DIET CHATBOT PROPOSAL

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OVERVIEW

To start with, our bot is able to provide a guideline for users. Basically, there are four categories users can choose, while another one is hidden from users because it is used for supporting the first four categories:

1. Create User (Initialization)
2. Planner
3. Search (Query)
4. Recommendation.
5. Database

And the below table illustrates basic features in each category of functions.

1. **Create Users** category contains:
   1.1 Acquire basic information of clients
2. **Planner** category contains:
   2.1 Trace user body status regularly
   2.2 Users' self-assessment
   2.3 Provide personalized diet plan
   2.4 Remind users to keep up with plan regularly
3. **Search** category contains (Healthpedia):
   3.1 Offer users comprehensive information of the food/nutrients they search
   3.2 Read menu from text
   3.3 Read menu from URL in JSON format
   3.4 Data of extraordinary food can be added by users if it does not exist in our DB
4. **Recommendation** category contains:
   4.1 Be able to share some healthy tips every day
5. **Database** category contains:
   5.1 User record
   5.2 Information about food and nutrients

DESCRIPTIONS

Descriptions of features mentioned above are as following paragraphs respectively:

1 Create Users

1.1 Acquire basic information of clients <Feature #1>

Before give client's specific suggestion for their personal goals, firstly our bot should be able to ask and acquire personal lifestyle information. Now the preliminary plan is shown as followings:

a. Height and Weight for BMI (Body Mass Index, as a measurement of weight status).
b. Amount of exercise daily, such as taking a walk 1 hour/day.
c. Proportion of vegetable and meat in diet
d. Daily intake of snacks
e. Daily intake of fruit
f. Goals for the future (Loss or gain weight, gain muscles or keep in shape etc.)
g. Others (This bullet will be extended later)

Our bot will guide the user through the information input process.

2 Planner

2.1 Trace user body status regularly <Feature #2>

This is one of the features inside our Planner category.

In this part, users are able to input their daily diet consumption details, including the food amount and types into our bot. For example, during breakfast, a user can tell our bot "I ate a 100g apple for my breakfast". Then our bot will recognize the critical information "apple" and "100g", and will automatically store this diet details into "User Record".

Whenever the users want to keep track of their body status or diet facts throughout a certain period of time, they can use "track" command in our bot. As a response, our bot will visualize the changes of body status or the process of diet consumption within this period of time, which can help users keep track of their body status for further planning.

2.2 Users' self-assessment <Feature #3>

In this feature, users will be asked to finish a list of questions regarding their diet and sport habits and their interested food, etc. And all information collected from this questions will be used for generating more personalized diet plan mentioned in next bullet point. In addition, the quiz scores can somehow reflect the lifestyle of user, from which the bot can provide users with more useful suggestions about health and diet.

Followings are a function template as well as a reference link for implementing this feature:

Function self_assessment(){

//offer several questions

//calculate the total scores

//give corresponding advices according to different score

}

Reference for quiz design:

https://www.sohu.com/a/191402772_770511;
https://www.proprofs.com/quiz-school/quizshow.php?title=how-healthy-are-your-eating-habits&q=1

2.3 Provide personalized diet plan <Feature #4>

After obtaining basic information of clients collected from user initialization part as well as self-assessment part, our bot can analyze all available data about our clients, and give a personalized diet suggestion to them.

At the same time, we understand the fact that some ingredients may be most appropriate but more expensive than some substitutes with acceptable insufficiency of nutrient. Therefore, we plan to consider the price of ingredient and optimize the suggestion based on budget given by client. Our bot will provide a budget range for user to choose from in order to filter out the plans which fail to meet user's budget plan.

To make our suggestion more reasonable and more easy to adopt, our bot will also generate diverse plans with detailed amount in grams or servings. These plans are generated based on users' favorite food, and also according to the features of food such as calories, protein and fat. We will give different plans different "healthy scores". Plan with high score

may be healthier but less delicious, so it could be marked as a difficult mode.

With all above designs, users can easily choose their preferable diet plans.

2.4 Remind users to keep up with plan regularly <Feature #5>

This feature serves as an optional service for Planner and users will have the chance to open or close this Reminder service.

When user decide to activate this function, he or she will regularly receive our reminders generated based on their diet plan as well as their current situation. For example, if a user set up a diet plan that is “Eat an apple every day and drink at least 10 cups of warm water”, according to the tracking record of this user, our bot can figure out has he or she eaten one apple and drunk 10 cups of water already today. If not, our bot will pop up a reminder to this user in order to remind him or her to fulfill the scheduled diet plan.

In addition, we will design various ways of reminder in the future so that the users will not feel it disturbing or boring.

3 Search

3.1 Offer users comprehensive information of the food/nutrients they search <Feature #6>

Once users have provided input of their personal information and start our service, when the “Healthpeida” mode is on, our bot can provide either knowledge about basic nutritive value or descriptions about the food in our database based on users queries.

Since we wish to help our users to understand the basic theory of how different types of nutrients they consume can affect their bodies, in this function our bot will first prompt a list of different nutrients for users to choose, and wait for user input. After our bot reads keywords provided by users, it will search through the database and output a refined description and extended reading with respect to the keyword while appending the link URL which contains the full description.

3.2 Read menu from text <Feature #7>

This feature allows users to input a text or a message containing critical information about food in a menu, and our bot can automatically extract the useful information from the text and store it as part of the diet consumption for that day. For example, when an input text is “Two 200g

apples for my breakfast", our bot will store "200g" and "apple" into "breakfast".

3.3 Read menu from URL in JSON format <Feature #8>

This feature is similar to <Feature #7>. The only difference focuses on the information source. In this feature, our bot will extract information from URL in JSON format.

3.4 Data of extraordinary food can be added by users if it does not exist in our DB <Feature #9>

Apart from providing data to users, since we know that we can hardly build a perfect database, so we will provide access for users to upload data about food that is not existing in our database, or to edit our data regarding the food if we accept the request.

This is actually an extended function of <Feature#6>, and will be activated once our bot cannot find the data corresponding to user input. Our bot will then ask for users if they wish to create such a data, and guide users to provide the information about the new keyword.

Also, if some contents are not correct, we provide a reporting system so that users can request access to edit our data. Once the request is reviewed and found to be useful, we will update our database and credit the providers.

4 Recommendation

4.1 Be able to share some healthy tips every day <Feature #10>

Send Daily sharing message to clients, which could be the following content:

- Some healthy tips for dieting
- Other clients' successful dieting plans

Healthy tips will be collected from the websites by other APIs. Other clients' plans could be selected from our own database based on user's information

5 Database

5.1 User record

Construct a database with the format shown below to keep track of user's information:

User ID	date	weight	height	BMI	...

Additionally, the weight and BMI will keep changing based on user's daily consumption (i.e. they will change along with <Feature #2>)

5.2 Information about food and nutrients

Construct a database with the format shown below to record the nutrients of the food:

Food	Calories	Protein	Fat	Carbohydrate	Price	...

The content including:

- Foods that we see commonly (banana, apple etc.)
- Foods input by the users (some daily food they eat that are not in the database)
- Foods from the canteen which is near to user's location (Assumed that the user are from HKUST, then food in LG7 will be recorded)

REFERENCE:

USDA Food Composition Databases ： https://ndb.nal.usda.gov/ndb/

World Health Organization ：
http://www.who.int/mediacentre/factsheets/fs394/en/

Recommended number of serves for adults：
https://www.eatforhealth.gov.au/food-essentials/how-much-do-we-need-each-day/recommended-number-serves-adults