TeamAlpha Submission

for

<SwipeMyRoomie>

Version 1.0

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1. Introduction

1.1 Purpose of the document

This document aims to elicit and detail the software requirements (functional and non-functional) for our website SwipeMyRoomie. Furthermore, this document describes the website's target audience, showcases its user interface, together with its hardware and software requirements.

A series of diagrams are also included in the document to serve as a structure in designing and developing SwipeMyRoomie.

1.2 Purpose of the product

In Singapore, by law, it is not possible to own a HDB flat unless you are married or above the age of 35. Furthermore, with the increasing migration rate in Singapore, university students and young adults need to find places to rent while studying or working in Singapore.

This website aims to help students and young adults in their search for roommates. Students often seek roommates to share the apartment with. Young adults who are immigrants may not have a family here in Singapore, may intend to stay with others. Hence, this website would enable students as well as young adults to find roommates and rent rooms together.

1.3 Intended Audience and Reading Suggestions

Before diving further into the product, it is important to understand who the intended audience for this document is.

- Developers are people who will write the codes (**front-end** and **back-end**) for the **device**.
- Project Managers will be in charge of the project designing the timeline, resources, and logistics for the project.
- Marketing staff will help to promote the system and encourage the public to use the website.
- Testers are employees that help to ensure that there are no bugs in the system and the system is running smoothly. If there are any **bugs**, they will report it to the development team and thereafter, the developers will make a patch for the bug.
- Users are defined as the people who will be utilizing the website. For SwipeMyRoomie, the target users are university students as well as young adults residing in Singapore.
- Documentation writers are those who report about the system requirements and its implementation in the form of a written report.

1.4 Product Scope

This product is intended to be used as an interactive website for students and young adults looking for roommates to communicate with each other. Consequently, they will be able to find roommates that they are compatible with.

Currently, the scope of the product will cover only **HDB rental services**. If the initial product release is successful, **condominium** and **apartment** rentals can be included. This will enable **private housing businesses** to find tenants who are students and young adults. Hence, increasing business opportunities for the private housing sector in Singapore.

Additionally, the product currently would allow students and young adults to create an account free of cost.

1.5 References

Presentation Slide Deck Design:

Documentation References:

Class Diagram:
https://www.visual-paradigm.com/guide/uml-unified-modeling-language/uml-class-diagram-tutorial

Coding references:

Sequence diagram
https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-sequence-diagram/

2. Overall Description

2.1 Product Perspective

This website is a new self-contained product. Hence, no further discussion will happen in section 2.1.

2.2 Product Functional Requirement

2.2.1 The system must allow the user to register for an account with their desired username and password.

2.2.2 The system must allow the user to login into their account.

2.2.3 The system must allow the user to view their profile and display their personal information.

2.2.4 The user must be able to update their profile based on their name, gender, age, occupation, ethnicity, and customise their roommate preferences.

2.2.5 The system must be able to search for appropriate roommates for the user based on the user's updated profile.

2.2.6 The system must allow the user to use the search function to input a location they prefer for their apartment and display the relevant apartment information to the user.

2.2.7 The system must allow the user to access the ChatBox to send and receive messages with other tenants.

UML

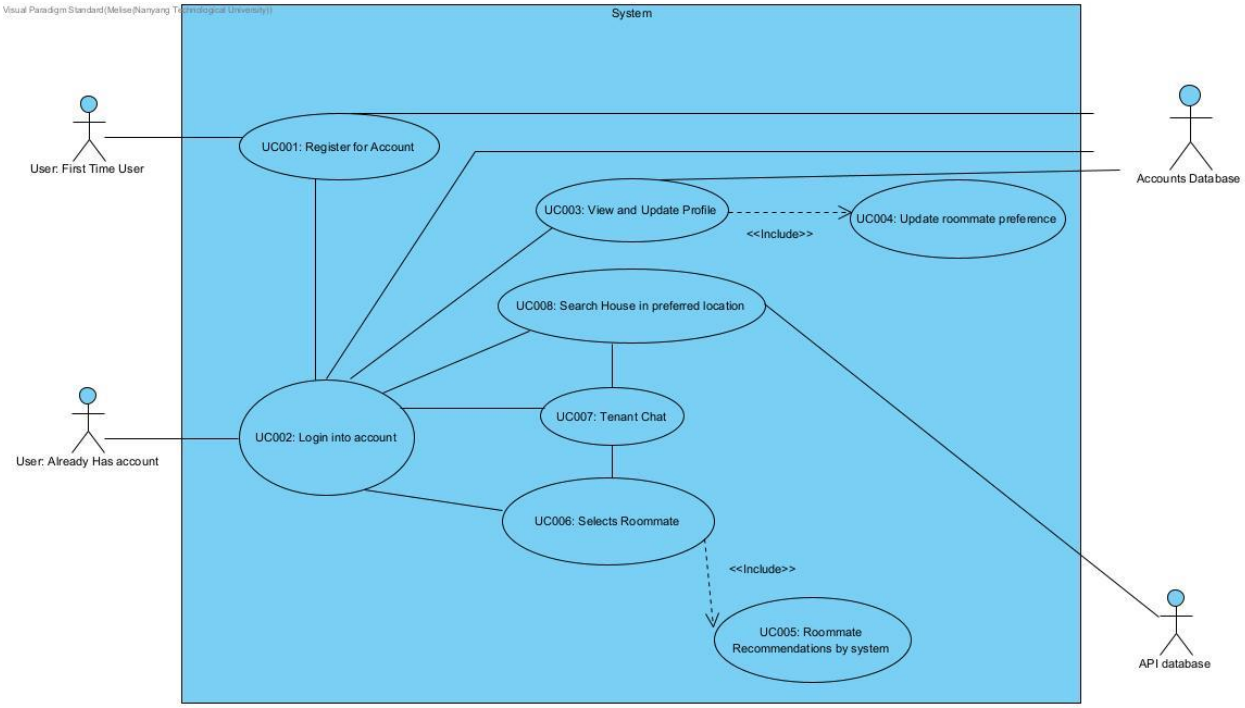


Figure 1: UML for the product featuring UC001 to UC008

2.3 Use Case

- UC001: Register for account
- UC002: Log in to the account
- UC003: View and Update Profile
- UC004: Update roommate preferences
- UC005: Roommate Recommendation
- UC006: Selects Roommate
- UC007: Tenants Chat
- UC008: Search for house in preferred area

Use Case ID:	UC001		
Use Case Name:	Register for new account		
Created By:	Ng Li Wang	Last Updated By:	Arushi
Date Created:	23 August 2021	Date Last Updated:	16 October 2021

Actor:	User, accounts Database
Description:	Register a new user account
Preconditions:	1) The user has a valid email address to be used as a login ID 2) The user's email address has not been registered in the accounts database
Postconditions:	1) New user account is created in the accounts database 2) The website redirects the user to the home page
Priority:	High
Frequency of Use:	1 per user in lifetime
Flow of Events:	Register: 1) The user enters an email and password. 2) The system checks with the accounts database if there is an existing email address being used. 3) The system then checks if the password fulfils minimal criteria of having at least one upper case character, lower case character and a number. 4) The user then re-enters their desired password into the "Confirm Password" input box. 5) The user clicks the "CREATE ACCOUNT" button. 6) The system confirms whether the password entered in the password and confirm password input box is the same (case sensitive). If it is, continue to the next step. 7) The system adds a new user record to the accounts database 8) The website prompts a success message "Account Registered". 9) The website redirects users to the home page
Alternative Flows:	If the user inputs an email that has been used in the accounts database: 1) The system will display an error message "email already exists" below the email input text field and return to step 1 If the user inputs a username of the wrong format (minimum criteria of example@mail.com): 1) The system will display an error message "invalid username (e.g. example@mail.com)" below the username input text field. 2) It will clear the username entered and return to step 1. If the user inputs a password of the wrong format (minimum criteria of one uppercase, one lowercase, and one number):

	1) The system will display an error message "invalid password (min. one uppercase, one lowercase and one number)" below the password input text field. 2) It will clear the password entered and return to step 1. If the password and confirm password input fields are different: 1) The system will display an error message "password does not match" below the password input text field. 2) It will clear the password fields and return to step 1.
Exceptions:	If the user triggers alternative flow more than 3 times (entering an existing email or invalid password), the user will be asked to try again later.
Includes:	-
Special Requirements:	-
Assumptions:	The user is a first-time user on SwipeMyRoomie. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC002		
Use Case Name:	Login into account		
Created By:	Sankar Samiksha	Last Updated By:	Arushi
Date Created:	23 August 2021	Date Last Updated:	16 October 2021

Actor:	User, accounts Database
Description:	User will perform login procedure
Preconditions:	1) The user has registered for an account
Postconditions:	1) The user has logged into the account 2) Website redirects the user to the main page with the user logged in
Priority:	High
Frequency of Use:	Every time the user uses the website.
Flow of Events:	1) The user clicks on the Login button on the main page which redirects them to input their Email and Password. 2) The user enters their Email. 3) The user enters their Password. 4) The user clicks the login button. 5) The system will search for the email in the accounts database. The email is case sensitive. 6) If the email is found, the system will check if the corresponding password saved in the accounts database matches the entered password. 7) If the password matches, the user is logged into the website. 8) The website redirects users to the home page.
Alternative Flows:	Failed password/email: If the user inputs an invalid password but a valid email 1) The website displays 'Incorrect password' 2) The website prompts the user to reenter the password again. If the user inputs an email that is not found in the database, 1) The website displays 'Incorrect Email'
Exceptions:	If the user types in the wrong password 3 times, the user will be redirected to the main page.
Includes:	-
Special Requirements:	-
Assumptions:	The user has an existing account on SwipeMyRoomie. The database has successfully stored the user's account details. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC003		
Use Case Name:	View and Update Profile		
Created By:	Bansal Arushi	Last Updated By:	Arushi
Date Created:	28 August 2021	Date Last Updated:	16 October 2021

Actor:	User, profile database, user_language database
Description:	Users will be able to view his/her profile including their name, gender, age, occupation, ethnicity, and preferred spoken language. Users will be able to update their profile.
Preconditions:	1) The user has an account on the website
Postconditions:	1) User can see their profile on one page and can scroll through the contents. 2) User can update their profile.
Priority:	High
Frequency of Use:	Whenever the user logs in, there is a high possibility of them viewing their profile. Hence, the frequency can range from daily to once a month. Updating profile will not be as regular.
Flow of Events:	1) The user clicks on the "profile" button on the navigation bar. 2) The system gathers the user's information from the profile database and the user_language database. 3) The user is redirected to another page. 4) The system then displays the user's profile information on one page. 5) The user can now view their profile by scrolling through this page. 6) When the user clicks the "update self profile" button, they can update their profile by updating information about their name, gender, age, occupation, ethnicity and preferred spoken language. 7) The user clicks on "update profile". 8) The system updates the information in the profile database and the user_language database.
Alternative Flows:	If the person has no information about themselves: The page will show a "NIL" at the name, gender, age, occupation, ethnicity and preferred spoken language output text fields.
Exceptions:	-
Includes:	-
Special Requirements:	-
Assumptions:	The user has an existing account on SwipeMyRoomie. The database has successfully stored the user's profile details. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC004		
Use Case Name:	Update Roommate Preference		
Created By:	Sankar Samiksha	Last Updated By:	Arushi
Date Created:	28 August 2021	Date Last Updated:	16 October 2021

Actor:	User, profile database, roommate_language database
Description:	Users will be able to update his/her roommate preference with regard to gender, age, occupation, ethnicity, and preferred spoken language.
Preconditions:	1) The user has an account on the website
Postconditions:	1) The user can set their roommate preference
Priority:	High
Frequency of Use:	The user may not frequently change their preferences for a roommate. Hence, it could be once every few months.
Flow of Events:	1) The user clicks their profile icon 2) The user clicks on the "update roommate preference" button. 3) The user can update the preference for their roommate with regards to gender, age, occupation, ethnicity and preferred spoken language. 4) The user clicks on "submit". 5) The preferences are updated into the profile database and roommate_language database. 6) This triggers UC005 automatically.
Alternative Flows:	If the person has no information about roommate preference. 1) The page will show a "NIL" at the name, gender, age, occupation, ethnicity and preferred spoken language output text fields.
Exceptions:	-
Includes:	UC005
Special Requirements:	-
Assumptions:	The user has an existing account on SwipeMyRoomie. The databases have successfully stored the user's roommate preference. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC005		
Use Case Name:	Roommate Recommendation		
Created By:	Sankar Samiksha	Last Updated By:	Poon Yan Xin Melise
Date Created:	6 September 2021	Date Last Updated:	16 October 2021

Actor:	Profile Database
Description:	User updating the roommate preference (UC004) would trigger this particular use case. In this use case, the system would match the user profile to other user profiles to give the user a recommended roommate.
Preconditions:	The User has gone through UC004 and updated their roommate preference.
Postconditions:	The user can now view their recommended roommates.
Priority:	High
Frequency of Use:	Daily recommendations will be given. Hence, UC005 is used daily.
Flow of Events:	1) Completion of UC004 will trigger the recommendation algorithm on the website. 2) Firstly, the system will filter users by gender preference. If there is no gender preference, the system moves on to the next step. 3) Secondly, the system will filter users by age preference within a range of +/- 5 years. If there is no age preference, the system moves on to the next step. 4) Thirdly, the system will filter users by occupational preference. If there is no occupational preference, the system moves on to the next step. 5) Then, the system will filter users by ethnicity. If there is no ethnicity preference, the system moves on to the next step. 6) Then, the system will filter users by language preferences. If there is no language preference move on to the next step. 7) The system will display the profiles of the filtered user on the roomie recommendation page.
Alternative Flows:	If roommate preferences have not been updated, The system will randomly pick users to display on the roommate recommendation page.
Exceptions:	-
Includes:	-
Special Requirements:	-
Assumptions:	The user has an existing account on SwipeMyRoomie. The database has successfully stored the user's roommate preference. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC006		
Use Case Name:	Select roommates		
Created By:	Anagha Ani	Last Updated By:	Poon Yan Xin Melise
Date Created:	28 August 2021	Date Last Updated:	16 October 2021

Actor:	User, Profile Database
Description:	The system will display the profiles of other users who best match their preferences on the home page. Users can then select which roommates they prefer.
Preconditions:	1) The user has logged into the system. 2) UC005 triggers successfully and can display users on the home page.
Postconditions:	1) The system displays the profiles of other users who best match the user's preferences. 2) The user performing the search can click on the profiles and thereafter through UC007 and UC008 contact the other users to find rental units that fit both of their preferences.
Priority:	High
Frequency of Use:	Daily. Users would use this function daily until they have managed to search for an appropriate roommate for themselves.
Flow of Events:	1) Completion of UC005 would display the profiles of the filtered users on the home page. 2) The user can click on the right arrow to view the profile of the next recommended user. 3) The user can click on the left arrow to view the profiles of the previous recommended user. 4) The user can also click on the blue "skip" button. 5) The system removes that filtered user from the user's recommendation page. 6) The user can click on the blue "chat" button to launch the Messages panel (UC007) if they wish to chat with other users.
Alternative Flows:	-
Exceptions:	-
Includes:	UC007
Assumptions:	The user has an existing account on SwipeMyRoomie. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC007		
Use Case Name:	Tenant chat		
Created By:	Poon Yan Xin Melise	Last Updated By:	Poon Yan Xin Melise
Date Created:	23 August 2021	Date Last Updated:	16 October 2021

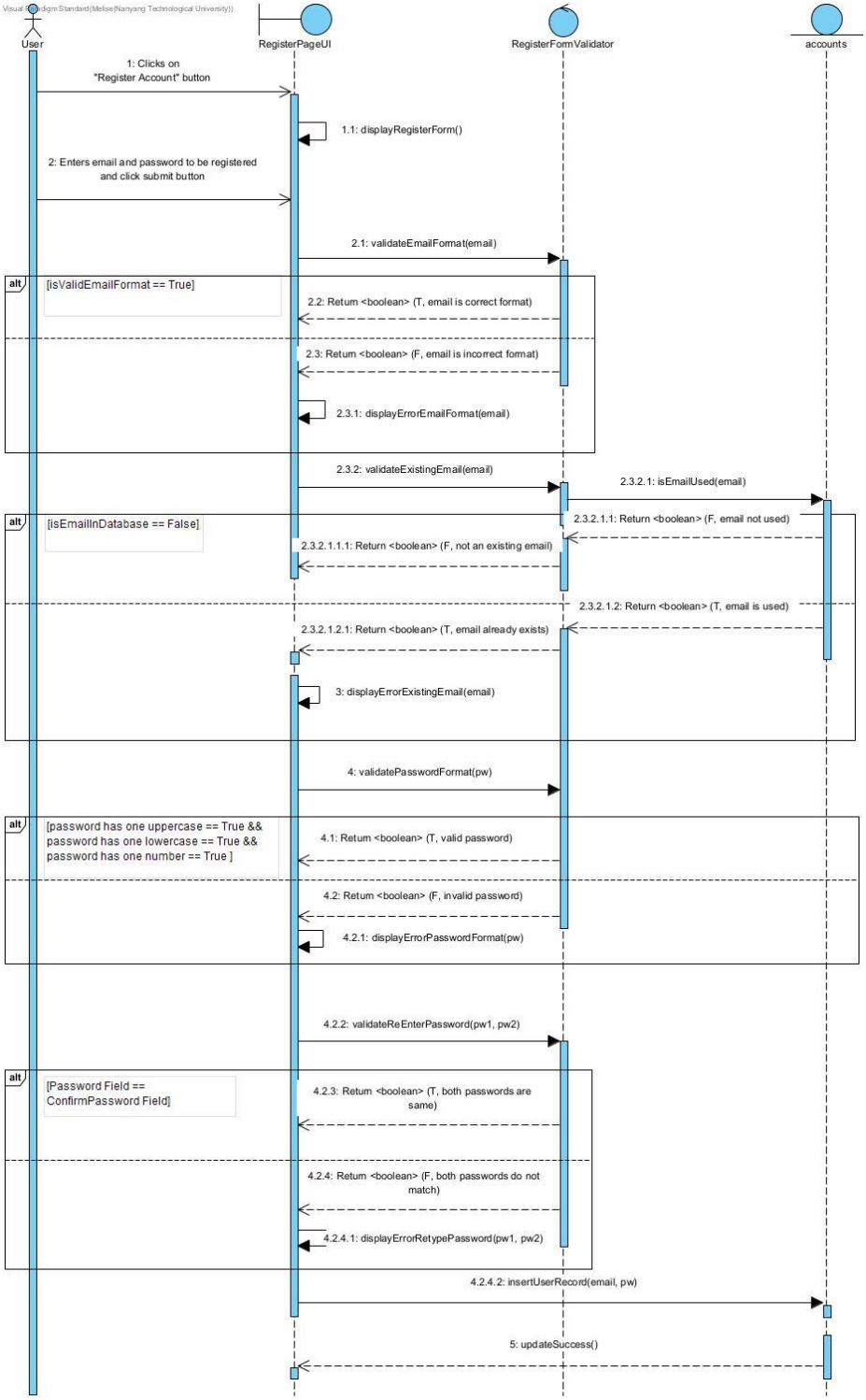
Actor:	User, Chat Database.
Description:	The User would be able to send and receive messages with another user on the website.
Preconditions:	1) The system database stores the data of existing chats. 2) The user has clicked on the "chat" button from UC006.
Postconditions:	Users can exchange messages with other users to discuss personal preferences about being roommates.
Priority:	High
Frequency of Use:	From daily to weekly. This depends on the frequency of messages sent between the users.
Flow of Events:	1) The User clicks on the blue "chat" button from UC006. 2) The system launches a new chat with that filtered user on the panel at the left. 3) The user types in a message. 4) The user clicks on the send button. 5) System displays the message on the receiver's profile as a new message. 6) The receiver can now choose to respond, the flow of events is repeated. 7) Upon confirmation from both parties to be roommates, both users can click on the red "Confirm Stay" button to confirm the pairing. 8) The system displays a notification on both users' profiles for a successful match. 9) This triggers UC008 automatically.
Alternative Flows:	From the main page, 1) Users can click on the "chat" button 2) Users can click an existing chat. 3) Continue from Step 3 in the main flow.
Exceptions:	-
Includes:	UC008
Assumptions:	The user has an existing account on SwipeMyRoomie. The server is working and there are no bugs in the system.
Notes and Issues:	-

Use Case ID:	UC008		
Use Case Name:	Search for house in preferred area		
Created By:	Sankar Samiksha	Last Updated By:	Poon Yan Xin Melise
Date Created:	23 August 2021	Date Last Updated:	30 October 2021

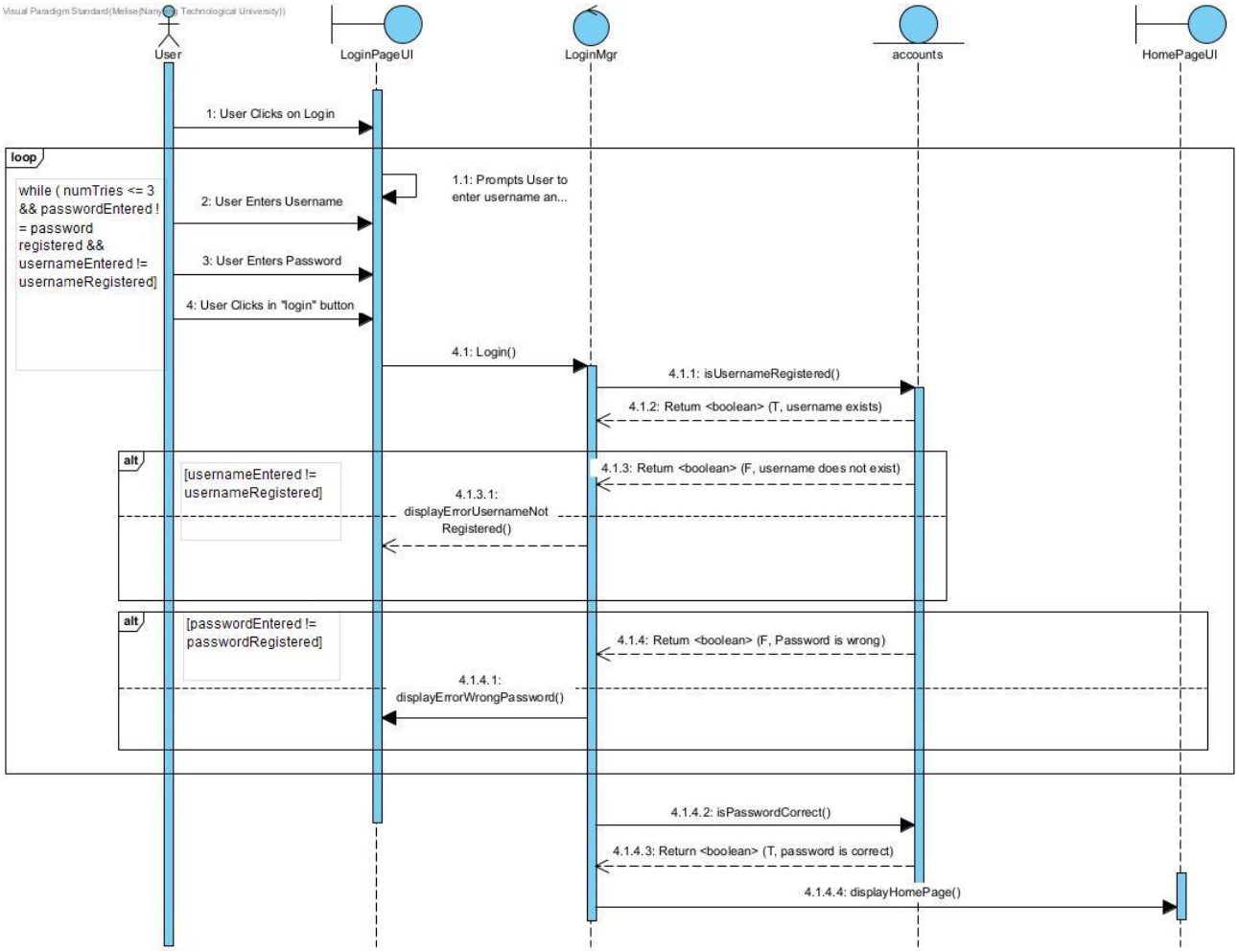
Actor:	User, API database
Description:	Searches for houses in the search area.
Preconditions:	The user has matched with a roommate in UC007.
Postconditions:	1) The houses within the area are shown. 2) The nearest facilities within the area are shown.
Priority:	High
Frequency of Use:	Daily while the user is using the website.
Flow of Events:	1) The user inputs their desired area (e.g., Punggol/Sengkang). 2) The system searches the API database to find all the houses that are available in the area. 3) The system searches the database for more information on the house. 4) The system prints the list of houses found in ascending order based on house ID. 5) The system prints the exact address of the house. 6) The system prints the Max floors of the building. 7) The system prints the availability of Market/Hawker nearby. 8) The system prints the availability of Multistorey Carpark nearby. 9) The system prints the completion year of the house.
Alternative Flows:	If the user inputs an invalid area, 1) The system displays an error message. 2) The system returns to ask the user for another area. If the user inputs an area with no houses available in the vicinity, 1) The system displays a “no houses available” message.
Exceptions:	-
Includes:	-
Assumptions:	The user has an existing account on SwipeMyRoomie. The server is working and there are no bugs in the system. Since the API for the house database is sourced externally, it is assumed that at the time of implementation the API is available.
Notes and Issues:	-

2.4 Sequence Diagram

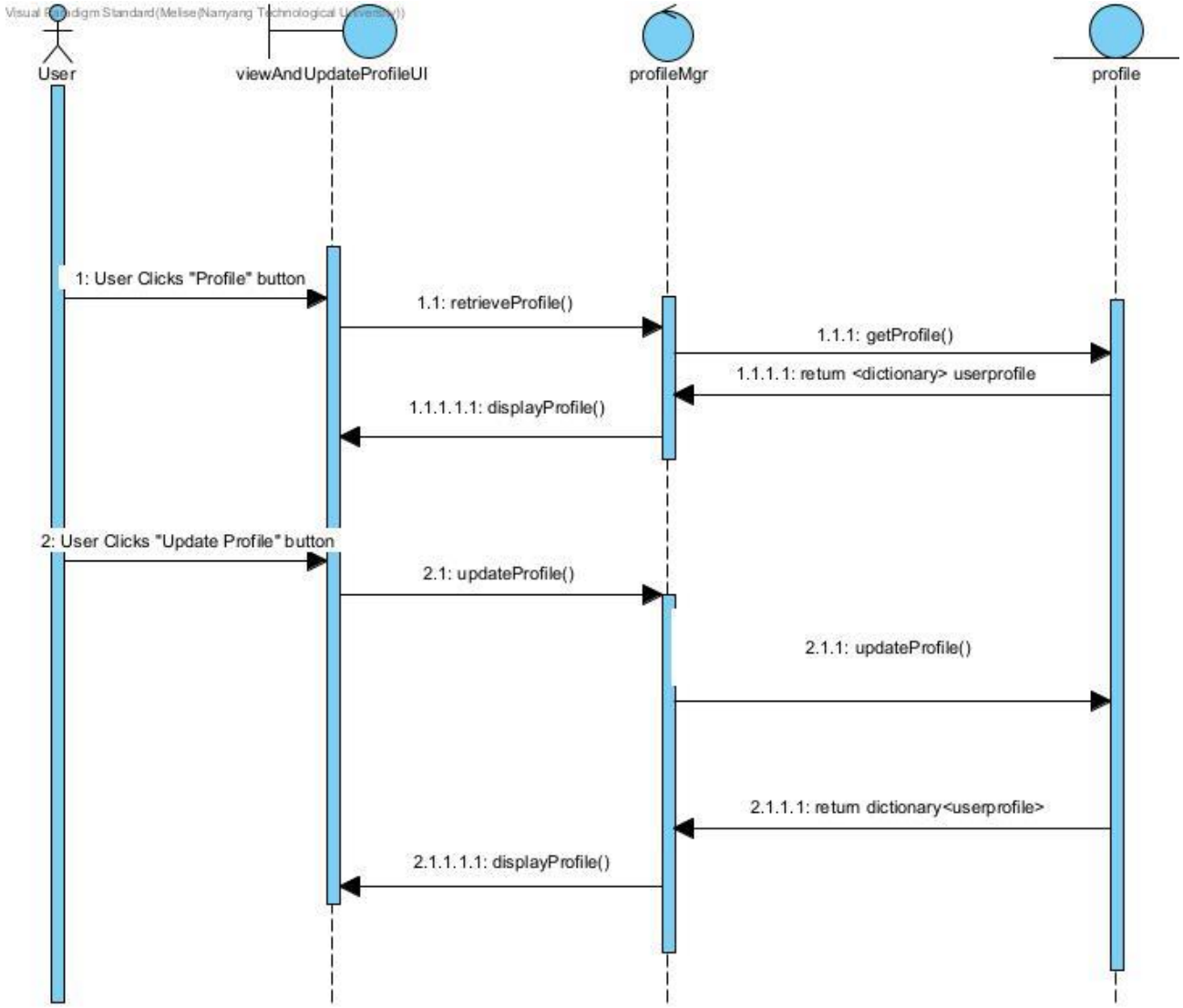
2.4.1 User Case 1



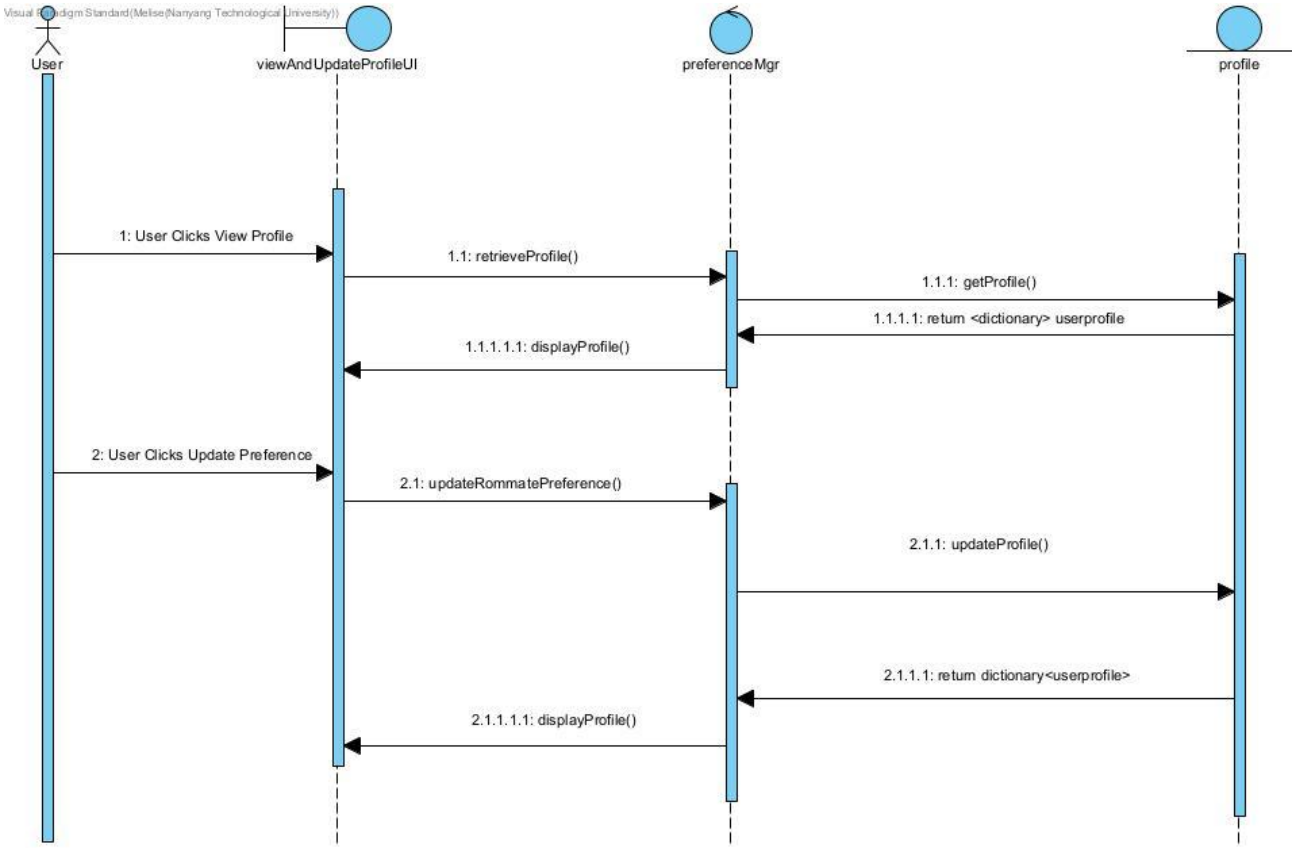
2.4.2 User Case 2



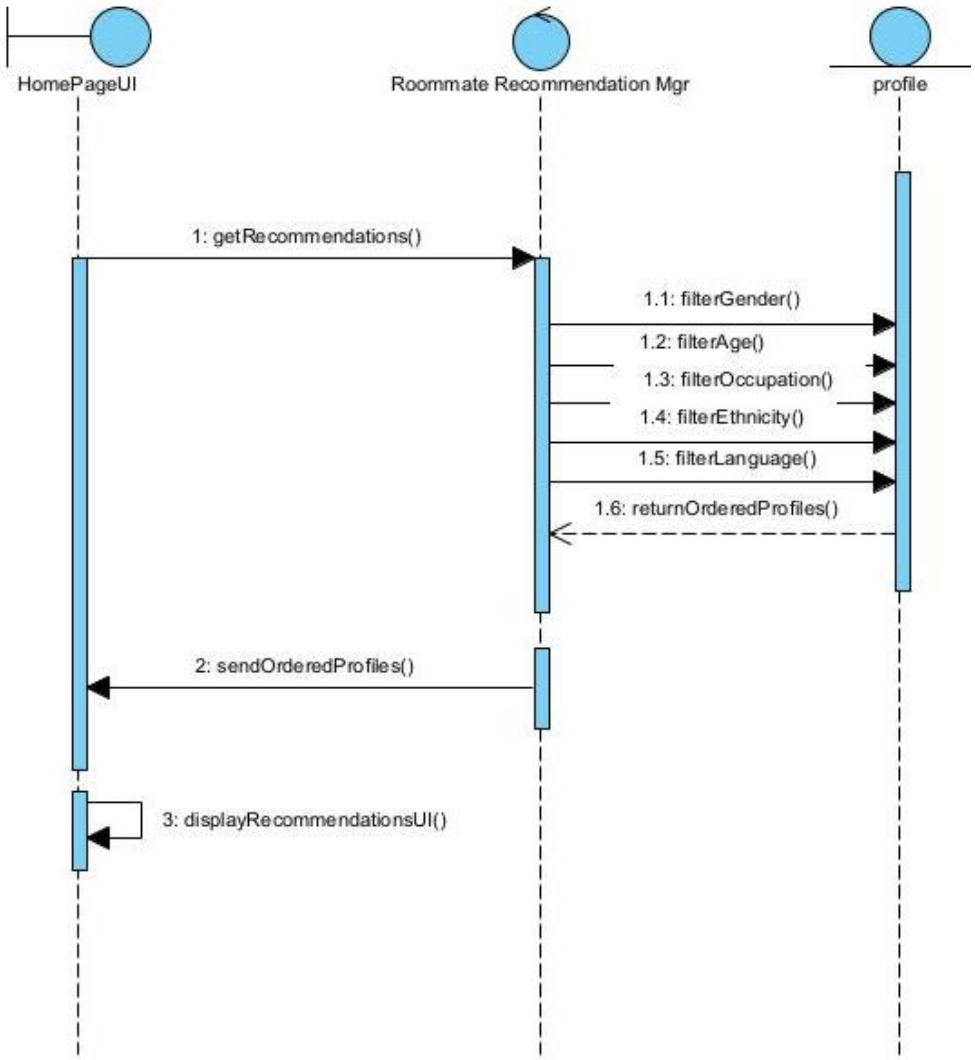
2.4.3 User Case 3



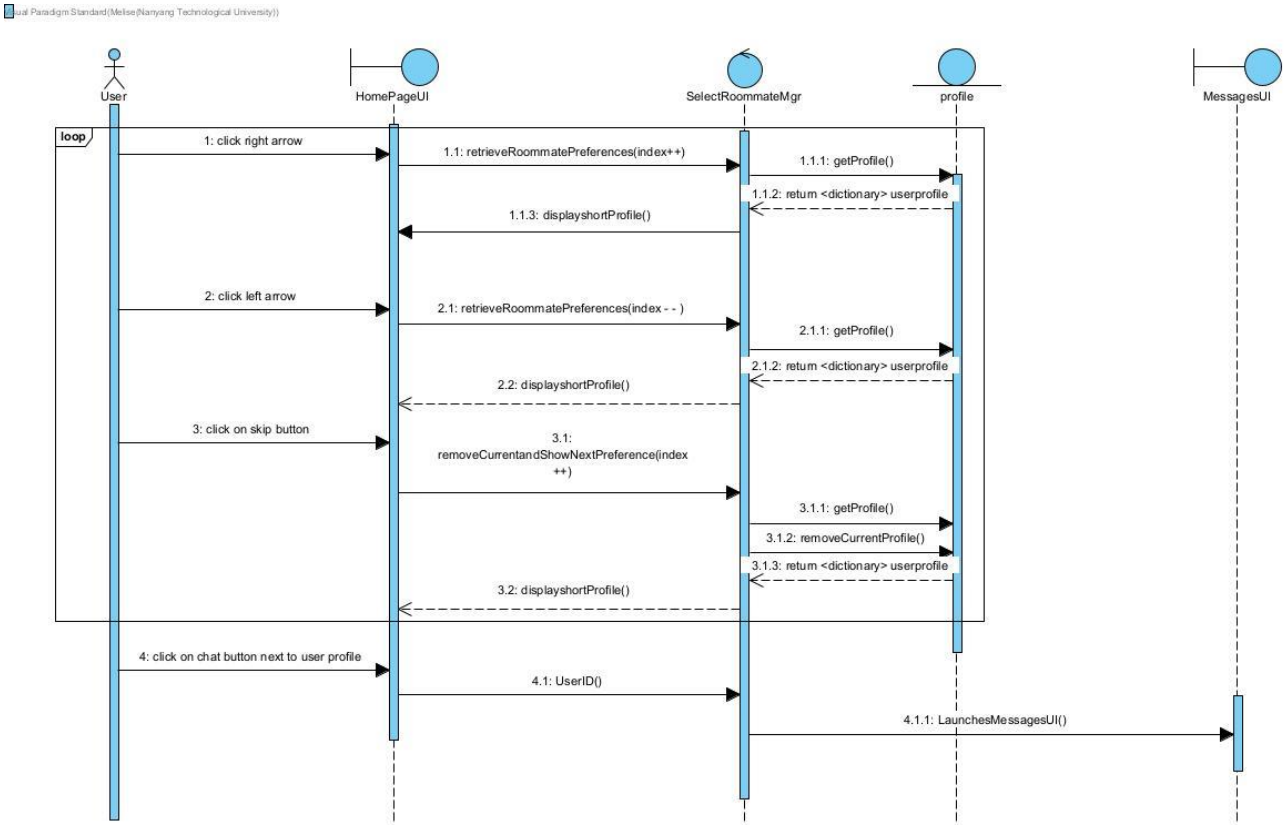
2.4.4 User Case 4



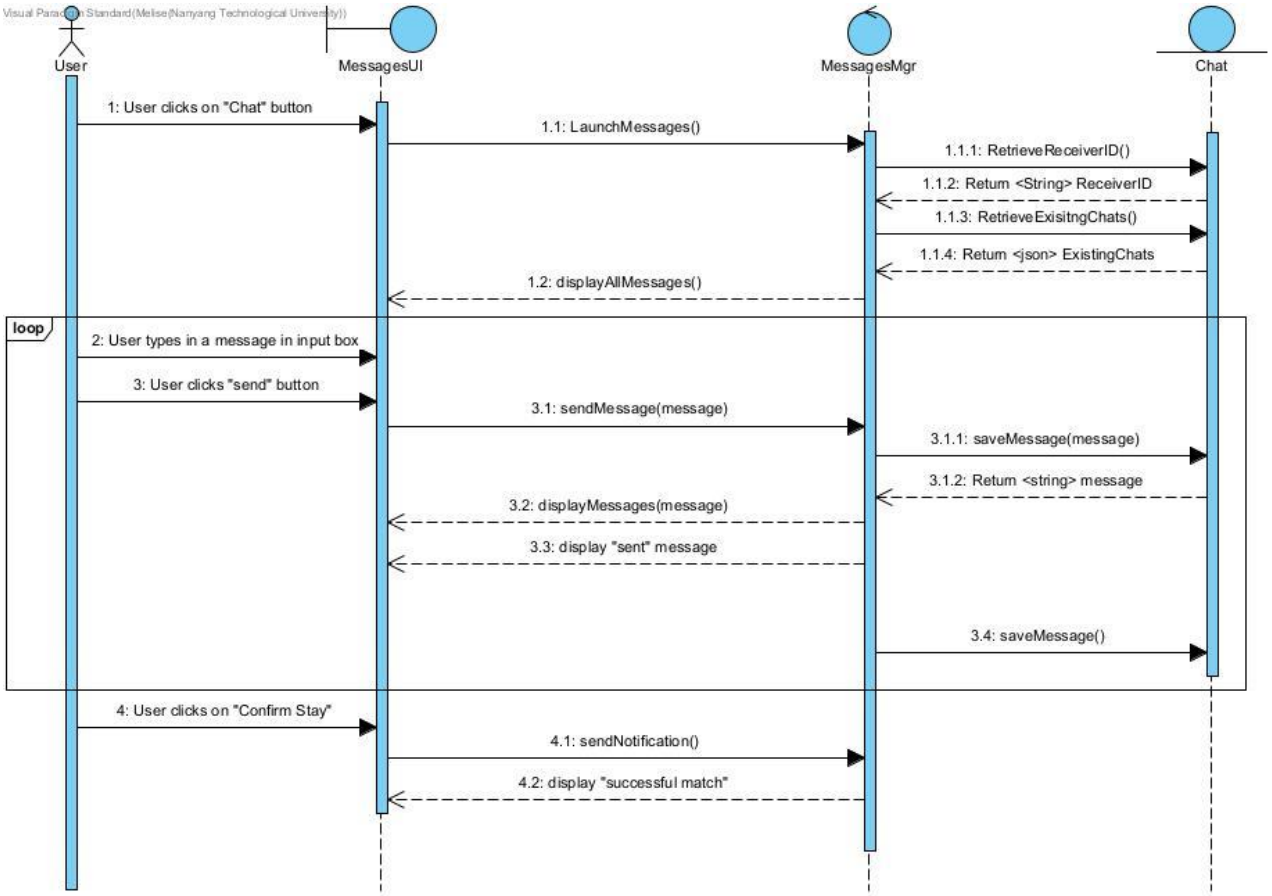
2.4.5 User Case 5



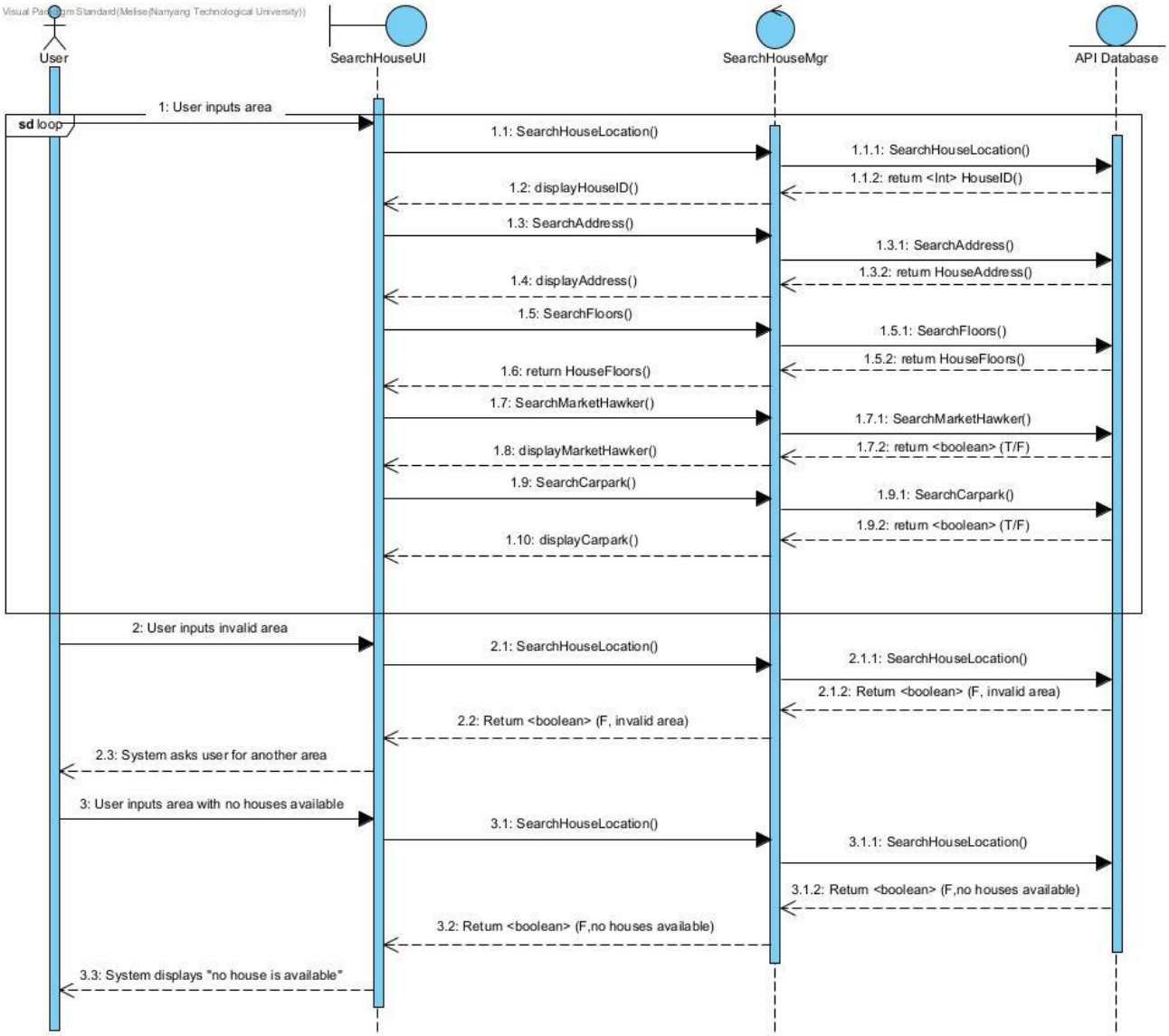
2.4.6 User Case 6



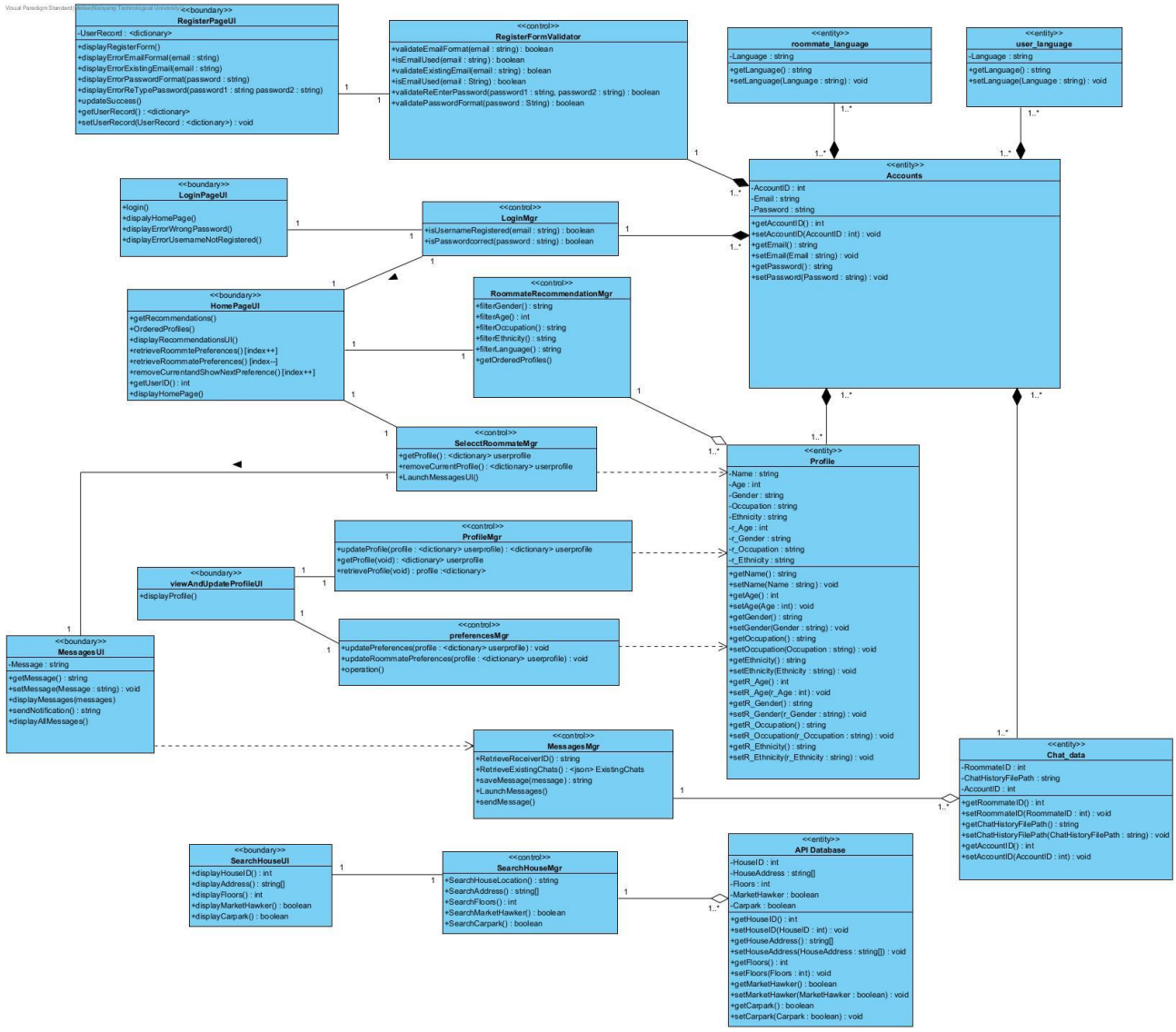
2.4.7 User Case 7



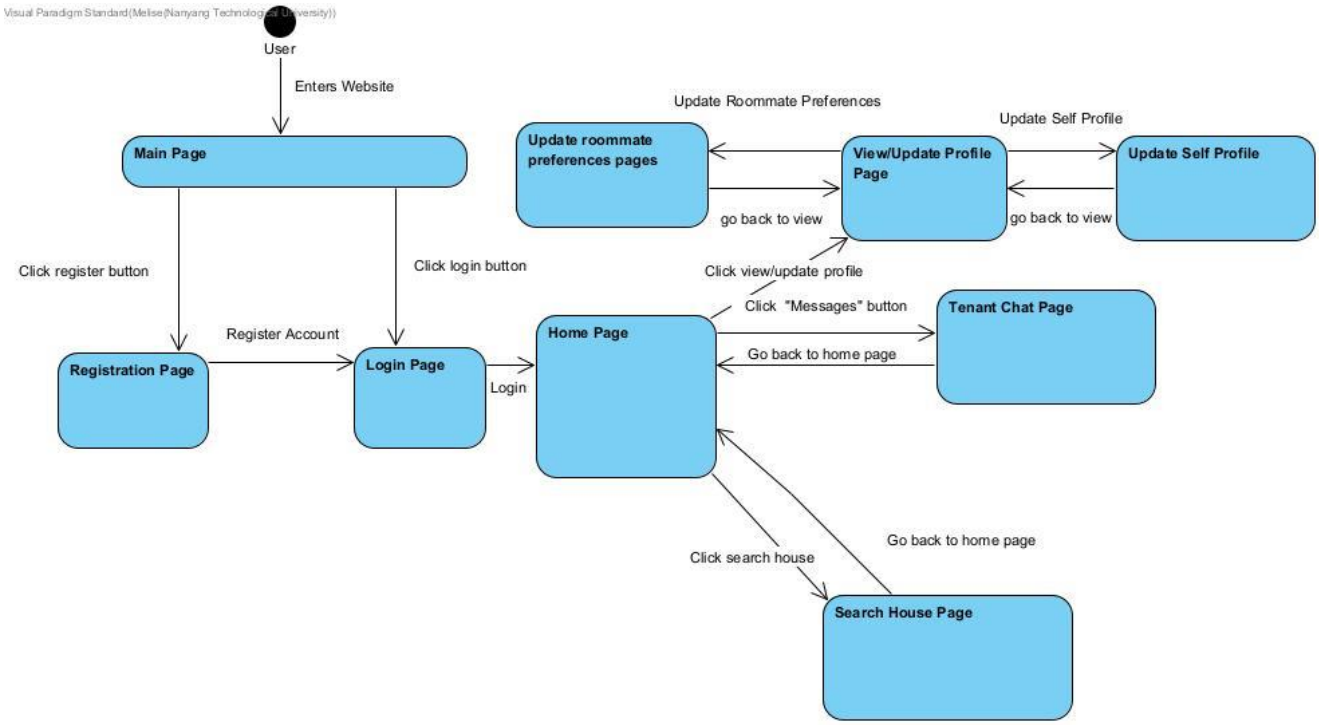
2.4.8 Use Case 8



2.5 Class Diagram



2.6 Initial Dialog Map



2.7 Operating Environment

This product is a dynamic website and will be able to work on any operating system (Linux, Unix, Windows).

2.8 Design and Implementation Constraints

There are some implementation constraints we would have to consider.

Firstly, SwipeMyRoomie relies on government API on data.gov.sg to search for available houses in Singapore. However, in the case where the API is taken down by the government, SwipeMyRoomie would not be able to be implemented. In the long run, further discussions with the government have to be done for SwipeMyRoomie to access the API.

Secondly, the API would have to be constantly updated to ensure that the houses stay relevant to the current houses in Singapore.

These are the specific technologies to be used for the website to run on localhost.

- Flask backend
- MySQL database

The language requirement for SwipeMyRoomie would be English as it is the main language of Singapore. Other languages can be implemented in due time when SwipeMyRoomie is introduced in other countries.

After the product is delivered to the buyer, the customer's organization will be responsible for maintaining the delivered software.

2.9 User Documentation

A video tutorial would be delivered along with the software when it is launched. This video serves as a step-by-step guide for the user to register, login, update their profile and preferences and chat with other tenants of SwipeMyRoomie.

The video can be found here: https://github.com/S-Samiksha/CX2006_Coding/blob/main/Documentation%20and%20Video/Video/Live%20Demo%20Video.MOV

More information about SwipeMyRoomie can be accessed on the "About" page on the website itself.

If the initial product release is successful, a ChatBot can be implemented on the website to assist users.

Furthermore, a user rating system can be implemented for users to provide feedback regarding the website.

2.10 Assumptions and Dependencies

Users should have a device with access to the internet capable of accessing the website.

The user's web browser should support HTML, CSS, JavaScript.

As data.gov.sg do not provide the postal code of the houses, this results in limited search capacity as users would not be able to search for houses based on postal code.

3. External Interface Requirements

3.1 User Interfaces

In this section, the UI mockup will be explained in detail.

Figure 1: The main page

On the home page, two buttons are provided – “REGISTER” and “LOG IN”. These two buttons will be used by new users (those without an account) and those with an existing account respectively. There will also be a navigation bar to allow users to surf the website with ease.

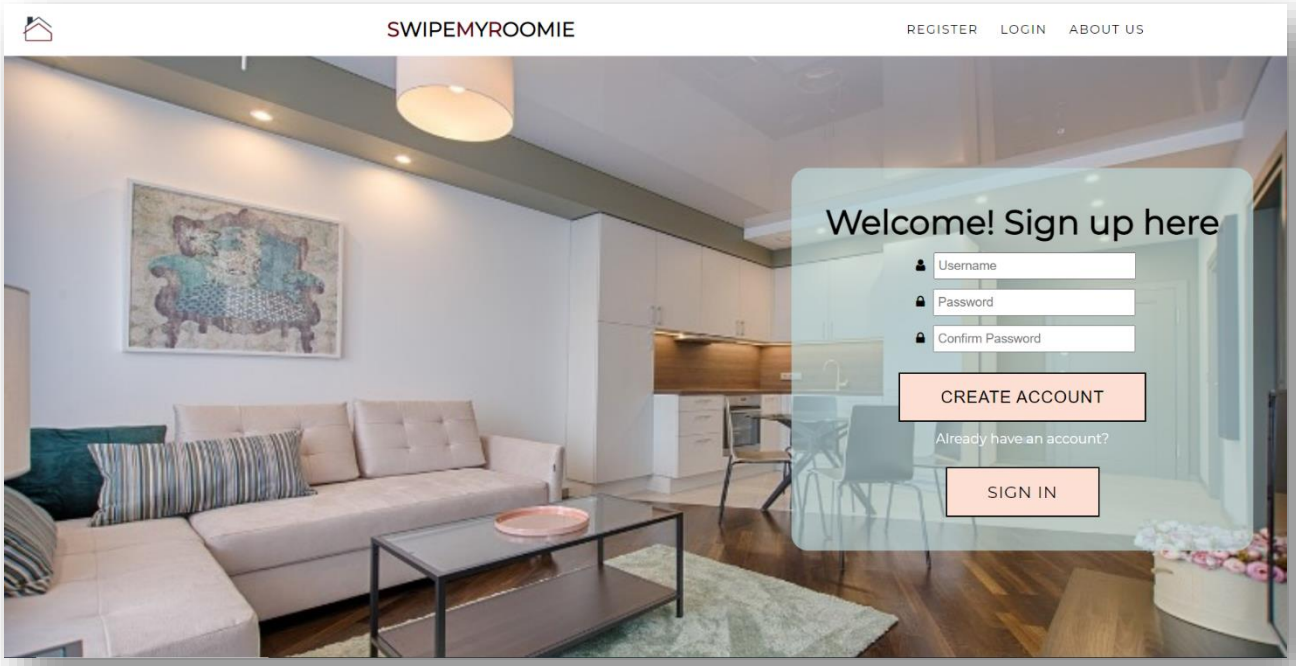


Figure 2: Registration page for new users

On the registration page, the new user can input an email and create a password. On this page, a "sign in" button is also provided should users want to be redirected to the login page. Else, after the new user input their email and password, they can click on "Create Account" which would redirect them to the update profile page (Figure 6).

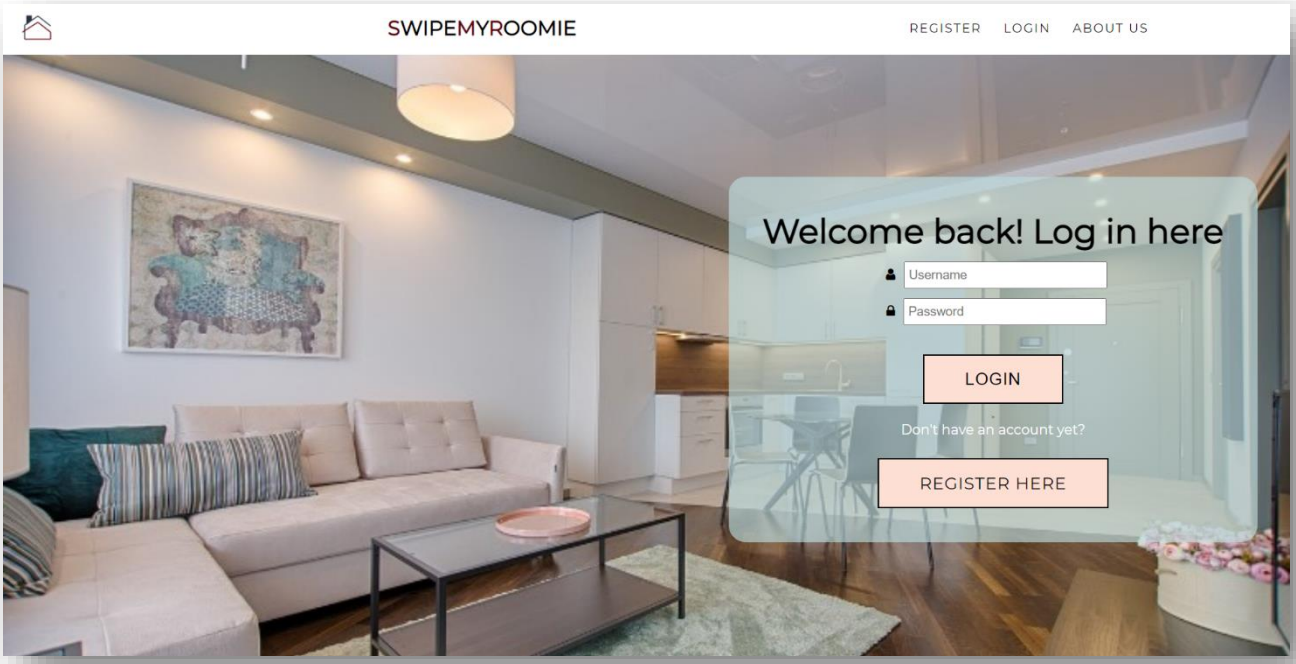


Figure 3: The login page

On this login page, the user can input their email and password to login into their account upon clicking “Login”.

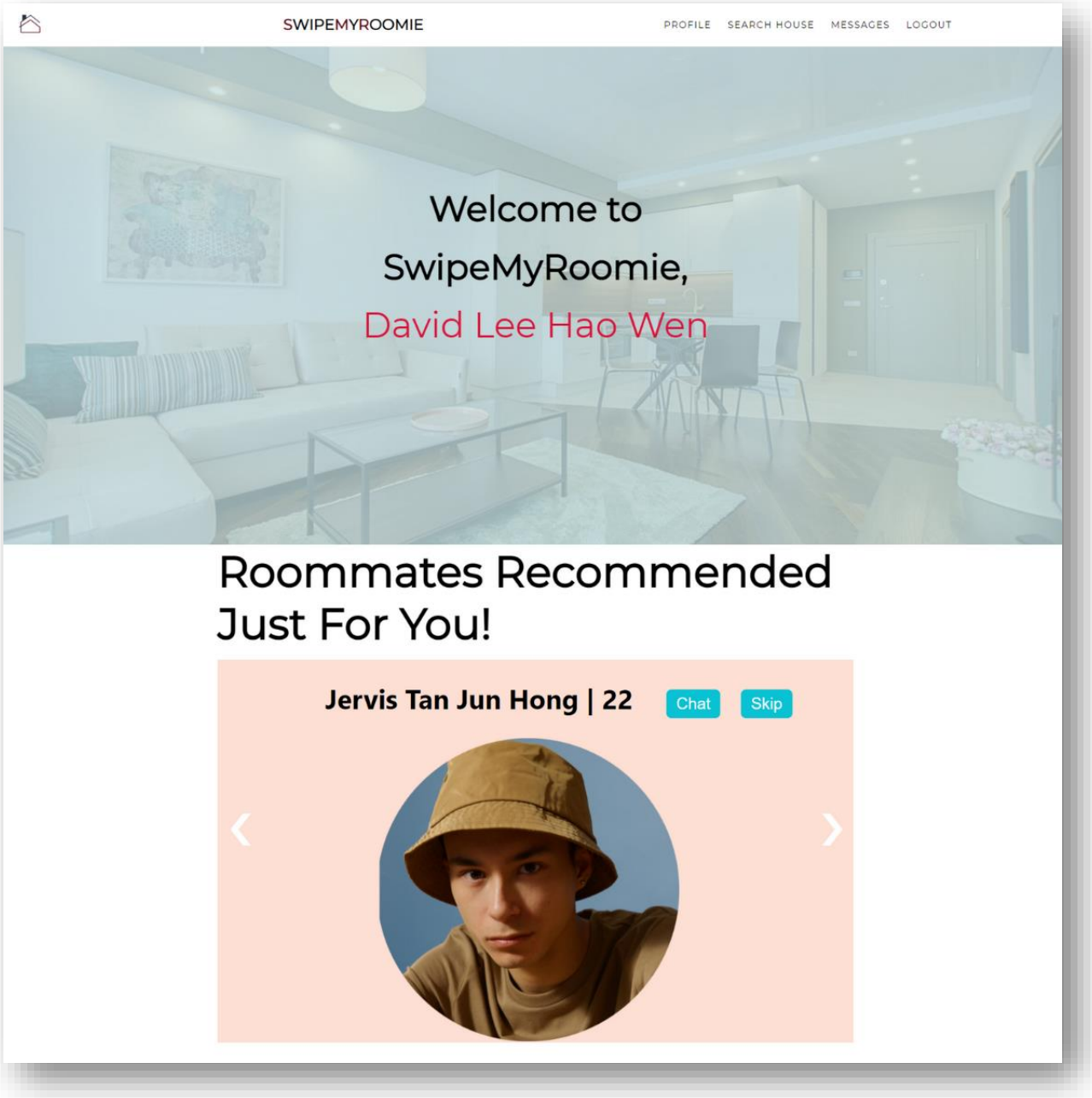


Figure 4: The home page

A personalized welcome message is generated.
Users can also find their recommended roommates directly on the home page when they scroll down.

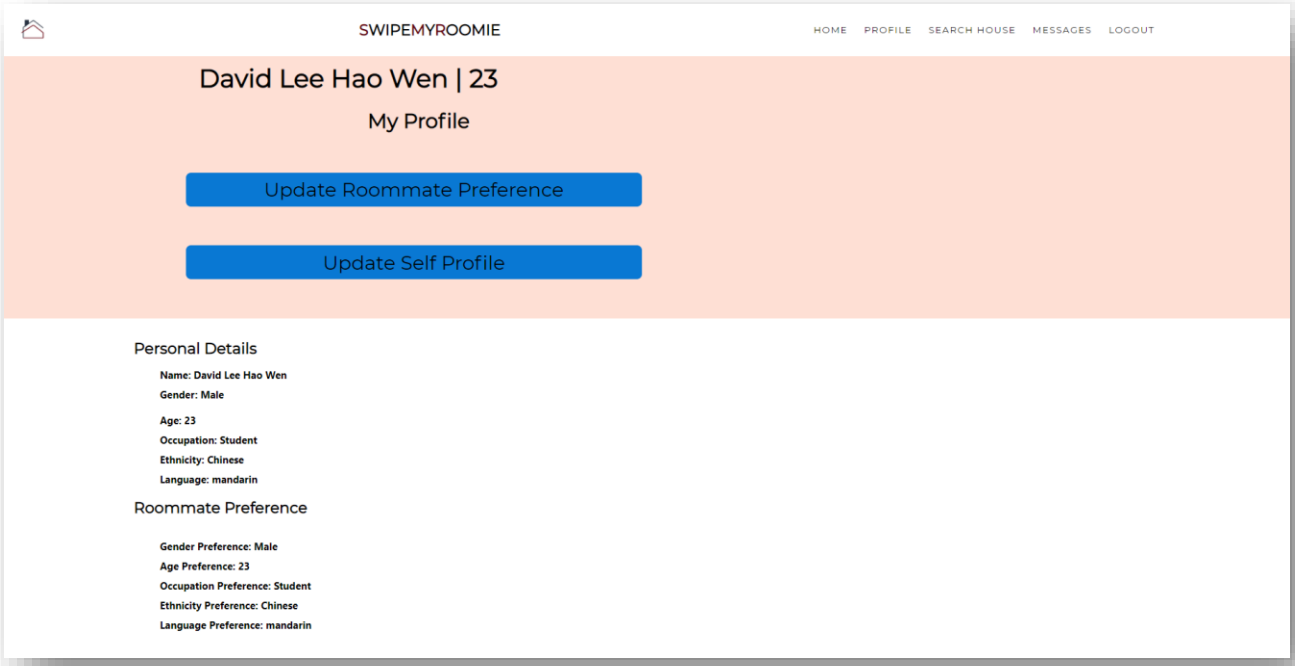


Figure 5: The profile page

Users can view further details about their profile and their preferred roommate preferences. The user can click on “Update Roommate Preference” which brings them to Figure 7 to update their roommate’s preferences. The user can also click on “Update Self Profile” which brings them to Figure 6 to update their profile.

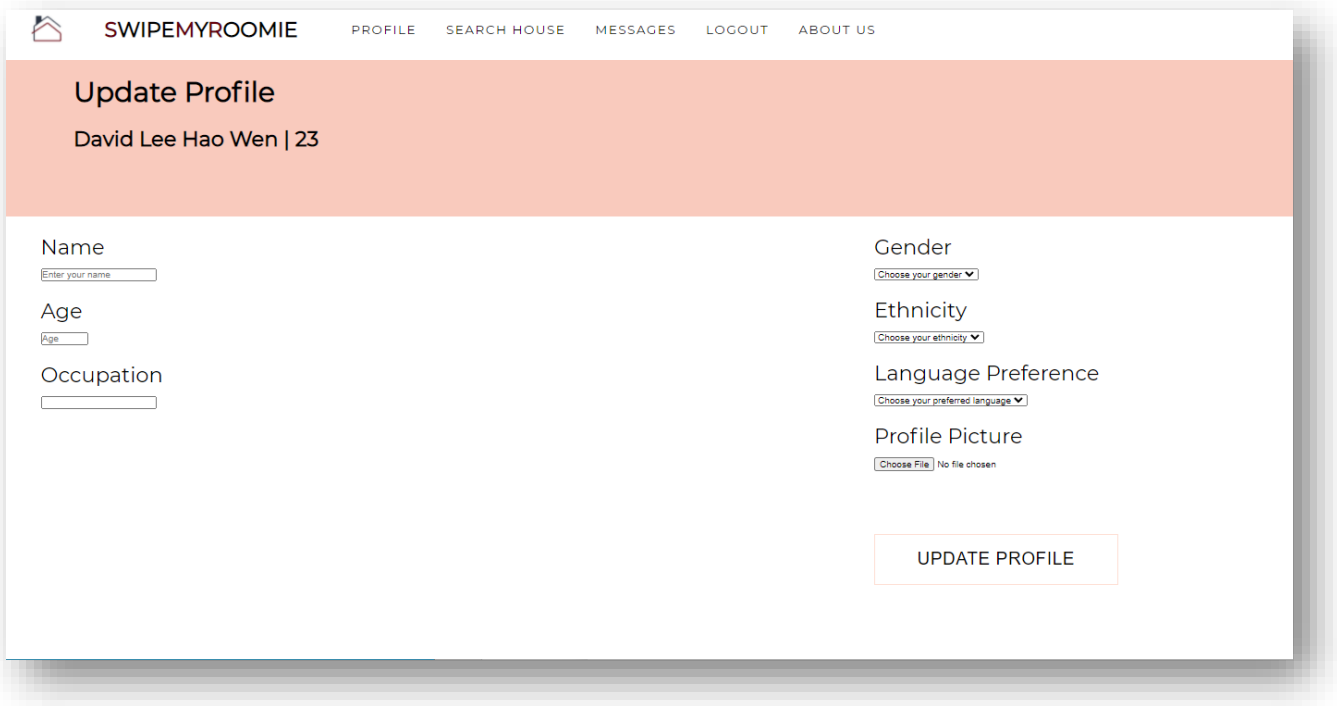


Figure 6: Updating Profile

The above page allows users to update their profiles.
The user can input their Name, Age, Occupation.
The user can also input their Gender, Ethnicity and Language preference and upload a Profile Picture.
The user can then click on “Update Profile” to save the changes made.

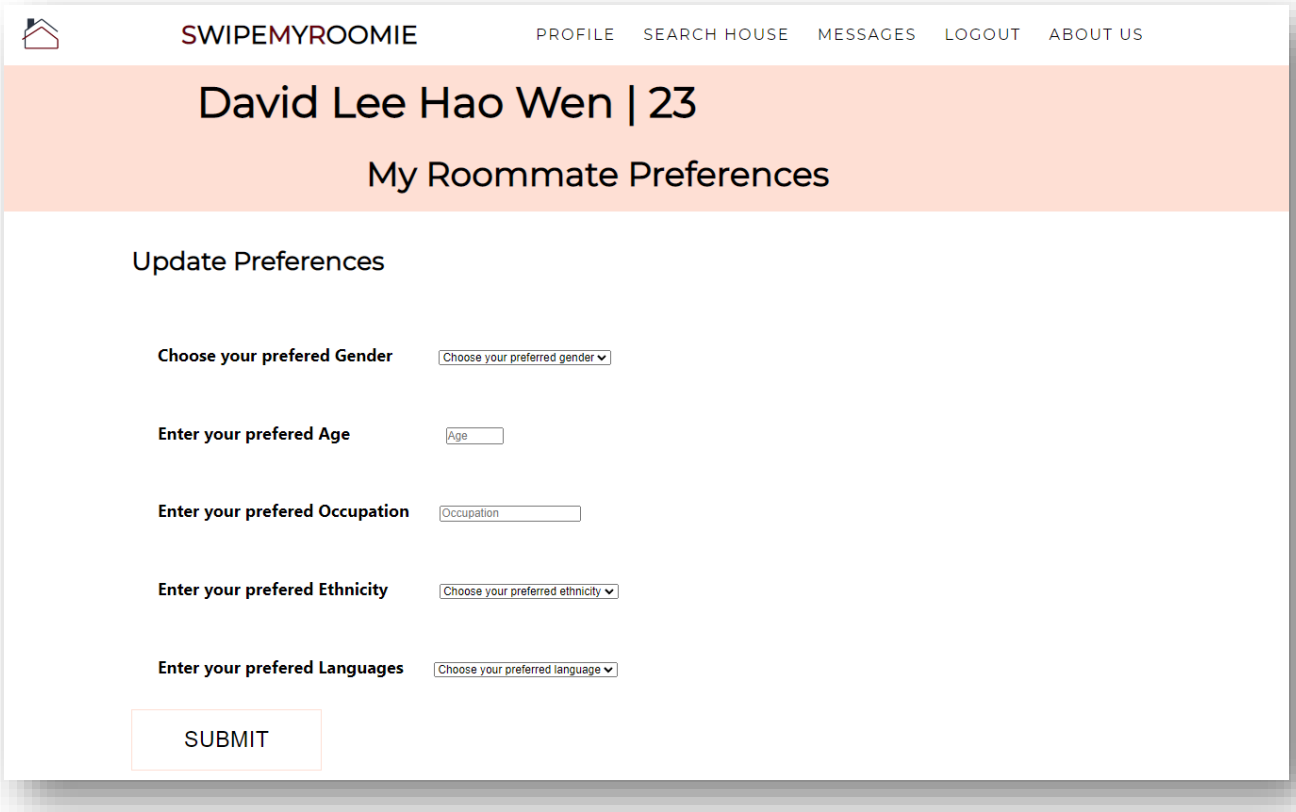


Figure 7: Updating roommate preference

The user can update their preferred roommate preference based on Gender, Age, Occupation, Ethnicity and Language.
They can click on “submit” when they are done with the inputs.

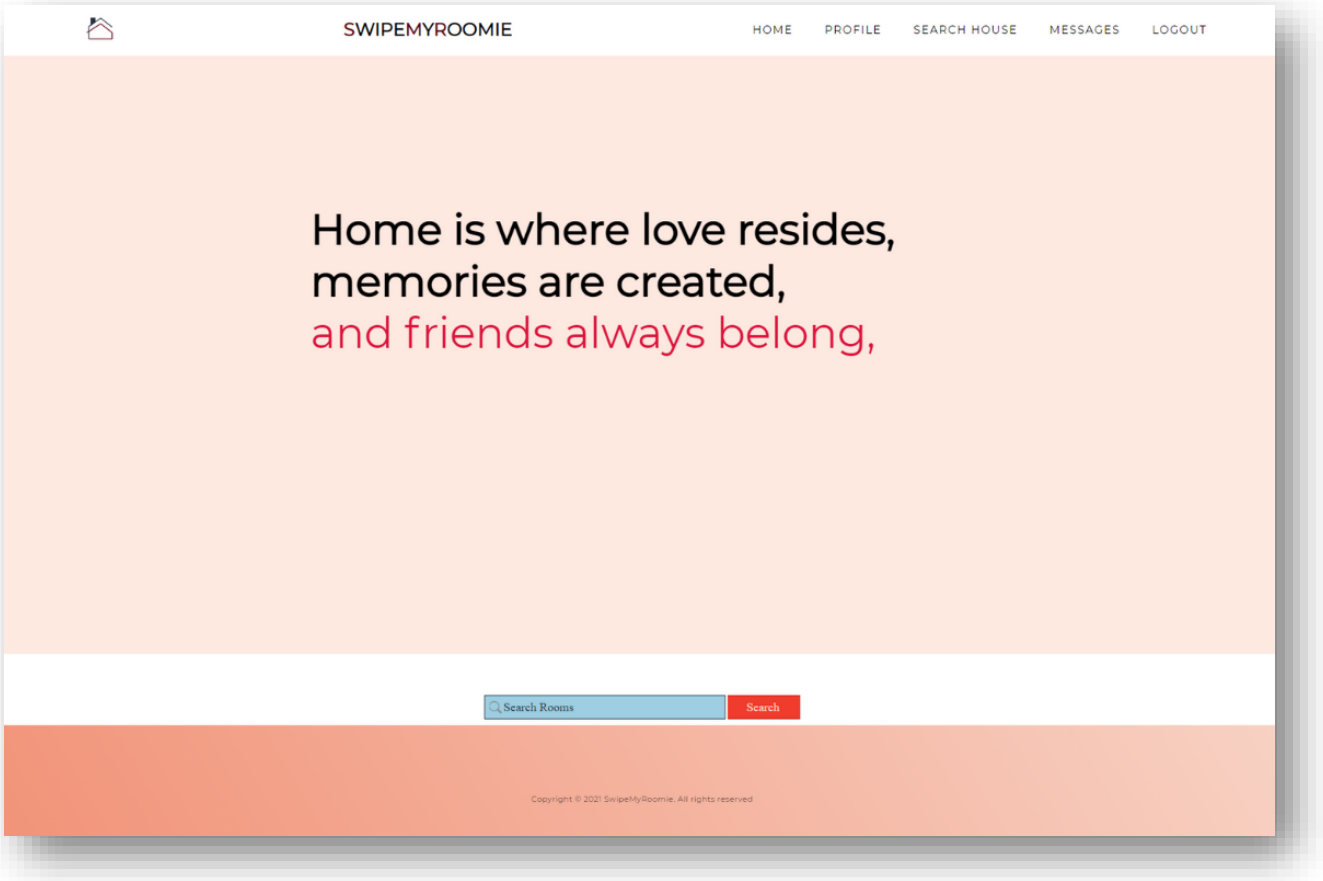


Figure 8: Search for houses

After the creation of accounts and finding their preferred roommate, the user and his roommate can search rooms based on the area they prefer on the blue search bar below.

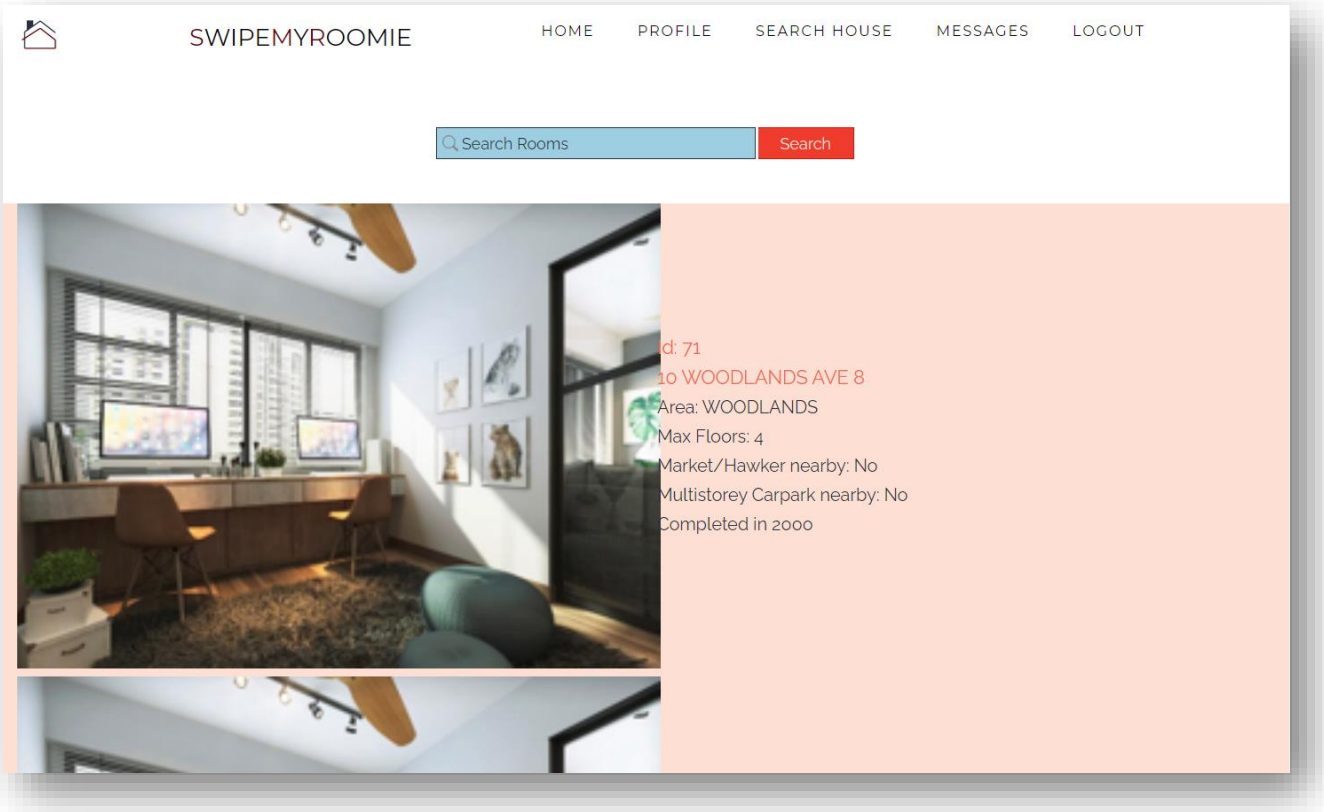


Figure 9: Search Results

If the user searches Woodlands, for example, all the houses and their rental rates will be displayed on the screen.

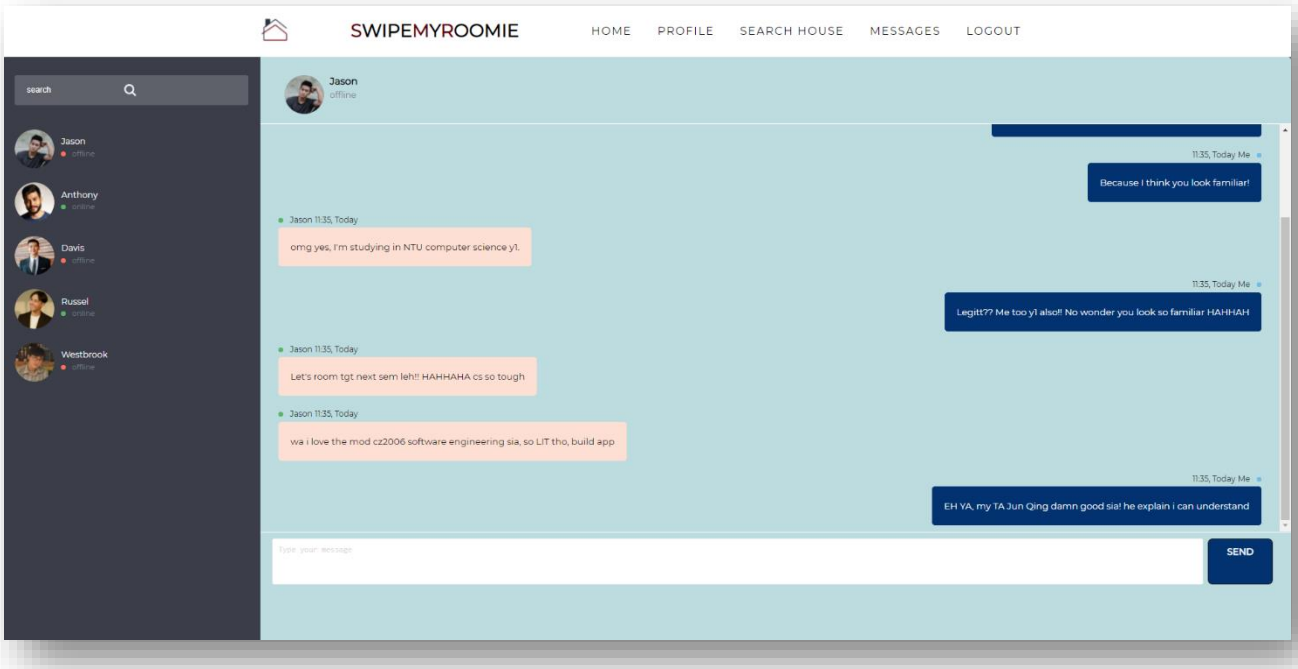


Figure 10: The chat feature

On this page, the user can chat with other users of similar preferences. They can type their message in the white box provided and click on “send” to send the message to the tenant they are messaging with.

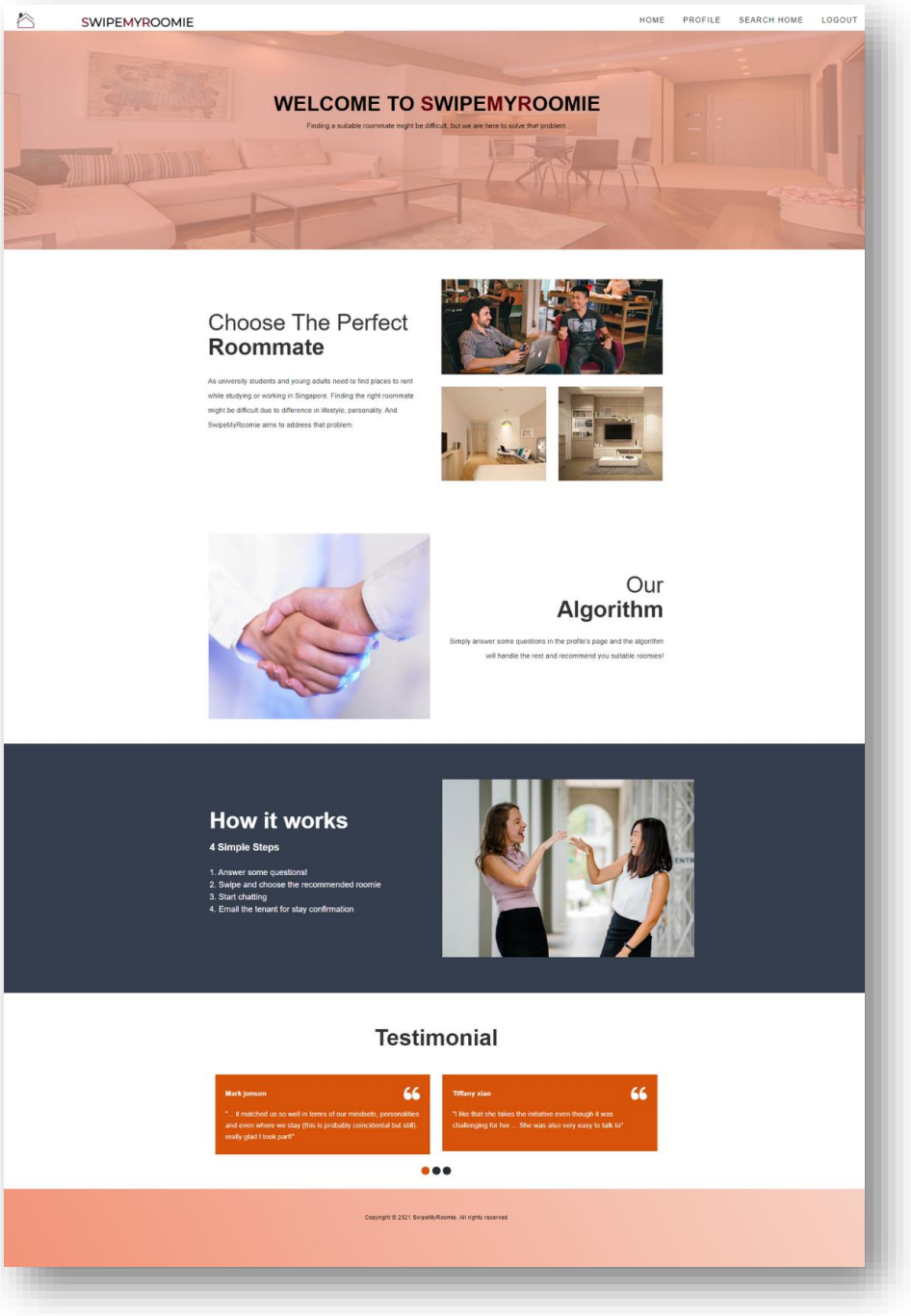


Figure 11: The about page

This page consists of the descriptions of SwipeMyRoomie, with details about how SwipeMyRoomie works, the algorithms used and also some testimonials for past and current users.

Implementation:

From the UI mockup, the working product will be built using the following software and programming languages (subjected to changes and will be adjusted according to the needs of the product and the user):

- Front end: HTML5, CSS3, JavaScript
- Back-end: MySQL Workbench, Python Flask

3.2 Hardware Interfaces

- Windows OS
- A browser that supports HTML, CSS, JavaScript

3.3 Software Interfaces

The software needed and their respective versions

- SQL Server==8.0.26
- MySql community server==GPL
- pip==21.2.4
- python == 3.9.5
- pandas==1.3.4
- Flask==2.0.2
- Flask-Login==0.5.0
- Flask-MySQLdb==0.2.0
- Jinja2==3.0.3
- virtualenv==20.8.1
- Werkzeug==2.0.2
- wheel==0.37.0
- mysqlclient==2.0.3
- requests==2.26.0
- mysql-connector-python==8.0.26

3.4 Communications Interfaces

SwipeMyRoomie will be accessed on the web browser. All functional features will be accessible through the running website.

4. System Features

4.1 Register for Account

4.1.1 Description and Priority

Using this feature, the user should be able to create a new account with a password and an email address which is also used as a login ID. This feature is of high priority as, without it, the user is unable to access any other feature of the website.

4.1.2 Stimulus/Response Sequences

1) The user enters an email and password.
2) The system checks with the accounts database if there is an existing email address being used.
3) The system then checks if the password fulfils minimal criteria of having at least one upper case character, lower case character and a number.
4) The user then re-enters their desired password into the “Confirm Password”
5) The user then re-enters their desired password into the “Confirm Password” input box.
6) The user clicks the “CREATE ACCOUNT” button.
7) The system confirms whether the password in the password and confirm password input box is the same (case sensitive). If it is, continue to the next step.
8) The system adds new user records to the accounts database
9) The website prompts the success message “Account Registered”.
10) The website redirects users to the home page

4.1.3 Functional Requirements

REQ-1: The system must be able to check if the password fulfils the pre-defined criteria
REQ-2: The system must be able to save the registered email ID and password, and it must have the ability to retrieve the information later.
REQ-3: The system must be able to send out a success message
REQ-4: The system must be able to alert the user if any part of the sequence is incorrect, with an appropriate message
REQ-5: The system must be able to redirect the user to the home page after successful completion.

4.2 Login to profile

4.2.1 Description and priority

The user must be able to successfully login to the website with their pre-existing account, once it is created. This feature is of high priority as the other features are inaccessible until the user is successfully logged in.

4.2.2 Stimulus/Response Sequences

1) The user clicks on Log In button on the main page which redirects them to input their Username and Password.
2) The user enters their Username
3) The user enters their Password.
4) The user clicks the log in button.
5) The system will search the username in the database. The username is case sensitive.
6) If the username is found, the system will check if the corresponding password saved in the database matches the entered password.
7) If the password matches, the user is logged into the website.
8) The website redirects users to the home page

4.2.3 Functional Requirements

REQ-1: The system must be able to alert the user appropriately if the account that they attempted to login with does not exist
REQ-2: The system must be able to alert the user if the password is not correct
REQ-3: The system must be able to recognise when the user ID and password exist, and correctly matches the database, it must then login to the website successfully.

4.3 View and Update Profile

4.3.1 Description and Priority

Users must be able to view his/her profile including their name, gender, age, occupation, ethnicity, and preferred spoken language. Additionally, the user must be able to update their profile information. This feature is of high priority.

4.3.2 Stimulus/Response Sequences

1) The user clicks their profile icon.
2) The system gathers the user's information from the database.
3) The user is redirected to another page.
4) The system then displays the user's information on one page for the user to scroll through.
5) The user can now view their profile by scrolling through the page.
6) When the user clicks the update button, they can update their name, gender, age, occupation, ethnicity and preferred spoken language.
7) The user can click on "update profile".
8) The system updates the database.

4.3.3 Functional Requirements

REQ-1: The system must be able to retrieve and display user information according to the profile being accessed
REQ-2: The system must be able to allow edits to the profile information, which can then be saved and retrieved when next accessed.

4.4 Find Roommates

4.4.1 Description and Priority

The system should be able to match user profiles to other user profiles to give each user a list of recommended roommates. They should be matched according to the roommate preferences on their page and the user information on other users' pages. This feature is of high priority.

4.4.2 Stimulus/Response Sequences

1) The user fills in their information and saves it
2) The system finds profiles that match the criteria corresponding to the user's roommate preferences
3) The system displays these profiles
4) The user can then click through them and pick their preferred roommates

4.4.3 Functional Requirements

REQ-1: The system should be able to identify users which match the roommate preferences on each profile
REQ-2: The system should be able to display the most relevant users, and must provide an easy interface for users to identify potential roommates and contact them

4.5 Search for Apartment

4.5.1 Description and Priority

Users should be able to search for apartments by location. The system must output the available units of the location searched for by the user. This feature is of high priority.

4.5.2 Stimulus/Response Sequences

1) The user inputs their desired area (e.g., Punggol/Sengkang).
2) The system searches the API database to find all the houses that are available in the area.
3) The system searches the database for more information on the house.
4) The system prints the list of houses found in ascending order based on house ID.
5) The system prints the exact address of the house.
6) The system prints the Max floors of the building.
7) The system prints the availability of Market/Hawker nearby.
8) The system prints the availability of Multistorey Carpark nearby.
9) The system prints the completion year of the house.

4.5.3 Functional Requirements

REQ-1: The system must be able to reference the existing database of available units according to the location input by the user and find the appropriate units.
REQ-2: The system must be able to display appropriate units in a format that allows users to find places easily according to location.
REQ-3: The system must be able to display the units on a map using pins, and display nearest facilities using symbols.

4.6 ChatBox Feature

4.6.1 Description and Priority

The user should be able to chat directly with other users on the website. This will enable users to personally determine if the profiles recommended to them qualify as potential roommate candidates. This feature is of high priority.

4.6.2 Stimulus/Response Sequences

1) The User clicks on the “Chat” button.
2) The system launches a new chat with a new tenant on the panel at the left.
3) The user types in a message.
4) User clicks on the send button.
5) The system displays the message on the sender’s screen as sent.
6) The system displays the message on the receiver’s profile as a new message.
7) The receiver can now choose to respond, the flow of events is repeated.

4.6.3 Functional Requirements

REQ-1: The system should enable users to send and receive messages
REQ-2: The system should be able to save, and retrieve sent messages and chat histories

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The website must be available if there is an internet connection.
- The website shall take within 3 seconds to load.
- The website must display an error should there be a failure in the internet connection.
- The website must be fully functional with no malfunctioning features
- When the website needs to be updated, the website should enable modular repair such that users are still able to use the website during downtime.
- The website should load every page within 5 seconds
- The system should be able to respond to potential internal or external changes affecting its delivery in a timely and cost-effective manner.
- The website must be able to be maintained easily after it is deployed- this includes easy repair in the event of bugs.
- All exception handling messages shall load within 0.75 seconds.
- Error messages must be displayed in English

5.2 Safety Requirements

- The users must be above the legal age of 18 years to avail use of the website to prevent children from interacting with strangers online.

5.3 Security Requirements

- The website must conceal the password while typing it.
- The system shall prevent unauthorized access to its database by password protection.
- The website must ensure the integrity of the user account information.
- The server must not return a restricted web page to any browser that it cannot authenticate.

5.4 Software Quality Attributes

- The database system must be robust to maintain a database of user passwords, profiles, and usernames.
- Database query must be done with standard SQL queries
- The website must display accurate information. The displayed data must be correct.
- The website should be available to the users any time of the day so that they can use it
- according to their ease.

5.6 Business Rules

- N/A

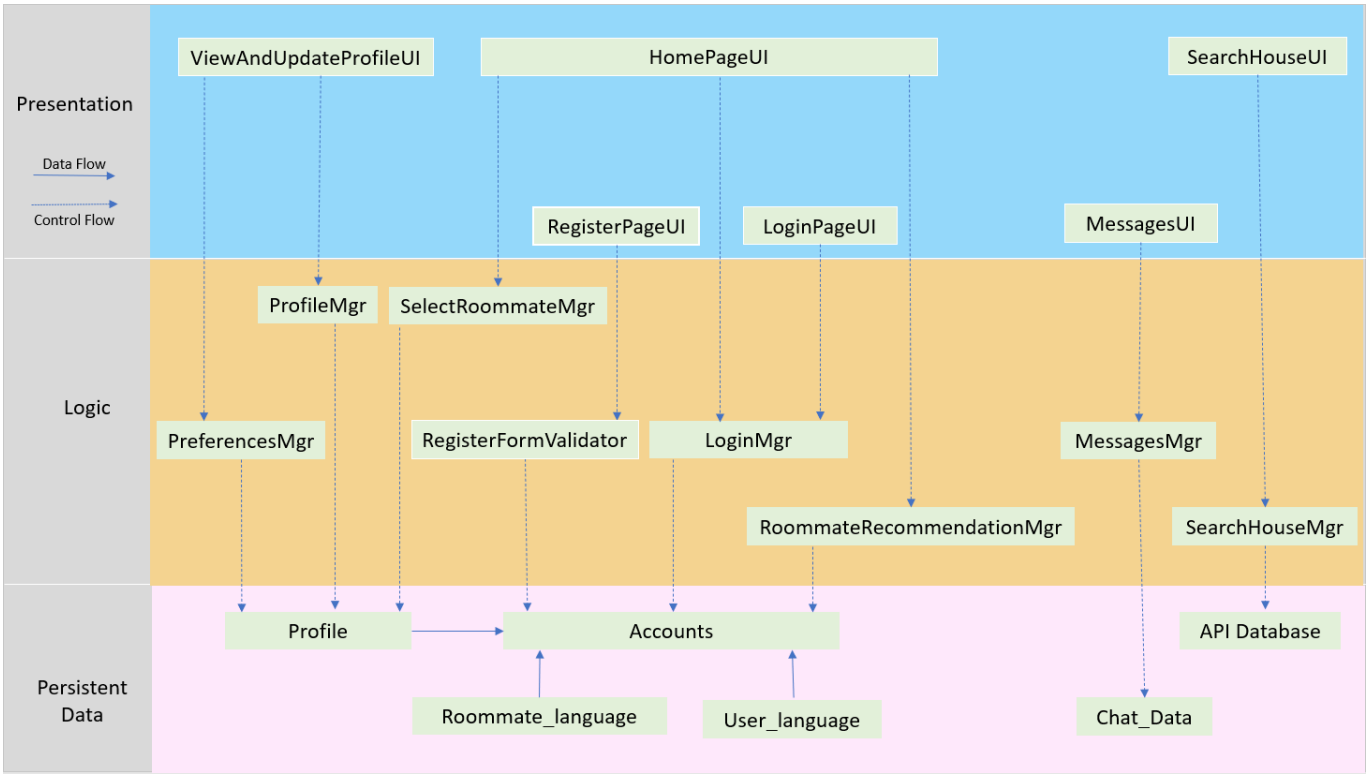
Appendix A: Glossary

Term	Definition
Product functions	The functional requirements of the product to be designed.
System functions	A system outcome that contributes to the goals and objectives of the program.
User Requirements	User requirements describe the business needs for what users require from the system. They are written early in the validation process, typically before the system is created.
Use Case	A written description of how users will perform tasks on the website.
Test Case	Specification of the inputs, execution conditions, testing procedures and expected results.
Front-End	Refers to the user interface, i.e., the graphical user interface of the system that makes it easier to use.
Back-End	The back end refers to parts of a computer application or a program's code that allow it to operate and that cannot be accessed by a user. This can include the server, application and database.
Device	Device refers to something made or adapted for a particular purpose. In context, it refers to the website.
Bugs	An error, flaw or fault in a computer program or system that produces an incorrect or unexpected result.
HDB Flat	Public housing in Singapore managed by the Housing Development Board(HDB).
University Students	People who have tight budgets due to the existing cost of education. Additionally, they may not be guaranteed to stay at their university campuses through their years of education in that university. Hence, they would need a home close enough to their university.
Young Adults	People who have just entered the workforce and may not earn enough to purchase a house. Additionally, they are below 35 years of age making them ineligible to purchase a HDB.
Service Costs	The costs involved in finding and employing a property agent or searching for a rental unit without the help of the consolidated approach supported by this website.
Response time	The amount of time taken by the website to respond to user commands.
Speed	The amount of time taken by the system to execute instructions- this may include the time taken to fetch data, display results etc.
Runtime	Runtime or execution time is the final phase of a computer program's life cycle, in which the code is being executed. In other words, it is the running phase of a program.
Minimal downtime	Downtime refers to periods during which a computer system, server or network is shut off or unavailable for use.
Server redundancy	A redundant server is kept offline. That is, it powers on with network/Internet connectivity but is not used as a live server. This server can be used to back up data and can be used in the case of a fault or failure in the server that is normally used.
Backup	A backup is a copy of data or code taken and stored elsewhere so that it may be used to restore the original in the event of data loss.

HDB rental services	The service whereby residents of Singapore can rent (i.e., pay on a monthly or yearly basis to live in) housing units is built by Singapore's Housing Development Board.
Roommates	A roommate is a person with whom one shares a living facility such as a room or flat.
Apartment	A suite of rooms forms one residence; a flat.
Immigrants	People who are new or temporary residents in Singapore, who do not have an established place of residence.
Condominium	A building or complex of buildings containing several individually owned apartments or houses- the property may have been built by the government or privately built by contractors. Condominiums in Singapore often include shared facilities such as gyms, swimming pools etc.
Private housing businesses	Businesses that are privately owned, which allow people to rent living spaces such as apartments, condos, and landed properties. Private Housing means neither the federal, state or local government subsidizes the rent.

Appendix B: Analysis Model

System Architecture



Appendix C: Reference

Source: http://www.frontiernet.net/~kwiegers/process_assets/srs_template.doc

Appendix D: Data Dictionary

No.	Name	Title	Type	Description
1	blk_no	Block Number	Text (general)	The block number is specified in this field
2	street	Street	Text (general)	The street no./name is specified in this field, which aids in identifying the location of the residential property.
3	max_floor_lvl	Maximum floor level	Numeric (general)	This field specifies the maximum number of floors in the building.
4	year_completed	Year completed	Datetime (Year) "YYYY"	This field specifies the year in which the property was built and completed. It aids in distinguishing between the older and newer models of residential units.
5	residential	Residential property tag	Text (general)	This tag is activated if the corresponding property is a residential property.
6	commercial	Commercial property tag	Text (general)	This tag is activated if the corresponding property is a commercial property.
7	market_hawker	Market and hawker tag	Text (general)	This tag details if there are markets and hawker centres in close proximity to the property.
8	miscellaneous	Miscellaneous	Text (general)	This field includes miscellaneous information about the property. Examples include admin office, childcare centres, education centres, Residents' Committees centres.
9	multistorey_carpark	Multi-Storey carpark tag	Text (general)	This tag is activated if the residents of the corresponding property have access to a multi-storey carpark.
10	precinct_pavilion	Precinct pavilion tag	Text (general)	This tag is activated if the property has an associated precinct pavilion.
11	bldg_contract_town	Town	Text (general)	This field specifies the town in which the property is located.

				Legend: AMK - ANG MO KIO BB - BUKIT BATOK BD - BEDOK BH - BISHAN BM - BUKIT MERAH BP - BUKIT PANJANG BT - BUKIT TIMAH CCK - CHOA CHU KANG CL - CLEMENTI CT - CENTRAL AREA GL - GEYLANG HG - HOUGANG JE - JURONG EAST JW - JURONG WEST KWN - KALLANG/WHAMPOA MP - MARINE PARADE PG - PUNGGOL PRC - PASIR RIS QT - QUEENSTOWN SB - SEMBAWANG SGN - SERANGOON SK - SENGKANG TAP - TAMPINES TG - TENGAH TP - TOA PAYOH WL - WOODLANDS YS - YISHUN
12	total_dwelling_units	Total dwelling units	Numeric (general)	This field specifies the total number of residential units available within the property.
13	1room_sold	Number of 1-room sold flats	Numeric (general)	This field specifies the total number of 1 room flats sold within the property.
14	2room_sold	Number of 2-room sold flats	Numeric (general)	This field specifies the total number of 2 room flats sold within the property. 2 room flat is a flat with 1 bedroom and attached bathroom. (~36-45 sq m).
15	3room_sold	Number of 3-room sold flats	Numeric (general)	This field specifies the total number of 3 room flat sold within the property.

				3 room flat is a flat with 2 bedrooms, 1 of which is a master bedroom with attached bathroom. (~60-65 sq m).
16	4room_sold	Number of 4-room sold flats	Numeric (general)	This field specifies the total number of 4 room flats sold within the property. 4 room flat is a flat with 3 bedrooms, 1 of which is a master bedroom with attached bathroom. (~90 sq m).
17	5room_sold	Number of 5-room sold flats	Numeric (general)	This field specifies the total number of flats with 5 rooms sold within the property. 5 room flats have 3 bedrooms, one of which is a master bedroom with attached bathroom (~110 sq m).
18	exec_sold	Number of Executive sold flats	Numeric (general)	This field specifies the total number of Executive flats sold within the property. Executive flats feature an additional space for a study room. It consists of 1 master bedroom with attached bathroom and 2 additional bedrooms. (~130 sq m)
19	multigen_sold	Number of Multigeneration sold flats	Numeric (general)	This field specifies the total number of Multi-generation flats sold within the property. These flats are designed to meet the needs of multi-generation families It consists of 4 bedrooms, 2 of which have attached bathrooms. (~115 sq m). A multi-generation family is any of the following: 1.Married/ engaged couple and parents

				2.Widowed/ divorced with a child and parents
20	studio_apartment_sold	Number of Studio apartment sold flats	Numeric (general)	This field specifies the total number of studio apartments sold within the property.
21	1room_rental	Number of 1-room rental flats	Numeric (general)	This field specifies the number of 1 room flats rented out within the property.
22	2room_rental	Number of 2-room rental flats	Numeric (general)	This field specifies the number of 2 room flats rented out within the property. 2 room flat is a flat with 1 bedroom and attached bathroom. (~36-45 sq m).
23	3room_rental	Number of 3-room rental flats	Numeric (general)	This field specifies the number of 3 room flats rented out within the property. A 3 room flat is a flat with 2 bedrooms, 1 of which is a master bedroom with attached bathroom. (~60-65 sq m).
24	other_room_rental	Number of Other room rental flats	Numeric (general)	This field specifies the number of rented flats within the property of types other than 1-room, 2-room, and 3-room.

Appendix E: Testing

Black Box Testing

1: Logging in with pre-existing accounts

a) Generic testing

Test ID	Scenario	Expected Result	Actual Result
1	Login with existing account username and password	The system displays the homepage for the user to continue the operation	The system displays the homepage for the user to continue the operation
2	Login without a valid username	The system displays an error message “Incorrect username/password”	The system displays an error message “Incorrect Username/Password”
3	Login without a valid password	The system displays an error message “Incorrect username/password”	The system displays an error message “Incorrect username/password”
4	Login without filling up the required fields	The system clears the partially filled in fields and refreshes the page	The system clears the partially filled in fields and refreshes the page

b) Specific cases (Combination)

Username	Password	Expected Result	Actual Result
davidlee@gmail.com	password123	Successful login	Successful login
davidlee@gmail.com	password	Incorrect username/password	Incorrect username/password
FongYi.Ming_2021@yahoo.com	YhqD@Sc	Successful login	Successful login
FongYi.Ming_2021@yahoo.com	Empty (““)	Incorrect username/password	Incorrect username/password
kyla.howell@gmail.com	BMUI$!	Successful login	Successful login
kyla	BMUI$!	Incorrect username/password	Incorrect username/password

2. Registration

a) Generic case

Test ID	Scenario	Expected Result	Actual Result
1	Register with a valid account username and password	The system displays success message and account created	The system displays success message and account created
2	Register username email with an incorrect format	The system will display an error message and clear the field	The system will display an error message and clear the field
3	Register password with incorrect format	The system will display an error message and clear the field	The system will display an error message and clear the field
4	Register with password mismatch	The system will display an error message and clear the field	The system will display an error message and clear the field
5	Register duplicate account with same email	The system will display an error message and clear the field	The system will display an error message and clear the field

b) Specific cases (Email address)

Test ID	Email Address	Expected Results	Actual Results
1	davidlee@gmail.com	Approve	Approve
2	FongYi.Ming_2021	Reject	Reject
3	kyla.howell@gmail	Reject	Reject

c) Specific Cases (Combination)

Test ID	Email Address	Password	Confirm Password	Expected Results	Actual Results
1	davidlee@gmail.com	password123	password123	Created new user	Created new user
2	davidlee@gmail.com	password123	password122	Password does not match	Password does not match
3	existing@gmail.com	password123	password123	Email already exists	Email already exists
4	FongYi.Ming_2021	password123	password123	Invalid username	Invalid username
5	davidlee@gmail.com	hi	hi	Invalid password	Invalid password

3: Home page

Test ID	Scenario	Expected Result	Actual Result
1	Clicks on Right arrow	The system displays the next recommended user	The system displays the next recommended user
2	Clicks on Left arrow	The system displays the previous recommended user	The system displays the previous recommended user
3	Clicks on Skip button	The system removes the user from the recommendation section and refreshes the page	The system removes the user from the recommendation section and refreshes the page
4	Clicks on Chat button	The system displays the messages page for the user to continue the operation	The system displays the messages page for the user to continue the operation

4: Search House

a) Generic cases

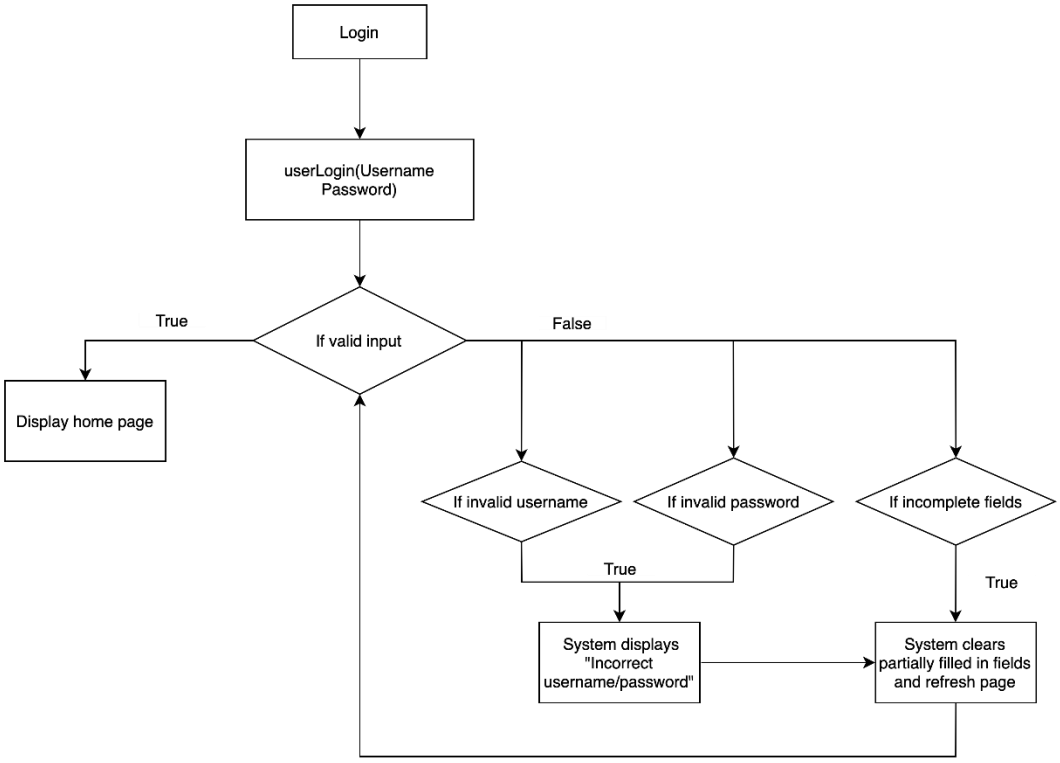
Test ID	Scenario	Expected Result	Actual Result
1	Search for valid area	The system displays a list of houses available in the searched area	The system displays a list of houses available in the searched area
2	Search for invalid area	The system displays an error message.	The system displays an error message.
3	Search for an area with no available houses	The system displays an error message.	The system displays an error message.

b) Specific cases

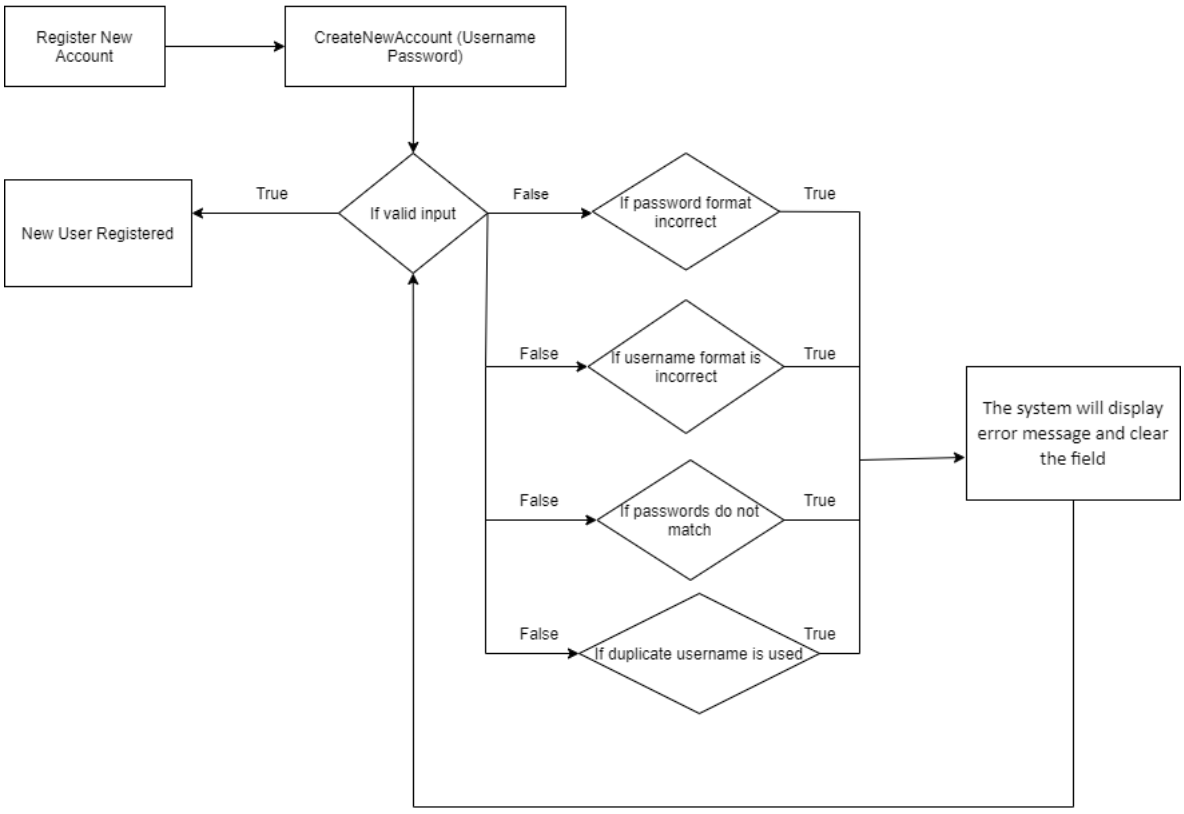
Test ID	Area	Expected Output	Actual Output
1	Toa Payoh	“283 Results in Toa Payoh”	“283 Results in Toa Payoh”
2	Toa P	“0 Results in query: Toa P”	“0 Results in query: Toa P”
3	hello	“0 Results in query: hello”	“0 Results in query: hello”

White Box Testing

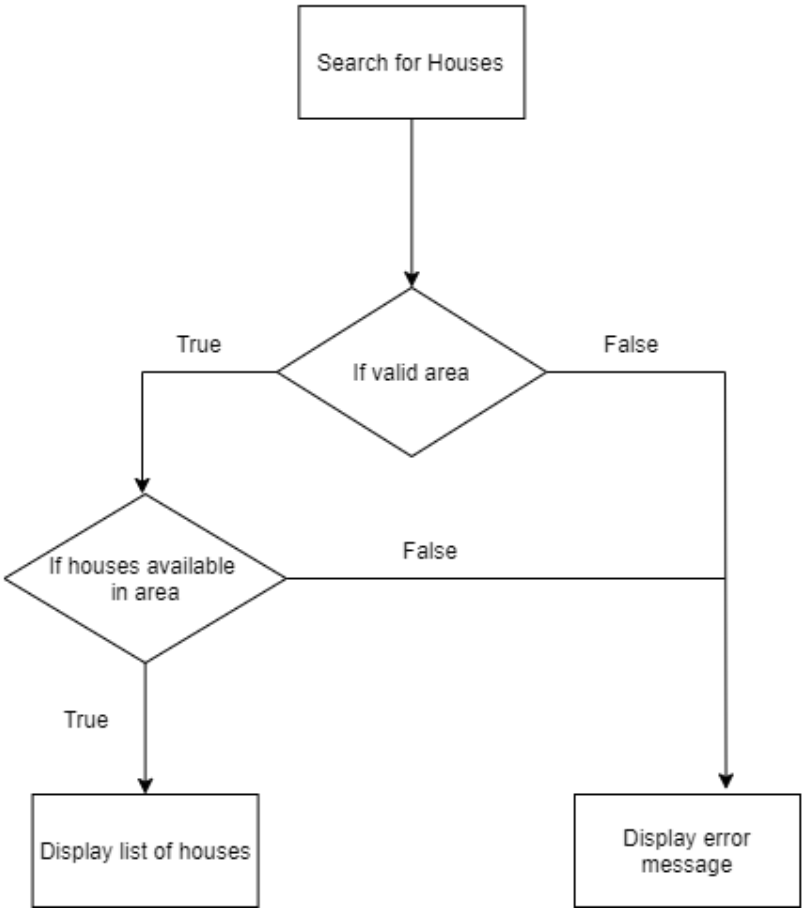
1. User login



2. Register account



3. Search Houses



Appendix F: Other diagrams

Simplified class diagram