Technologies

Health Tracker/Meal Recommendation Application


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APPLICATION WORKFLOW

Project Description

Our team set out to build a health lifestyle application that allows you to track your meals and daily nutritional intake. What separates our application from other health tracking applications is we utilize machine learning for our built in meal recommender to help users meet their health goals.

User Inputs

- Personal Health data
- Set weight goals
  - If User wants to gain or lose weight
- Set sub health goals
  - Where does user want to get their calories from
- Meals/Meal Choices
  - Manual inputs or choices from our recommender

Application Outputs

- Utilizing health data determine daily caloric intake
  - Also determine intake for subgoals
- Recommend applicable meals based on user profile
- Support User accountability through progress tracking

Objective

The objective when creating this application was to make a health tracking application with the user experience in mind. Maintaining a healthy lifestyle is difficult, and tracking it to help hold yourself accountable can be even harder. We aim to help with that through our meal recommending service. Through our service we research the healthy options for you, provide you with the nutrition data, and log the data for you all you need to do is set up your account, tell us your goal, and pick what meal sounds best.

MEAL RECOMMENDATION SYSTEM

Meal Recommendation System Abstract

By utilizing public food datasets, we created a recommendation system using k-nearest neighbors. From your health data and diet options, our model provides recipes with instructions and nutritional information, personalized to the user. We take into account for dietary restrictions (low cholesterol, low fat, vegan, etc.).

Food Database

- ***Kaggle Fastfood nutrition database***
  - *250+ menu item from 300+ fastfood restaurant*
- **Kaggle Food.com recipes and reviews**
  - 300,000+ recipes taken from Food.com website
  - All recipes are categorized based on dietary restrictions

User Dietary Reference Intake (DRI)

- ***Calculate***
  - *User BMI*
  - *Daily estimated energy requirement (EER)*
  - *Nutritional requirements*

Meal recommendations

- ***Utilizing k-nearest neighbors***
  - *Provide meals, personalized by user's DRI*

```
dataset[dataset.restaurant == "Homemade"].info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 359206 entries, 515 to 523030
Data columns (total 15 columns):
 #   Column                Non-Null Count   Dtype
---  ------                --------------   -----
 0   Name                  359206 non-null  object
 1   TotalTime             359206 non-null  object
 2   RecipeIngredientParts 359206 non-null  object
 3   Keywords              359206 non-null  object
 4   Calories              359206 non-null  float64
 5   FatContent            359206 non-null  float64
 6   SaturatedFatContent   359206 non-null  float64
 7   CholesterolContent    359206 non-null  float64
 8   SodiumContent         359206 non-null  float64
 9   CarbohydrateContent   359206 non-null  float64
 10  FiberContent          359206 non-null  float64
 11  SugarContent          359206 non-null  float64
 12  ProteinContent        359206 non-null  float64
 13  RecipeInstructions    359206 non-null  object
 14  restaurant            359206 non-null  object
dtypes: float64(9), object(6)
memory usage: 43.8+ MB
```

```
dataset[dataset.restaurant != "Homemade"].info()

<class 'pandas.core.frame.DataFrame'>
Int64Index: 283 entries, 0 to 507
Data columns (total 15 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   Name                  283 non-null    object
 1   TotalTime             0 non-null      object
 2   RecipeIngredientParts 0 non-null      object
 3   Keywords              0 non-null      object
 4   Calories              283 non-null    float64
 5   FatContent            283 non-null    float64
 6   SaturatedFatContent   283 non-null    float64
 7   CholesterolContent    283 non-null    float64
 8   SodiumContent         283 non-null    float64
 9   CarbohydrateContent   283 non-null    float64
 10  FiberContent          283 non-null    float64
 11  SugarContent          283 non-null    float64
 12  ProteinContent        283 non-null    float64
 13  RecipeInstructions    0 non-null      object
 14  restaurant            283 non-null    object
dtypes: float64(9), object(6)
memory usage: 35.4+ KB
```

```
dataset.describe()
```

	Calories	FatContent	SaturatedFatContent	CholesterolContent	SodiumContent	CarbohydrateContent	FiberContent	SugarContent	ProteinContent
count	359489.000000	359489.000000	359489.000000	359489.000000	359489.000000	359489.000000	359489.000000	359489.000000	359489.000000
mean	362.712107	18.176088	7.080752	65.745345	363.680371	36.845324	3.128411	16.598664	13.371261
std	410.123604	31.314959	11.157232	98.236296	315.087161	53.571202	4.451553	43.551048	15.670609
min	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	158.400000	4.900000	1.300000	2.100000	99.300000	11.600000	0.700000	2.200000	3.000000
50%	282.700000	12.000000	4.000000	34.700000	277.400000	25.800000	1.900000	6.000000	7.300000
75%	454.800000	23.200000	9.200000	92.200000	569.900000	46.100000	4.000000	17.100000	19.300000
max	70396.600000	7963.400000	1035.200000	5113.800000	1199.900000	4648.700000	519.500000	4553.100000	479.300000

We preprocessed and store data using python pandas library. Scikit-learn is used for recommendation system

Challenges

- Inexperience in database technologies, required additional research before technical work could begin
- Prioritizing what aspects to track for nutrition and meal recommendation
  - Allow user to choose which nutritional data is most important to them through sub goals
  - Factor in allergies, financial restrictions, religious restrictions, ect

Future Works

- It is our Ethical responsibility to have all dietary restriction options available and verified to 100% accuracy before offering this application to customers.
- Would like to also add workouts and a possible workout schedule recommender to create a well rounded fitness application
- Add a mobile application to increase accessibility for users.