**INTI International College Penang School of Computing**

**3+0 Bachelor of Science (Hons) in Computer Science, in collaboration with Coventry University, UK**

**3+0 Bachelor of Science (Hons) in Computing, in collaboration with Coventry University, UK**

**Coursework cover sheet**

**Section A - To be completed by the student**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Student Details:**   |  |  |  | | --- | --- | --- | | Group Members | Full Name | CU Student ID Numbers | | 1 | TAN YI JIA | 12672752 | | 2 | TEH GER MIN |  | | |
| Semester: April 2024 | |
| Lecturer: Khor Jia Yun | |
| Module Code and Title:  6002CEM– Mobile App Development | |
| Assignment No. / Title: Coursework  CW2 – Project | % of Module Mark  75% |
| Hand out date:  **12-Apr-2024 (Friday of Week 2)** | Due date:  **17-June-2024 (Monday of Week 12)** |
| Penalties: No late work will be accepted. If you are unable to submit coursework on time due to extenuating circumstances you may be eligible for an extension. Please consult the lecturer. | |
| **Declaration:**  I/we the undersigned confirm that I/we have read and agree to abide by the University regulations on plagiarism and cheating and Faculty coursework policies and procedures. I/we confirm that this piece of work is my/our own. I/we consent to appropriate storage of our work for plagiarism checking.  Signature(s): \_\_\_\_\_\_yijia\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (TAN YI JIA) (TEH GER MIN) | |

**Marking Rubric**

Your report will be marked against the following criteria:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 0-9 | 10-14 | 15-17 | 18-20 | Marks Given |
| Application complexity –    Coverage & Functionalities  (20%) | App with one screen and one feature.  Basic complexity (basic usage of elementary UI interface). | App with more than one screen and more than one feature.  Basic-medium complexity (basic- medium usage of UI interface elements). | App with more than two screens with more than two features.  Medium complexity (medium-good usage of UI interface elements). | App with more than three screens with more than three features.  High complexity (good usage of UI interface elements). |  |
|  | 0-2 | 3-4 | 5-7 | 8-10 |  |
| Application complexity –  Proper methods for persistence of data  OR  integration with API  (10%) | No cloud/local data persistence or other cloud services (e.g. authentication – authorization services/ other external APIs).  OR  Attempt to use persistence method or API but has errors and is not working. | Local or cloud persistence services and no authentication.  OR  Use of at least one external APIs or sensor. | Local or cloud persistence services and with / without authorization.  AND  Use of **one** external APIs or sensor. | Local or cloud persistence services with authorization.  AND  Use of **more than one** external API or sensors intensively. |  |
|  | 0-1 | 2-3 | 4 | 5 |  |
| Application of MVVM design concept  (5%) | No use of any MVVM design concept. | Might be using some type of separation of concern without following the MVVM principles. | Demonstrate some level use of MVVM design without error. | Demonstrate good MVVM design concept. |  |
|  | 0-2 | 3-4 | 5-7 | 8-10 |  |
| Application UI Design  (10%) | Poor UI design. The work looks more like a draft and unfinished work. | GUI design is acceptable, but much improvement is needed on the choice of colour palette and / or the ease of use. Need major modifications to make it suitable for its purpose. | GUI design is acceptable, but some areas need improvement such as choice of colour palette or ease of use. The overall design might need minor modifications to make it suitable for its purpose. | GUI design is user-friendly, easy to understand and has suitable choice of colour palettes. The design is appropriate for its purpose. |  |
|  | 0-5 | 6-8 | 9-11 | 12-15 |  |
| Overall performance and extra efforts  (15%) | The work is incomplete and student(s) showed poor planning and execution of the proposed work. | The basic features of the work presented were complete but did not show extra efforts put in to enhance it. All basic requirements are fulfilled but much improvements are needed. | The work presented shows a moderately well thought-out app design and some extra efforts put in to create the app. Based on the work presented, the student showed good level of dedication poured into the work. | The work presented shows a very well thought-out app design and a lot of efforts are put in to create the app. Based on the work presented, the student showed highly visible independence, dedication poured into the work and very talented. |  |
|  | 0-2 | 3-4 | 5-7 | 8-10 |  |
| Video  (10%) | No video  Or many contents in the video is irrelevant and poor content presented. | Video content is very basic. Presentation is not very smooth with lack of some level of app details. | Video content is decent. Presentation is smooth and somehow organized with some level of app details are covered. | Video content is very clear, comprehensive and cover all level of details of the apps. |  |
|  | 0-2 | 3-4 | 5-7 | 8-10 |  |
| Report - Contents  (10%) | Failed to include all required sections. Information presented is irrelevant to the report. | Include some of the required sections but organization required improvement.  Some information/explanation / discussion are unclear or lack of clarity  Simple use case diagram with basic notations used, however, with many mistake/errors. | Include all required sections and somehow organized.  Some of information/ explanation/ discussion required minor clarify.  Acceptable use case diagram and all notations are clear and used correctly with minor mistake/errors. | Include all required sections.  All information/ explanation/ discussion are very clear, comprehensive and no improvement needed.  Comprehensive use case diagram and all notations are clear and used correctly with zero mistake/error. |  |
|  | 0-2 | 3-4 | 5-7 | 8-10 |  |
| Report - Format  (10%) | Missing cover and table of contents.  Missing most of the labels and captions for figures and tables.  Missing screenshots of the program output. | Missing cover or table of contents.  Missing labels or headers for some sections.  Very few screenshots of the program output. | Complete with cover and table of contents.  Missing some labels and / or captions for figures and tables.  Adequate screenshots of the program output. | Complete with cover and tables of contents.  All figures are properly labelled and captioned.  Very comprehensive screenshots of the program output. |  |
|  | 0-2 | 3-4 | 5-7 | 8-10 |  |
| Submission – Completeness and punctuality  (10%) | Many required files are missing.  OR  Submission delayed in more than 1 hour but less than 24 hours. | Most of the essential files are submitted on time and some files might not be in the format as instructed. Some missing files such as README.  OR  Submission delayed in less than an hour. | All required files are submitted on time, but some files are not in the format requested. | All required files are submitted on time and in correct format as instructed. |  |

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## 

## Introduction

In today's fast-paced world, individuals often struggle to maintain emotional balance and well-being due to overwhelming responsibilities and continuous stimuli from social media and work (Waris Qidwai, 2016). This can lead to stress, anxiety, and emotional exhaustion, worsened by a lack of tools and support for managing emotions. "Habitual Heart" is developed to address these challenges by promoting emotional awareness and cultivating positive habit formation by recognising the impact of habits on daily life and emotional health (José Antonio Ruiz-Hernández, 2022).

"Habitual Heart" is a mobile app designed to help users cultivate beneficial habits and improve emotional well-being. The application provides features like habit tracking, emotional reflection, and meditation tools. The functions enabled users to set and monitor goals effectively. The app aims to empower individuals to make lasting positive changes, enhance productivity, and achieve overall life fulfilment. "Habitual Heart" supports users in overcoming the challenges of habit development and achieving sustainable improvements through tools like habit goal setting.

## Use Case Diagrams

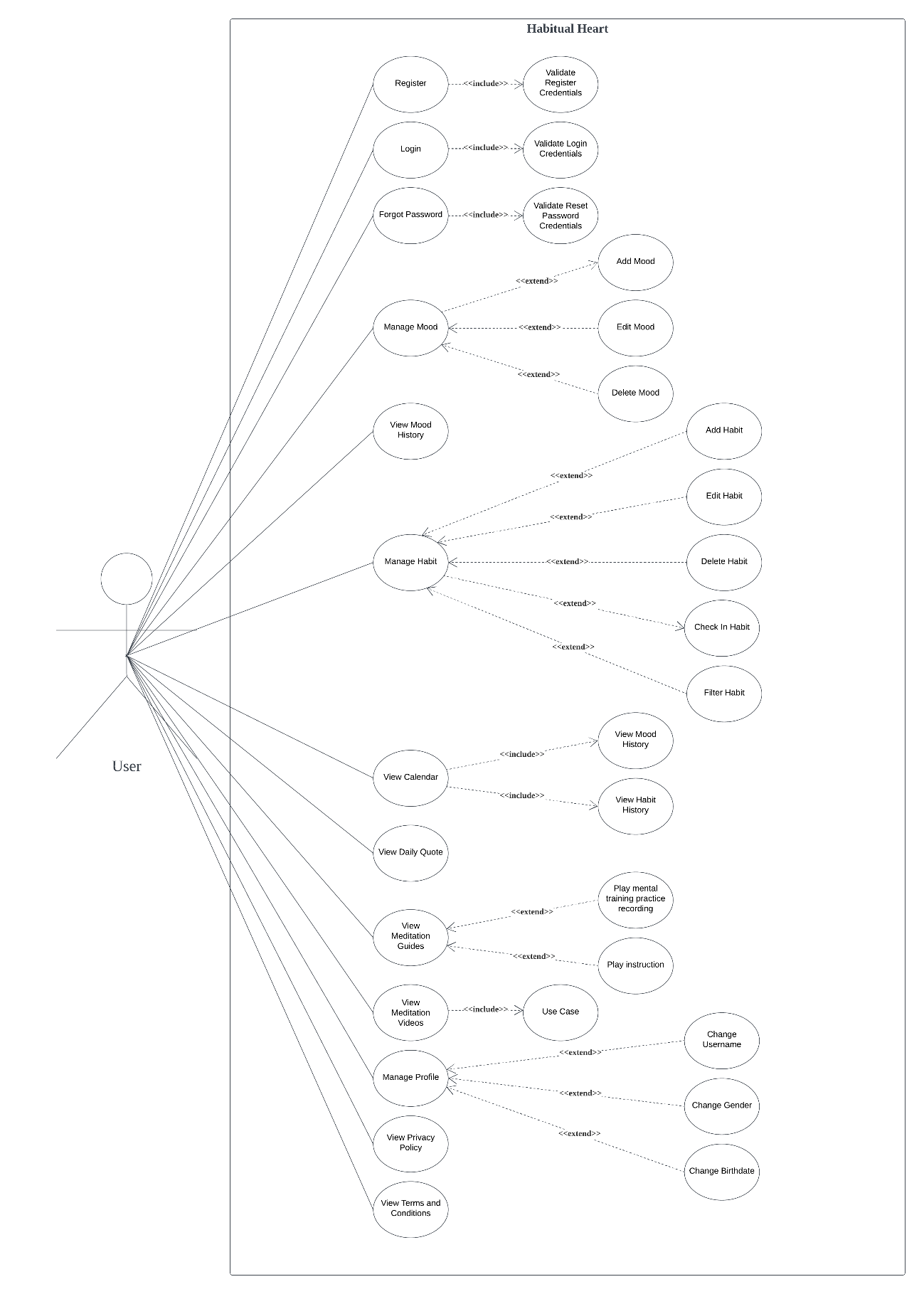


Figure 1 Use Case Diagram

The use case diagram for the "Habitual Heart" application outlines the various functionalities available to users. The primary actor as the user who interacts with the system to manage moods, habits, and other related activities. The main use cases include registering, logging in, and resetting passwords, each with a validation process to ensure correct and valid user information. Besides that, users can manage their moods and habits by adding, editing, deleting, and viewing mood and habits history. The application also allows users to view a calendar that displaying the mood and habit histories. Moreover, users can access daily inspirational quotes, meditation guides, and meditation videos, with functionalities to play the practice recordings and instructions. Lastly, users can manage the user profiles by changing the username, gender, and birthdate, and view the application's privacy policy and terms and conditions.

## Modules and Screenshots

#### Sign In Module, Forgot Password Module – Tan Yi Jia

When the app is first launched, the login page is showed as shown in Figure 2. Log in consists of only 2 inputs, email and password. If the email and password are empty, or email and password are invalid, an error message will pop out as shown in Figure 3. Figure 4 shoes if user have registered the account but not yet verify the email account, a message will show to ask user to verify the email account, then only can sign in.

If the user clicked on the “Sign Up” button, they will be directed to the Sign Up Module - **Tan Yi Jia**.

If the user clicked on the “Forgot Password?” button, a reset password email will send to the user’s email that filled in in the email text field. If the text field is empty, or the email does not exist, an error message will show as shown in Figure 8.

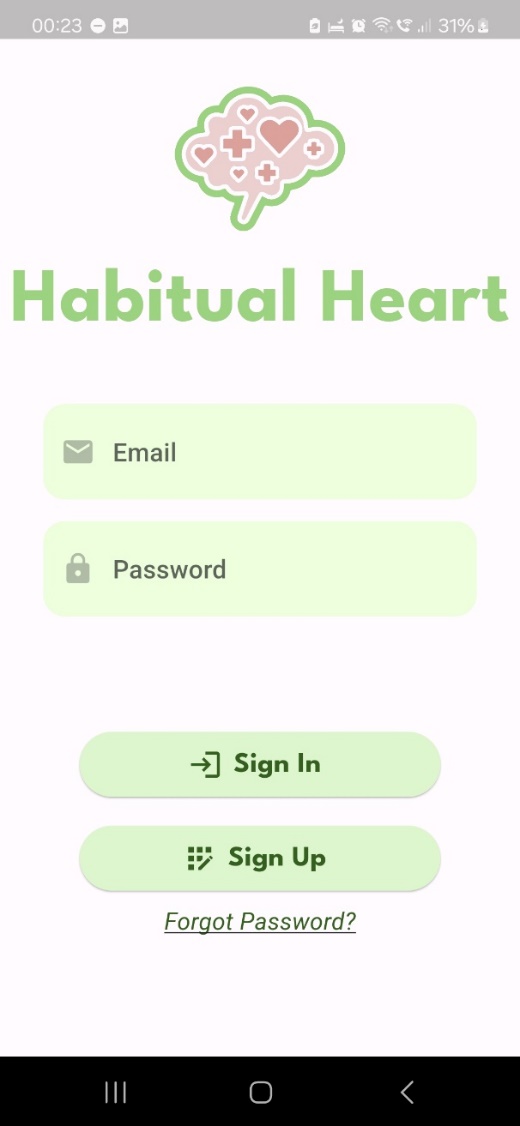


Figure 2 Sign in Page

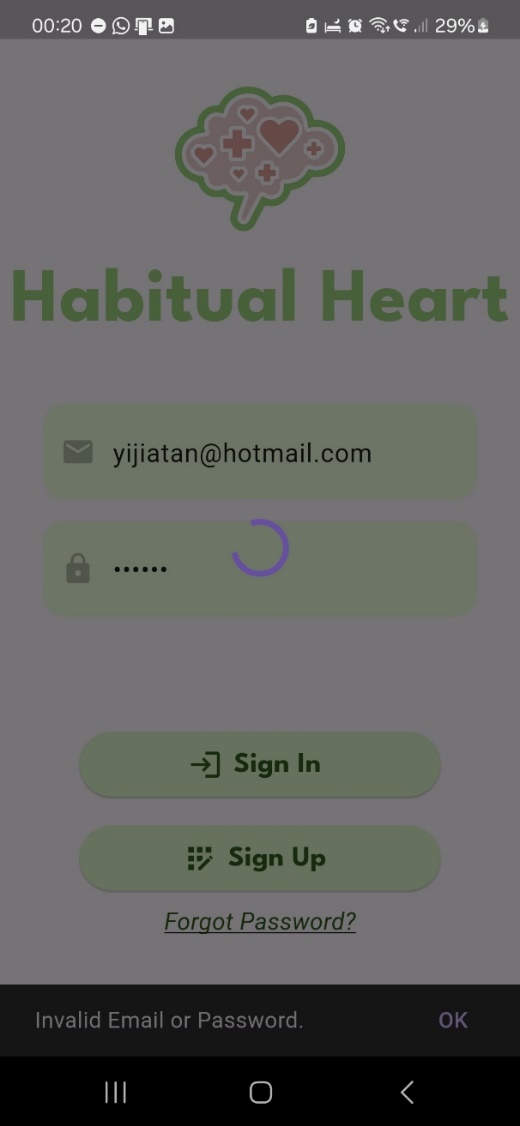


Figure 3 Message shown when not all fields are filled or invalid email or invalid password

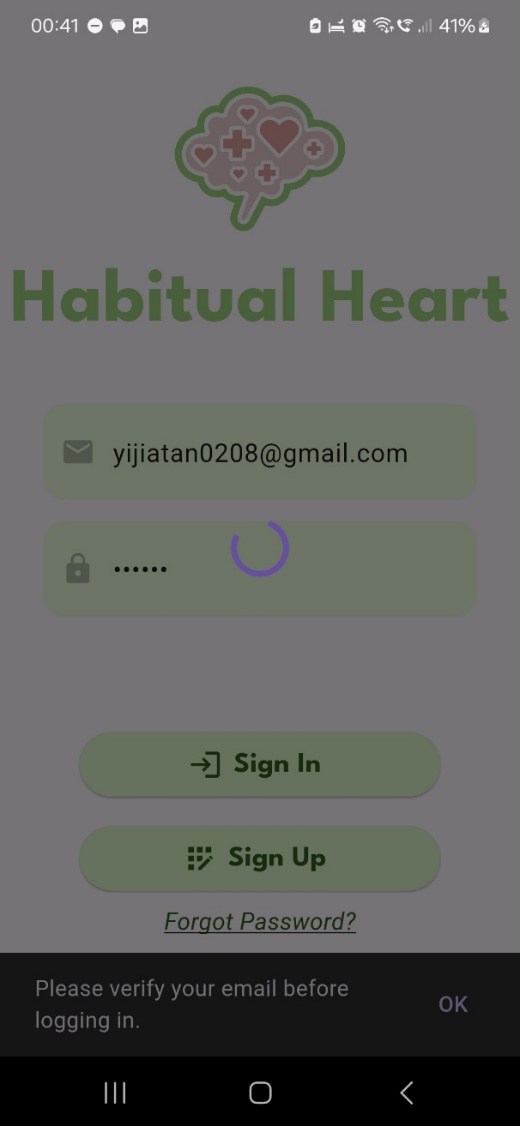


Figure 4 Message shown when email is not verified

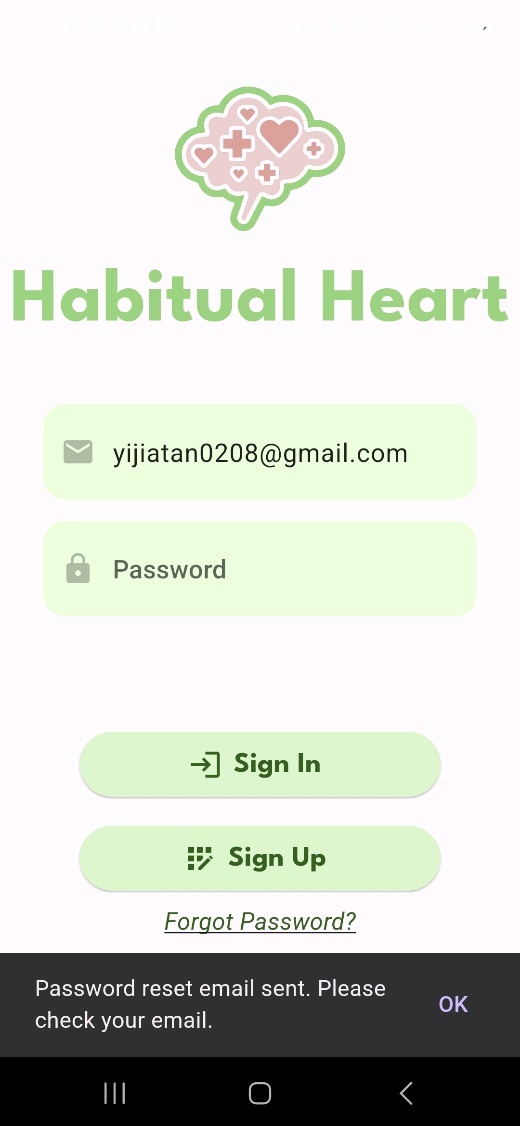


Figure 5 Reset Password

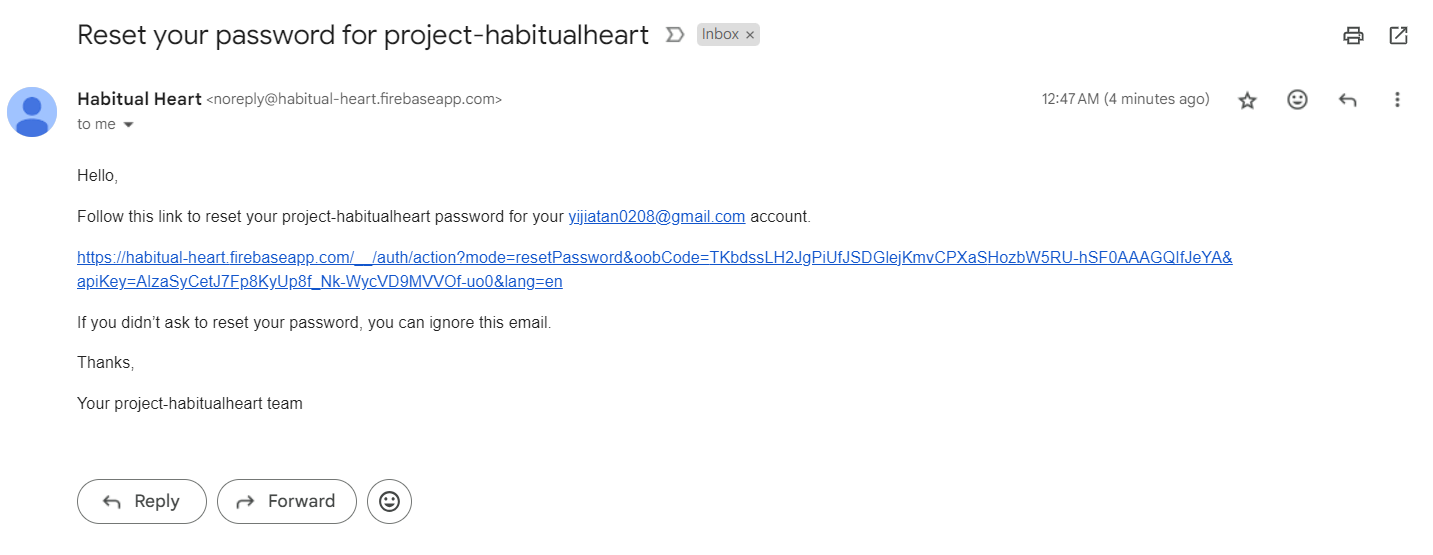


Figure 6 Reset Password Email

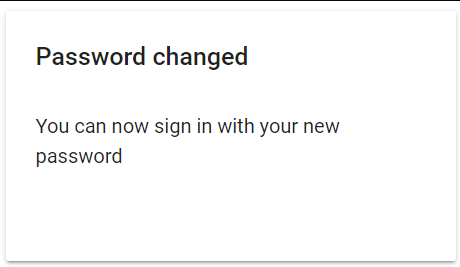
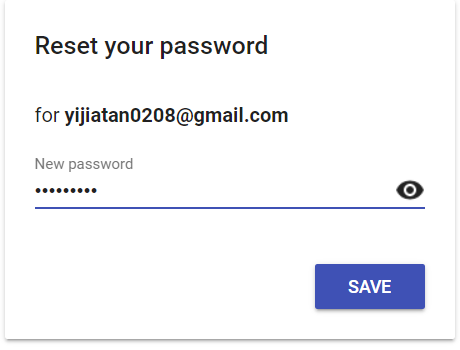
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Figure 7 Changed Password

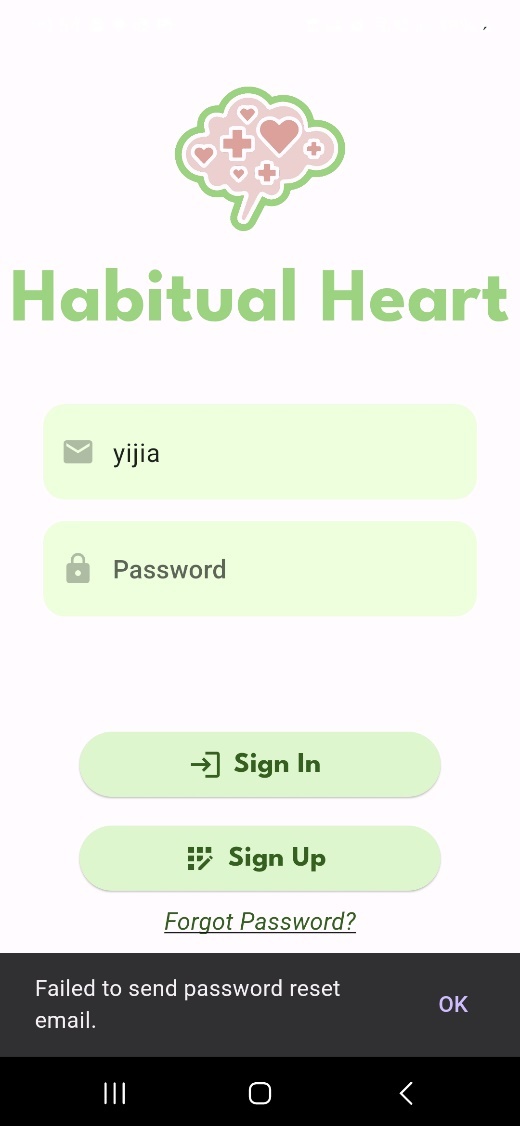
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Figure 8 Failed to Send Reset Password Email

#### Sign Up Module - Tan Yi Jia

This module allows users to create an account by filling in their username, email, password, and confirm password fields (Figure 9). Each field must be completed for validation to proceed, and additionally, the password and confirm password fields must match (Figure 10).

If validation is successful, users are then redirected to the Sign In module with a confirmation message shows upon successful registration (Figure 11). Thus, a confirmation email is sent to verify the email address, ensuring it is valid (Figure 12).

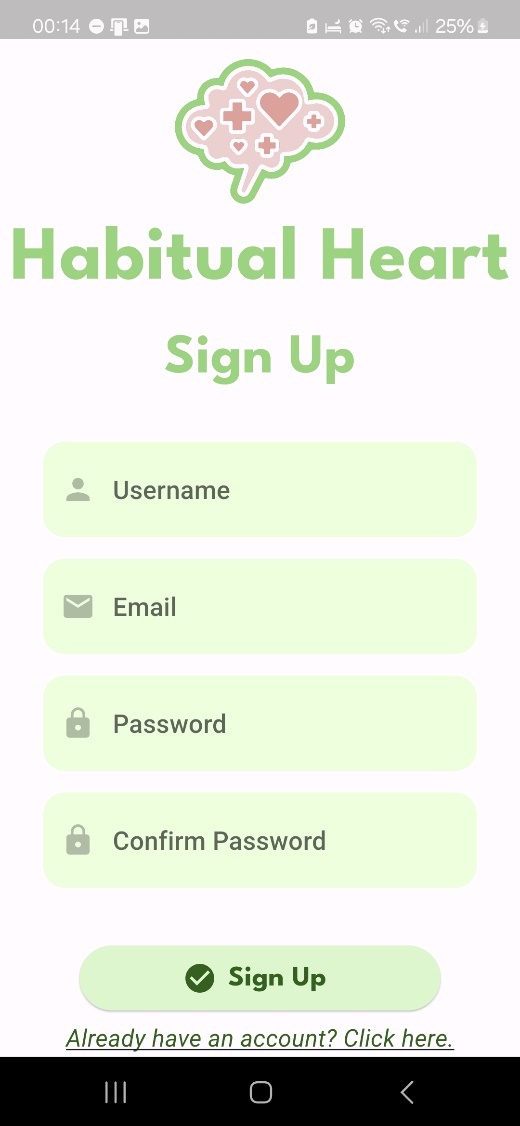


Figure 9 Sign Up Module

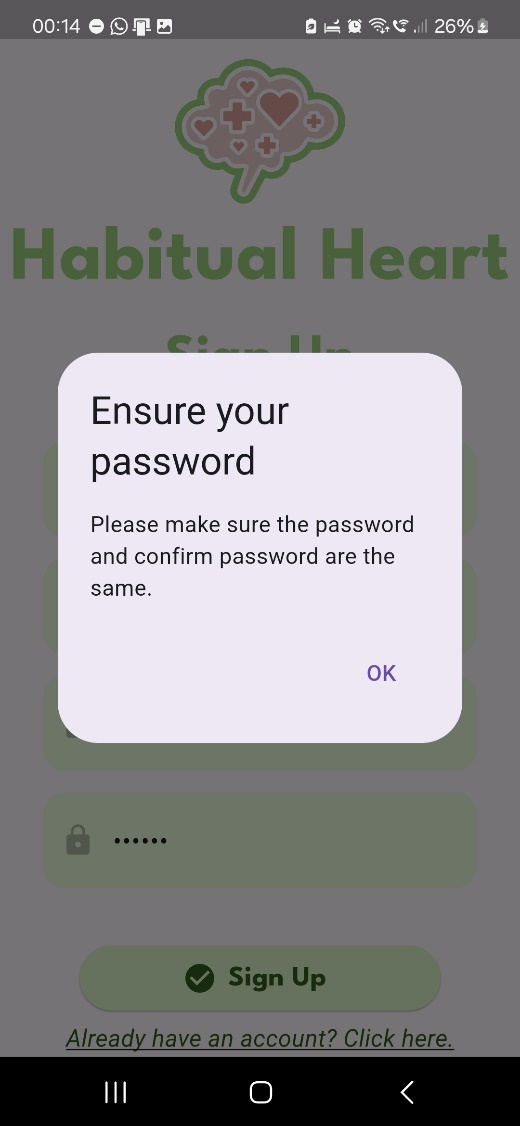
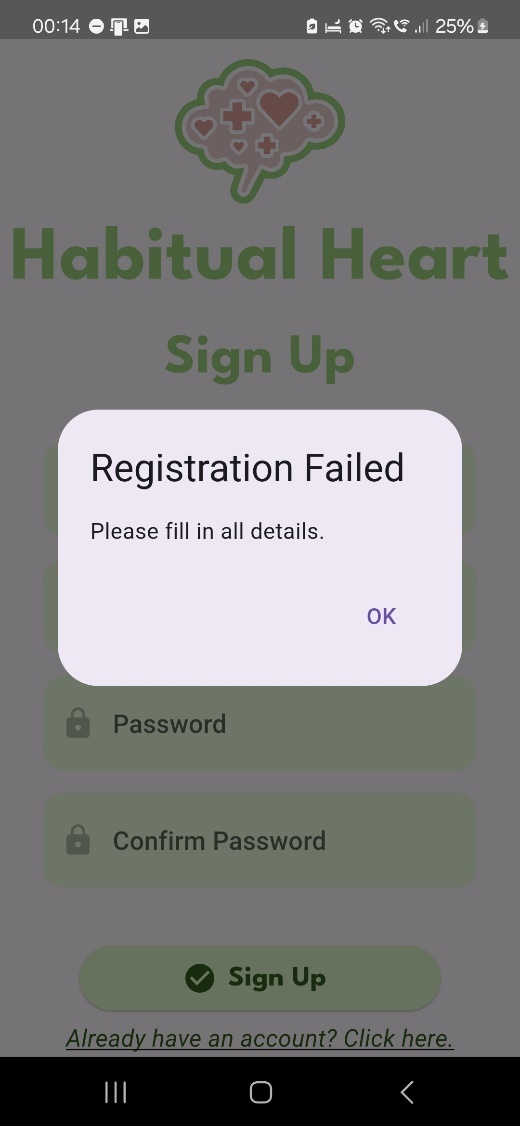


Figure 10 Error messages for the validation for account registration

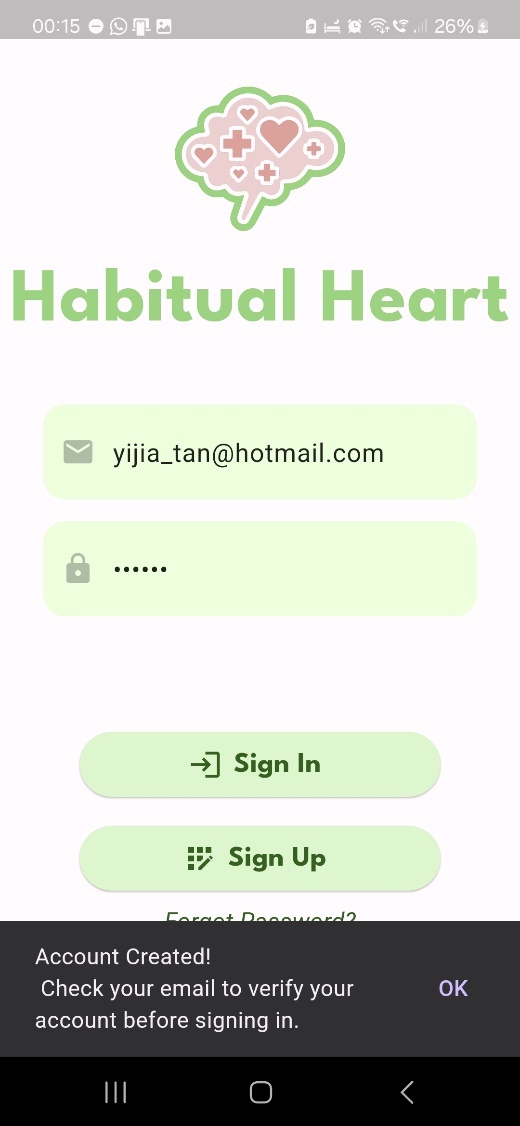


Figure 11 Account Created Message

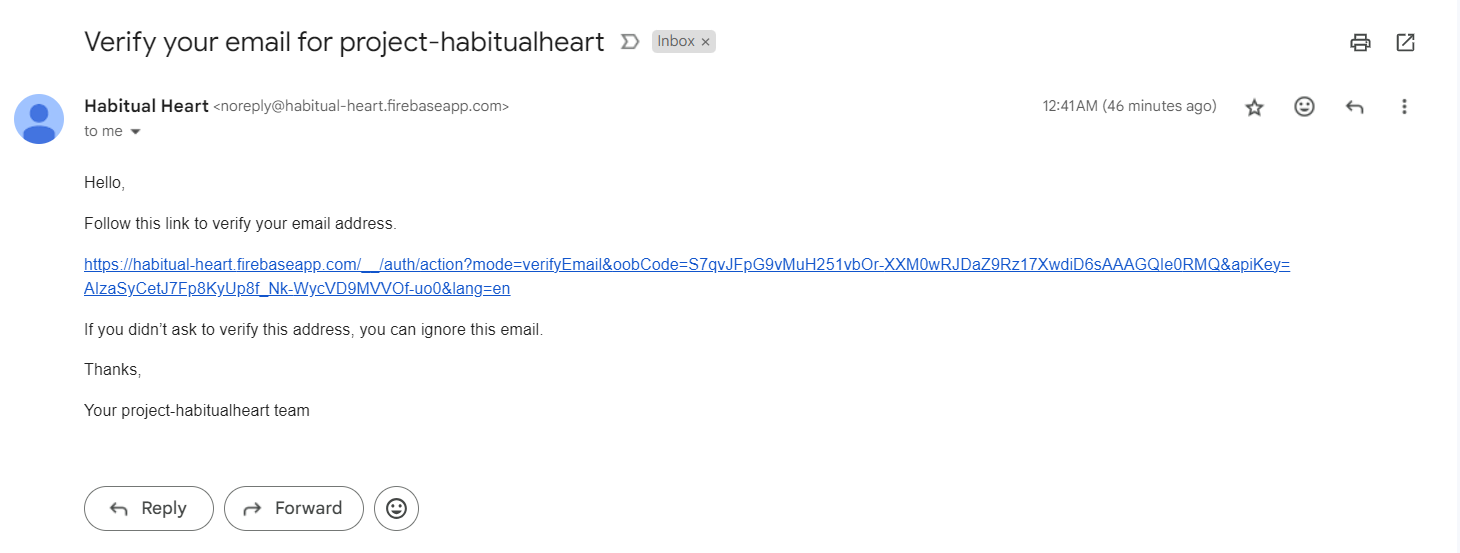


Figure 12 Confirmation Email to verify email existences

#### Home Page Module – Tan Yi Jia, Teh Ger Min

After signed in to the app, users are greeted with the current date and a display of their mood for the day, represented by an icon. If no mood has been recorded for today, users can select the icon and log their current mood in the Mood Creation Module – Tan Yi Jia. Below the mood, the Habits List showcases a personalised list of habits, indicating their current status and streaks.

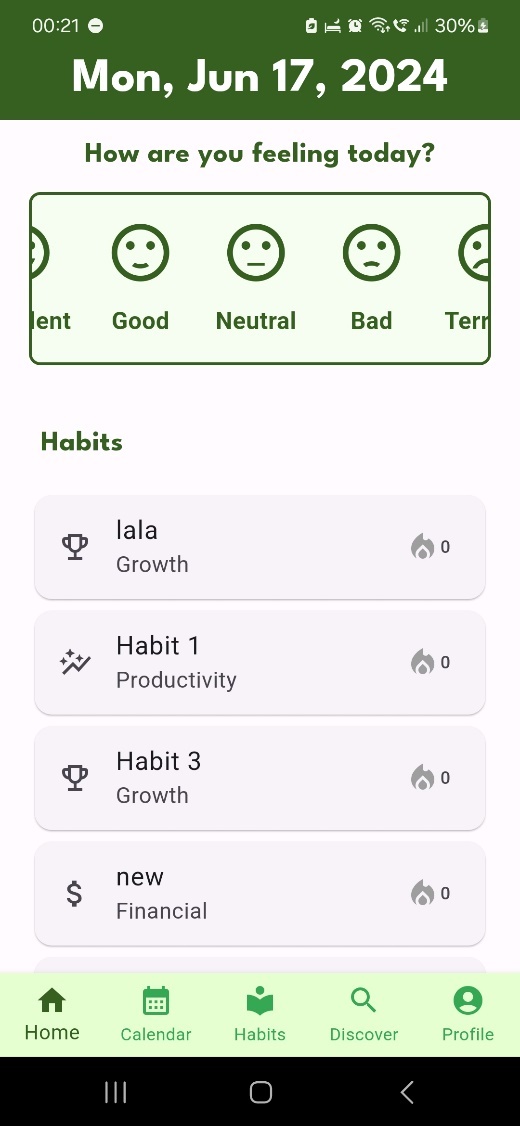
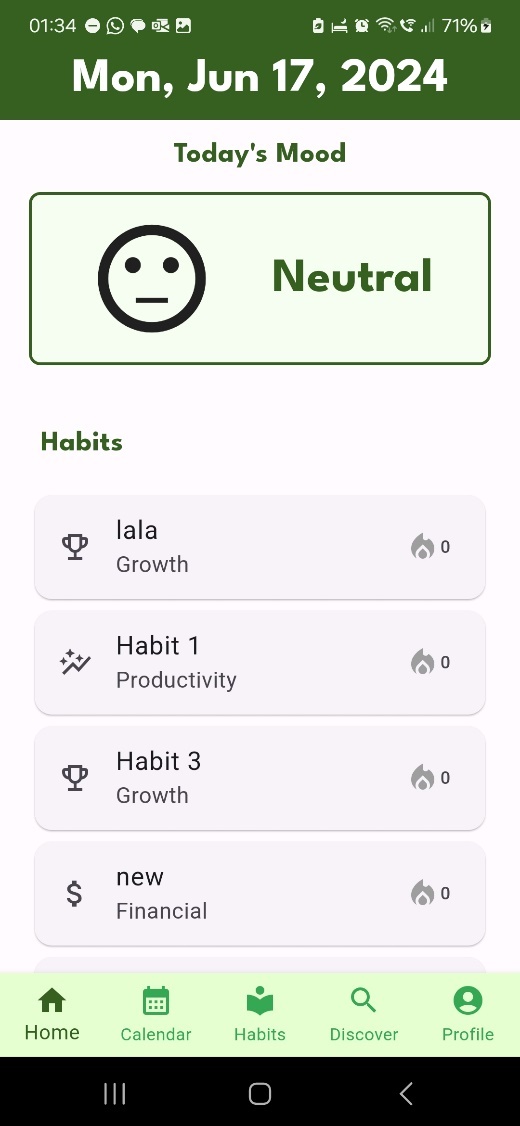
 

Figure 13 Home Page

#### Mood Creation Module – Tan Yi Jia

The mood creation module is to let users log their current mood and add descriptive details. Users can select their mood from predefined options (Excellent, Good, Neutral, Bad, Terrible), each associated with an icon. The user can pick the date and time for the mood entry using a date-time picker (Figure 15). They can also add a description to provide more context about their mood (Figure 14).

Upon saving, the mood data (including the selected mood, timestamp, and description) is stored in the Firestore database. The home page then displays the current day's mood with its corresponding icon and provides navigation to detailed mood entries as shown in Figure 16. In the mood details page, it displays the details of a specific mood entry, including the mood type, description, and timestamp, and provides options to edit or delete the entry.

When the user clicked edit button, it will proceed to a new page that allows users to update their mood records by selecting a new mood, modifying the description, and adjusting the timestamp (Figure 17). If the user clicked delete button, a confirmation message will pop out to confirm user wants to delete the mood entry (Figure 18).

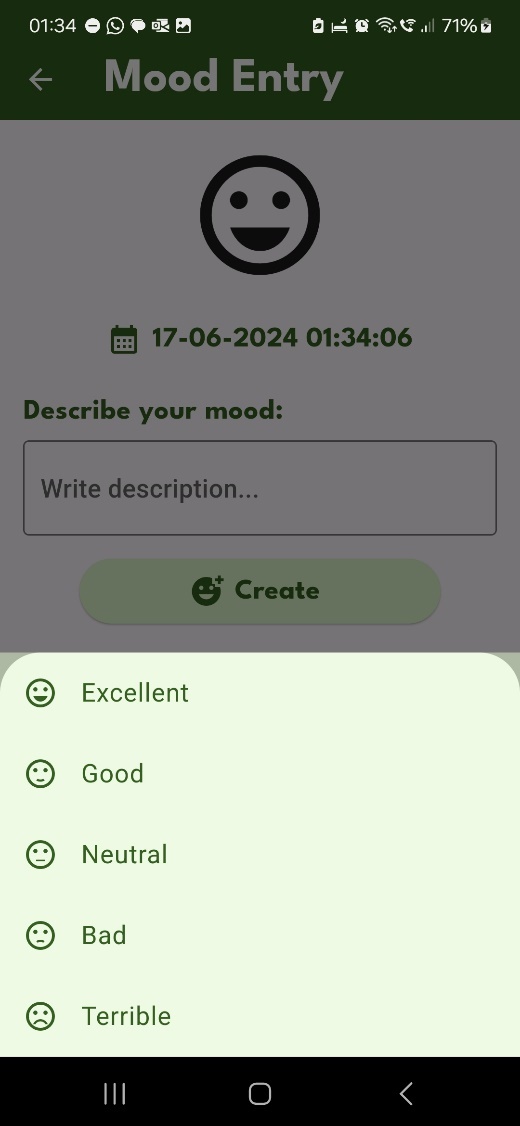
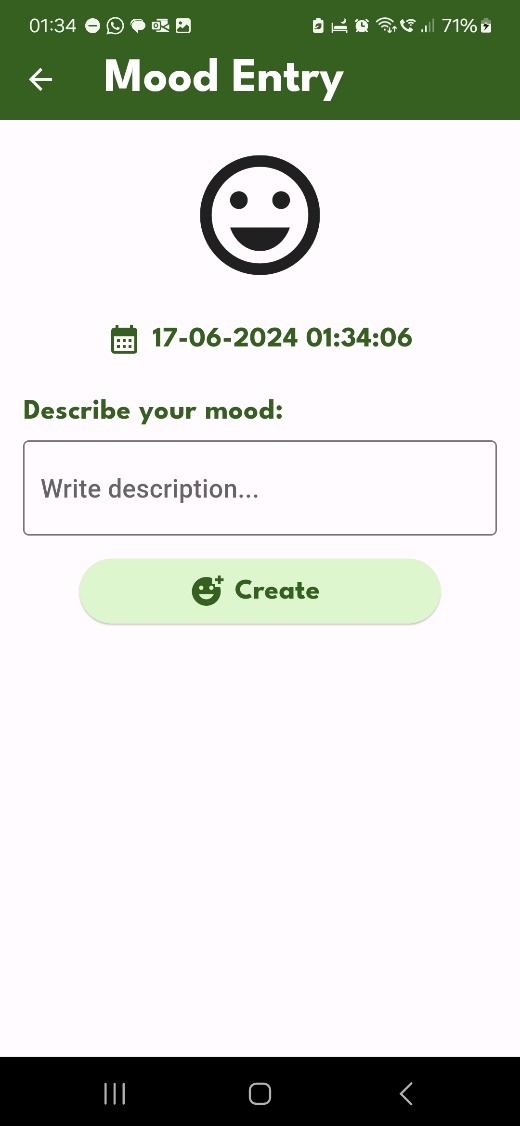


Figure 14 Mood Entry Creation

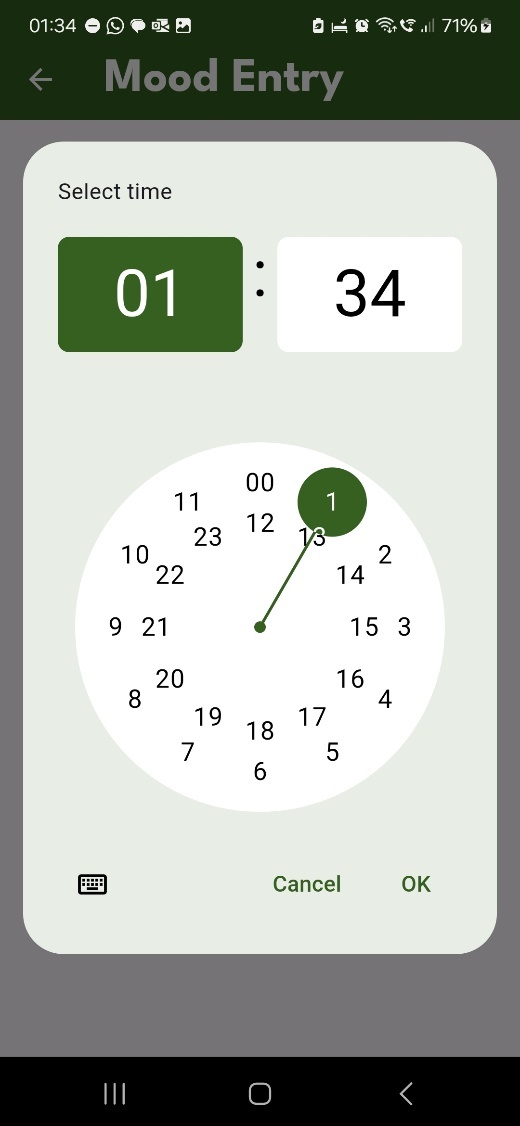
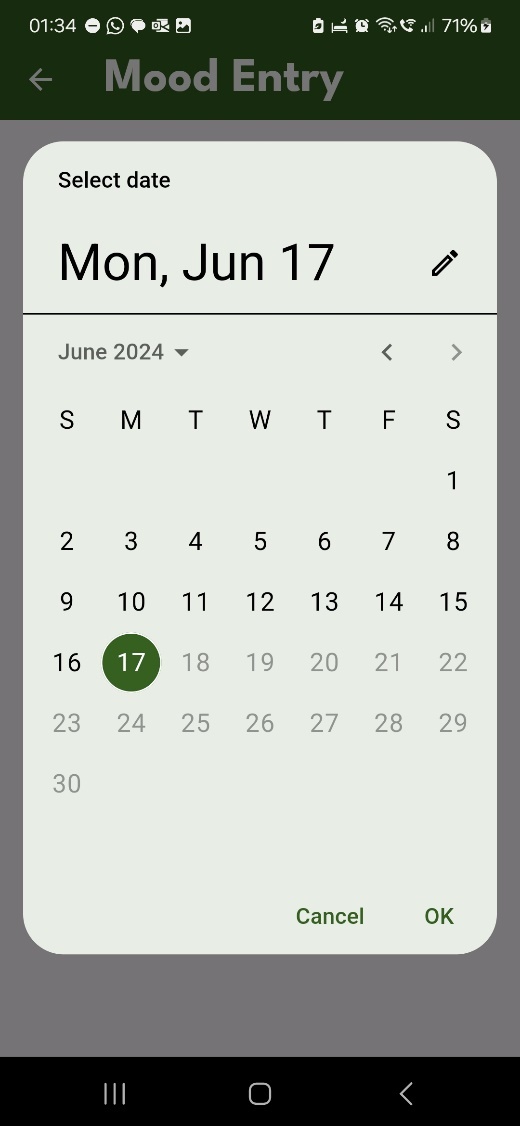


Figure 15 Mood’s Date and Time Entry

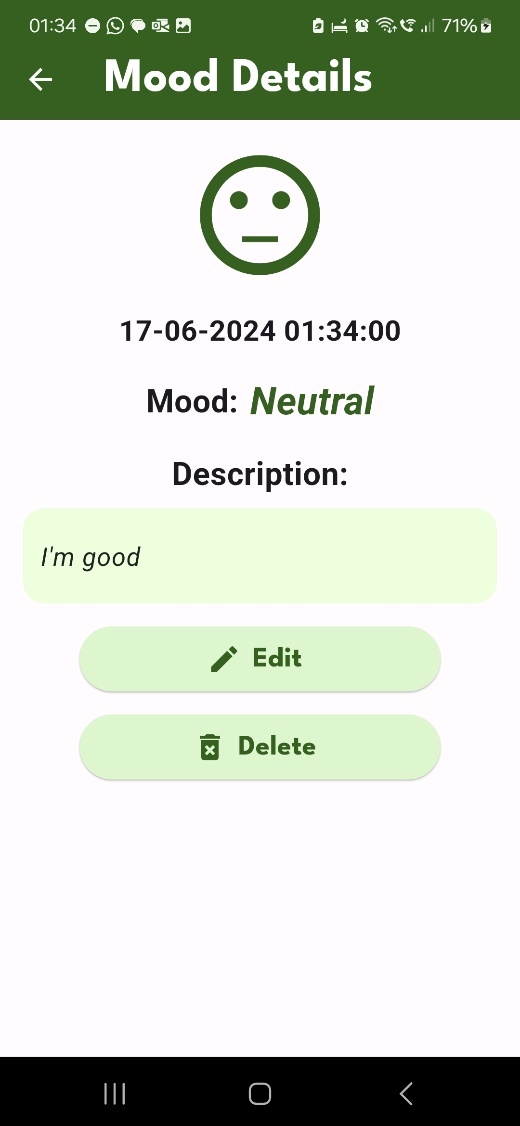


Figure 16 Mood Details

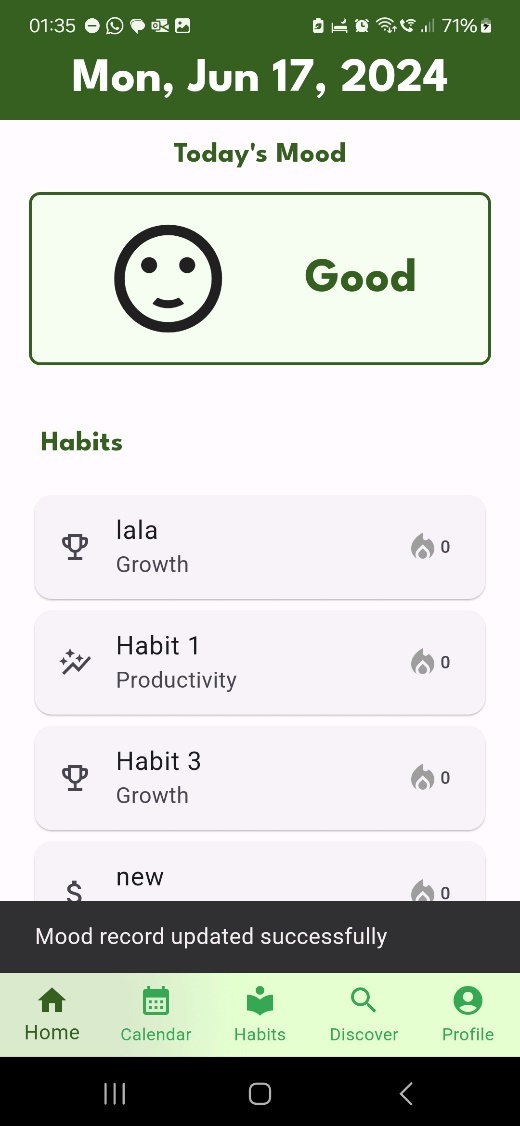
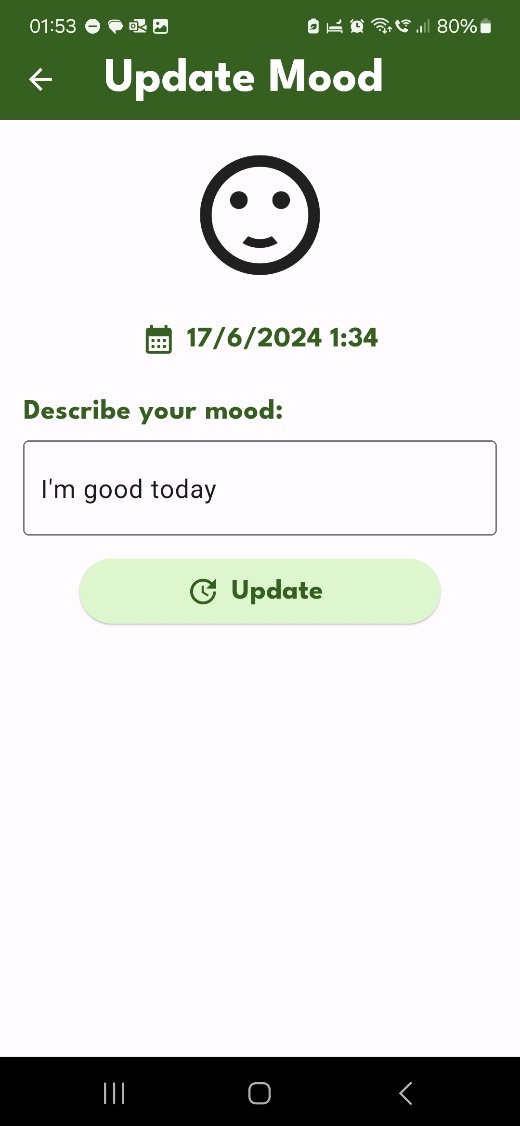


Figure 17 Edit Mood Entry

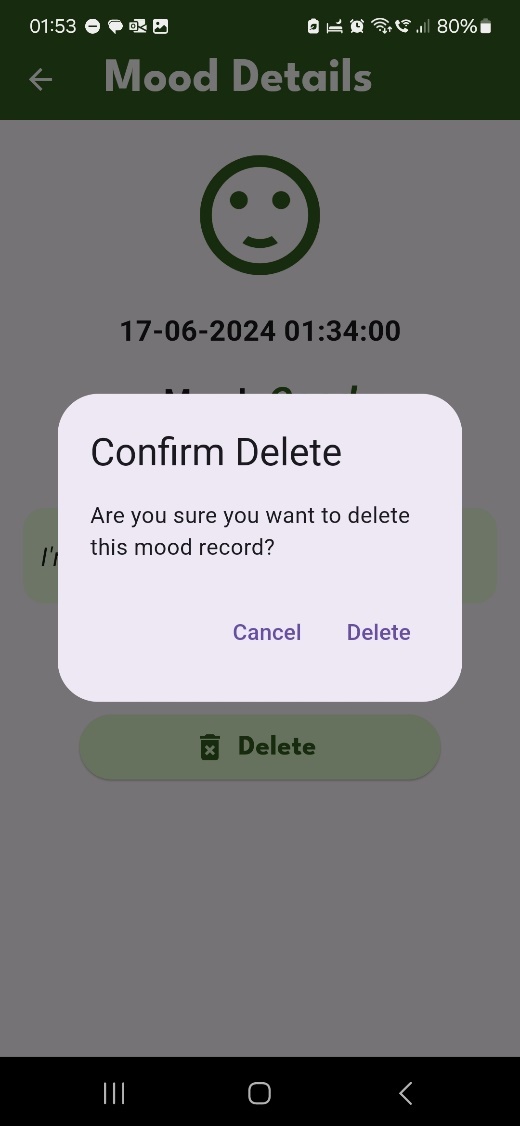
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Figure 18 Delete Mood Entry

#### Calendar Module – Teh Ger Min

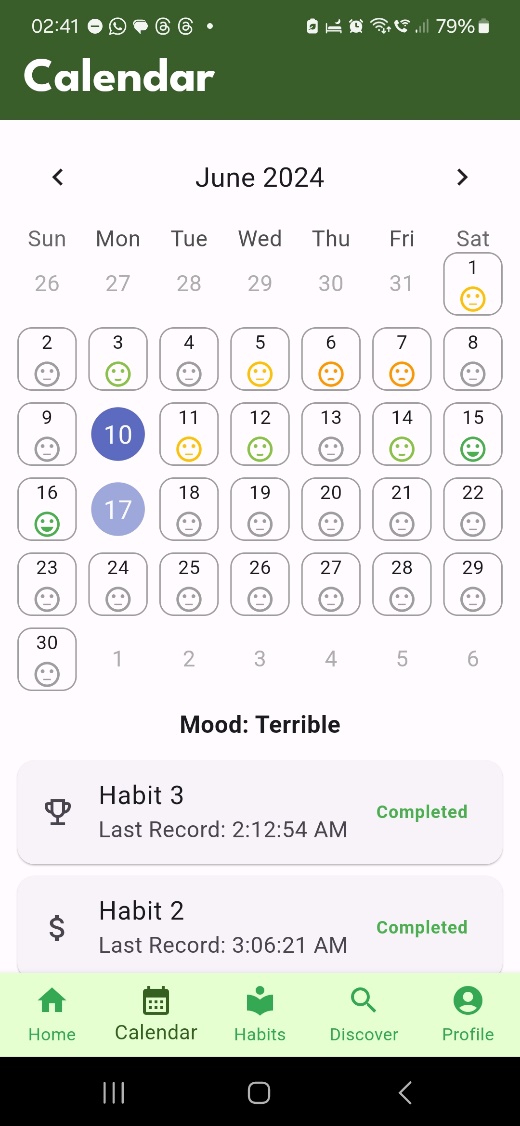
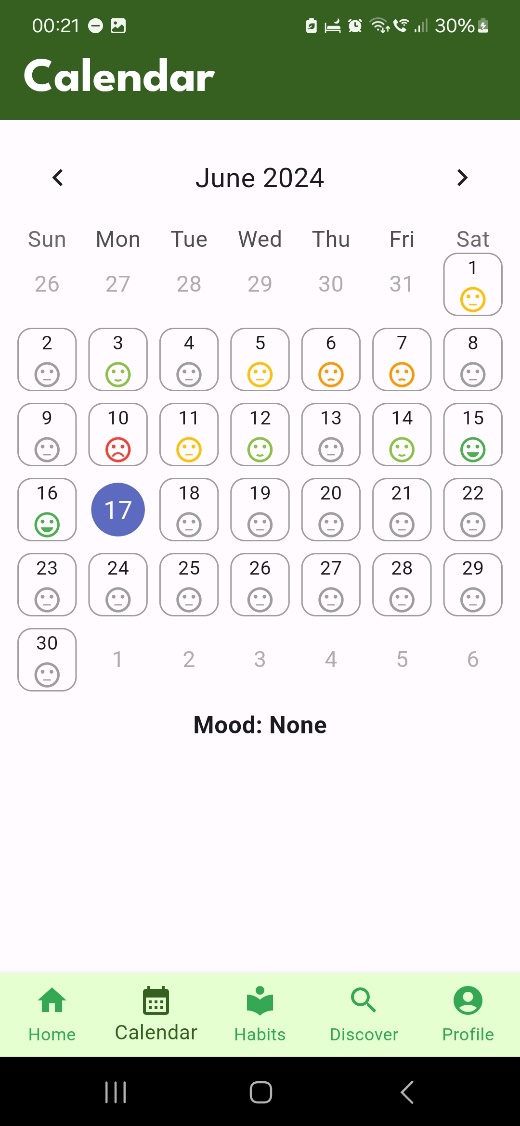


Figure 19 Calendar Module

#### Habits Module – Teh Ger Min

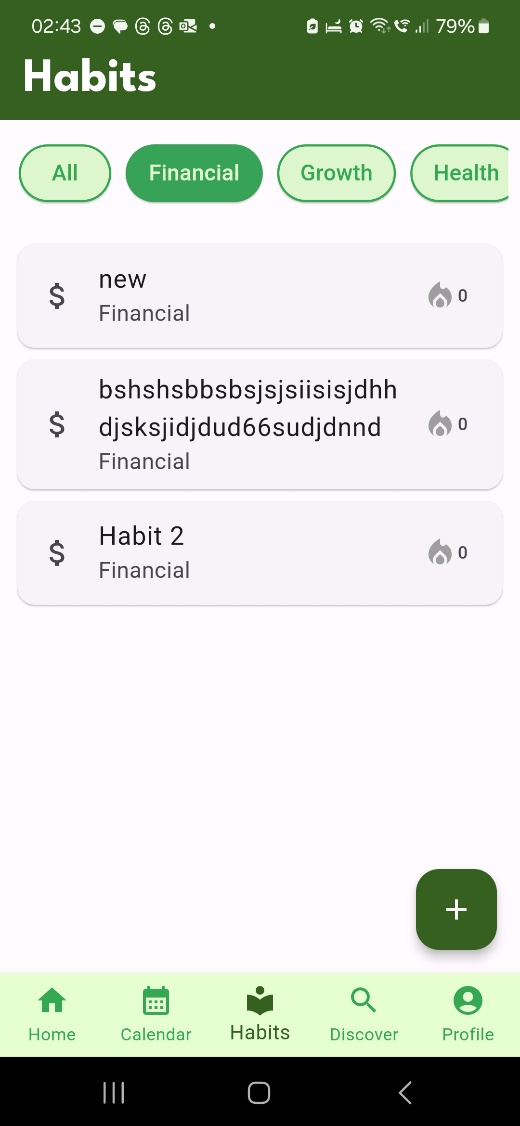
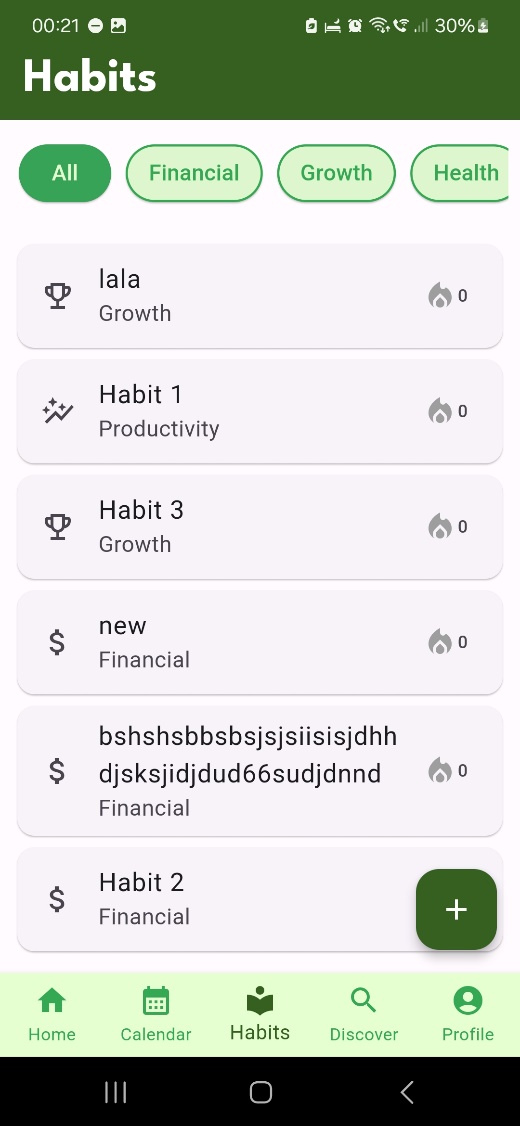
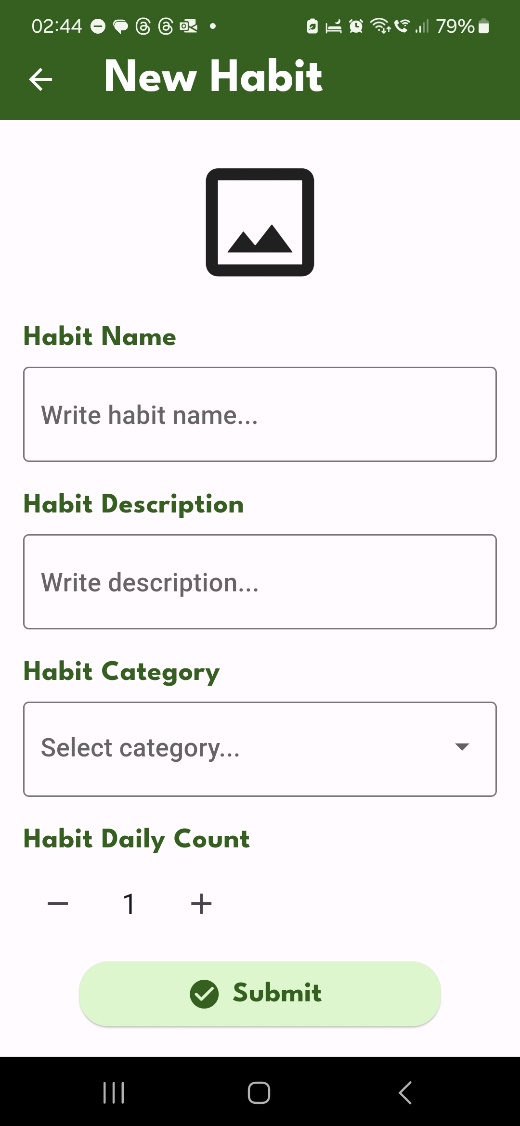


Figure 20 Habits Module

#### Habits Creation Module – Teh Ger Min



#### Discover Module - Tan Yi Jia

The Discover module has three main sections. The first section displays a daily motivational quote retrieved from an API, featuring the quote and the author's name in a graceful design.

The second section is "Meditation Guides" which displaying various meditation tools in a grid layout. Users can tap to access detailed guides. The guides include the detailed instructions and audio guidance for deep breathing techniques (Figure 23), mindfulness meditation sessions with themed durations (Figure 22), and guided sleep meditation accompanied by soothing music (Figure 24).

The final section, "Meditation Videos," lists YouTube meditation videos, allowing users to launch and view them by tapping on the titles. Thus, the video’s link opens either in the YouTube app or a web browser (Figure 25).

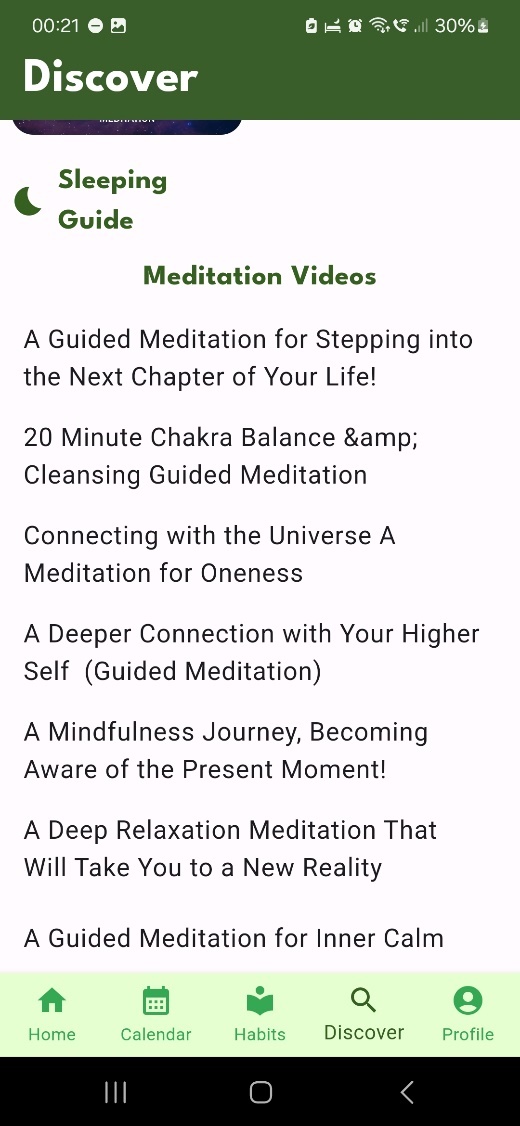
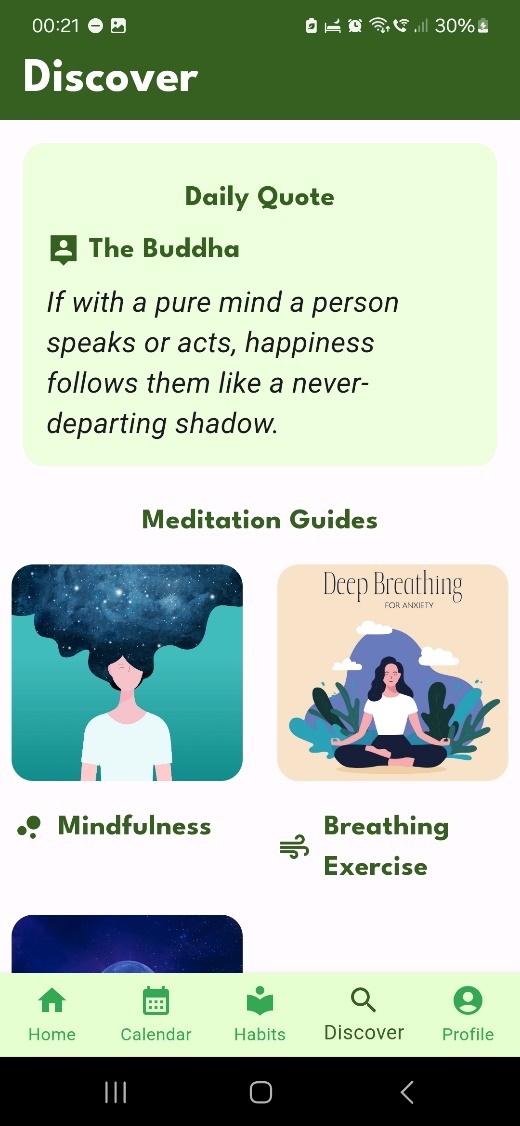


Figure 21 Discover Module

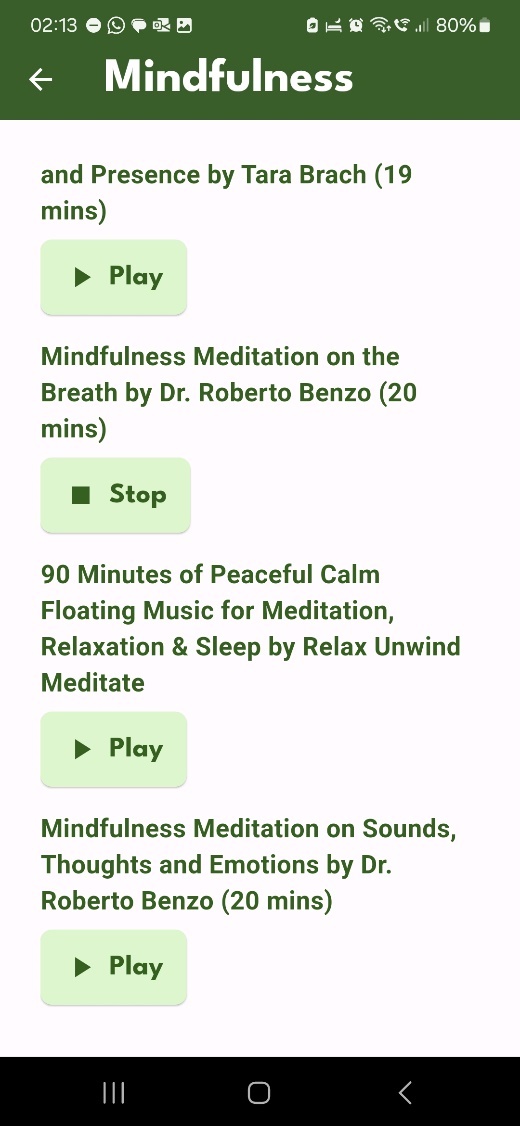
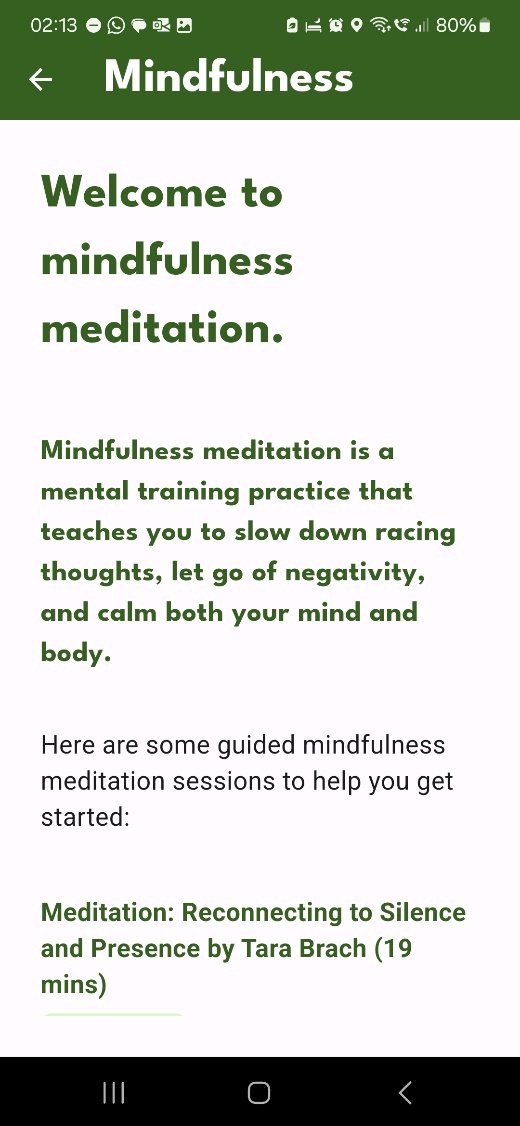


Figure 22 Discover Module - Meditation Guides (Mindfulness Meditation)

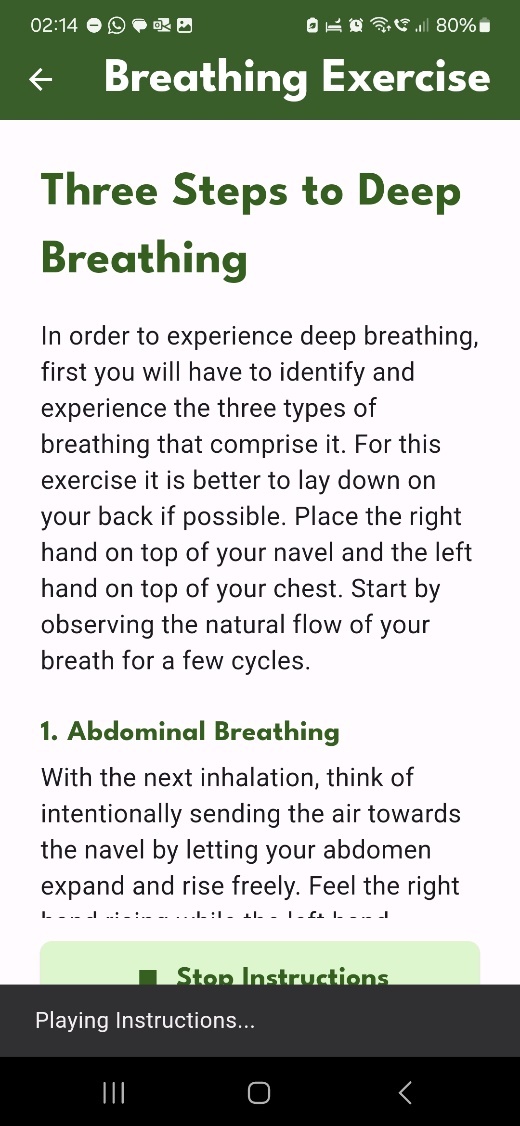


Figure 23 Discover Module - Meditation Guides (Breathing Exercise)

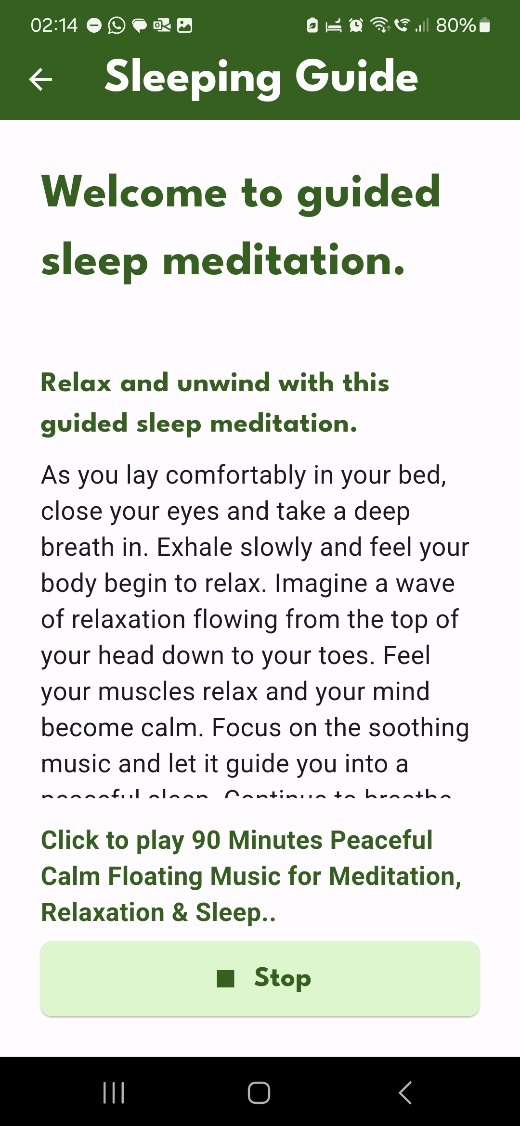


Figure 24 Discover Module - Meditation Guides (Sleeping Guide)

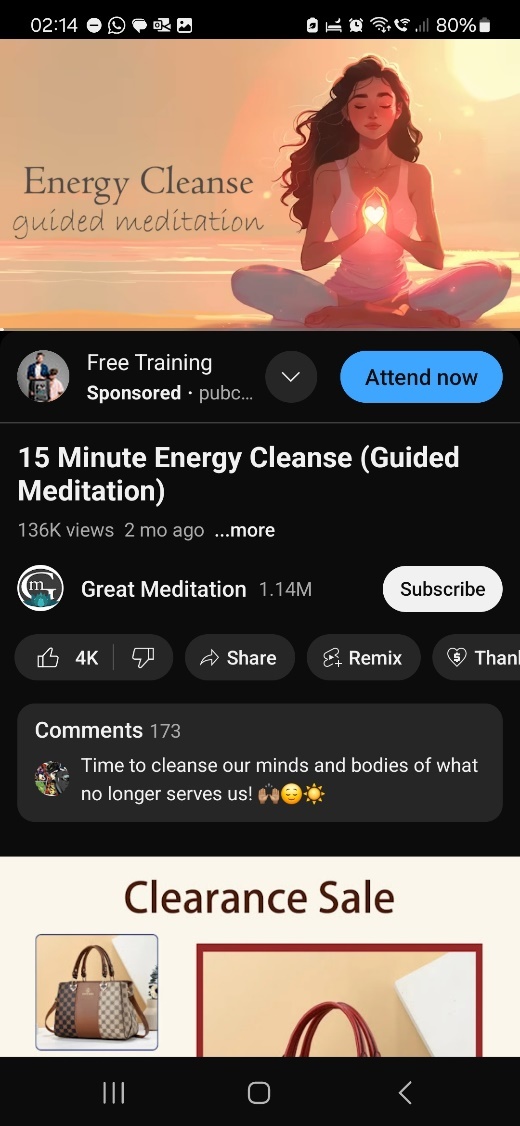


Figure 25 Discover Module - Play Meditation Videos in YouTube

#### User Profile Module – Tan Yi Jia

The User Profile module serves as a centralized hub for users to manage their account information and access various features related to their profile. The profile page displays the user's profile information: username. It fetches the user's data from the Firestore database and displays it prominently on the page. Besides that, users can edit their profile information by clicking the "Edit Profile" button. It will navigate the user to a dedicated page where they can modify their profile details, such as their username, or other personal information (Figure 27).

Next, users can enable or disable daily reminders for receiving the mood creation notification. User can also view the mood history through this module which allowing users to view and track their mood history or emotional well-being over time (Figure 28).

Next, this module includes sections for displaying legal information related to the application, such as the Privacy Policy and Terms and Conditions (Figure 29). Users can access these pages by tapping on the respective buttons or links. Finally, the module included a "Sign Out" button that allows users to securely sign out of the application, ending their current session with proceed back to the Sign In module.

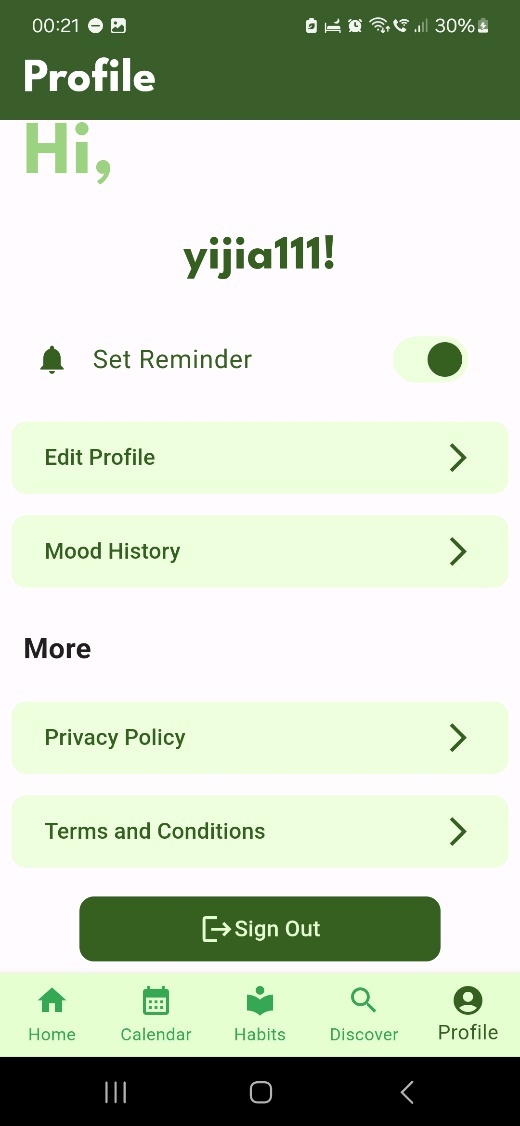


Figure 26 User Profile Module

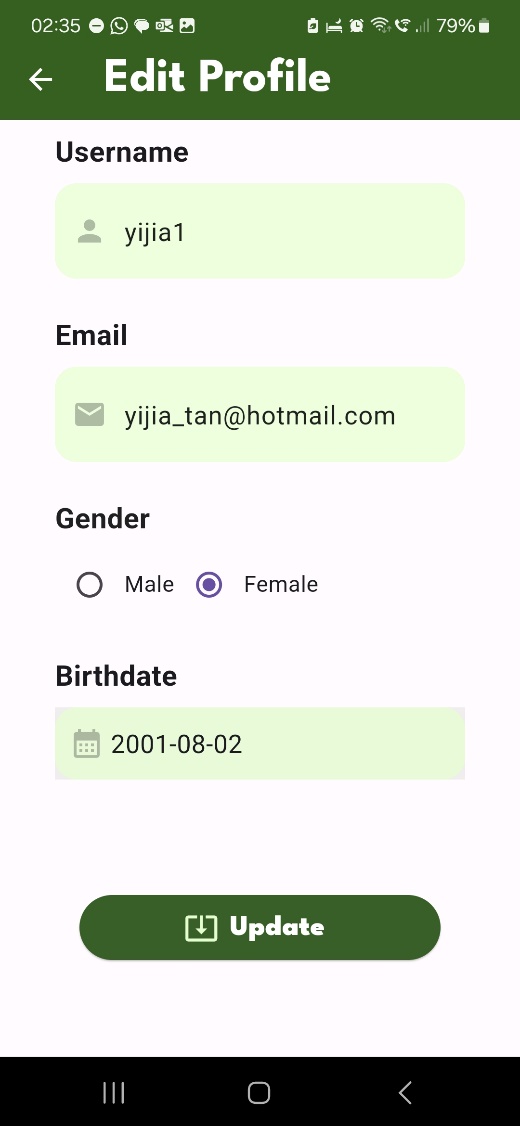


Figure 27 Update User Profile Information



Figure 28 Mood History

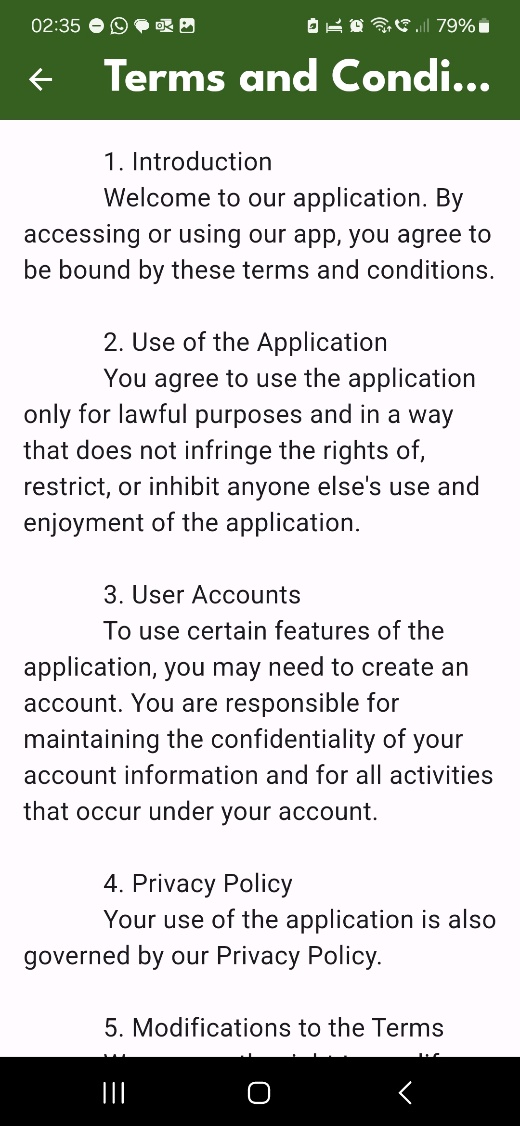
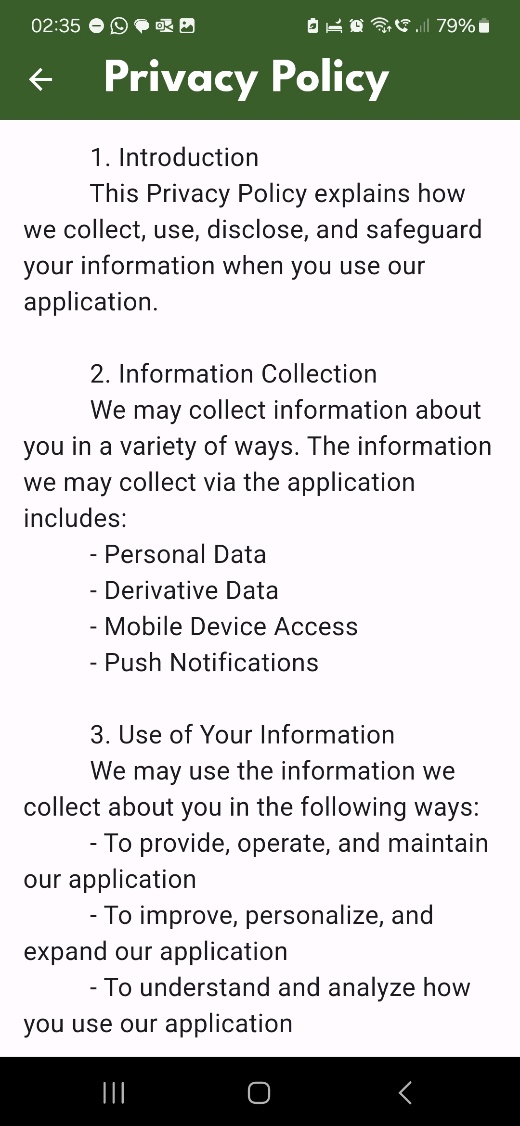


Figure 29 Privacy Policy, Terms & Conditions

## Strengths of the App

Firstly, the application offers a comprehensive suite of features that support both mood and habit management, allowing users to track and improve their emotional well-being and productivity simultaneously. These features include essential functionalities such as adding, editing, and deleting moods and habits, as well as viewing histories for both. Users can precisely track their progress and make the necessary routine modifications through this kind of detail. Additionally, the app incorporates motivational elements like daily quotes and meditation guides, which provide users with ongoing support and encouragement. The ability to manage personal profiles and view important policies directly within the app adds to its convenience and user-friendliness.

## Limitations of the App

Although the "Habitual Heart" application has many advantages, but also has several drawbacks. The lack of interaction with other wellness and productivity apps is a major disadvantage. This restriction may make the app less helpful ultimately for users who depend on this to handle different parts of daily lives across multiple apps. Furthermore, the app currently lacks strong analytics capabilities, which are essential for customers who want to do extensive statistical research on their data. Users may find it more difficult to understand their behaviour patterns and make wise selections if this is missing.

## Future Enhancements

Future improvements have been proposed to overcome those highlighted weaknesses and further improve the application. One key improvement is the introduction of detailed analytics. Providing users with advanced analytical tools is important for the app. This can offer deeper insights into the user's mood and habit data, which helps the user make more informed decisions. Besides that, expanding integrations with popular health and productivity apps is another crucial enhancement. This feature would allow users to seamlessly connect "Habitual Heart" with other tools they are currently using to create a more cohesive and comprehensive approach to personal well-being and productivity. Additionally, incorporating community features such as social sharing and progress tracking can foster a sense of community and provide users with additional motivation. Finally, adding gamification elements, such as rewards and challenges, can boost user engagement and make the process of habit and mood tracking more enjoyable. These enhancements aim to create a more robust, user-friendly, and engaging application that better meets the needs of its users.

## Reflections from the Group Members

### Tan Yi Jia

Throughout the development of the "Habitual Heart" application, I have gained invaluable experience and skills, particularly in areas where I previously had limited knowledge. One of the most significant learning experiences has been working with Flutter for the first time. Flutter is different from other UI frameworks I have used in the past. Flutter offers a unique approach to UI design by using a widget-based architecture, which allows for the creation of highly customizable and responsive interfaces. This was a departure from the traditional, component-based frameworks. The widget-centric design paradigm in Flutter promotes a more modular and reusable approach to UI components, which can enhance both development efficiency and code maintainability. Additionally, Flutter’s “hot reload” feature significantly sped up the development process by allowing real-time updates without needing to restart the application, thus making the iterative design and testing cycle much more efficient.

Another area where I have seen considerable growth is in my understanding and utilization of Firebase. Before embarking on this project, my experience with backend services was mostly centered around traditional server setups and SQL databases. Firebase introduced me to a different way of handling backend operations, emphasizing real-time data synchronization, and seamless user authentication with Firebase's various features. For example, Firestore is used for database management, and Firebase Authentication is used for user management. This has increased my perspective on backend development. This transition from a more conventional backend setup to a cloud-centric, real-time approach has not only enhanced my technical skill set but also provided me with insights into building modern, scalable applications. In conclusion, the process of developing the "Habitual Heart" application has been hard but enjoyable. This has improved my knowledge of Firebase and Flutter and made me realize how important flexibility and ongoing education are to software developers.

### Teh Ger Min

## Appendix

GitHub link: <https://github.com/yjia28tan/HabitualHeart>

## References

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**Code References**

**Tan Yi Jia**

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**Teh Ger Min**