



SC2006 Lab4 Deliverables

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Black Box Testing

AuthController

The **AuthController** class is responsible for managing user authentication on the website, encompassing both user registration and login processes.

User Authentication

When a user attempts to log in, the AuthController handles the collection and validation of their login credentials, specifically the email and password. The controller first verifies that the input data meets the required format and is complete. It then retrieves the hashed password associated with the email from the database. By comparing this stored hashed password with the password provided during login, the controller authenticates the user. If the credentials match, the user is granted access to their dashboard, signalling successful authentication.

User Registration

For new users registering on the website, the AuthController ensures the collection of essential information, including the user's **Name**, **Email**, **Password** and **Confirm Password**. This data undergoes thorough validation to confirm correctness and completeness. To securely store user passwords, the controller hashes the password before saving it in the database, safeguarding sensitive information.

Additionally, a unique identifier (ID) is generated and assigned to each new user, distinguishing them within the system and facilitating efficient data management. Upon registration, the AuthController initiates an email verification process, sending a unique 6-digit code to the email address provided by the user. The user must enter this code to verify their email address. Once the correct code is entered, the controller confirms the user's identity, granting them access to the dashboard and full access to the website. This email verification step enhances account security by ensuring the validity of the user's email address before full access is granted.

Equivalence Class and Boundary Value Testing

Equivalence Class Testing

Equivalence class testing is a black-box technique used to create test cases by dividing input or output domains into partitions, where each partition represents a set of values that should produce similar behaviour in the system. For the EatWellthy application, test cases are created to cover each partition at least once, under the assumption that if one input in a partition yields a particular outcome, other inputs in the same partition will likely result in similar behaviour. The key aspects of equivalence partitioning include:

- Each subset of inputs should produce consistent outputs.
- If one input in a subset triggers an issue, others in the subset likely will too.
- If an input does not reveal an issue, similar inputs may also be error-free.

Valid Equivalence Classes describe inputs that represent typical user behaviours or acceptable values, which the system should handle smoothly.

Invalid Equivalence Classes describe erroneous or incomplete inputs, which the system should handle by displaying appropriate error messages or rejecting the input.

Boundary Value Testing

Boundary value testing is an extension of equivalence partitioning that targets the edges or limits of acceptable input values. This type of testing ensures the EatWellthy system behaves as expected at the boundaries of input ranges, catching potential issues where input values are at their minimum or maximum limits.

1. Login Function

- **Valid Equivalence Class:** Usernames and passwords in the correct format (e.g., valid email format and password length).
- **Invalid Equivalence Class:** Usernames and passwords with incorrect formats (e.g., invalid email structure or incorrect password length) or with missing information.

2. Sign-Up Function

- **Valid Equivalence Class:** Correctly formatted inputs for Name, Email, Password, Confirm Password and other required fields.
- **Invalid Equivalence Class:** Inputs for Name, Email, Password, Confirm Password or other required fields with incorrect formats (e.g., invalid email format, too short or too long password) or missing fields entirely.

Test Cases and Result

Login

Input parameters: Email and Password

No.	Test Input	Expected Output	Actual Output	Pass?
1	(Valid) Email: " kevin@gmail.com " (Valid) Password: "Password"	Redirected to Dashboard	Redirected to Dashboard	Yes
2	(Invalid) Email: "" (Valid) Password: "Password"	Stays on the current page, Pop-up box "Please fill in this field"	Stays on the current page, Pop-up box "Please fill in this field"	Yes
3	(Valid) Email: "kevin@gmail.com" (Invalid) Password: ""	Stays on the current page, Pop-up box "Please fill in this field"	Stays on the current page, Pop-up box "Please fill in this field"	Yes
4	(Invalid) Email: "kevingmail.com" (Valid) Password: "Password"	Stays on the current page, Pop-up box "Please include an '@' in the email address."	Stays on the current page, Pop-up box "Please include an '@' in the email address."	Yes
5	(Valid) Email: "kevin@gmail.com" (Invalid) Password: "Pass"	Stays on the current page, Pop-up box "Please enter a password with 6 or more characters"	Stays on the current page, Pop-up box "Please enter a password with 6 or more characters"	Yes
6	(Valid) Email: "kevin@gmail.com" (Invalid) Password: "Pass123"	Stays on the current page, Pop-up box "Invalid Credentials"	Stays on the current page, Pop-up box "Invalid Credentials"	Yes

Sign-up

Input Parameters: Name, Email, Password, Confirm Password

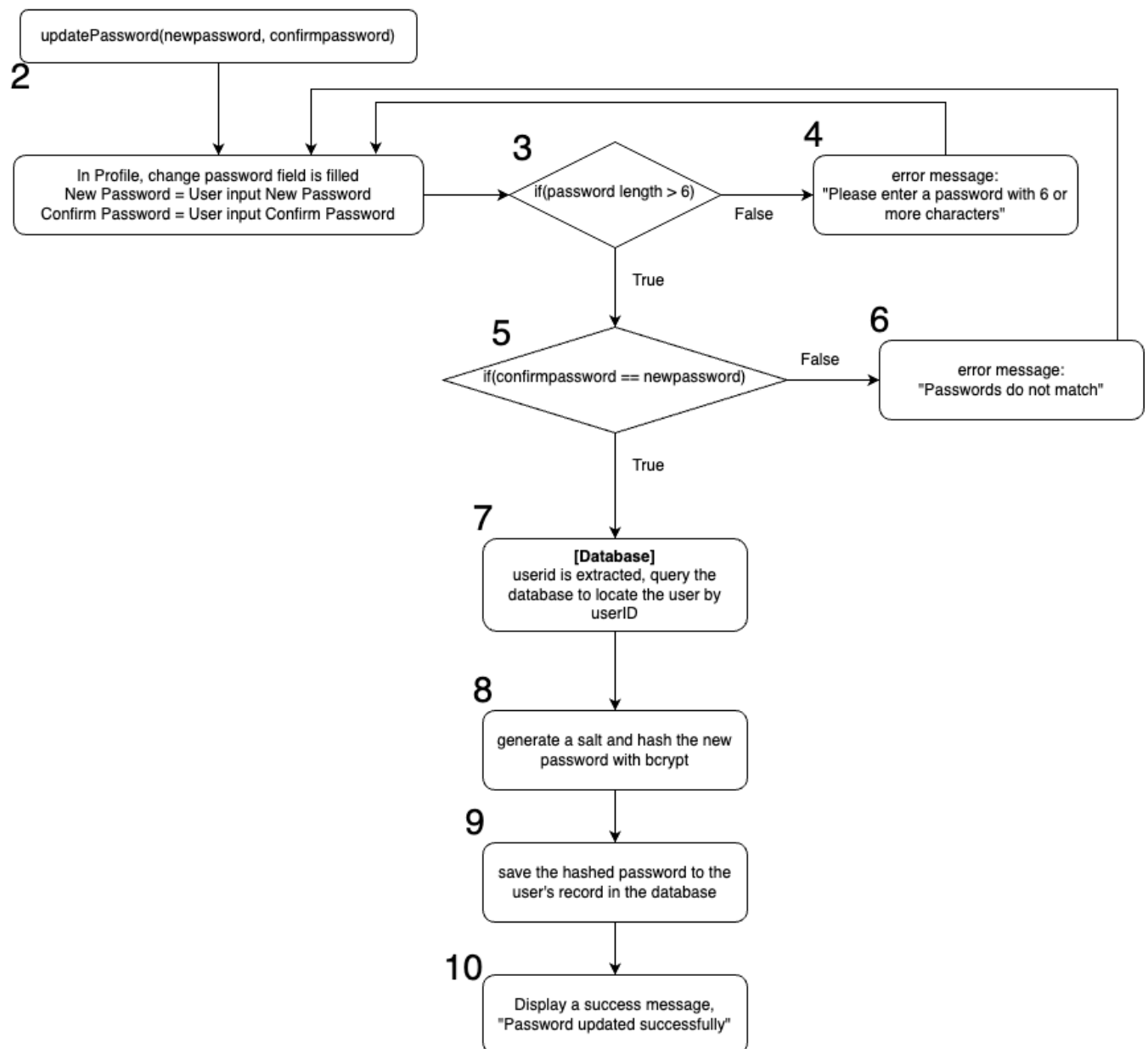
No.	Test Input	Expected Output	Actual Output	Pass?
1	(All Valid Inputs) Name: "Kevin James" Email: " kevin@gamil.com " Password: "Password" Confirm Password: "Password"	Redirected to Verify Email Page, where they have to enter a 6 digit code.	Redirected to Verify Email Page, where they have to enter a 6 digit code.	Yes
2	(All Valid Inputs except Name) Name: "" Email: " kevin@gamil.com " Password: "Password" Confirm Password: "Password"	Stays on the current page, Pop-up box "Name is required"	Stays on the current page, Pop-up box "Name is required"	Yes
3	(All Valid Inputs except Email) Name: "Kevin James" Email: "" Password: "Password" Confirm Password: "Password"	Stays on the current page, Pop-up box "Please include a valid email"	Stays on the current page, Pop-up box "Please include a valid email"	Yes
4	(All Valid Inputs except Password) Name: "Kevin James" Email: " kevin@gamil.com " Password: "" Confirm Password: "Password"	Stays on the current page, Pop-up box "Please enter a password with 6 or more characters"	Stays on the current page, Pop-up box "Please enter a password with 6 or more characters"	Yes
5	(All Valid Inputs except Password) (All Valid Inputs) Name: "Kevin James" Email: " kevin@gamil.com " Password: "Pass123" Confirm Password: "Password"	Stays on the current page, Pop-up box "Passwords do not match"	Stays on the current page, Pop-up box "Passwords do not match"	Yes
6	(All Valid Inputs except Confirm Password) Name: "Kevin James" Email: " kevin@gamil.com " Password: "Password" Confirm Password: ""	Stays on the current page, Pop-up box "Passwords do not match"	Stays on the current page, Pop-up box "Passwords do not match"	Yes
7	(All Valid Inputs except Confirm Password) Name: "Kevin James" Email: " kevin@gamil.com " Password: "Password" Confirm Password: "Pass123"	Stays on the current page, Pop-up box "Passwords do not match"	Stays on the current page, Pop-up box "Passwords do not match"	Yes

White Box Testing

Update Password

A. Control Flow Graph

1



B. Basis Path Testing

Cyclomatic Complexity = | decision points | + 1 = 2 + 1 = 3

Basis Paths

1. Baseline Path: 1,2,3,5,7,8,9,10
2. Basis Path 2: 1,2,3,4
3. Basis Path 3: 1,2,3,5,6

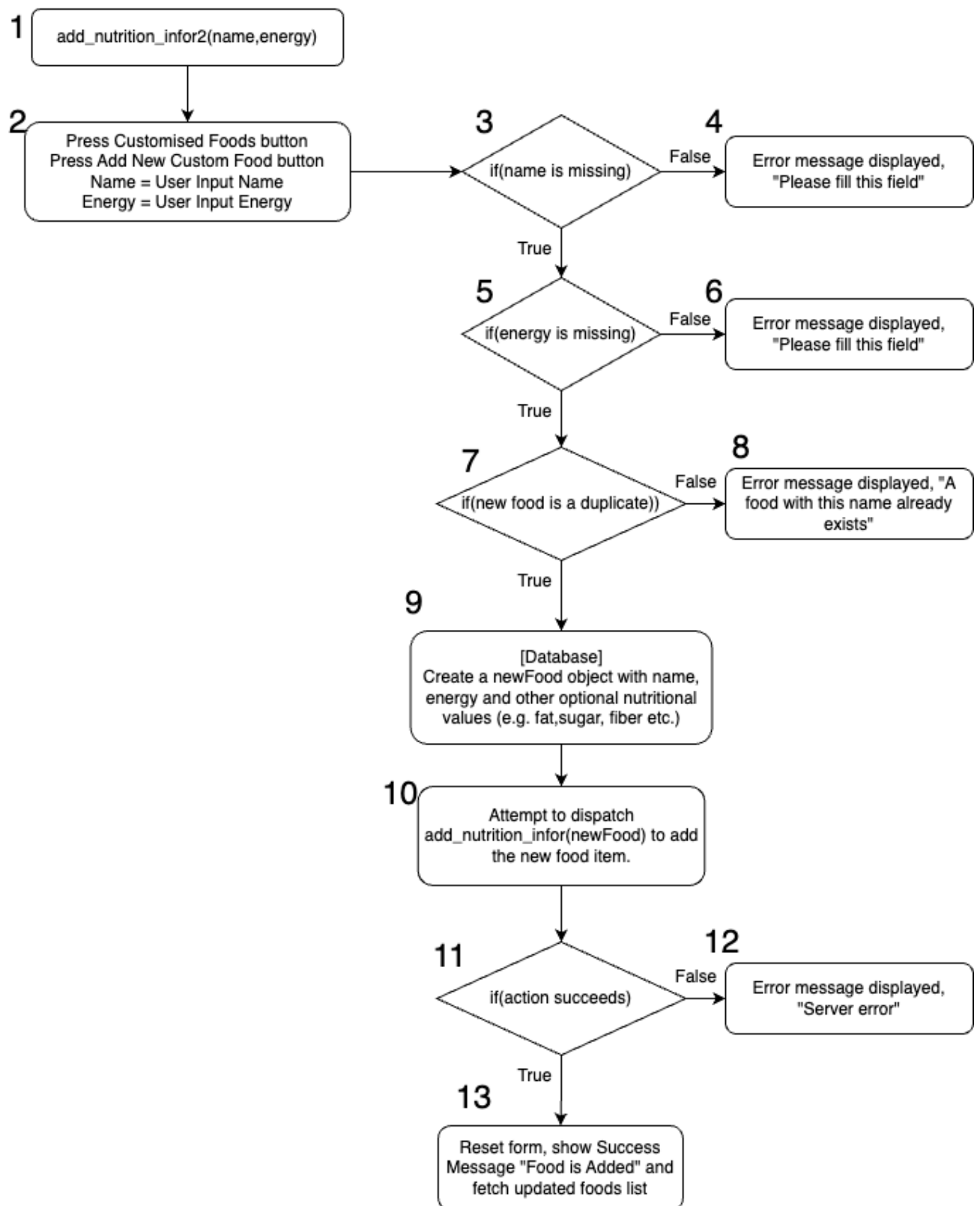
C. Test Cases and Results

UpdatePasword(newpassword,confirmpassword)

No.	Test Input	Expected Output	Actual Output	Pass?
1	(Valid) New Password: "Password12" (Valid) Confirm Password: "Password12"	Success message displayed, "Password updated successfully"	Success message displayed, "Password updated successfully"	Yes
2	(Invalid) New Password: "" (Valid) Confirm Password: "Password12"	Error message, "Password must be at least 6 characters"	Error message, "Password must be at least 6 characters"	Yes
3	(Invalid) New Password: "Password12" (Valid) Confirm Password: ""	Error message, "Passwords do not match"	Error message, "Passwords do not match"	Yes
4	(Invalid) New Password: "Pass" (Valid) Confirm Password: "Password12"	Error message, "Passwords do not match"	Error message, "Passwords do not match"	Yes
5	(Invalid) New Password: "Password12" (Valid) Confirm Password: "Pass"	Error message, "Passwords do not match"	Error message, "Passwords do not match"	Yes

Add a Personalised Food Item

A. Control Flow Graph



B. Basis Path Testing

Cyclomatic Complexity = | decision points | + 1 = 4 + 1 = 5

Basis Paths

1. Baseline Path: 1,2,3,5,7,9,10,11,13
2. Basis Path 2: 1,2,3,4
3. Basis Path 3: 1,2,3,5,6
4. Basis Path 4: 1,2,3,5,7,8
5. Basis Path 4: 1,2,3,5,7,9,10,11,12

C. Test Cases and Results

Add_nutritional_infor2(name, energy)

No.	Test Input	Expected Output	Actual Output	Pass?
1	(Valid) Name: "Margherita Pizza" (Valid) Energy: "204"	Success message displayed "Food added successfully", Display the food in "My Custom Foods" list.	Success message displayed "Food added successfully", Display the food in "My Custom Foods" list.	Yes
2	(Invalid) Name: "" (Valid) Energy: "204"	Error message, "Please fill in the field"	Error message, "Please fill in the field"	Yes
3	(Valid) Name: "Margherita Pizza" (Invalid) Energy: ""	Error message, "Please fill in the field"	Error message, "Please fill in the field"	Yes

*Other Nutritional Values are optional

Demo Sequence

Name	Functionality to Demo
Qixian, Xiaotao	Show Landing Page, Register, Change Password and Delete Account, Google Log in, Profile set up, Dashboard, Nutrition Finder, Refresh Diet Suggestions, Tracker, History Search, Customised food, Analysis
Rishika, Yichi	Continue showing Grocery, Calendar, FAQs, Location, and the personalised chatbot Welloh

Demo Script

Name	Functionality to Demo	Script
Qixian, Xiaotao	Landing Page	<p>The top four strengths that distinct EatWellthy from other products. Custom meals, Track Progress, AI Chatbot, Store Locator.</p> <p>Xiaotao hovers on each block as Qixian finish reading the titles to show the detailed description</p>
Rishika , Yichi	Grocery, Calendar, FAQs, Location, Welloh	<p>The well integrated and accessible structure of our website. We can add the diet suggestions to the website calendar as well as Google calendar through the Calendar Section and the dashboard section. Shop at the online websites of the grocery stores, go through FAQs, Store Locator, Welloh.</p> <p>Yichi demonstrates the functionalities side by side as explains the flow and the structure.</p>

Landing Page

Qixian: Once you open our web app, you'll see our top strengths that make us stand out! We allow you to record and track your diet progress, locate nearby grocery stores, and provide AI-powered diet suggestions and our AI chatbot, Welloh, for super personalized advice. Stick around to see how we make all this happen!

Xiaotao: (Hover over the four cards for details) Each card will reveal more as Qixian explains.

Registration

Qixian: Since our app is all about personalization, what's our first step?

Xiaotao: I'd register my own account first!

Qixian: Exactly! Let's create an account using my email for registration.

(Xiaotao enters: Qixian, zqx2467027771@gmail.com as both username and password.)

Qixian: We'll get a verification code almost instantly (unless you're on NTU email—then it might take a year or two).

(Xiaotao enters the verification code.)

Changing Password

Qixian: You know, I think my password isn't safe enough. Let's change it to double the length because... double the security, right?

(Xiaotao enters a new password, logs out.)

Qixian: Let's log back in. Wait, why can't I log in?

Xiaotao: Oh, right! We changed the password!

(Xiaotao logs in with the new password, and success!)

Deleting Account and Google Login

Qixian: My memory is so bad I keep forgetting passwords. Any way to log in without entering one?

Xiaotao: Easy, just use Google login!

Qixian: Great idea! Let's delete the account and try Google login—quick and no passwords to remember.

(Xiaotao deletes the account and logs in via Google.)

Qixian: And we're in! That fast.

Profile Setup

Qixian: The dashboard looks kind of plain. Let's set up our profile.

(Xiaotao enters profile info: name "Boss," dietary preferences, and selects a fun icon.)

Qixian: I love chicken but, sadly, I'm allergic to beef.

(Xiaotao updates preferences and returns to the dashboard.)

Nutrition Finder

Qixian: Let's check out the Nutrition Info button.

(Xiaotao searches for "apple" and "big mac" to get quick results from the Nutritionix API.)

AI-Powered Diet Suggestions

Qixian: This is one of our favorite features—AI-powered meal suggestions. It uses your preferences to create a meal plan just for you!

Xiaotao: Personally, I prefer beef, and I'm allergic to eggs.

Qixian: Adjusting preferences, you'll see beef added and eggs removed. Perfect!

Meal Tracker

Qixian: Our meal tracker displays your meals from the past three days, so it's easy to track your progress.

(Xiaotao logs today's breakfast as "banana" and lunch as "big mac.")

Recent Meals and History Search

Qixian: To verify our meals, we can check Recent Meals for the last three days or use History Search for specific dates.

(Xiaotao views Recent Meals, searches today's date, and updates breakfast to "two bananas.")

Custom Food Entry

Qixian: Want to log custom foods like mom's famous recipe? We allow you to add your own food items.

Xiaotao: I'll add "Software Engineering Project" for 100 calories.

(Xiaotao enters SWE and logs one SWE for dinner.)

Dashboard Overview

Qixian: That wraps up today's meals! Everything's organized, but for a full view of my progress, let's check out the main dashboard.

(Xiaotao clicks Dashboard to show graphs for macronutrient breakdown and calorie progress.)

Rishika and Yichi

1. Grocery Page:

Rishika -

Let's start with the Grocery page. This section is designed to simplify grocery shopping for EatWellthy users by highlighting stores where they can find healthy ingredients.

[Yichi - show the Grocery section of the website and click on the names of the stores as Rishika tells the stores we can access]

Rishika - We can access the websites of popular stores like FairPrice, Giant, Cold Storage, and Prime. Each store listing includes a brief description of what they offer—such as fresh produce, organic options, or specialty items.

[Yichi - Explore any one of the websites to show that we can buy vegetables/ fruits from the website, on the search bar type "apple"]

Rishika - Users can explore each store's website directly from here to check for current promotions or specific product availability. The goal is to make healthy shopping convenient and to connect users with a variety of options that support their nutrition goals.

2. Calendar Page:

Rishika - Our calendar is thoughtfully designed to give users a clear view of their daily, weekly, and monthly schedules, allowing for seamless planning and organization. Users can hover through the months, navigate past or upcoming weeks, and always find today's date highlighted for quick reference. The calendar includes options to add, update, or delete events, making it easy for users to keep track of their schedules.

[Yichi - hover through the buttons of next previous today (on left) monthly daily and weekly of the calendar(on right of the page)]

Yichi - Let's add an event to remind me to exercise for 30 minutes at 7 pm today!

[Yichi - click on add event, event title - exercise, event description - treadmill, start date today and time select 7pm, and end date today and time select 7:30 pm]

Rishika - We can add this event to Google Calendar

[Yichi - add event to google calendar]

Rishika - And also add this event to our website's calendar

[Yichi - go back to the website tab and click on create event]

Rishika - The event is displayed here on the calendar

Yichi - Oh no! I forgot to add cycling in the description!

Rishika - No worries—our website is designed to make this super simple. You can quickly update your calendar by adding the cycling session here.

[Yichi - click on the event and add cycling to the event description and the event title and update the event]

Rishika - The event is now updated, and visible on the calendar

Yichi - Ahh I forgot I have to meet my SWE group at 7 pm!

Rishika - We've got you! We can also delete the event by simply clicking on the event and pressing delete

[Yichi - show the delete functionality]

Rishika - Importantly, the calendar integrates directly with the Dashboard and the Diet Suggestions feature. Users can automatically add their personalised diet recommendations to their EatWellthy calendar. They can choose to add only a few meals they like from the generated suggestions or the entire plan as well. And, if they want to sync it with their Google Calendar, they can do so with just a click.

[Yichi - go to the dashboard and show this functionality]

Rishika - This setup not only helps users remember their meal plans but also enables them to stick to their nutritional goals more effectively.

3. FAQs Page:

Rishika - Next, we have the FAQs page. This is a central place where users can find answers to common questions about the EatWellthy platform.

Here, we've organized answers to questions like 'How do I input my meals and dietary preferences?' and 'What is WellOh, and how does the chatbot work?'

This page ensures users feel supported as they navigate the site, offering clarity on everything from meal tracking to grocery shopping to platform navigation.

[Yichi - just scroll through while Rishika says]

4. Location Page:

Yichi- I know what to eat and how much to eat, but where do I buy my ingredients from?

Our Location page is all about helping users locate nearby stores that align with their wellness needs. By using their current location, users can quickly see options in their area and make informed decisions about where to shop for their groceries at the closest stores.

This feature brings convenience and flexibility to the grocery experience, ensuring that users always have access to stores with quality, nutritious products nearby.

[Yichi - display the functionality, search "fair price", "ntuc" in the searchbar]

5. Welloh Chatbot:

Yichi - I want personalized advice on health and wellness that suits my nutritional needs and my BMI.

Finally, let me introduce WellOh, our AI-powered chatbot. WellOh is here to assist users in real-time with questions about their meal plan, nutrition, grocery availability, meal suggestions at an affordable price and more.

By interacting with WellOh, users can get meal suggestions, learn nutritional information for specific foods, and even get personalized advice on maintaining their wellness goals. WellOh provides instant responses, making it easy for users to get the help they need without waiting.

[Yichi - Interact with Welloh, prompt “who am i? (answer in markdown)”, “who are you?”, “I want to have egg tart for today's snack, generate a meal plan”]

Closing Statement

In summary, EatWellthy is designed to support users’ wellness journeys from every angle. With the Dashboard, Profile, Analysis, Tracker, Grocery page for shopping convenience, Calendar for diet planning, FAQs for guidance, Location page for finding nearby stores, and WellOh chatbot for personalized assistance, we aim to make healthy living easier and more accessible for all. Thank you for exploring the platform with me!