2019 2nd semester Bachelor Project

Vegan Friendly

Topic: Android Application Development for Vegan, Vegetarian

Team Name: m&m

Teammates / Student ID: Hyo Eun Kwon / 1516944
Min Ji Kim / 1510748
Yoojin Kim / 1612894

Submitter / Student ID: Yoojin Kim / 1612894

Submitted date: 22.11.2019

Directed Professor: Seok Jong Yoo

Contents

I. Introduction

a. Motivation and goal

The demand for vegetarian food is increasing with the recent growth of the vegetarian population. Although the number of vegetarians in Korea in 2019 is estimated to be over 1 million, it is not easy to practice vegetarianism in Korea due to insufficient awareness and information about it.

Therefore, in this project, the problems faced by vegetarians were diagnosed in two ways. The first is that it is difficult for vegetarians to find a restaurant that suits their vegetarian type. In the case of vegetarian restaurants that are now available online, the information is often outdated or inaccurate. In order to solve this problem, by reflecting the latest data, this project is an application that allows users to search and check information on vegetarian restaurants filtered by their vegetarian type. For prototype, information on vegetarian restaurants is limited on Seoul district.

The second is that it is difficult for vegetarians to maintain a balanced nutritional status because of insufficient information about vegetarian diets. Vegetarians tend to eat out more narrowly than non-vegetarians. Since you are more likely to eat fixed foods, you need to put extra effort into maintaining an even nutritional status. However, there are currently no nutrient management applications for vegetarians. Therefore, we designed an application that allows vegetarians to input their food, including food from restaurants and analyze these nutrients to diagnose their current health condition. In addition, based on the analyzed nutritional status, it can provide the recommendation that fulfill the missing nutrients.

b. Summary

'Vegan Friendly' is the application that can search vegan restaurant and analyze nutrients for vegetarian. User can choose their type of vegetarian, such as Lacto, Ovo, Pesco, and this type is filtering the list of the restaurant. In this case, the application provides information such as the restaurant name, location, phone number, business hours and menu. The user can scrap the searched restaurant and check it separately in My Information. In addition, users can check the nutrients they are currently lacking by entering the food they ate into the system. Users can either search for the food they ate or select the corresponding menu on the restaurant information page to add food to 'Today's Food'. The user can check my nutritional status through the graph analyzed on a daily or weekly basis, and the application recommends vegetarian menus in the Seoul area according to the nutritional status analyzed on a weekly basis. Users can check their health status and consume insufficient nutrients more easily through nutrient analysis and menu recommendation functions.

c. Programming language and environment

For Android application development, Android Studio and Java language were used. For database management such as nutrient analysis and vegetarian restaurant, SQLite and Real Time Database provided by Firebase were used. Data provided by Food Safety Information Service public data were used.

II. Body

a. Technology and characteristic

Implemented using JAVA-based language in Android. When logging in, Firebase authentication provided by Google is used, and Firebase's Real Time database is used as the database. When accessing the built-in database, SQLite is used to access and retrieve data.

b. Requirement analysis

1) Add/analyze food intake

The user can search for the food they ate and add it to the list of eaten food and can check the daily/weekly intake. Application provides the graph of percentages including ingested carbohydrates, protein, fat. The user can also check the nutrient information for a specific food and the application provides a recommended food for insufficient nutrients and shows brief information about the food.

2) Search vegetarian restaurants

The application shows information of vegetarian restaurants in the Seoul area. The user selects a vegetarian type, and the system outputs a vegetarian restaurant suitable for the user. User can scrap a favorite restaurant and can also check the menu of the restaurant.

c. Explanation of function and structure

1) First page

i) Signing up and Logging in

Log in and manage members using Firebase authentication. Users can sign up for membership and log in using their email address. This is stored in Firebase.

2) Diet management

i) Calendar, date

Using the DatePicker to specify the date to add the food. When you first connect, it is automatically set to the current date.

ii) Search/add food

When the plus (+) button is pressed, a food search screen appears, and the user enters a keyword to search. The searched food is displayed on a list, and if you click it, the selected food is added to the date. The added food is stored in the food information of the account in Firebase.

iii) A list of food for a day

You can check the list of foods added on that date. Clicking on a food will take you to a detail page that displays detailed information about that food's nutrients. You can delete food by clicking the delete button at the bottom. This data is also deleted from Firebase.

iv) Analysis of daily intake

Analyze the intake according to the recommended daily amount based on the list of foods eaten today. The percentage of intake of carbohydrates, protein and fat is displayed as a pie graph. If there is no food eaten, the phrase ‘No food was eaten today’ is displayed.

3) Weekly intake analysis

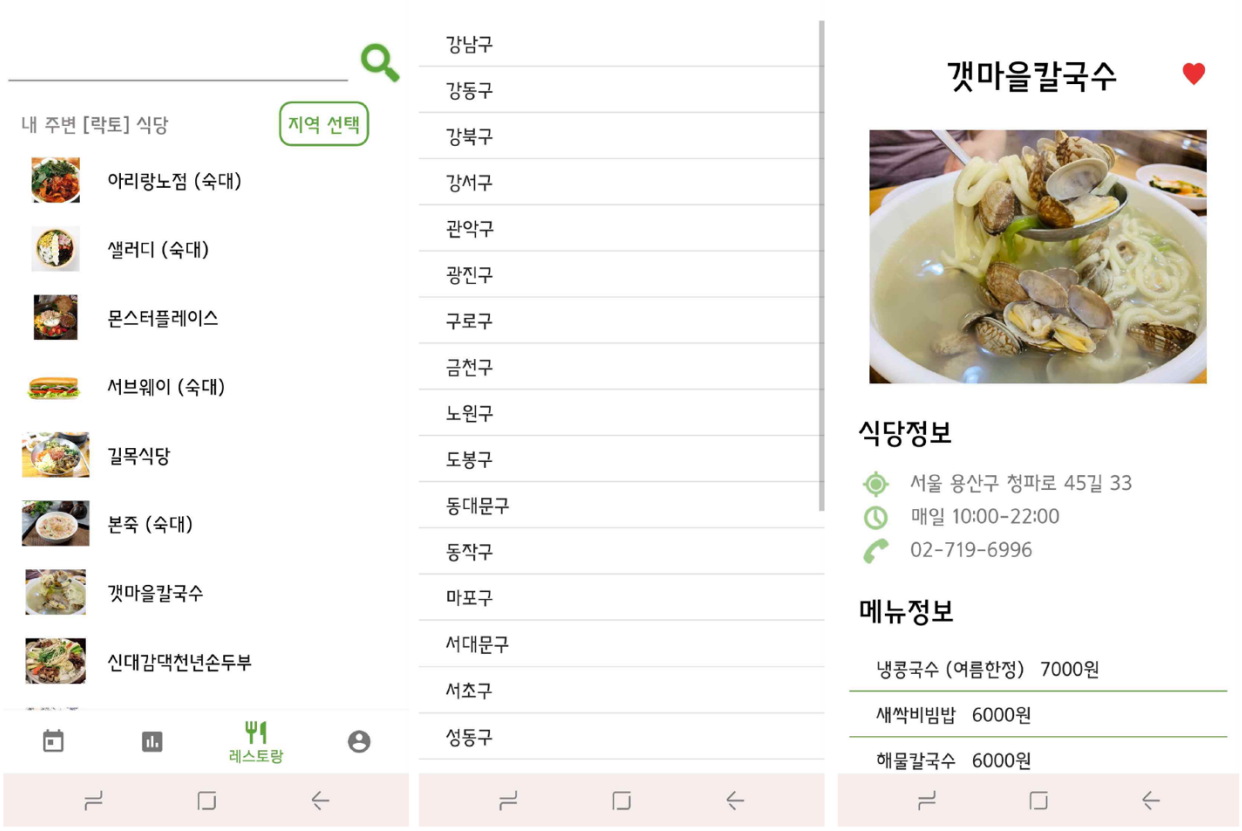
i) Weekly intake analysis

When specifying a date, it shows the amount of intake for the week before that day as a percentage. Carbohydrate, protein and fat are analyzed, and intake is displayed as a bar graph. A message is displayed informing you of which nutrients you lacked the most in the past week.

ii) Recommended food

Based on the analysis of nutrient intake, a menu that can fill the lack of nutrients is recommended. Two menus are recommended based on your constituency, and if you click on a recommended food, you will be taken to the detail page of a restaurant that sells the food.

4) Vegetarian restaurant



i) Nearby restaurants

Based on the user's location, it shows the vegetarian restaurants in the district to which the user belongs first. At this time, the output information is displayed differently according to the user's vegetarian type.

ii) Select region

Click the region selection button to show vegetarian restaurants in a specific district in Seoul.

iii) Restaurant detail page

If you click on one of the vegetarian restaurants shown in the list, you will be taken to the detail page of that vegetarian restaurant. You can check the restaurant's detailed information and menu, such as location, business hours, and phone number. At this time, if you press the heart button in the upper right corner, the restaurant is scrapped. If you press and hold the menu at the bottom of the menu information, you can directly add the corresponding food to the food you ate today.

5) My page

i) Nickname and vegetarian type

You can check the nickname and vegetarian type you have assigned at the top of the main page of My Page.

ii) Correction of personal information

On the personal information edit screen, you can edit the user's nickname, age, gender and vegetarian type. Age and gender are used to designate daily recommended nutrients when analyzing nutrients, and vegetarian type is used when printing restaurant information

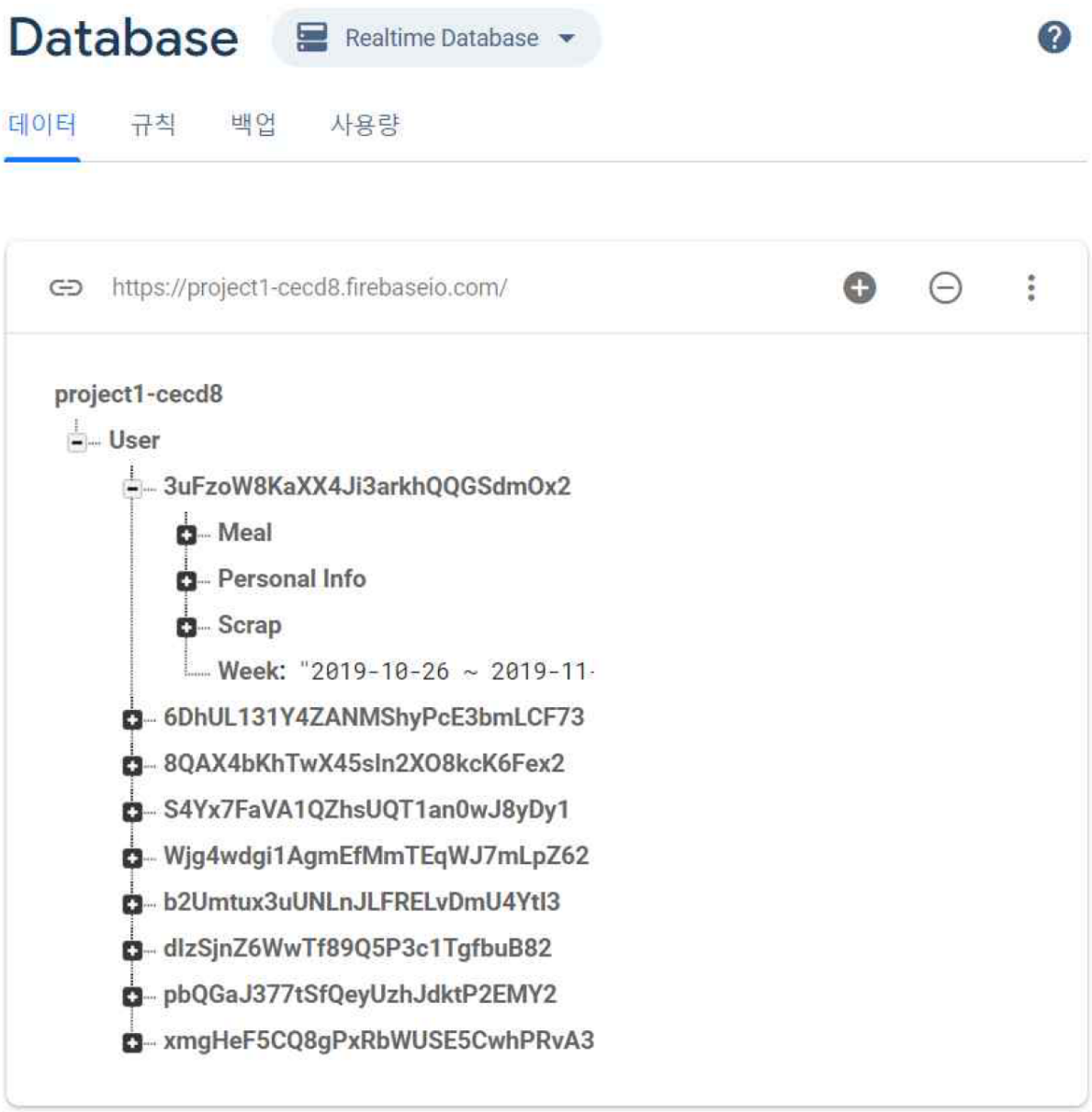
iii) Scrap

In the scrap screen, you can see the vegetarian restaurants scrapped by the user at once. If you click on the list of vegetarian restaurants, you can check the detailed information of the restaurant.

iv) Logout

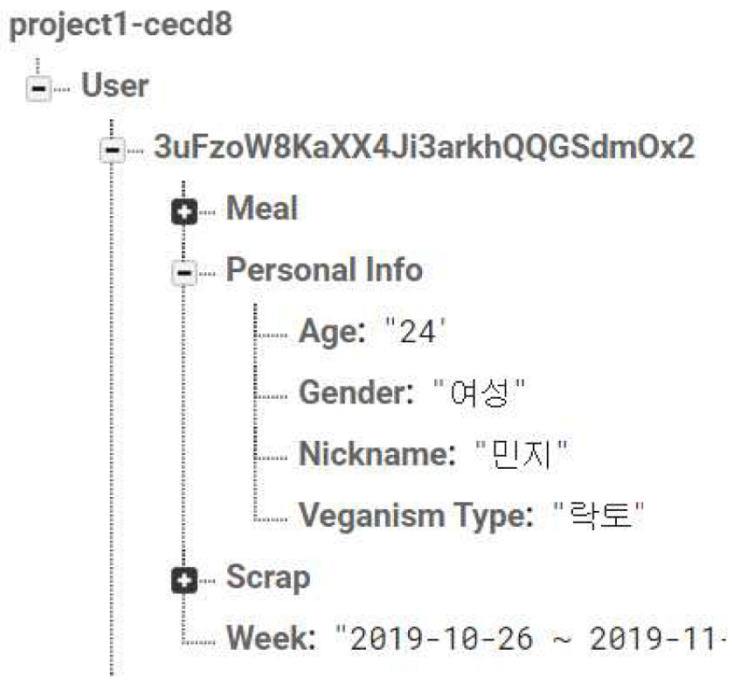
If you click the logout button, you are logged out of Firebase user authentication management, and all databases saved by the user are preserved.

6) Database design



The database was designed as follows using Firebase's Realtime Database. There is a user item under the project, and there are Meal, Personal Info, Scrap and Week under a different Uid for each User.

In the meal sub item, the index number of the food eaten for each day is stored.

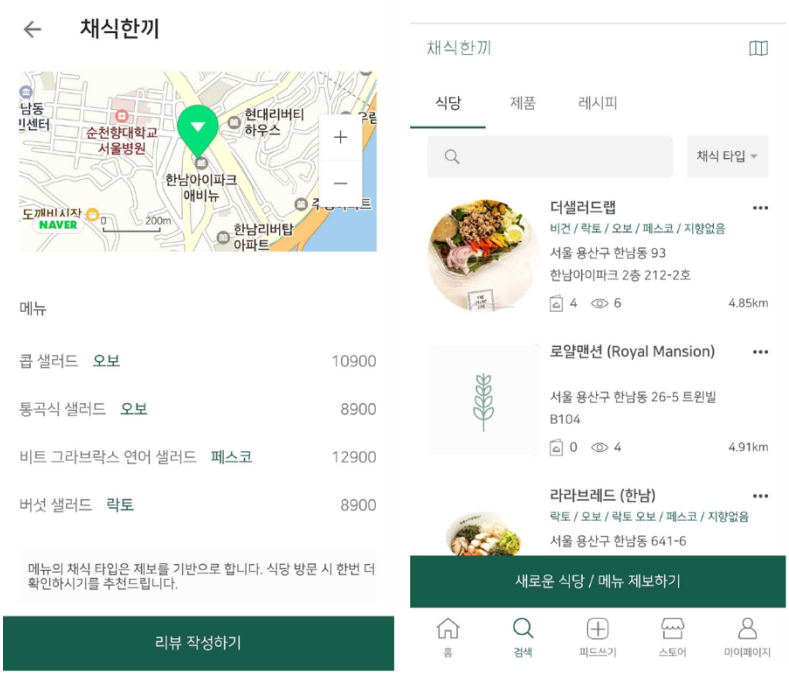


In the personal info sub items, age, gender, nickname and vegetarian type are stored.

In the Scrap item, the number of the vegetarian restaurant scraped by the user is stored in order. At the end, in the Week item, the date information of the week to be analyzed is stored separately.

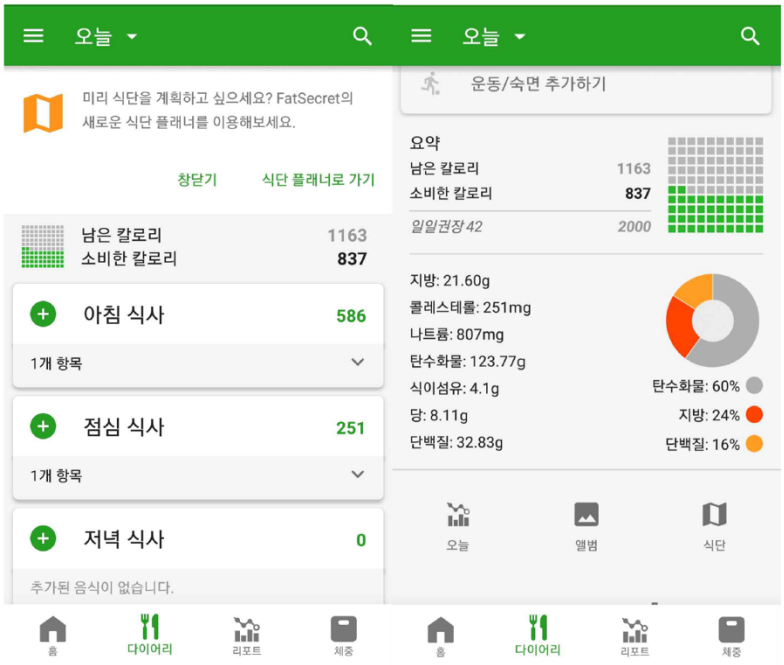
d. Comparison between other apps which have similar function

1) Chae-Sik Han Kki



'One meal of vegetarian food' is the largest vegetarian app in Korea and provides information on vegetarian restaurants across the country, including Seoul and Busan. However, because vegetarian restaurant information is updated through members' tips, the information is often outdated or unreliable. It also shows menus and prices but does not provide detailed nutritional information for each menu. In order to supplement this information, 'Vegan Friendly' set the vegetarian restaurant information to Seoul to increase the reliability of the information and allowed users to check the nutritional information of the vegetarian menu.

2) FatSecret



'FatSeceret' is a widely used nutrient analysis application for diet. Nutrient analysis apps currently on the market are mostly designed for people who are on a diet, so the appropriate number of calories to consume per day is usually very low. Also, there was a limit to analyzing the eating habits of vegetarians because it was produced based on non-vegetarians. To compensate for this, 'Vegan Friendly' raised the calorie standard to maintain a healthy diet and allowed a more detailed analysis of nutrients on a vegetarian basis.

III. Conclusion

a. Problems and solutions encountered during development

There were too many duplicate items in the DB of food safety countries brought for nutrient analysis, or there were cases where there was no value for a specific nutrient. Therefore, when this DB was used for the first time, there was a phenomenon that the nutrient did not increase even if similar information was searched, or food was added. To solve this problem, similar items and items that did not show various nutrient values were removed from the DB of Food Safety Country. After removal, no duplicate values were found.

SQLite and Firebase Real Time Database were mainly used for DB utilization in application production, but there was a problem that Firebase was very slow in fetching restaurant menu photos. There were a lot of photos, and the capacity was large, so it was difficult to display them in real time when scrolling and importing photos. Therefore, when accessing the app for the first time, all photos should be retrieved, and when moving pages after that, the previously received photos should be displayed.

b. Expected effects and improvements

Users can save and record the vegetarian diet eaten during the day and analyze the nutrients on a daily or weekly basis. At this time, the user can change the analysis date to a desired date and check which nutrients are lacking or exceeded. The app recommends a menu of vegetarian restaurants in the user's constituency based on the analyzed insufficient nutrients, and through this, the user can try to manage a healthier diet. Users can also check specific information such as the name, address, phone number, and menu of the recommended restaurant directly from the app.

In addition to the recommended restaurants, users can check and search information on vegetarian restaurants in the Seoul area. At this time, if the user sets his/her vegetarian type, the results of the vegetarian restaurant are output differently depending on the type, which helps to maintain his/her vegetarian eating habits. The user can add the menus of the restaurants that are searched and printed to the list of meals I ate by clicking 'I ate today'. Through the app, you can easily search for vegetarian diet information and add the food you eat to view the results of nutrient analysis.

Currently, ‘Vegan Friendly’ is only available in the Seoul area. However, if a database is provided in the future to provide information on vegetarian restaurants in various constituencies, it will help to expand the vegetarian population. On the other hand, since this app is designed only for storing individual diet and analyzing nutrients, there is no window for communication between users. If a service that allows vegetarians to share information with each other, such as a bulletin board, is provided in the future, more accurate and reliable vegetarian information can be provided.

c. The role of submitter

Vegetarian restaurant data was imported and divided by region. The list was made according to the region selected by the user, and pictures were uploaded from Drawable. A filter was applied according to the user's vegetarian-oriented type. Convenience is enhanced by the ability to save the restaurant selected by the user to the scrap box and add the restaurant's

menu to the food eaten today. By adding a search function, users can find the restaurant they are looking for.

My Page to store the user's personal information is configured. To analyze the intake, the user's age, gender, nickname and vegetarian-oriented type were received and stored in Firebase (real-time database). Even if a user logs in with the same account on another device, the saved data can be retrieved. Firebase authentication was used to ensure that both login and logout proceed securely.