Group 14

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Developer Section: https://github.com/Alexmac22347/DontEatThat

Don’t Eat That!

November 27, 2016

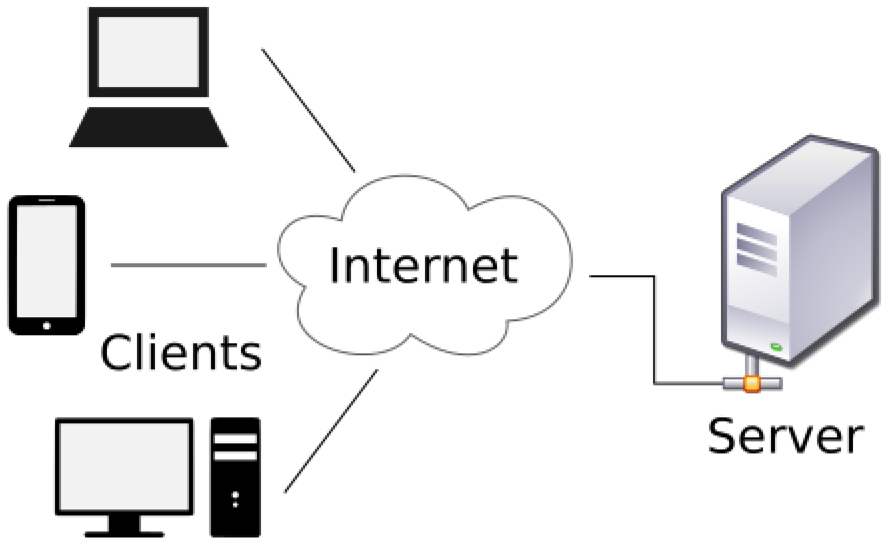
Design Document

INTRODUCTION

We plan to build Don’t Eat That! as a web application that can be used by both general and registered users to compare two food products to determine the healthier option. The web application will retrieve nutritional data from the FatSecret Platform REST API, which uses a database of nutritional information. After retrieving the nutritional facts, Don’t Eat That! will use an algorithm to determine the healthier option. The algorithm can be altered to meet the specific needs of a user.

This document will attempt to explain the architecture and design of the system using the 4+1 architecture model.

SYSTEM ARCHITECTURE AND RATIONALE



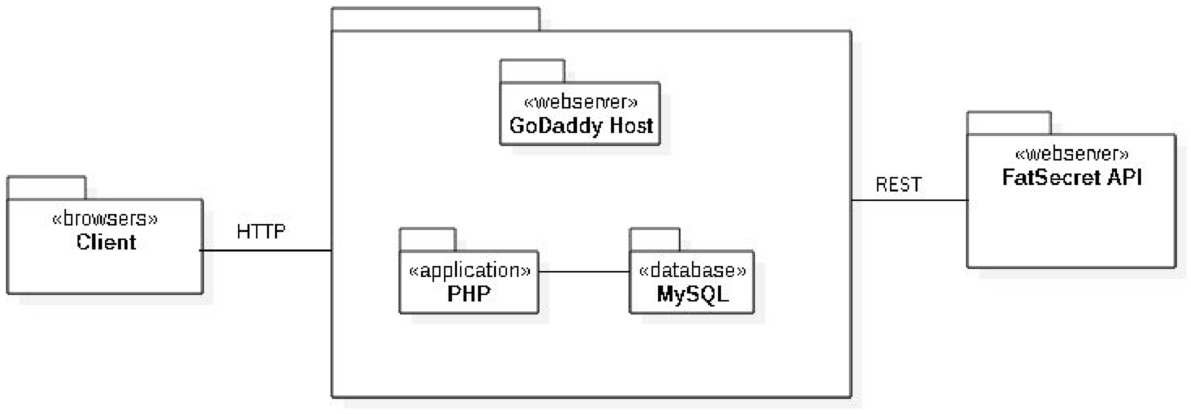
Client-Server Architecture
Source: https://en.wikipedia.org/wiki/File:Client-server-model.svg

This is a web application, so various languages and software platforms will be used. The application will follow a "Client-Server" architecture. We chose this architectural pattern because it resembles the type of interactions seen in our use cases. The user (*client*) is curious about the nutritional values of two food items and wants to learn more. The user requests information regarding their two food items of choice by using our web application (*server*). The front-end is written in HTML, CSS, JavaScript and uses the Bootstrap framework. The back-end consists of a REST API and a MySQL database. To connect the front and back ends, we are using PHP as our server-side programming language.

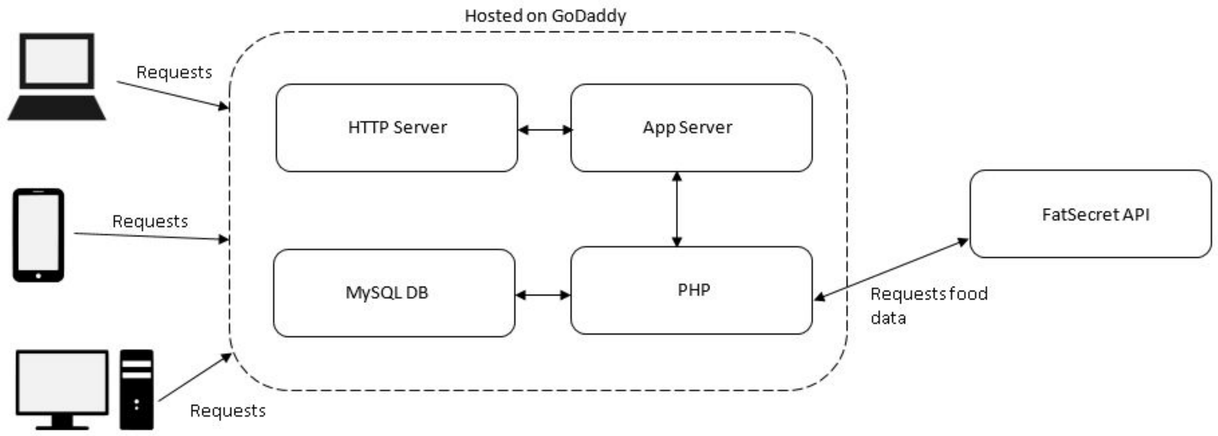
The web application consists of the following major components:

1) Web server on which the application is hosted and where client requests are processed
2) User database used to create and manage user accounts
3) FatSecret Platform REST API used to access nutritional information of food products

Deployment Diagram - Static View



Dynamic View and Description



HTML (HyperText Markup Language) & CSS (Cascading Style Sheets)

The user interfaces are written in HTML, the standard markup language for creating web pages and applications. HTML describes the structure and layout of a web page by using tags and attributes. CSS describes how HTML elements are displayed on the screen. CSS can be used to separate document content from presentation. This separation can improve content accessibility and provide flexibility and control in presentation characteristics. We chose to use HTML and CSS because these languages are common to make web pages, making it easy to find online reference/support.

Bootstrap

The front end (user interfaces) are developed using the Bootstrap framework. The Bootstrap framework is commonly used in web applications for responsiveness. Bootstrap automatically adjusts the layout of web pages according to the user's screen size. Therefore, our web application will have a user-friendly front end regardless if the user is on an Android phone/tablet, iPhone/iPad, or a commonly used browser such as Google Chrome or Mozilla Firefox. This responsiveness is the main reason we decided to use the Bootstrap framework. Another reason the Bootstrap framework was selected is because of its popularity, which made it easy for us to find tutorials and support.

jQuery

jQuery is a lightweight JavaScript library that is commonly used in web application development to make coding in JavaScript easier. jQuery can take tasks that require many lines of JavaScript code to run and turn the tasks into methods that can be easily called in a line of code. That was the reason we chose to use jQuery in our web application. By using jQuery, we can take complicated tasks, such as updating a form, autocomplete, and validating a form, and easily perform these tasks by calling a method. jQuery is also very popular amongst software developers, making it easy to find online resources/support for problems that arise during development.

MySQL

The web application is hosted by GoDaddy.com Inc., an Internet domain registrar, and web hosting company. GoDaddy provides web domains with database services using the MySQL database system. MySQL is a database system that runs on a server and uses standard SQL. We chose to use a domain host with MySQL because MySQL is free to use, compiles on multiple platforms, works for applications of all sizes, and has earned a reputation for reliability. These attributes allow our web application to work on multiple operating systems and browsers.

PHP (Hypertext Preprocessor)

PHP is an open-source, general-purpose scripting language that can be embedded into HTML. PHP code is executed by the server (back end), which generates HTML and sends it to the client (front end). Within the HTML code of the user interfaces, PHP code can be embedded, allowing the user interface pages to interact with the FatSecret API and user database. For example, a user can enter two food products and PHP code can be used to retrieve information about the food products from the API. We chose to use PHP because PHP supports a wide range of databases, can be used on multiple operating systems and supports most browsers. PHP is also a commonly used server side language, so online help and support are easily found.

When a user registers, sensitive information such as the user's name and password could potentially be retrieved by malicious users. To prevent these malicious actions, account security and authentication is achieved by using PHP's built-in encryption functions. As of version 5.5, PHP provides password encryption by using a bcrypt hash function *password_hash()*. Login authentication is also supported by PHP. Passwords are verified via a built-in function *verify_password()*.

FatSecret Platform REST API

The FatSecret Platform REST API allows us to integrate the comprehensive FatSecret database of nutritional information into our web application. We chose to use this API for multiple reasons. First, the FatSecret database has a reputation for accuracy and efficiency, which is a functional requirement of our application. Second, FatSecret offers a great deal of support for their API, making it easy to find guides, manuals, and libraries to make the most effective use of the API. Third, the API returns the correct result even if the user input is slightly incorrect, which enhances the user experience. Finally, the FatSecret REST API is free and allows unlimited calls a day with no throttling limits, which is more than enough for the planned usage of Don't Eat That!.

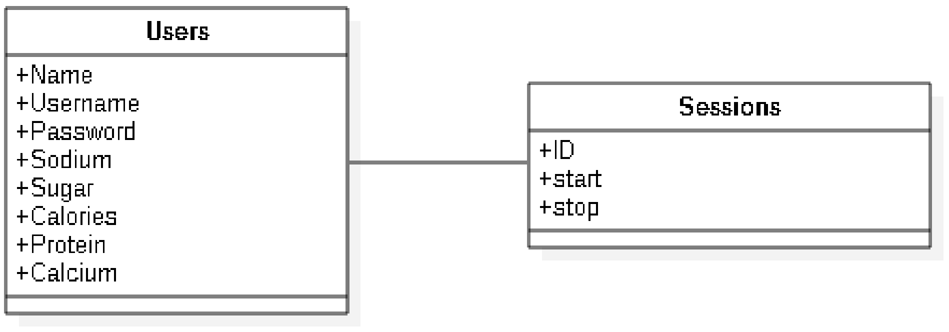
Originally, we had planned to use our own MySQL database of food items, but encountered a great deal of difficulty in finding the correct items. The original database was unable to deal with slightly incorrectly spelled inputs from the user. Furthermore, the database often returned variations of an item instead of the actual item. Attempts to fix these problems proved fruitless. It was apparent that the FatSecret REST API was a much more effective alternative.

Secure Sockets Layer

The application uses Secure Sockets Layer (SSL) security technology to establish an encrypted link between the server (backend) and the browser (frontend). We chose to use SSL technology for multiple reasons. First, GoDaddy offers an SSL Manager feature that makes it very easy to use SSL to secure our system. Second, SSL is widely used amongst web developers as it has a reputation for reliability and safety. Finally, SSL offers a visual cue to users that our application is secured. On Google Chrome, the visual cue is a green lock in the URL bar. The visual cue lets users know that their data is safe - providing them a peace of mind and enhancing their experience.

DATA

The web application uses two sources of data: user information and nutritional facts. The user information will be stored in a MySQL database provided by our domain and server host, GoDaddy. The nutritional facts will be stored in a database that is accessed by the FatSecret REST API. We will be responsible for the addition, removal, and maintenance of the data in the user database. However, we have no control over the FatSecret database. We can only access nutritional data from the FatSecret database through their API.



DETAILED DESIGN

Static Behaviour

The browser is connected to the application via Hypertext Transfer Protocol (HTTP). The application is hosted on a web server by GoDaddy. The application uses a MySQL database, which is accessed by using the server side language PHP. The application also uses a REST API from FatSecret.

Dynamic Behaviour

When a user uses the application, whether on a laptop, phone, or desktop computer, the application sends requests to the GoDaddy server. On the server, PHP scripts process the user’s request and attempt to gather the appropriate nutritional data from the FatSecret REST API.

GUI

The user interface will be built using HTML, CSS, JavaScript, and the BootStrap framework. With the use of PHP, we are able to create dynamic web pages. The theme of the user interface is to be learnable, efficient, and visually appealing. These design goals influence the choice of logo, layout, buttons, and colours. At the bottom of every page is a disclaimer that informs users about the limitations of this web application (preventing users from confusing this web application as a source of medical advice) and attribution to FatSecret.

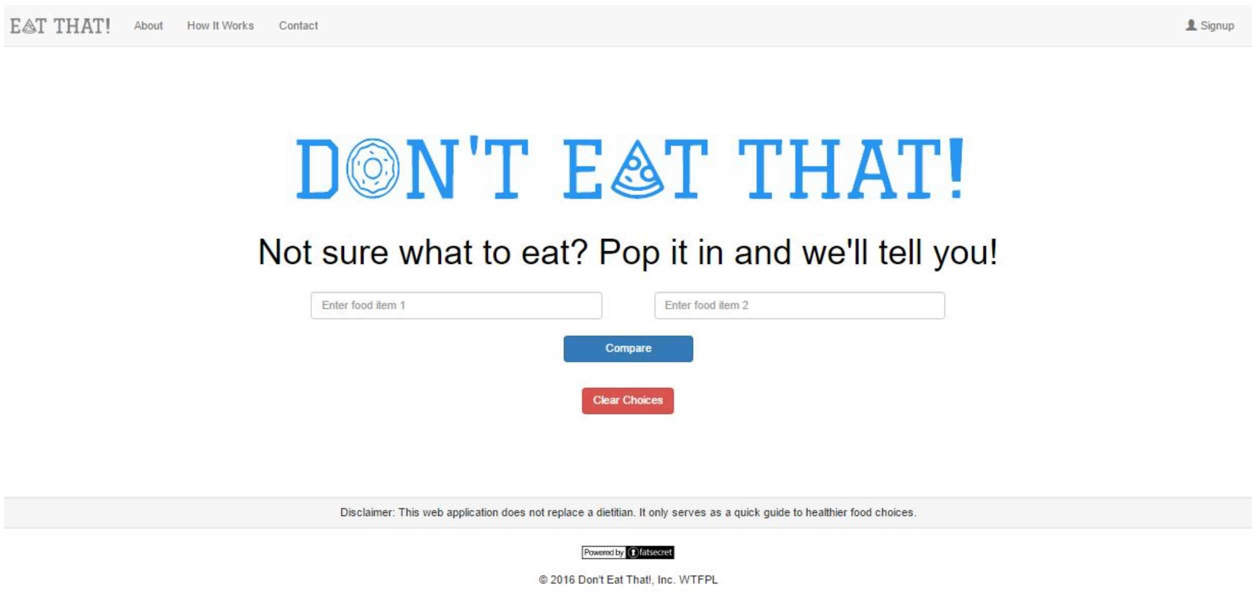
Validation

The user interface is reviewed with the client on a weekly basis. These reviews yielded some changes to our initial proposal of the user interface. The user recommended that minor changes be made to the fonts for an easier reading experience. Furthermore, the user interface was not consistent across different platforms and devices, so we implemented the Bootstrap framework. These changes resulted in a more user-friendly interface that worked across multiple platforms and devices.

Likewise, the functional requirements are reviewed with the client on a weekly basis as the developers gain experience developing the system. The changes in requirements resulting from these reviews are scheduled to be performed in the following iterations.

Home Page

The home page will be used by both registered and general users. Our logo and a catchy phrase telling the user to compare two food items are located at the top middle of the home page. Below, in the centre of the home page, the user will be able to enter in two food products for comparison. The user can clear the text boxes by using the “Clear Choices” button. The placement of the text boxes and the buttons is designed to be easy to understand and use. At the top of the home page, the user can provide feedback about the web application, log into their account, or sign up for an account.


EAT THAT!
About
How It Works
Contact
Signup
DON'T EAT THAT!
Not sure what to eat? Pop it in and we'll tell you!
Enter food item 1
Enter food item 2
Compare
Clear Choices
Disclaimer: This web application does not replace a dietitian. It only serves as a quick guide to healthier food choices.
Powered by fatsecret
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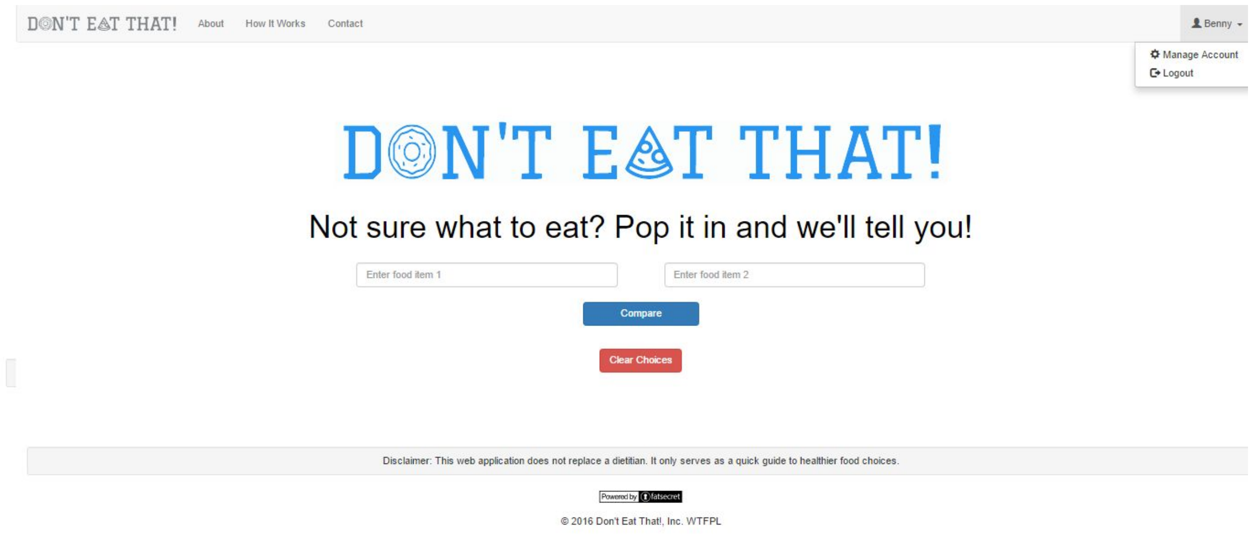
Above: The home page when the user is not signed in (on Microsoft Edge)

If the user has signed in, then the upper right corner of the home page will show the user's registered name and allow the user to access account settings or sign out. The home page displays the user's registered name to ensure the user that they are logged in and to make the user feel more comfortable.


DON'T EAT THAT!
About
How It Works
Contact
Benny
Manage Account
Logout
DON'T EAT THAT!
Not sure what to eat? Pop it in and we'll tell you!
Enter food item 1
Enter food item 2
Compare
Clear Choices
Disclaimer: This web application does not replace a dietitian. It only serves as a quick guide to healthier food choices.
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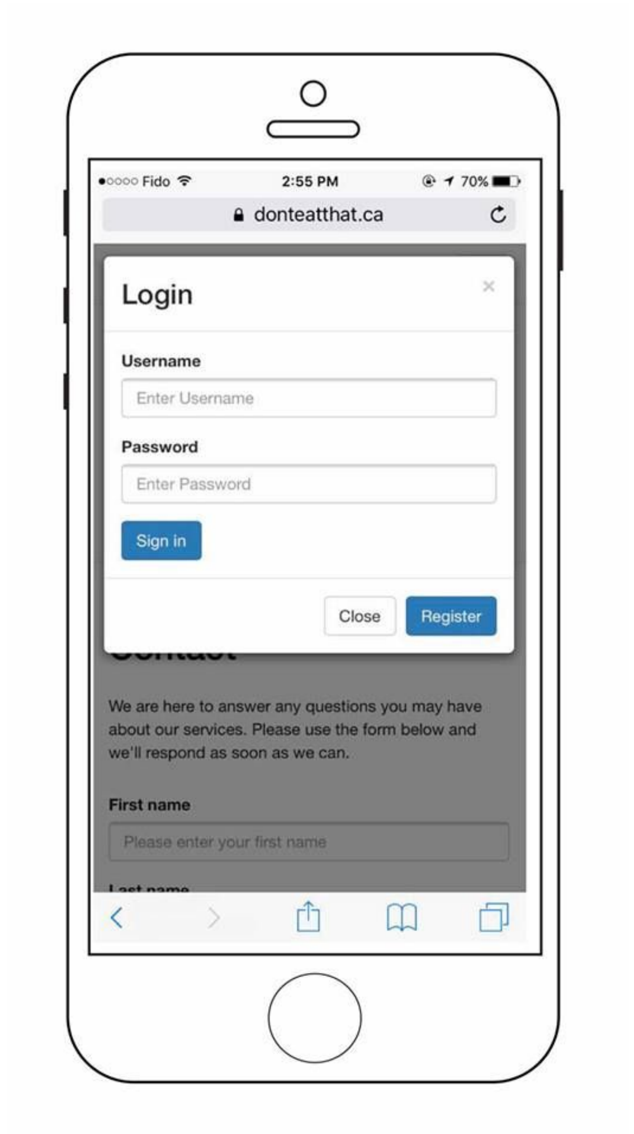
Above: Home page when user is signed in (on Google Chrome)

Login Page

The login page is a modal used by users to log into their account. The login modal will temporarily deactivate all other features on the web page until it is closed. The login modal will have two textboxes: one for the username and one for the password. After entering the information, the user will log in by pressing the “Sign in” button. If the user does not have an account but wishes to make one, the user can do so by pressing the “Register” button, which will redirect the user to the Registration page. A modal was used instead of a separate page to create a more interactive and interesting user experience. Instead of simply going to another page, the user has something pop up at them.



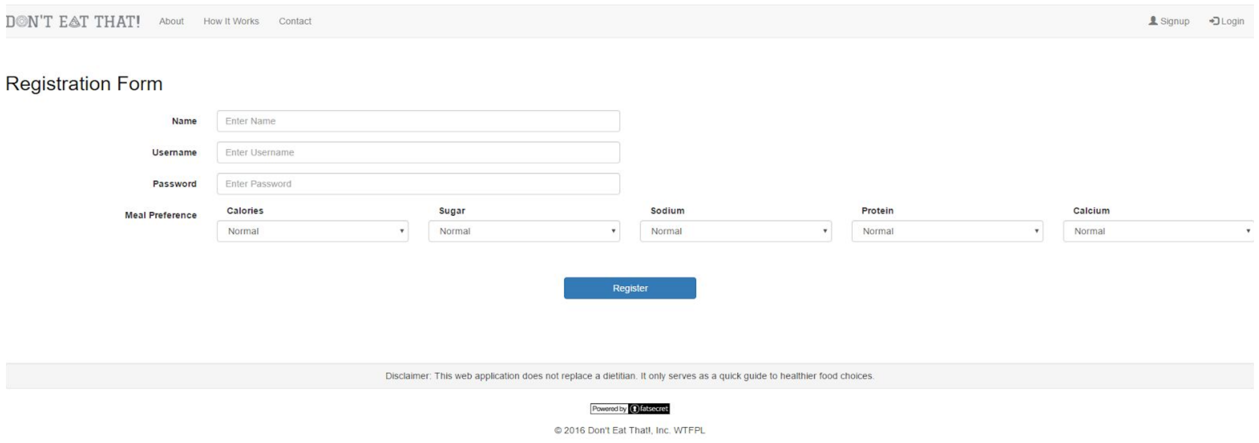
We are here to answer any questions you may have about our services. Please use the form below and we'll respond as soon as we can.

Above: The Login modal (on Apple iPhone 6)

Registration Page

The registration page will be used by general users to create new accounts. The registration form will consist of three textboxes: one for the user's name, one for the desired username, and one for the password. The form will also have five drop down menus where the user can indicate their meal preferences. The user will be able to adjust their preference for the amount of calories, sugar, sodium, protein, and calcium in their foods. The drop down menus are used to create consistency among the user preferences. If users were allowed to freely enter their preferences, answers could vary widely, making it difficult for the application to store and use the user preferences. However, with drop down menus, the preferences must be one of: Normal, High or Low. Limiting users down to these three choices allows users to express their preferences while allowing the web application to easily store and use the preferences.

After entering all of the information and registering (using the "Register" button), the user will be redirected to the main page where the user will be logged in with their name showing in the top right corner. If the user does not fill out all of the desired information, the system will prompt the user to fill in the missing information. The user will be unable to register until all information is complete. This check is to prevent users from making incomplete accounts, which would make it difficult for the system to store and use their information effectively.



Registration Form

Name: Enter Name
Username: Enter Username
Password: Enter Password
Meal Preference: Calories: Normal; Sugar: Normal; Sodium: Normal; Protein: Normal; Calcium: Normal

Register

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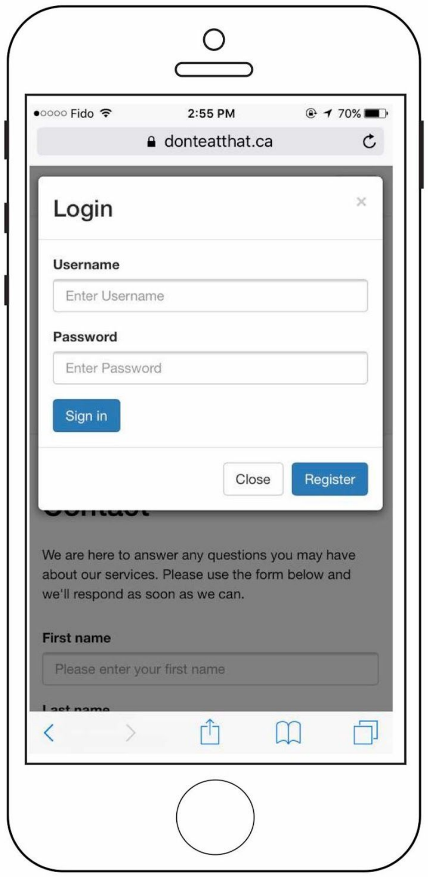
Above: Registration Page (on Google Chrome)


●○○○○ Fido 2:55 PM 70%

donteatthat.ca

Login

Username

Enter Username

Password

Enter Password

Sign in

Close Register

Contact

We are here to answer any questions you may have about our services. Please use the form below and we'll respond as soon as we can.

First name

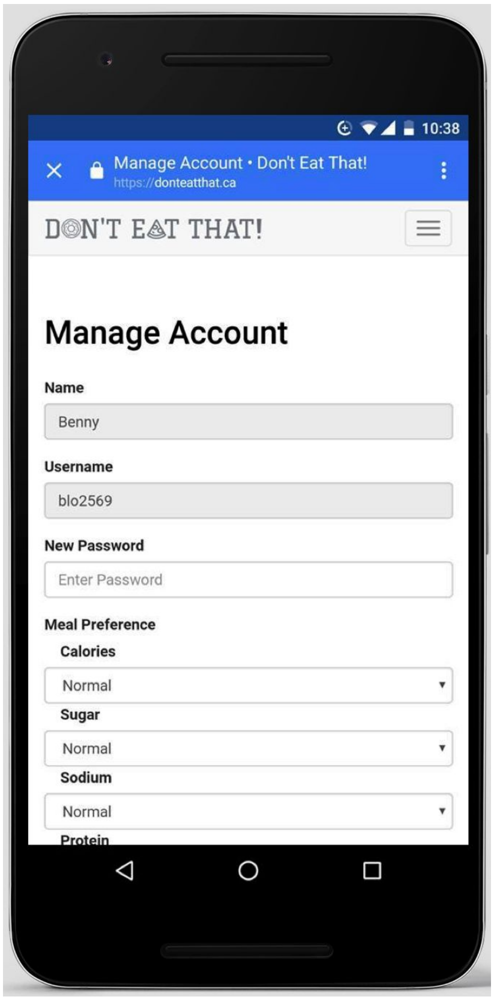
Please enter your first name

Last name

Above: Top half of Registration page (on Google Chrome - iPhone 6)

Manage Account Page

The manage account page is based off of the registration page. When a signed in user accesses the manage account page, they will see a page very similar to the registration page. This is to make editing account information easy for the user, as the user will have already seen the page and knows where to put their information. However, the input boxes for the name and username will be grayed out and inaccessible, as the user cannot change their name or username. The drop down menus will display the user's most recently saved preferences. The user can change their password and/or meal preferences by using the input box and the drop down menus. Changes will be recorded after the user presses the "Update Account" button. Alternatively, if the user wishes to delete their account, it will be deleted from the database after the user presses the "Delete Account" button and confirms by clicking "Yes" on the prompt that shows up. The "Delete Account" button is red to capture the user's attention, so they do not accidentally delete their account.



10:38

Manage Account • Don't Eat That!
https://donteatthat.ca

DON'T EAT THAT!

Manage Account

Name

Benny

Username

blo2569

New Password

Enter Password

Meal Preference

Calories

Normal

Sugar

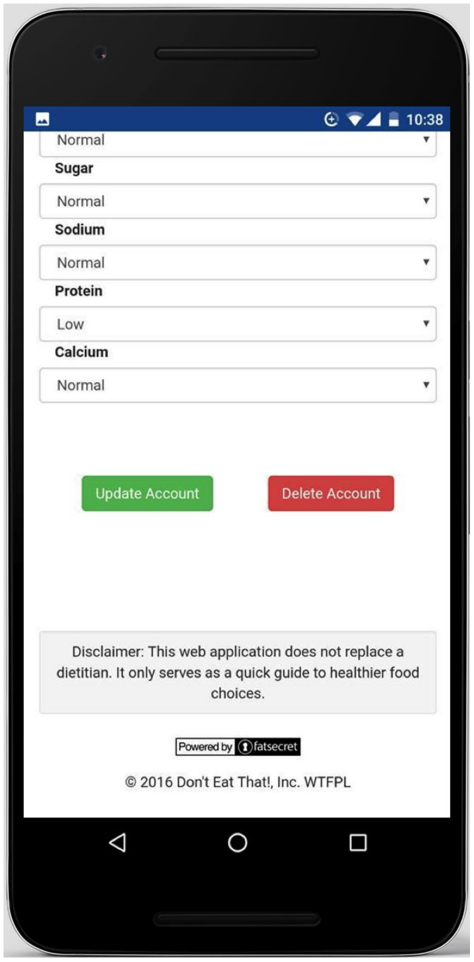
Normal

Sodium

Normal

Protein

Above: Top half of Manage Account page (on Android smartphone - Google Nexus 5x)


Normal

Sugar

Normal

Sodium

Normal

Protein

Low

Calcium

Normal

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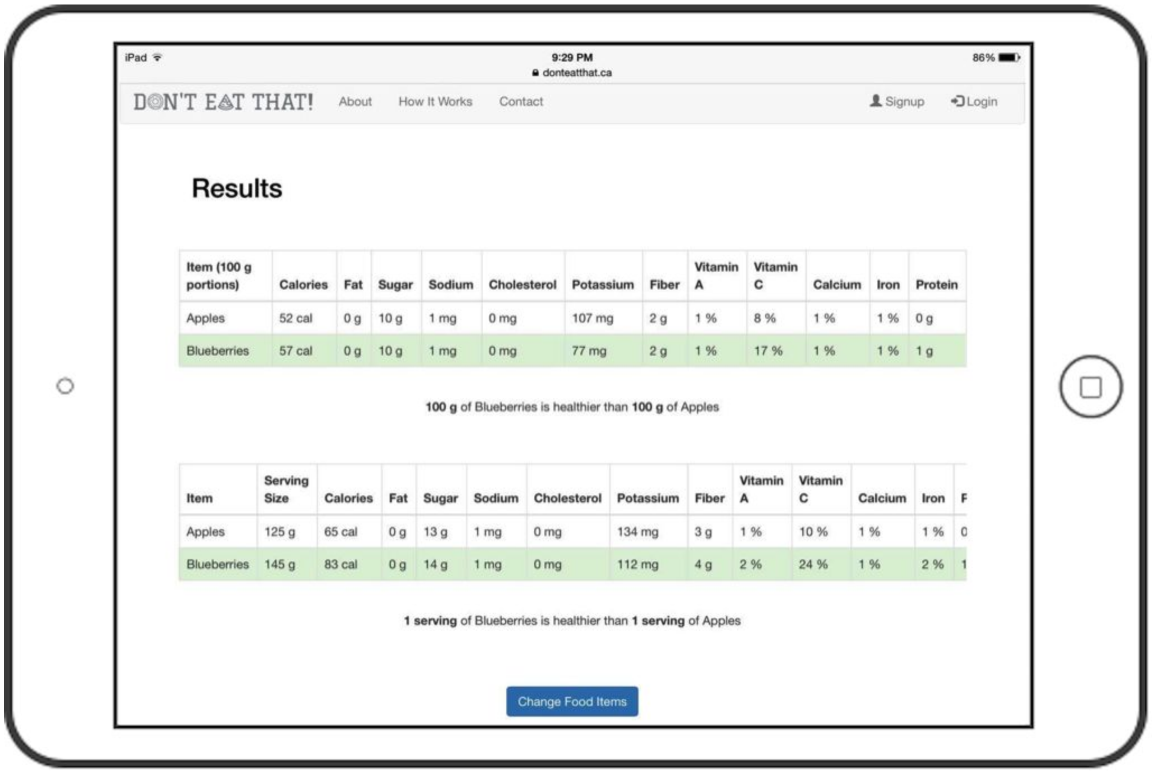
Above: Bottom half of Manage Account page (on Android smartphone - Google Nexus 5x)

Recommendation Page

The recommendation page displays the results of the user's comparison. The user will be able to see two tables; both display the amount of calories, fat, sugar, sodium, cholesterol, potassium, fiber, Vitamin A, Vitamin C, calcium, iron and protein in the user's submitted food choices. The top table displays the nutritional data of a 100 g portion. Below the top table is a recommendation that is made based on the nutritional data of a 100 g portion. The bottom table displays the nutritional data of a typical serving. Below the bottom table is a recommendation that is made based on the nutritional data of a typical serving. In both tables, the recommended choice is highlighted. Two sets of nutritional data and recommendations are used to give the user a complete understanding of their choices. We cannot use only the set of data using 100 g portions because food is not usually consumed in 100 g portions. We also cannot use only the set of data using typical portions because different portions sizes can affect the results. Thus, two sets of data are needed for a fair and complete view. Also, the tables have a scrollbar that user can use on smaller screen sizes to view the nutrition facts displayed on the table. The user can go back to the home page to compare other food items by using the “Change Food Items” button.



Results

Item (100 g portions)	Calories	Fat	Sugar	Sodium	Cholesterol	Potassium	Fiber	Vitamin A	Vitamin C	Calcium	Iron	Protein
Apples	52 cal	0 g	10 g	1 mg	0 mg	107 mg	2 g	1 %	8 %	1 %	1 %	0 g
Blueberries	57 cal	0 g	10 g	1 mg	0 mg	77 mg	2 g	1 %	17 %	1 %	1 %	1 g

100 g of Blueberries is healthier than **100 g** of Apples

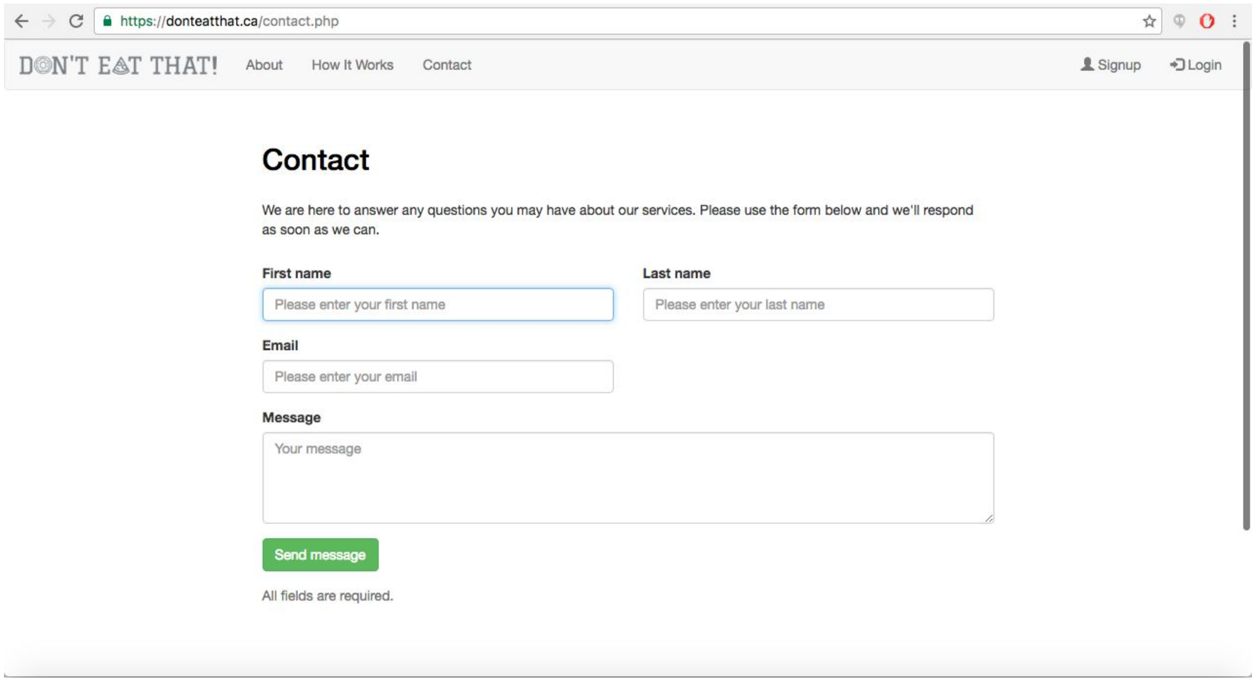
Item	Serving Size	Calories	Fat	Sugar	Sodium	Cholesterol	Potassium	Fiber	Vitamin A	Vitamin C	Calcium	Iron	F
Apples	125 g	65 cal	0 g	13 g	1 mg	0 mg	134 mg	3 g	1 %	10 %	1 %	1 %	0
Blueberries	145 g	83 cal	0 g	14 g	1 mg	0 mg	112 mg	4 g	2 %	24 %	1 %	2 %	1

1 serving of Blueberries is healthier than **1 serving** of Apples

Above: Results Page (on Apple iPad)

Contact Page

The contact page allows users to send messages to the developers. In the contact page, the user must enter their first name, last name, email, and message. This information is used to reply to the user appropriately. If a user does not fill out all of the fields, the system will let the user know which fields to fill in via error messages. This is to prevent incomplete messages from being sent to the developers. After all fields are completed, the user can use the green “Send message” button (designed to be visually appealing) to send the message.



Contact

We are here to answer any questions you may have about our services. Please use the form below and we'll respond as soon as we can.

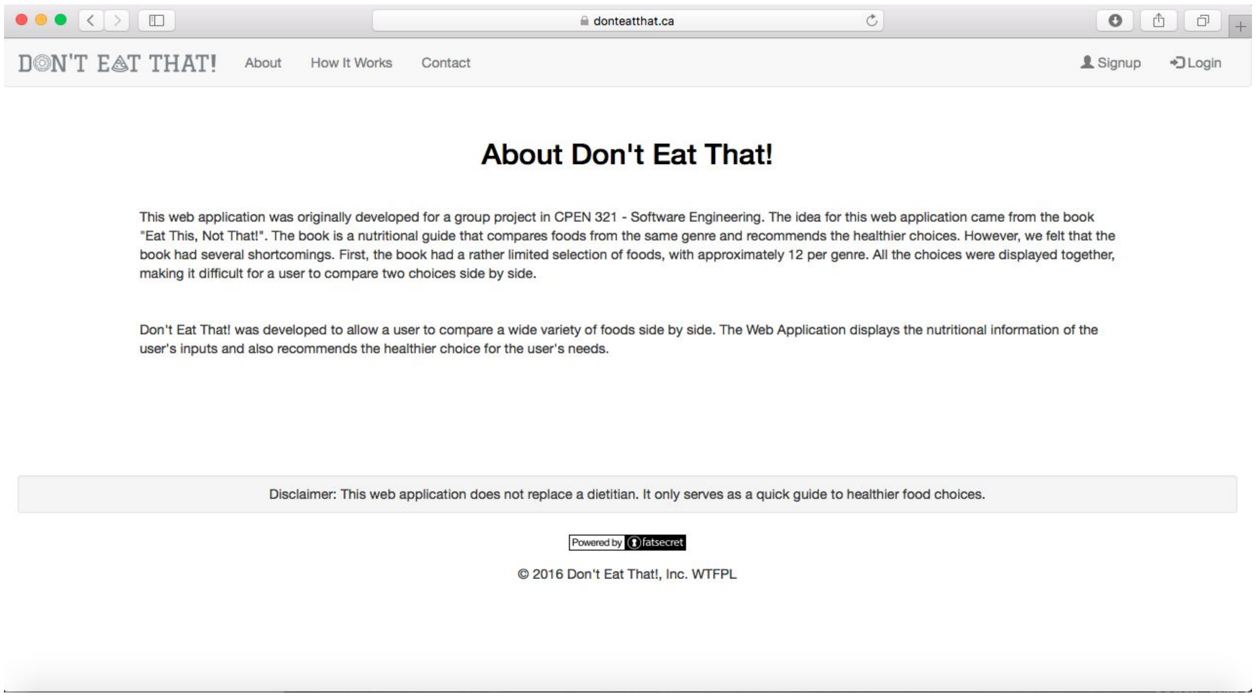
First name: Please enter your first name
Last name: Please enter your last name
Email: Please enter your email
Message: Your message

All fields are required.

Above: Contact Page (on Google Chrome)

About Page

The about page is used to inform users about the background and inspirations of the application.



About Don't Eat That!

This web application was originally developed for a group project in CPEN 321 - Software Engineering. The idea for this web application came from the book "Eat This, Not That!". The book is a nutritional guide that compares foods from the same genre and recommends the healthier choices. However, we felt that the book had several shortcomings. First, the book had a rather limited selection of foods, with approximately 12 per genre. All the choices were displayed together, making it difficult for a user to compare two choices side by side.

Don't Eat That! was developed to allow a user to compare a wide variety of foods side by side. The Web Application displays the nutritional information of the user's inputs and also recommends the healthier choice for the user's needs.

Disclaimer: This web application does not replace a dietitian. It only serves as a quick guide to healthier food choices.

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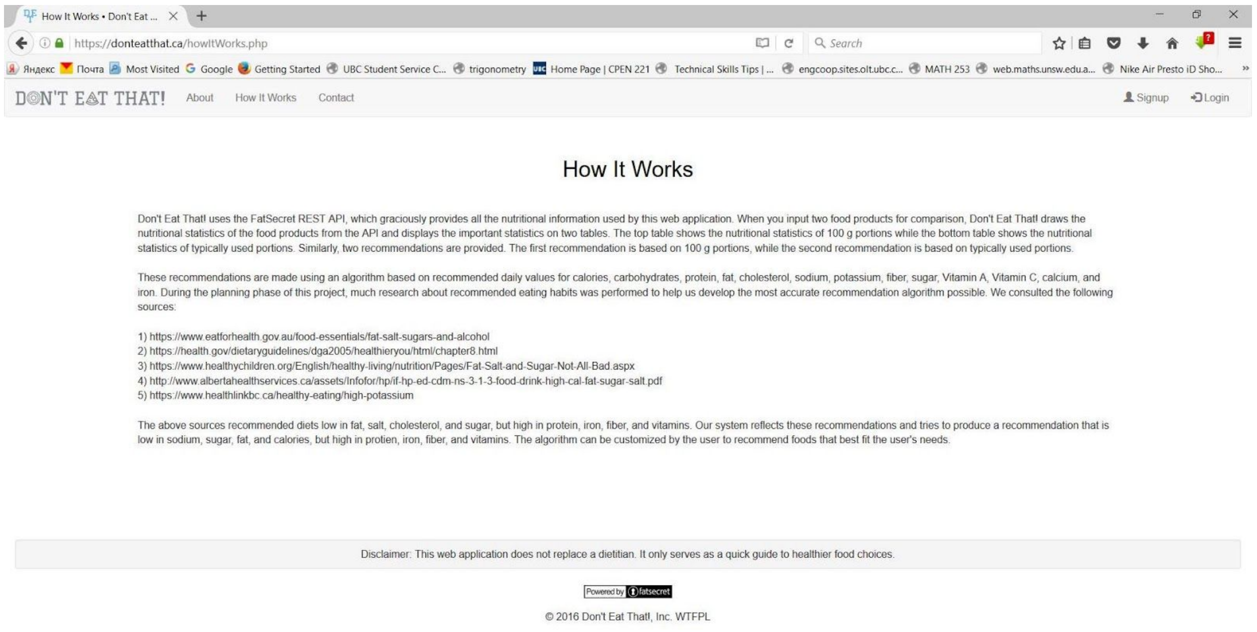
Above: About Page (on Safari)

How It Works Page

The how it works page is used to inform users about how the application works. The page explains the technologies behind the application, what the application does, and how recommendations are made. In addition, the user is shown the sources that were used in the design of the recommendation algorithm. The purpose of this page is to answer questions users may have about the functioning of Don't Eat That!. Furthermore, allowing users to see the default recommendation algorithm will allow users to confirm that it fits their dietary preferences.


How It Works • Don't Eat ...
https://donteatthat.ca/howItWorks.php
Search
Яндекс Почта Most Visited Google Getting Started UBC Student Service C... trigonometry Home Page | CPEN 221 Technical Skills Tips | ... engcoop.sites.olt.ubc.c... MATH 253 web.maths.unsw.edu.a... Nike Air Presto iD Sho...
DON'T EAT THAT!
About
How It Works
Contact
Signup
Login

How It Works

Don't Eat That! uses the FatSecret REST API, which graciously provides all the nutritional information used by this web application. When you input two food products for comparison, Don't Eat That! draws the nutritional statistics of the food products from the API and displays the important statistics on two tables. The top table shows the nutritional statistics of 100 g portions while the bottom table shows the nutritional statistics of typically used portions. Similarly, two recommendations are provided. The first recommendation is based on 100 g portions, while the second recommendation is based on typically used portions.

These recommendations are made using an algorithm based on recommended daily values for calories, carbohydrates, protein, fat, cholesterol, sodium, potassium, fiber, sugar, Vitamin A, Vitamin C, calcium, and iron. During the planning phase of this project, much research about recommended eating habits was performed to help us develop the most accurate recommendation algorithm possible. We consulted the following sources:

1) https://www.eatforhealth.gov.au/food-essentials/fat-salt-sugars-and-alcohol
2) https://health.gov/dietaryguidelines/dga2005/healthieryou/html/chapter8.html
3) https://www.healthychildren.org/English/healthy-living/nutrition/Pages/Fat-Salt-and-Sugar-Not-All-Bad.aspx
4) http://www.albertahealthservices.ca/assets/Infofor/hp/if-hp-ed-cdm-ns-3-1-3-food-drink-high-cal-fat-sugar-salt.pdf
5) https://www.healthlinkbc.ca/healthy-eating/high-potassium

The above sources recommended diets low in fat, salt, cholesterol, and sugar, but high in protein, iron, fiber, and vitamins. Our system reflects these recommendations and tries to produce a recommendation that is low in sodium, sugar, fat, and calories, but high in protien, iron, fiber, and vitamins. The algorithm can be customized by the user to recommend foods that best fit the user's needs.

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Above: How It Works Page (on Mozilla Firefox)

Installation guide

The files in public_html should be placed in a folder which is hosted on the internet. We use a web host which was purchased from godaddy.com

Certain php scripts require Oath keys or MySQL username/password/database names. These should be placed in a new file: config/config.php

Here is an example of a config.php file:

```php
<?php

return array(
    'consumer_key' => 'fatsecret_consumer_key',
    'secret_key' => 'fatsecret_secret_key',
    'database_username' => 'mysql_username',
    'database_password' => 'mysql_password',
    'database_hostname' => 'mysql_hostname',
    'database_name' => 'mysql_database_name'
);

?>
```

DontEatThat! uses the FatSecret Platform API in order to retrieve food data. The autocomplete functionality also requires the premier version of the API. After signing up for the API, you should receive a consumer key and a secret key. Place these in the config.php file as shown above.

Also, DontEatThat! requires at least PHP 5.5 to run. This is because the function used to encrypt user passwords is only available in PHP 5.5 and above.

Hosting on Linux

Here's how to get the website running on localhost if you're a linux user.

1. First, install XAMPP

2. In order for the website to properly work, you must suppress some warnings. Edit the file /opt/lampp/etc/php.ini, and replace the line

```
error_reporting=E_ALL & ~E_DEPRECATED & ~E_STRICT
```

with

```
error_reporting=E_COMPILE_ERROR|E_RECOVERABLE_ERROR|E_ERROR|E_CORE_ERROR
```

3. After installing, go to the folder /opt/lampp/htdocs

4. Remove everything in the folder htdocs, and copy all all the files and folders in DontEatThat/public_html into htdocs

5. Create a folder in /opt/lampp called config/

6. place your config.php in the config/ folder you just created. Heres the config.php I use:

```
<?php

return array(
    'consumer_key' => 'get your own consumer key',
    'secret_key' => 'get your own secret key',
    'database_username' => 'root',
    'database_password' => '',
    'database_hostname' => 'localhost',
    'database_name' => 'Group14DB'
);

?>
```

Almost there! Now you need to setup the user database.

1. In a web browser, go to the url 'localhost/phpmyadmin'
2.
3. Now, we have to create the user database
    i. Create a new database called "Group14DB"
    ii.
    iii. Create a new table in this database called "Users"
    iv.
    v. Go to the "Users" table, then click on the "Structures" tab
    vi.
    vii. Add the following columns (case sensitive. Data type is shown in parentheses):
        - Name (varchar(64))
        - Username (varchar(64))
        - Password (varchar(256))

        - Calories (varchar(8))
        - Sugar (varchar(8))
        - Sodium (varchar(8))
        - Protein (varchar(8))
        - Calcium (varchar(8))
4. Now, start the XAMPP Webserver:

   ```
   sudo /opt/lamp/xampp start
   ```

You're done! Check out the website by going to 'localhost' on your web browser.