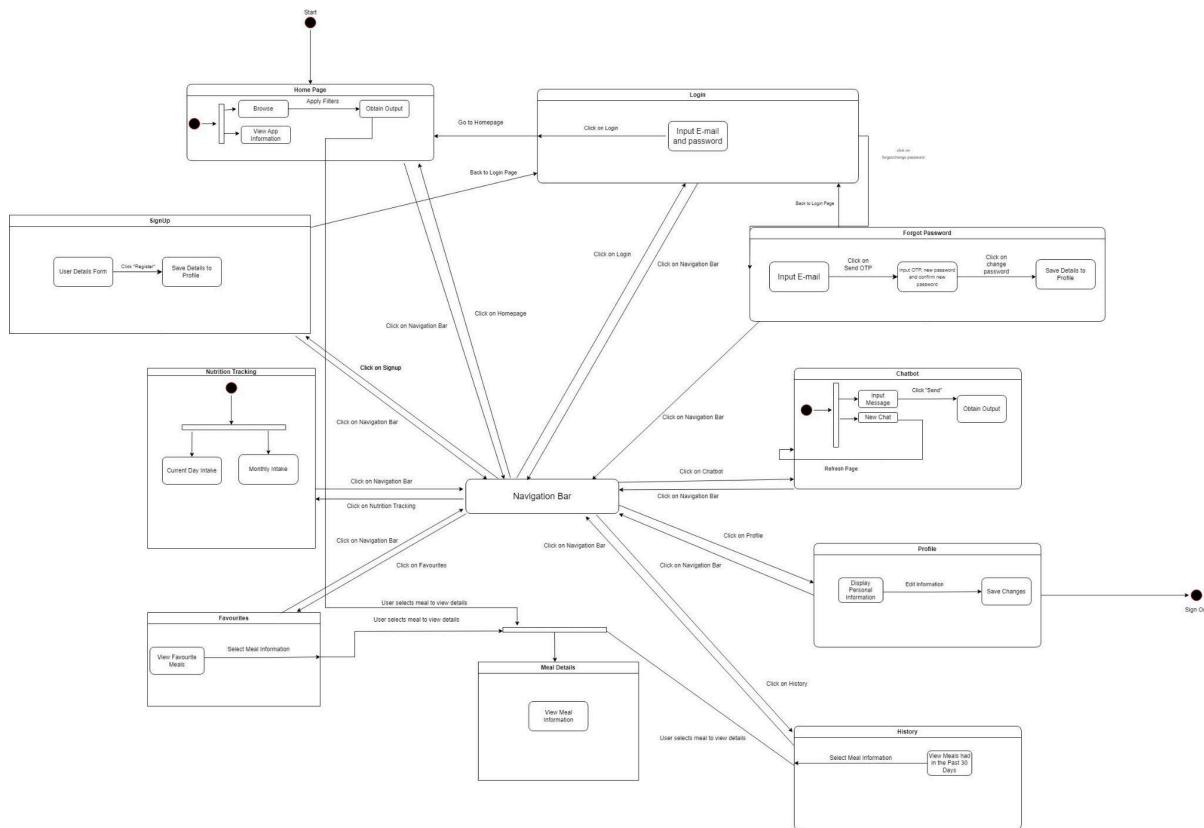
13. Select meal



14. View nutrition intake



Dialog Map



System Architecture Model

