Summer 2020 | CS 157A

GNT-Market

Grocery Nutrient Tracker, Calorie Calculator

Team 11
Tracy Ho & Inhee Park

Project Description

- **Goal & Motivation** :
  With the on-going unprecedented pandemic situation, one essential activity that still needs to be done is grocery shopping. It is often advised to be a quick process with a healthy selection due to the need of minimizing time spent inside a store, along with the need to have proper nutrients from a well-balanced diet given how sedentary people's lives have become from staying at home. To help people's dietary needs, we propose the "GNT-Market" web app as a **G**rocery **N**utrient **T**racker as well as a Calorie Calculator. This can assist people track their grocery buying along with food consumption to have a better view of their diet.
- **Stakeholders** : consumers
- **Application Domain** : health, food, nutrient
- **Benefits to Users** : Quick and healthy tracker for users' grocery shopping list

System Environment

- **Structure of the system (3-tiered architecture)** :

Layer/Tier	Front-end	Middle-ware	Back-end
Role	Web Client	Web Server	DB Server
Software	Bootstrap [1-2]	TomCat [3-4]	MySQL [5]
Application Language	HTML, CSS, JS	Java, JSP	SQL

- **HW/SW used** : macOS Sierra 10.12.6
- **RDBMS used** : MySQL Ver 8.0.19; MySQL Workbench 6.0.10
- **Application languages** : Java, SQL, JSP, HTML, CSS, JS

Functional Requirements (DB manipulation activities)

A list of detailed descriptions of users and how users interact with your application

- **User Interaction with the App:**
  There are 9 features to "GNT-Market", which will be incorporated in a web application. Most of the data source will come from FoodData Central (FDC) of the U.S. DEPARTMENT OF AGRICULTURE. [6]

  1. **[Dish ⇒ Grocery List ⇒ Nutrient/Calorie Information]**
     User inputs a desired dish from a menu in the app.
     The app will provide a list of grocery items with nutritional distribution (with exceeding/deficient nutrition) and the calorie information of each item.

  2. **[Grocery List ⇒ Nutrient/Calorie Information]**
     User inputs a list of grocery items in the app.
     Then the app outputs cumulative nutritional distribution (with exceeding/deficient nutrition) and the calorie information of each item.

  3. **[Grocery Browser]**
     Users can browse food categories corresponding to section names of grocery aisles.
     Which users can then add food items into their grocery list.

  4. **[Search By Branded Grocery Item / Food]**
     Users can type in grocery items to search for and add to their grocery list.
     Both branded items and general food name are accepted.

  5. **[Dietary Restriction]**
     Users can set their dietary restrictions (e.g. food allergy) to the app.
     Then if the user selects a grocery item that conflicts with their diet restriction, the app gives a warning.

6. **[Browse Beneficial Food]**
   Users can browse a paired list of food and their respective beneficiary body systems, so they may tailor food items for their specific health needs.

7. **[User Creation]**
   A user will be able to register their own account to use the web application with an email and password.
   Then they will be able to use the application for their own usage.

8. **[Nutrient Suggestions]**
   A user who may want to get more of a particular nutrient in their diet may look into suggestions of what is rich in those nutrients, so they can include it in their list of groceries to buy.
   This will display a list of food items that contain a specific nutrient, giving the user an idea of what nutrients they are taking in their diet.

9. **[Favorite Food Items]**
   Users are able to mark which items as favorites so they may be able to access the items easier, whether it is to look up more details of the items or to re-add the items in their grocery list.

Describe each individual function/feature, functional process and I/O.

- **Functions**:
  1. **Frequently Purchased Grocery Items**: Keeping track of the number of times an item has been purchased, and store those items as frequently purchased items.

  2. **List of Dietary Restrictions**: Set dietary restrictions by adding specific food items to be avoided.

  3. **List of Beneficial Food**: Selects a body system from a dropdown menu that a user is concerned about, then the app will suggest healthy foods that can benefit that body system.

4. **Create/Delete a Grocery Shopping List Card**: Users can create a card that will contain all of the grocery items that they want to purchase. Items can be added to this card, deleted, or updated accordingly.

5. **Duplicate Grocery List**: Users that wish to reuse a previously made grocery list may be able to copy what they previously created.

6. **Browse Grocery Categories**, such as:
   - ✓ Beverages – coffee/tea, juice, soda
   - ✓ Bread/Bakery – sandwich loaves, dinner rolls, tortillas, bagels
   - ✓ Canned/Jarred Goods – vegetables, spaghetti sauce, ketchup
   - ✓ Dairy – cheeses, eggs, milk, yogurt, butter
   - ✓ Dry/Baking Goods – cereals, flour, sugar, pasta, mixes
   - ✓ Frozen Foods – waffles, vegetables, individual meals, ice cream
   - ✓ Meat – lunch meat, poultry, beef, pork
   - ✓ Produce – fruits, vegetables

7. **Calorie Tracking**: Provides different categories to keep track of calories. Users will use the food that they already have added to keep a count of their calories.

Non-functional issues

Detailed descriptions of Graphical User Interface...

The web application will use Bootstrap to incorporate the following GUI concept into the web interface. Bootstrap is a collection of templates in HTML/CSS/Javascript for most GUI components (Tables, Buttons, Progress Bars, Pagination Panels, Dropdowns, Forms, Inputs, Carousel, and etc.) including Grid System, Themes.

Below is a concept sketch of the "GNT-Market" app. The main component is a Grocery List, and each item in the list can be populated with 3 different methods (by search, browse, or dish menu). The results will show Nutrition and Calorie Information at the bottom. Users may add their dietary restriction, so that the app will warn them when they add an avoided item to their grocery list. Development will be based on this conceptual GUI draft.

<table>
<tr><td colspan="4">GNT-Market</td><td colspan="2">User Add (+)</td></tr>
<tr><td colspan="3">Grocery List</td><td rowspan="2">By Search Food
Type Food Name</td><td colspan="2">Beneficial Food List
Learn More</td></tr>
<tr><td>+</td><td>2% Milk</td><td>x</td><td>ok</td><td>tolist</td></tr>
<tr><td>+</td><td>Cream Cheese</td><td>x</td><td rowspan="5">By Browse
Fruit Veggie Meat ...</td><td>ok</td><td>toList</td></tr>
<tr><td>+</td><td>Oranges</td><td>x</td><td>ok</td><td>toList</td></tr>
<tr><td>+</td><td><s>Peanut Butter</s> (!)</td><td>x</td><td colspan="2">Food Restriction List</td></tr>
<tr><td>+</td><td></td><td>x</td><td>no</td><td>Peanut</td></tr>
<tr><td></td><td></td><td></td><td>no</td><td></td></tr>
<tr><td></td><td></td><td></td><td rowspan="2">By Dish Menu
Type Dish Name</td><td>no</td><td></td></tr>
<tr><td colspan="3">Nutrition Info
50% Carb 30% Protein 10% Fat</td><td colspan="3">Calorie
1,000 kcal/mol</td></tr>
</table>

Detailed descriptions of Security...

Security of users will be protected by an email and password to identify the user. The username and password will be securely stored in the database, which the password will be encrypted, so even the web administration will not be able to see the

password. Users must use their own email and password to login to be able to use the application. If they forget their password, they can provide their email address for a password change request. The web application itself will use HTTPS to have encrypted connections.

Detailed descriptions of Access Control…

For access control, users will only be able to have access to their own data. They will not be able to retrieve nor modify data from other users. There will be checks in place to make sure that only the user sees their own data. Administrators will be able to have access to all data, including user data and backend data that is only available to admin-level users.

References

[1] Add Bootstrap to JSP Page
[2] Build fast, responsive sites with Bootstrap
[3] Apache Tomcat
[4] Apache Tomcat Troubleshoot
[5] MySQL Workbench
[6] FoodData Central Download Data (All Data Types: April 2020 version 2* (CSV – 85M))