

Meal Suggestions

Final Project

CSC 392

Noah Davis & Jie He

Application Description

Our application is a python script that takes a set of nutritional logs from a MySQL server then uses those logs to recommend meals based on data analysis. It uses scikit-learn and pandas to achieve that goal.

Pandas is used to clean and manipulate data that is read from a CSV file. The CSV file contains data from a SQL server.

Given a (relatively) large set of user logs it will return a meal plan for a user with a goal of helping the user lose weight. The goal can be change through a value in the script. The meal plan is generated using scikit-learn with the techniques that we've learned in this class.

The application script can be found in the file: `meal_suggestions.py`

The script outputs a selection of potential meal items. These meal items are not realistic but are as we expected when documenting our proposal (For example, 9 sticks of butter is an unrealistic meal).

Our source code is well commented and should be more descriptive than this report.

Accuracy

The model accuracy is not very high. We are OK with that--It is meant to be a prototype / proof-of-concept. Our scores ranged from 51 to 67% accurate on our dataset during our tests. This is as expected, since our weight increase or decrease was generated at a random 50%. In the future, we hope to experiment with real foods and real logs, different feature sets, etc in order to create a real-world working model for nutritional logging.

Dataset & Log Generation

The dataset that we used included 45000 nutritional logs. Foods used were real-world foods taken from the USDA SR28 foods database. Foods were sorted into categories of: Breakfast, Breakfast Drinks, Lunch, Lunch Drinks, Dinner, Dinner Drinks, and Snacks.

Logs were generated using SQLAlchemy and a MySQL server running on our local machine. This allowed us to generate a set of logs that matched the user inputs from another project, and integrate meal recommendations into that other project. We can now pass the recommended meals into our web application or generate recommended meals against the set of real logs in our web application.

The log generation script can be found in the file: `fake_logs.py`

Server: localhost:8889 » Database: a_test » Table: test_meal

</

[phpMyAdmin for our local database with logs]

Use Case

After executing the script, a user is prompted for their ID. In the real world, this will be handled through CSRF tokens or session variables. We did not enforce type checking or error handling for our use case since that is handled by the web application.

```
Enter your user ID: |
```

```
Enter your user ID: 47
```

Upon receiving an ID, the application asks for the user's current weight. This is intended as a substitute for the web application reporting of a user's daily weight and also so that the application matches our proposed mock screenshot.

```
Enter your user ID: 47
```

```
Welcome back, 47!
```

```
What is your current weight (in lbs)?: 299|
```

After receiving the weight, it begins to model the user's log information. The application selects features that we have defined and fits them to the three different types of models that we learned in this class: Artificial Neural Network, K Neural Network, and Decision Tree. It chooses the most accurate model for that specific user and then returns a selection of meals.

We think that the models could be significantly improved with better data but are happy with our results as a proof-of-concept.

```
Enter your user ID: 47
```

```
Welcome back, 47!
```

```
What is your current weight (in lbs)?: 299
```

```
Your meal plan for today has been generated,
```

```
Breakfast: 3 of KASHI,ORIGINAL WAFFLE and 1 cup of BEVERAGES,CHOC DRK,MILK & SOY BSD,READY TO DRK,FORT
```

```
Lunch: 1 of BURGER KING,WHOPPER,W/ CHS and 2 cup of BEVERAGES,CARB,LEMON-LIME SODA,NO CAFFEINE
```

```
Dinner: 2 of BEEF,TENDERLOIN,STEAK,LN & FAT,1/8\ FAT,SEL,CKD,BRLD" and 1 cup of BEVERAGES,NUTRITIONAL SHAKE MIX,HI PROT,PDR
```

```
Snack: 3 of CANDIES,REESE'S BITES
```

The user may then take dietary actions based upon their recommended meals.

We think that other analytics could be created based upon this dataset and hope to implement them over the summer, alongside a full-fledged online nutritional logging system.