CS383 Group Project

Software design document (SDD)

for

Prepared by:
Group 4521

Contents

Introduction

[Allergy Bud] is an application that aims to revolutionize allergy handling. With a user-friendly interface and great features, Allergy Bud lets the users control their own health and well-being.
[Allergy Bud] provides its users with the ability to quickly obtain allergy-related information concerning any given product by simply scanning its barcode.
Additionally, this application offers food recommendations to help users easily to discover allergen free options wherever they go.
One of the main advantages of our Allergy Bud app is the ability to promote a sense of belonging with allergy sufferers, health professionals and individuals who are having a similar circumstances.
in case of a reaction Allergy Bud, Allergy Bud is having emergency assistance feature which grants users access to emergency contacts, medical information, and nearby healthcare facilities
More than an application Allergy Bud is a lifesaver. It serves as your trusted companion while you are searching for allergy-friendly recipes, navigating the aisles of the grocery store, or simply spending time with friends.

1.1 Purpose

The purpose of this document is to provides a high-level overview of the system architecture and the implementation and describes the data design associated with the system this document, its aims to outline the specific requirements and for the development. our application "Allergy Bud" personalizes the users culinary experience based on allergies and dietary restrictions. It guides you through recipes, scans barcodes to alert you of any allergen ingredients, and revolutionizes your cooking journey.

1.2 product Scope

The Allergy Bud application goal is to enhance the user safety in a more convenient way by allowing them to manage any allergens.
our Allergy Bud will have the following features:
Registration: when the app launches, the users are asked to sign in with personal information.
User profile: The user can customize their profiles to show them the best results for their dietary preferences.
Services: Search recipes, filter allergens based on user profile (which can be private), and scan product barcodes for instant allergen information.
User motivation: our app's life mission is to create a community where users share their experience, advice, and recommend allergy friendly recipes.
Emergency situations: A one click feature to contact help. sharing user location and allergies for more efficient assistance.
Availability: App accessible to all without payment required promoting inclusivity.

1.3 Reference

https://youtu.be/MMAo5JGTz_k?si=YM39bQqyMBsLFlz4
https://youtu.be/lh0m-U3NJQo?si=LtjNt_6pM7Dydztz
https://youtu.be/obLemkvbWr0?si=I8FMmoQd76KXjkms
https://youtu.be/iaX11vYFhZ4?si=XirE2zwlIHwtVdyq
https://youtu.be/obLemkvbWr0?si=_Ma-v3P7tCjyi8QG
https://youtu.be/CZTkgMoqVss?si=9FwDWOnMc32uDN2R
https://youtu.be/gyRsgt2iKXg?si=uR6aOHEXL0W0ReYs
https://youtu.be/6XrL5jXmTwM?si=ydtI6OntRpdc8BLw

1.4 Structure

we will discuss all sections of our SDD document,

Starting with the introduction section, we provided an overview of our document and discussed the influence of this application and the intended users who will use it and its functionality.

In the System Overview section, it's about the background and components surrounding the design of the application.

In Architecture Design section we outlined the system's architecture description, analyzed its components, and provided design rationales.

In Data Design in this section, we wrote database description and describe the data structures and the data flow diagram.

In the Component Design section, we presented a detailed description of our design using four diagrams, such as class diagrams, state diagrams, activity diagrams, and sequence diagrams. These diagrams effectively explained the major requirements of our system.

In Human Interface Design section, we focused on the final interface intended for user interaction we also provided an overview of the user interface, highlight some of the interfaces utilized within the application, and include a form to describe what the system is offerings.

2. System Overview

Our AllergyBud app is designed to improve the health and wellbeing of our users whose having allergies and similar circumstances, to help them to make a good decision about their food choices by scanning the barcode of the product to have more information about the product and decide based on their dietary preferences, allergies, nutritional goals Here is the outline of the components part and functionality of our application:

UserRegistration: Users create a profile using their name, email, password, etc. or log in to their account, to put their dietary preferences, allergies, and nutritional goals. This information helps our app to personalize the recommendations.

Search and Filter: The main feature of our app is its ability to search for food products or recipes based on user preferences, Users can filter by various specification such as dietary preferences (e.g., vegetarian, vegan, gluten-free) nutritional content (e.g., low sodium, high protein), ingredient exclusions (e.g., dairy, nuts), and more.

Ingredient Analysis: our app offers a detailed ingredient analysis for the products, allowing users to understand the nutritional content, and any potential allergens present in the product, this can help our users to be careful about their purchases.

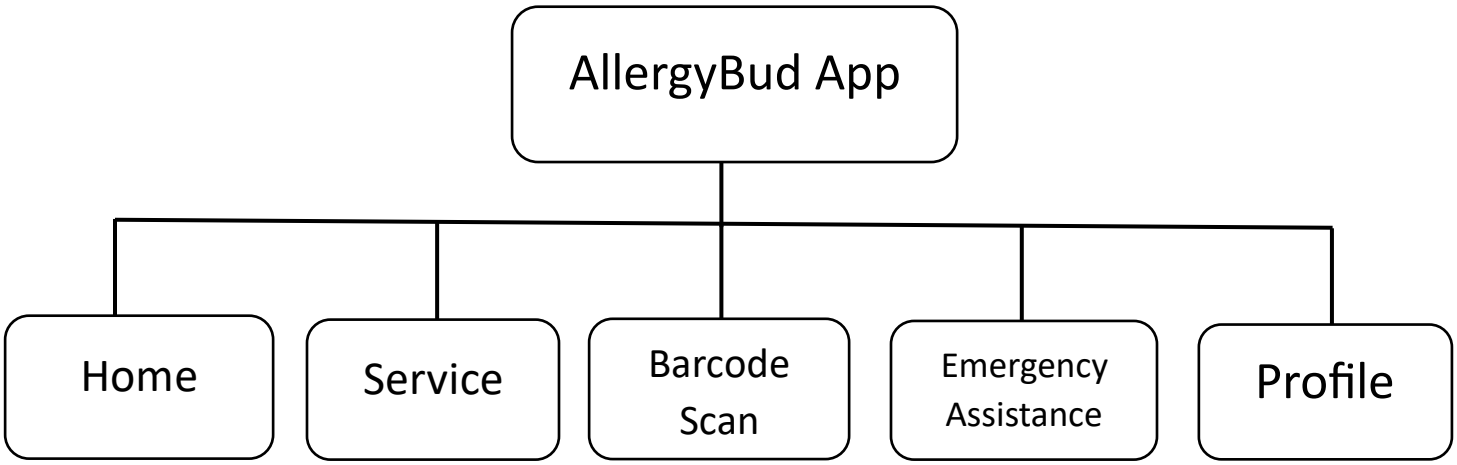
Recipe Recommendations: our app also suggests a simple recipe based on the user's preferences, and to ensure that our users meet their dietary requirements our app offers a new meals idea.

Community: our app offers some of the social features that allow the users to talk to each other and to share recipes, advice and experiences within the app, this makes users support each other in their dietary journeys.

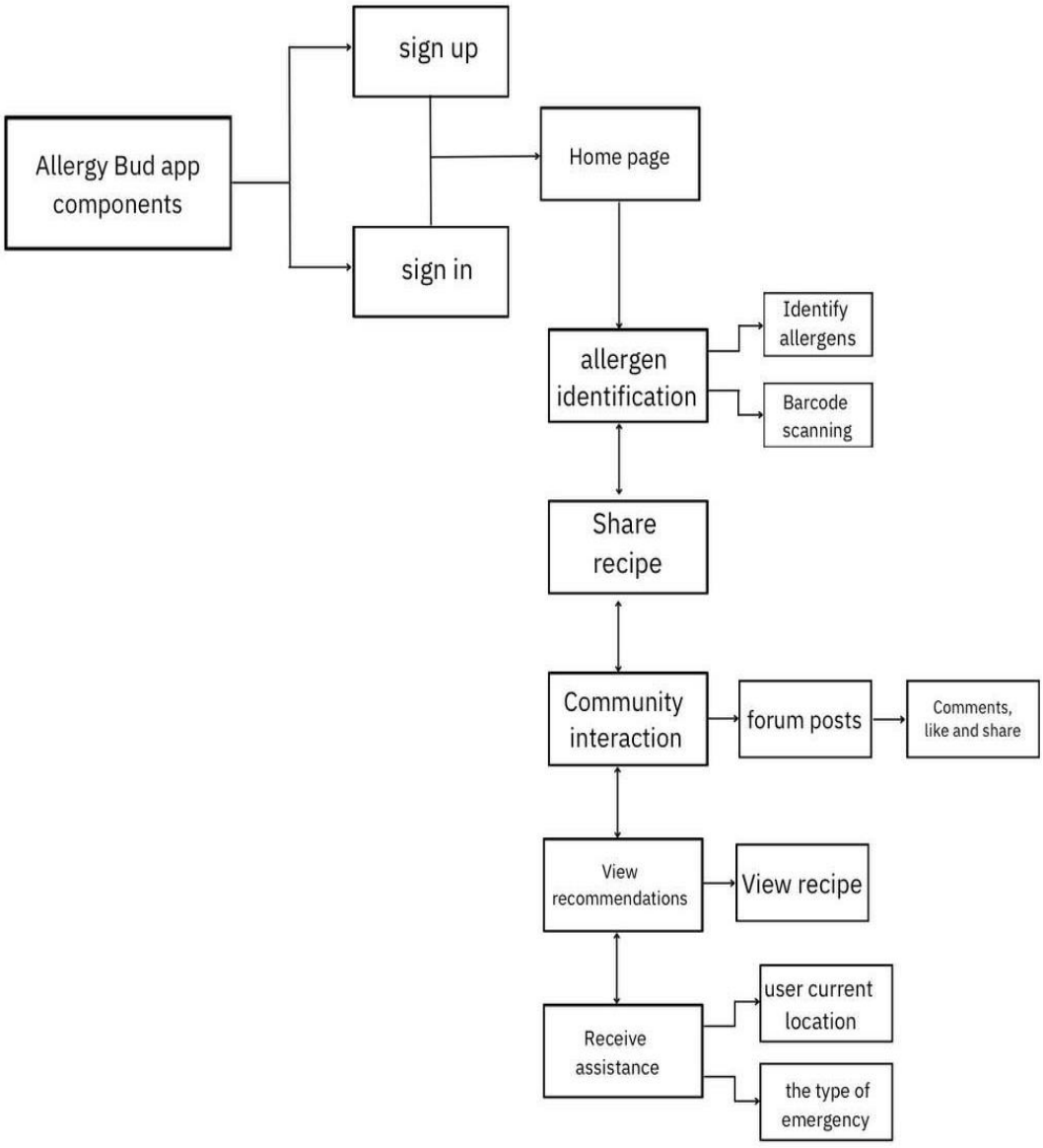
Architecture Design

3.1 Architecture description

The architecture of our food app has the structure and the components to enable the app to function effectively in filtering and providing information about food items for the user to have a great experience. The app is for mobile devices, so it has the constraint and requirements for it.
As a mobile application we used react native framework to ensure the optimal compatibility and performance for both iOS and android users, the core functionality of our app is using logic and algorithms for filtering food items based on the user's specified criteria interacting with a local database to get nutritional information and managing user accounts.



3.2 Decomposition description



3.3 Design rationale

we chose the design rationale for our app 'Allergy Bud' based on the needs and requirements of our users, this is the main reasons behind it:

1- The Database: for our app that requires storing a lot of data information about the products, recipes, users' information and lastly, medical information in case of emergencies.

2- User interface: our main goal for the user interface was making the user access the required information and functions more quickly and easily, The interface features has an easy operated menu for the main pages and the key services. For example, recipe or food suggestions, bookmarks.

3- Barcode scanning: this function is accompanied by a straightforward interface design and it operates by a barcode recognition algorithm to obtain products' information precisely.

4- Nutritional recommendation: our app has an advanced nutritional recommendation system is designed it is based on the allergy information of the users, also the recommendations are constantly updated following the changes in the user's allergy profile.

5- Emergency and alarms: has a special emergency and alerts interface that allows the user to quickly access healthcare information in emergency situations.

6- Security and privacy: the app has a strong security measures to protect the users' data and personal information, giving options to the users to alter their privacy and decide who can access their information.

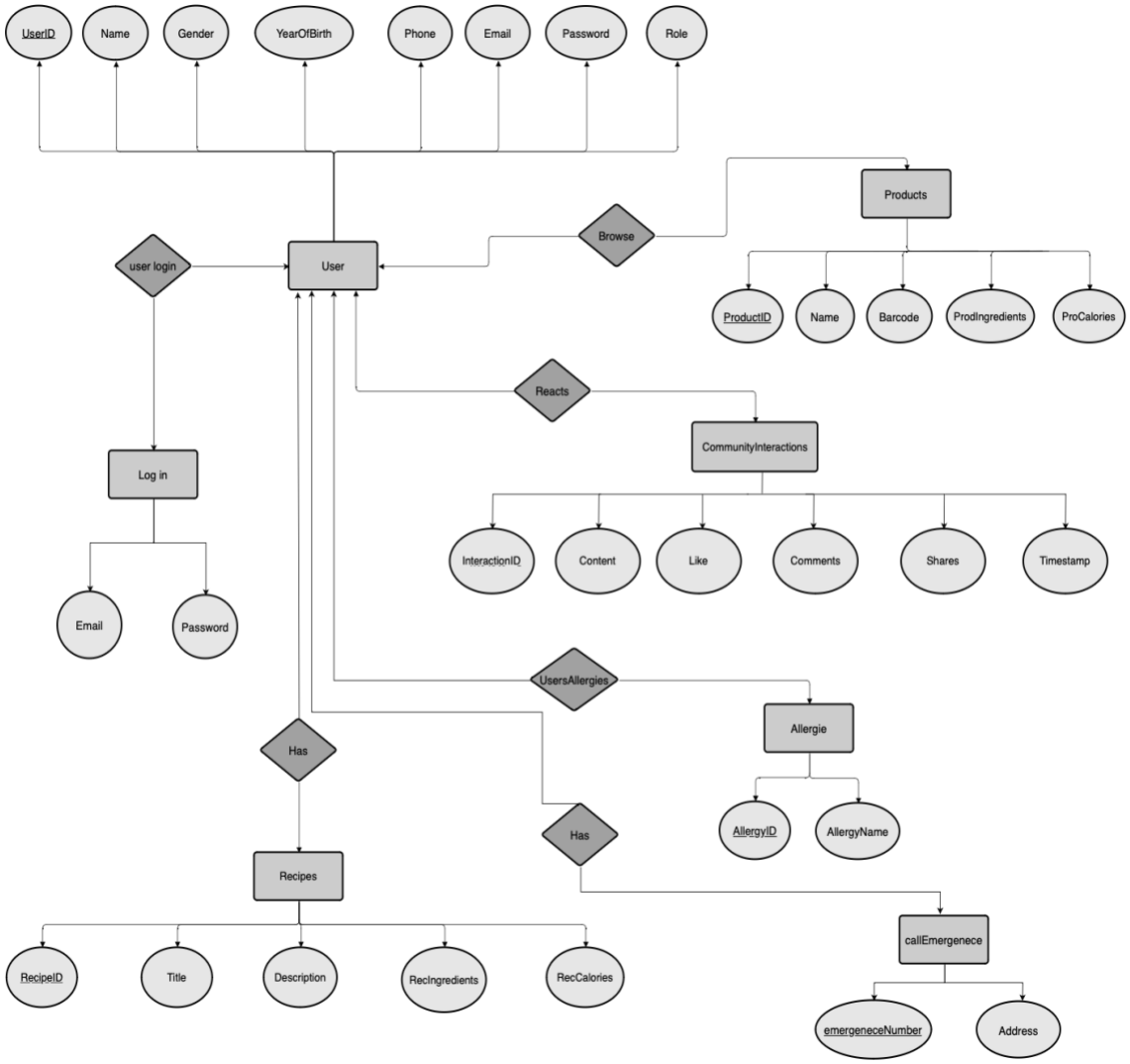
7- Testing and improvement: to improve the application performance and user's experience, continuous process tests are held.

4. Data Design

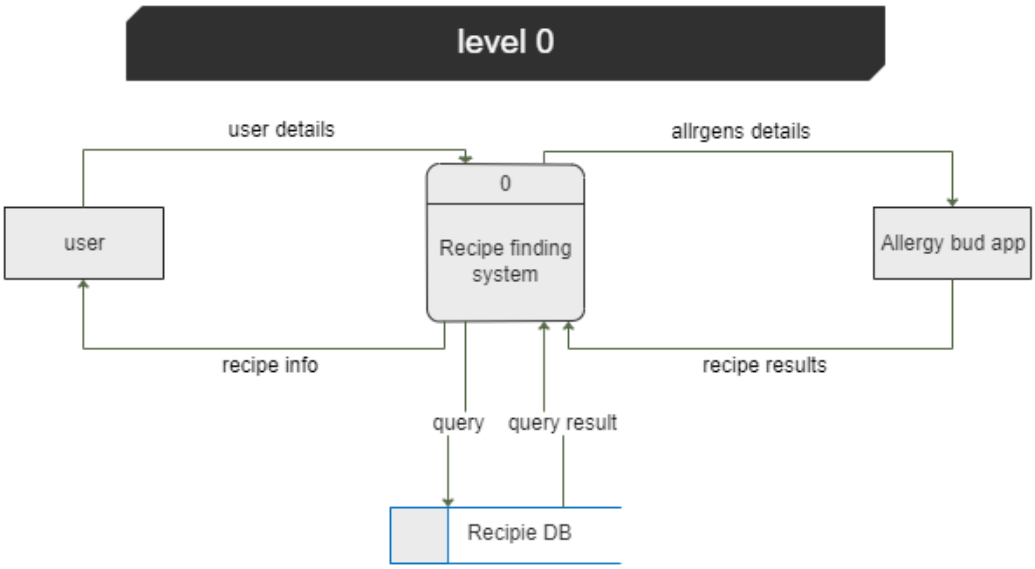
4.1 Database description

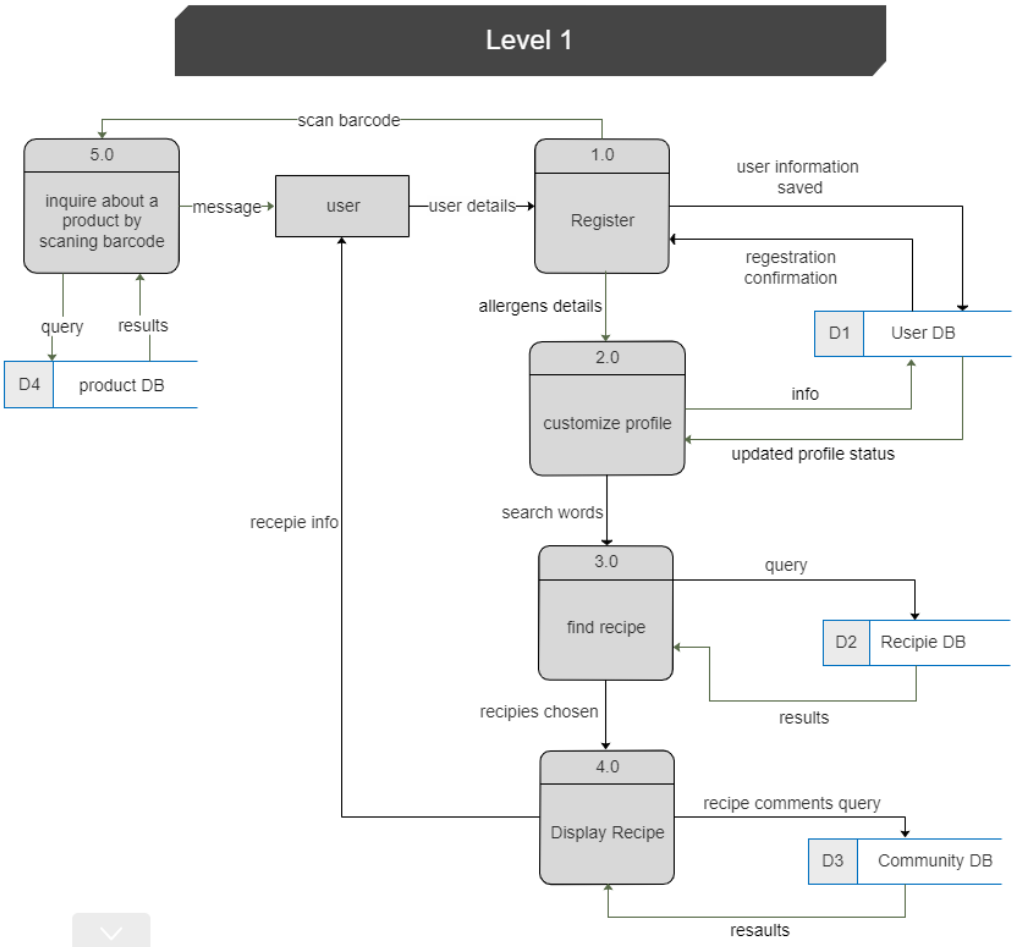
The Allergy Bud database has 7 tables (Users, Allergies, UserAllergies , Products, Recipes, CommunityInteractions , and callEmergenece) that contain attributes and relationships between them. First, we have a user table which contains user information (UserID , Name, Gender, YearOfBirth , Phone, Email, Password, Role) the primary key is the userID .
Then we have allergies table which have (AllergyID , AllergyName) the primary key is the AllergyID .
The third table is UserAllergies table which contains (UserID , AllergyID) UserID is a foreign key referencing to the Users table and AllergyID is a foreign Key referencing to Allergies table. The fourth table is Products which contain (ProductID , Name, Barcode, ProdIngredients , ProCalories) ProductID is the Primary Key.
the fifth table is Recipes which contains (RecipeID, Title, Description, UserID , RecIngredients , RecCalories) RecipeID is the Primary Key and UserID is foreign key referencing to Users table.
the sixth table is CommunityInteractions which contains(InteractionID , UserID , Content, Like, Comments, Shares, SharedToUserID , Timestamp) InteractionID is the Primary Key and UserID and SharedToUserID are Foreign Key referencing to Users table.
The last one is callEmergenece which contains (emergeneceNumber , UserID , address) UserID is foreign key referencing to Users table.

4.2 Data structure

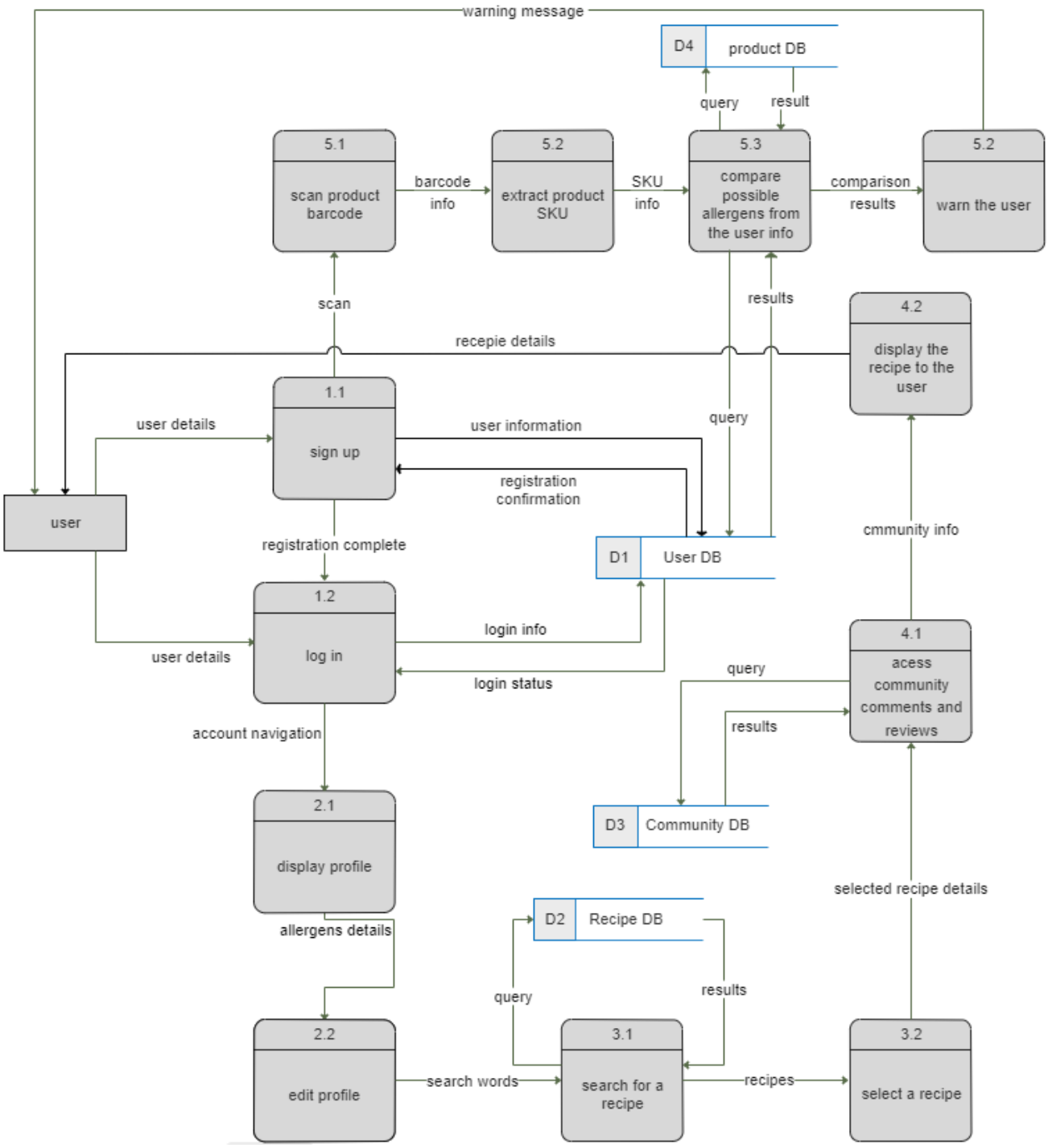


4.3 Data-flow Diagram (DFD)



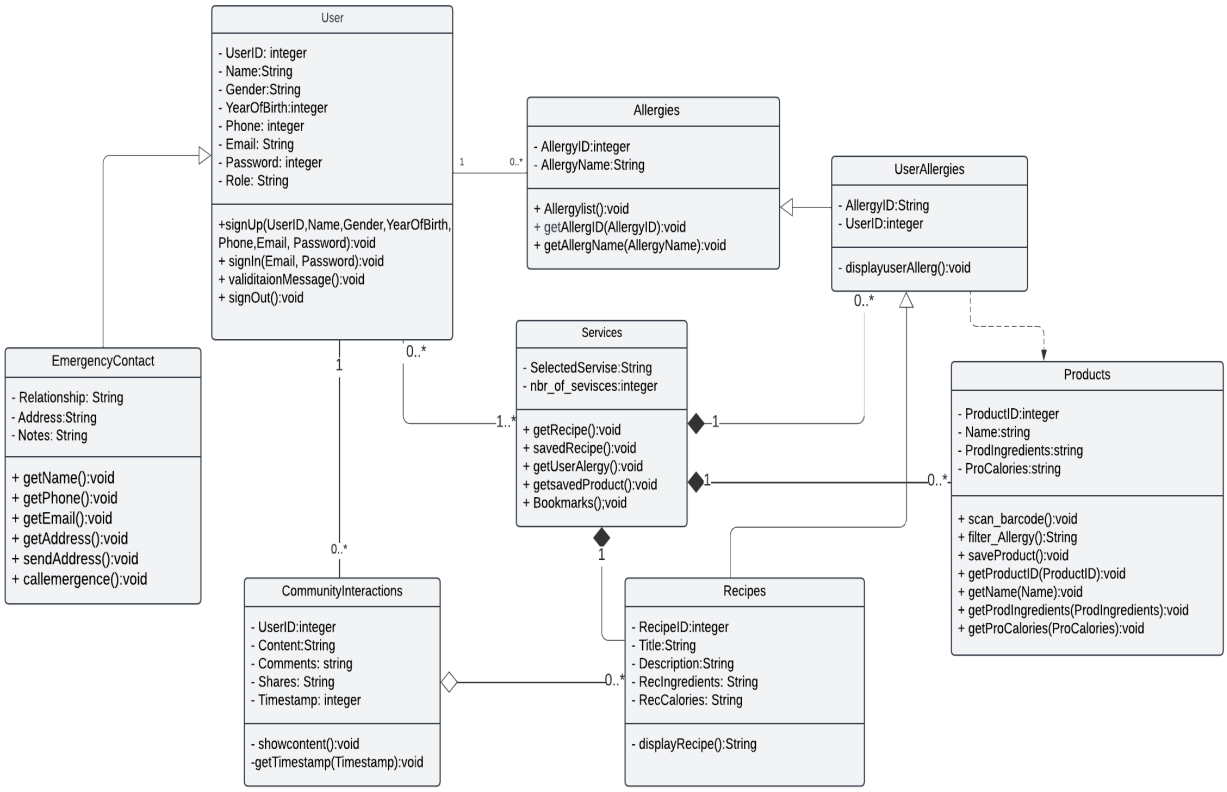


Level 2


warning message
D4
product DB
query
result
5.1
scan product barcode
barcode info
5.2
extract product SKU
SKU info
5.3
compare possible allergens from the user info
comparison results
5.2
warn the user
scan
results
4.2
display the recipe to the user
recepie details
1.1
sign up
user details
user information
query
registration confirmation
user
registration complete
D1
User DB
cmmunity info
1.2
log in
login info
user details
login status
4.1
acess community comments and reviews
query
results
account navigation
2.1
display profile
D3
Community DB
selected recipe details
D2
Recipe DB
allergens details
query
results
2.2
edit profile
search words
3.1
search for a recipe
recipes
3.2
select a recipe

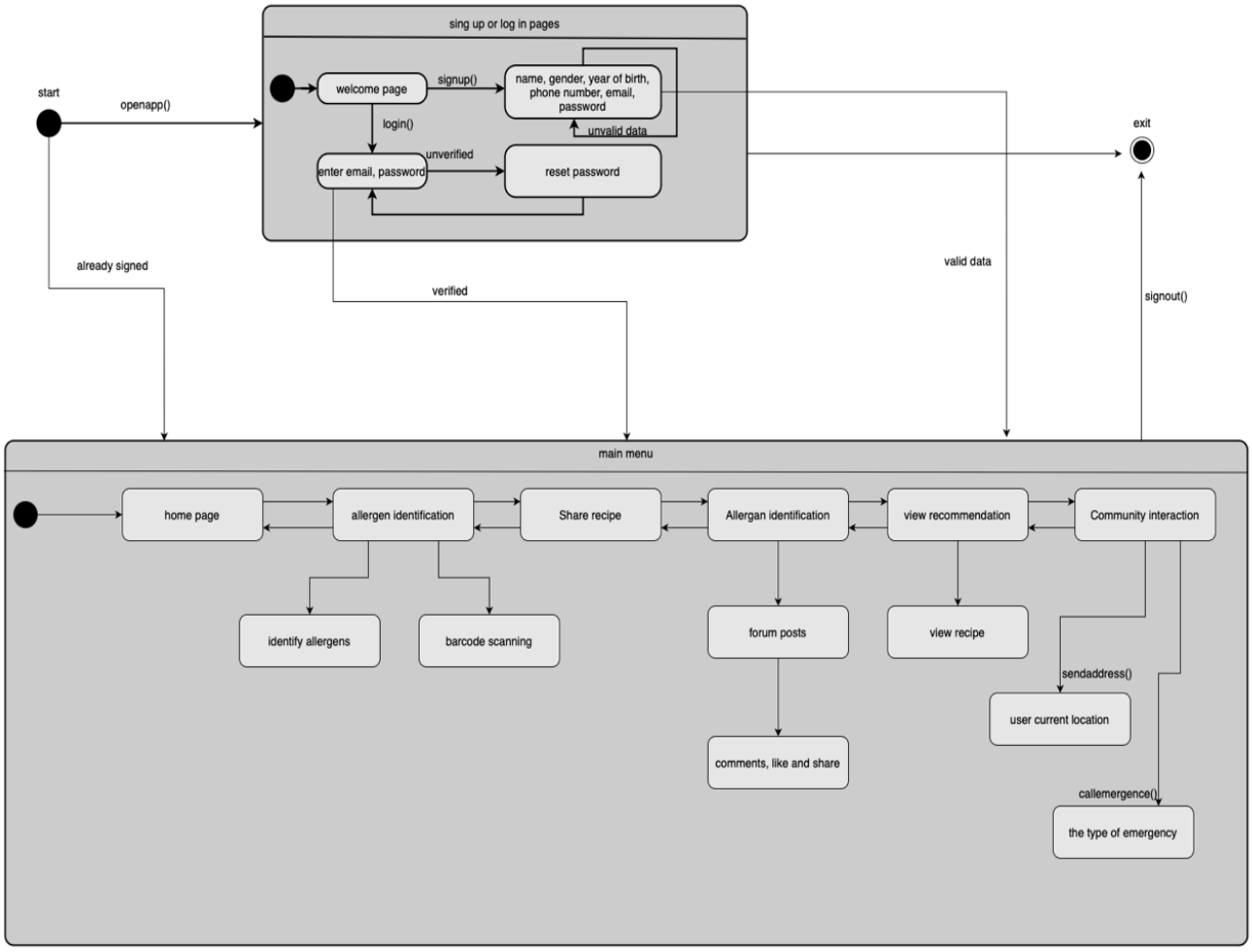
5. Component Design

5.1. Class diagram

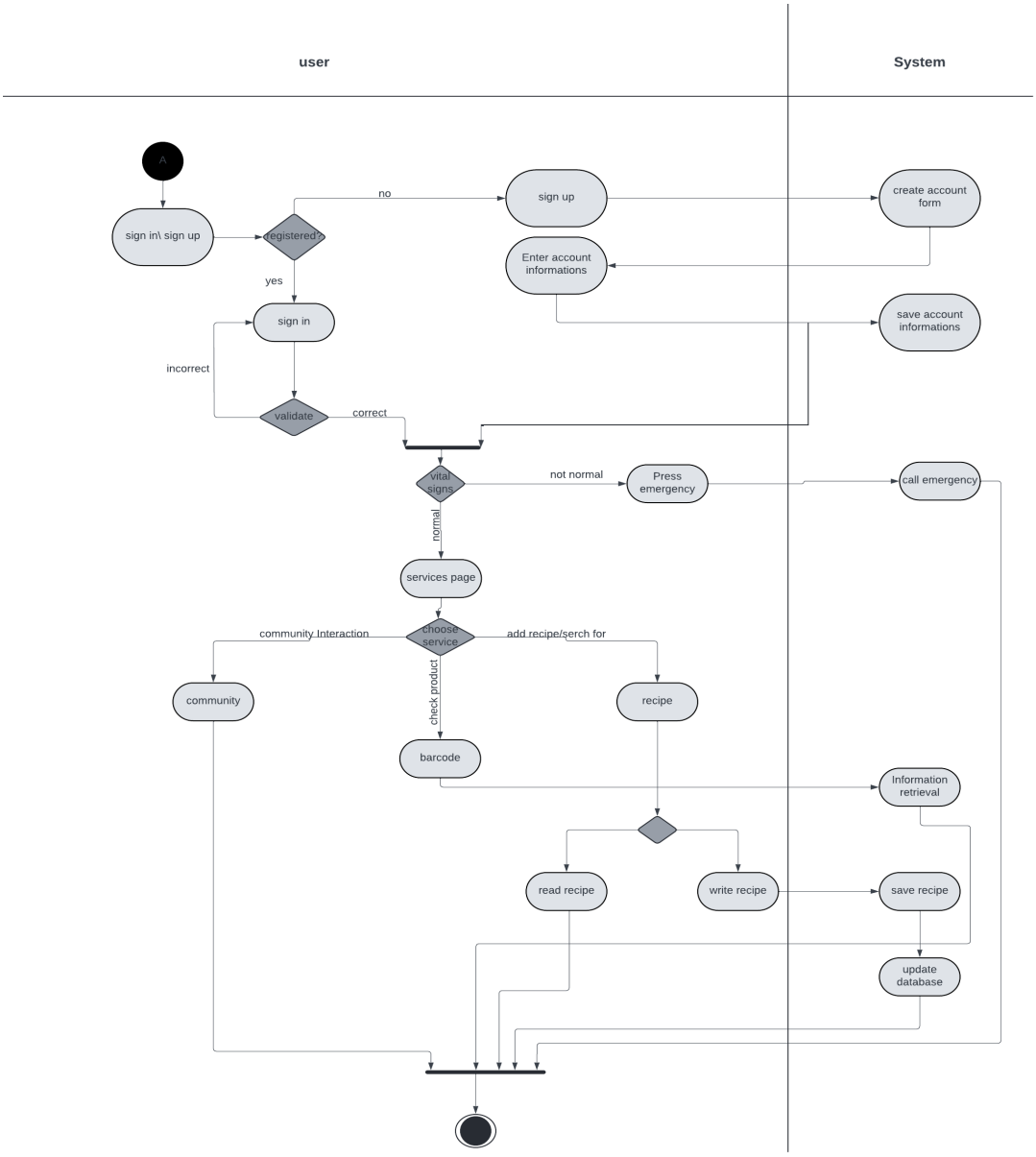


In this class diagram, we have eight classes first we have user class that has one to many relationship, then we have UserAllergy that will inherits the allergies form Allergy class, product class has dependency relationship with UserAllergy because the product content depends on it ,and the Recipes class will inherits from the UserAllergies class to get recipes that suit the user, also we have Service class that has Composition relationships with three classes (UserAllergies, product , Recipes) because its strongly dependent, lastly we have community interaction class has an Association relationship with User class, and the Emergency Contact class the inherits the information from the user.
Overall, this class diagram provides a representation of the relationships and dependencies between the different classes in the system, giving an understanding of how they are interconnected and interact with each other.

5.2. State diagram

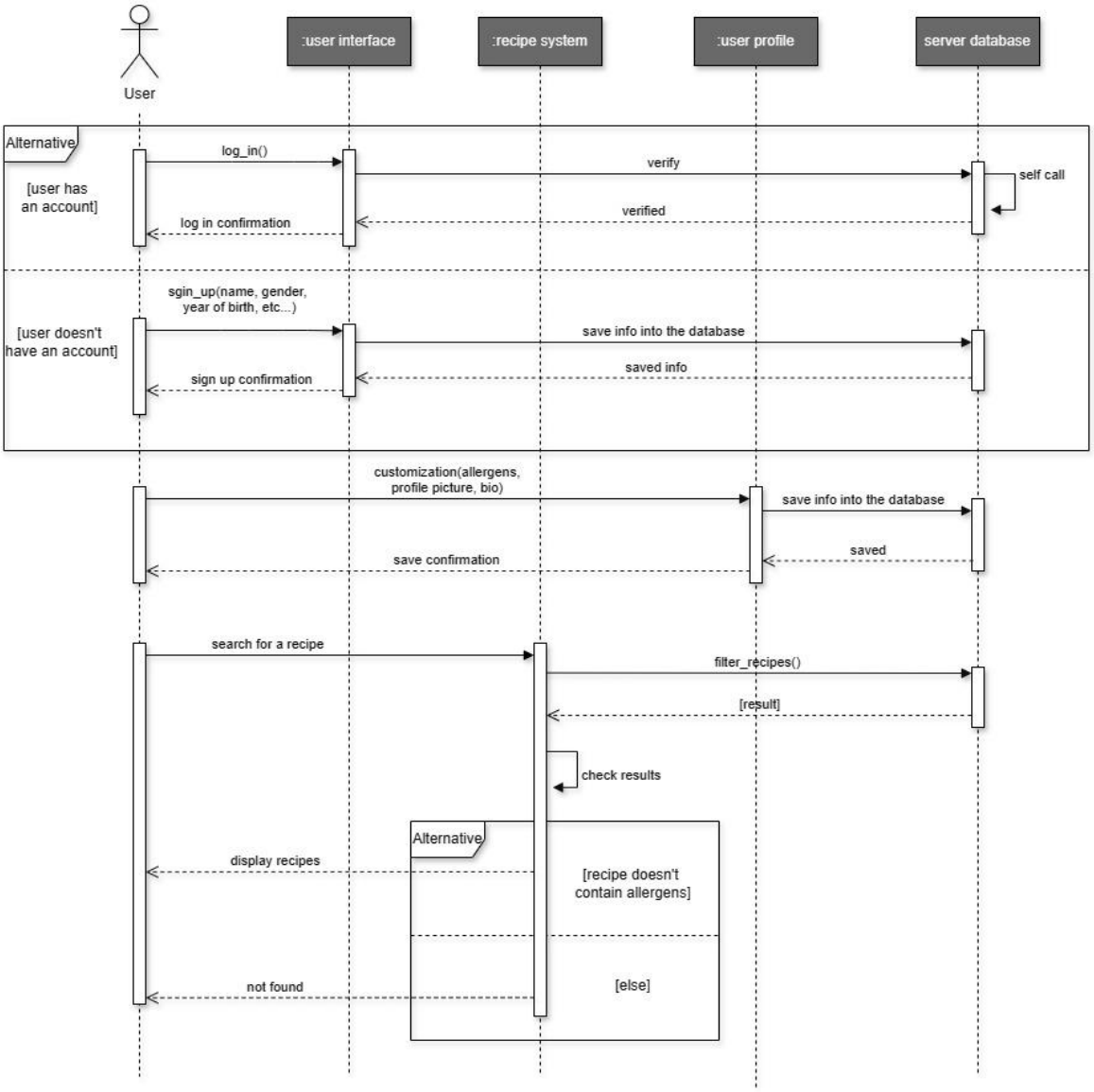


5.3. Activity diagrams



our app start to sign in if the user already has an account or sign up if it's a new user, and the system saves the registration information, Upon completion of the registration process, the user will be able to choose the needed service, like scanning the barcode, searching for a recipe, or adding a recipe and also will be able to interact with the community, The system also will be able to call emergency services when a difference in vital signs is noticed.

5.4. Sequence diagram



In the beginning If the user has an account, they will login using their login information that will be verified with the user's information in the database, if it succeeded a login confirmation will be sent back to the user.

In case of a new user that doesn't have an account, an instance from the user Interface class will be created, The user will fill the required information (name, gender, year of birth, phone number, email, password) to make a new account, and it will be saved in the database and sign up confirmation will be send back to the user, also the user can modify their profile or allergen information the user's edited information will be saved in the database, and the save confirmation will return to the user.

Additionally If the user wants to search for a recipe, an instance from the recipe Service class will be created, and it will query the recipes and user's allergies information from the database, After that the results will display the desired recipes to the user if they fulfilled the condition, in other case of not finding a recipe that doesn't contain user allergies, an else statement will be executed that will print a "not found" message to the user.6. Human Interface Design

6.1. Overview of user interface

Allergy Bud user interface: It has a registration and login screen that allows users to access their accounts or create an account, and a home screen that displays the community, also there is a Service page that has all the service that our app has like 'recipe for u', 'bookmark'…etc.

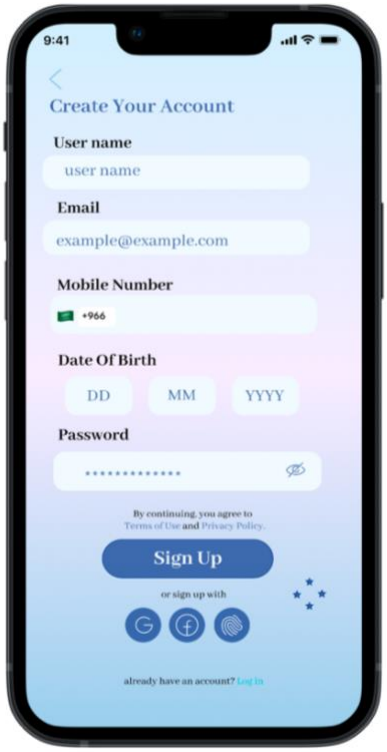
Users can scan the product barcodes to obtain information related to the product and wither its allergic or not, our app offer the users a personalized dietary recommendations for each user based on their allergy profile, and we have a page for calling emergency that will send your location to the nearest hospital and share your location with your relatives, the last page we have is a profile page that has the user profile(following, followers, post, replies, likes.. etc.

This is a simple and easy-to-use interface that makes our users to take control of their health and their well-being and enjoy an interactive experience with our app.

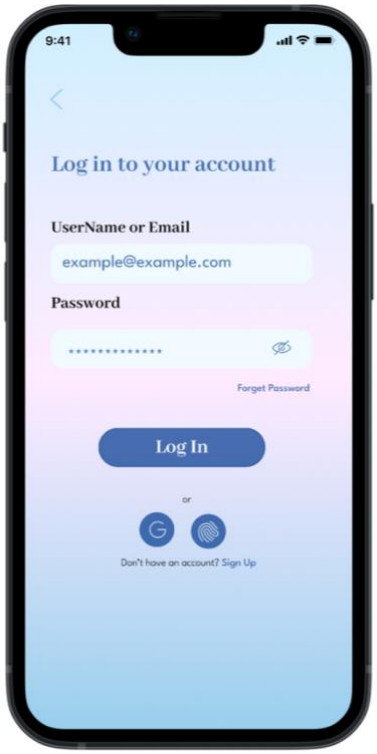
6.2. Detail design of user interface

Application start page

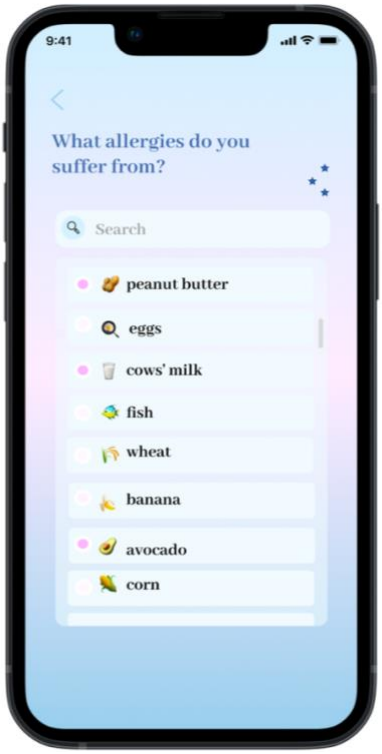
Sign up



Sign in

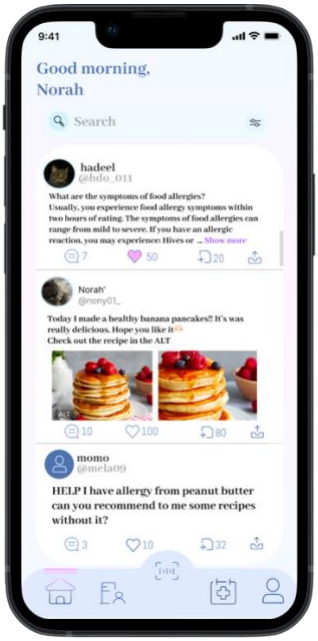


Allergy list

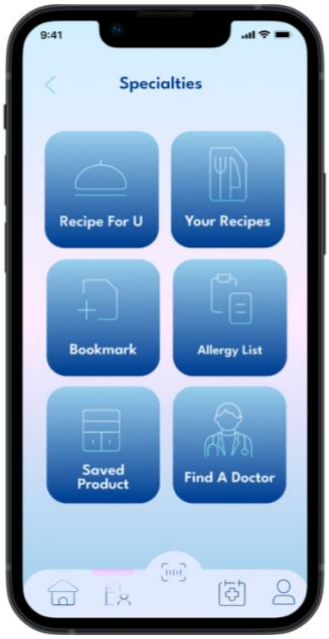


First of all we have the welcome page for the app and then the users will be prompted to either sign up for a new account if they doesn't have one or sign in into their account with the username/email and password, in case of sign up the users will enter the required information to create a new account and fill in the required information (username, email, phone, date of birth, password) now that the account has been created the user will get the Allergy list to select the allergies that they suffer from.

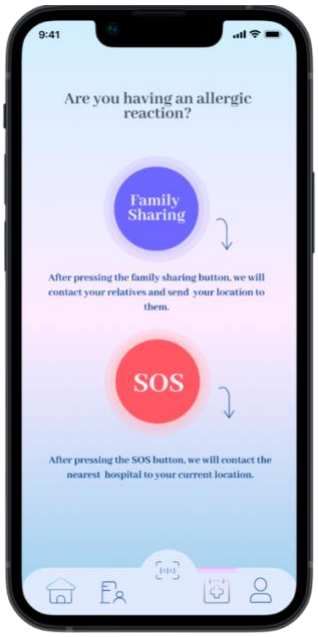
Home Page



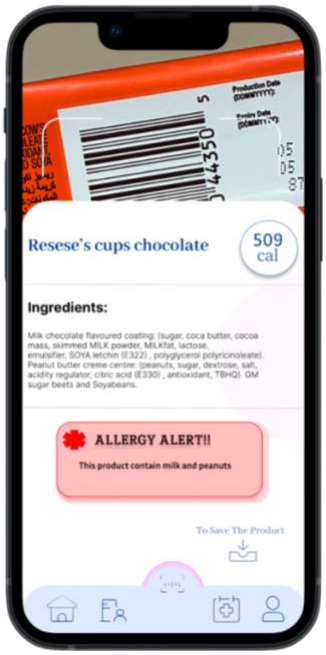
Specialties



emergency

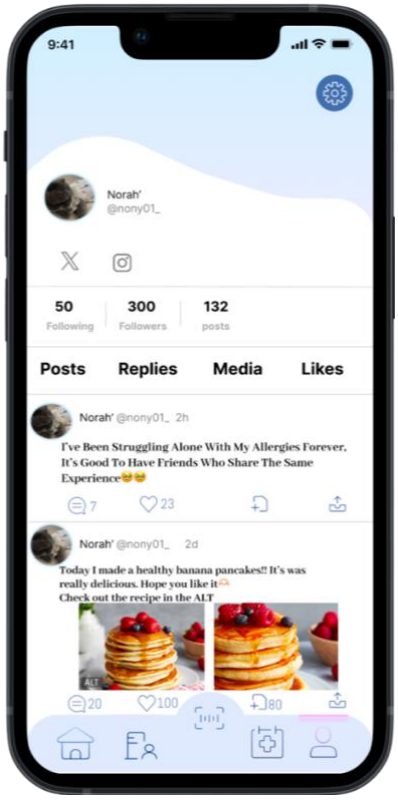


Barcode scanning

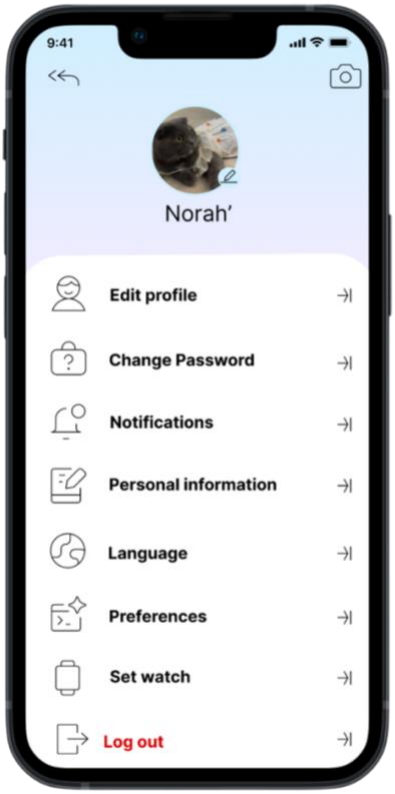


The second main page in the app is specialties page, it will enable the users to use some services in the app such as saved products and allergies list.
The third page is barcode scanning, where the users can scan the product and it will display its calories, integrations, and an alert in case that product will cause allergies for the users.
The fourth page is an emergency page that will enable the users to seek help from their family or a hospital and send their location to them if they have a dangerous allergic reaction.

Profile



Sitting



The fifth page is the profile page screen which will display the user's profile and their social interactions.
The sitting page will enable users to edit their profile and change their password and some other settings.

7 - Work Section

student name	section work
Melaf Alobidan	- System overview **From the Architecture design:** Architecture description **From the Component Design:** Class diagram **From the Interface Design:** Overview of user interface & Detail design of user interface - Auditing and reviewing team
Alhanof Alfadhel	**From the introduction:** structure **From the Architecture design:** Decomposition description **From the Component Design:** Class diagrams
Manar Altorbag	**From the data design:** Data-flow Diagram (DFD) **From the Component Design:** Sequence diagram - Auditing and reviewing team
Aryam Aljarallah	**From the data design:** Database description **From the Component Design:** Activity diagram **From the Interface Design:** Detail design of user interface - Auditing and reviewing team
Rahaf Alosaimi	**From the data design:** Design rationale **From the Component Design:** Activity diagram **From the Interface Design:** Overview of user interface
Raghad Alharbi	**From the data design:** Data structure **From the Component Design:** State diagram - Auditing and reviewing team
Jana Alsuwailimi	**From the data design:** Data structure **From the Component Design:** Sequence diagram **From the Interface Design:** Detail design of user interface
Lujain alsayegh	**From the data design:** Data-flow Diagram (DFD) **From the Component Design:** State diagram