



Fooder:

A Healthier Groceries Recommender

by: Mia Martin



Hello!

I am Mia Martin

Data Scientist / Problem Solver / Finance Guru

The slide is decorated with various hand-drawn illustrations of fruits and vegetables. At the top left is a blue bubble. Below it is a yellow lemon. To the right of the lemon is a green leaf. Further right is a slice of orange. At the top center is a whole orange. To its right is a green kiwi. At the top right is a slice of watermelon. On the right side, there is a green lime. Below the lime is a slice of yellow lemon. At the bottom right is a small red cherry. At the bottom center is a green kiwi. To its left is a yellow banana. At the bottom left is a red strawberry. The word 'Agenda' is written in a large, orange, cursive font in the center of the slide.

Agenda

1. The Grocery Recommender Problem
2. Defining “Healthier”
3. Data Exploration
4. Building and Evaluating the Healthier Recommender
5. Next Steps

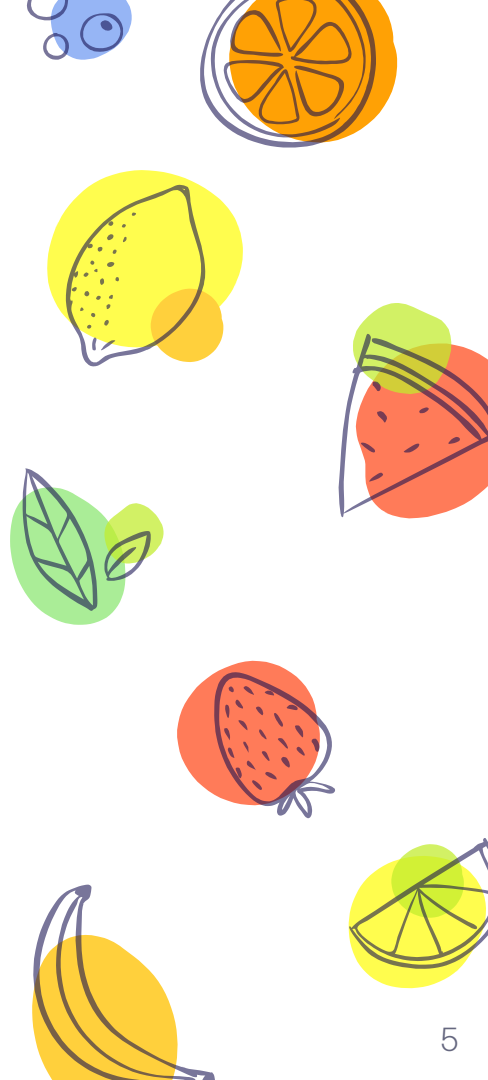
1. The Problem




The Problem

Most online grocery retailers have user or item based recommender systems.

My goal is to build a recommender system that outputs a similar food item that is healthier than the original choice.



The background is white and decorated with various hand-drawn illustrations of fruits and vegetables. These include a blueberry cluster in the top left, an orange slice at the top center, a green leafy vegetable at the top right, a watermelon slice on the right, a lemon at the middle left, a green leaf at the bottom left, a strawberry at the bottom left, a banana at the bottom center, a green leafy vegetable at the bottom center, a green apple slice at the bottom center, a cherry at the bottom right, and a lemon slice at the middle right.

I generally do really
well on diets for
like 7-8 hours and
then I wake up

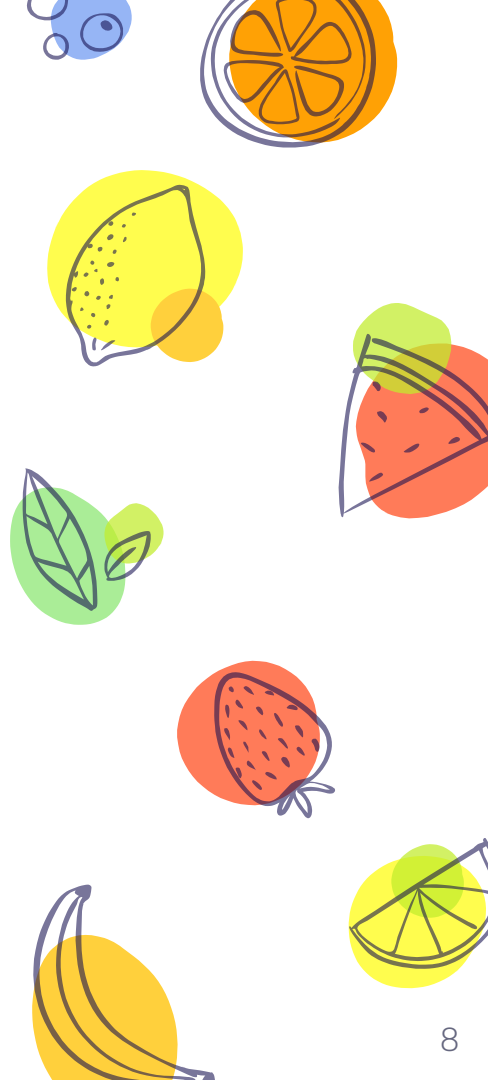
2.

Defining "Healthier"



What Makes Food Healthy?

- Fewer calories
- More nutrients
- Bucketing certain food groups as healthy/unhealthy



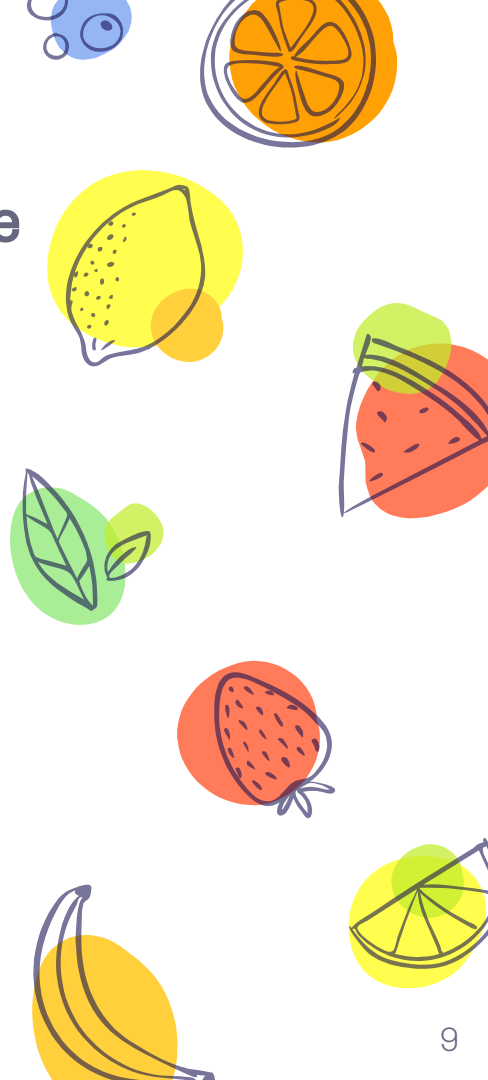
Nutrient Rich Food Index

Nutrient Density Score (NRFNn)

- ✓ Protein
- ✓ Fiber
- ✓ Vitamin A
- ✓ Vitamin C
- ✓ Calcium
- ✓ Iron
- ✓ Monounsaturated Fats
- ✓ Potassium
- ✓ Magnesium

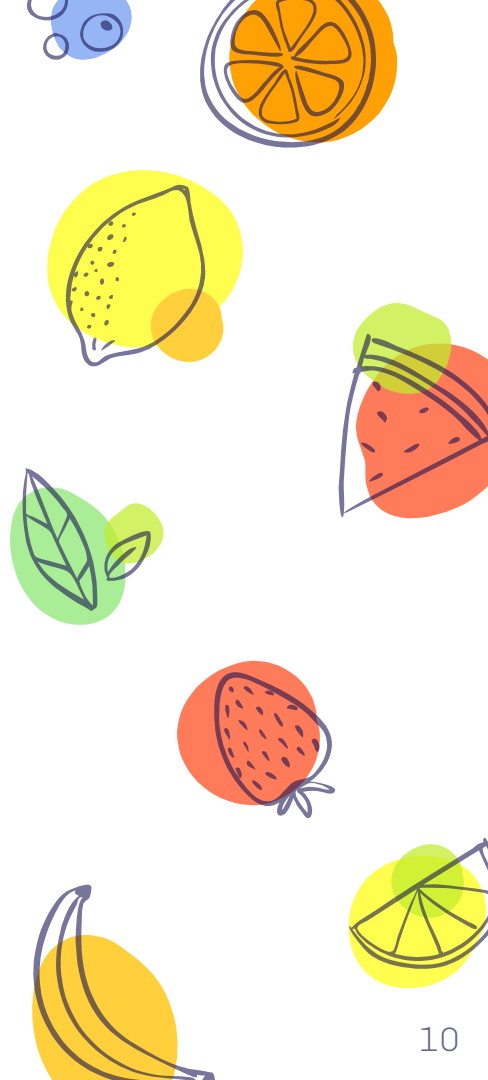
Limited Nutrients Score (LIM)

- ✗ Trans Fats
- ✗ Saturated Fats
- ✗ Sugars
- ✗ Sodium



Evaluating Nutrient Index

- Percent of daily value as defined by the USDA
- Spot check items (fortified foods ranking high)
- Cap at 100% daily value



3.

Data Exploration



Food Data Central (FDC)

- All foods vs. branded foods
- Concatenating several dataframes with different units and serving sizes
- Null values



Tagging Food Items

- FDC food categories: > 10K nulls
- Natural Language Processing
- Unsupervised Learning Techniques



4.

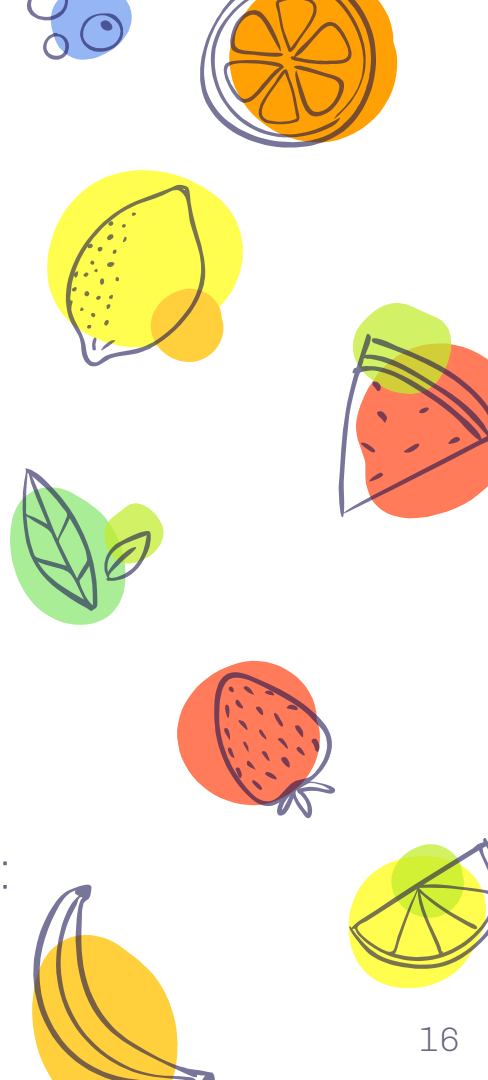
Building and Evaluating the Recommender

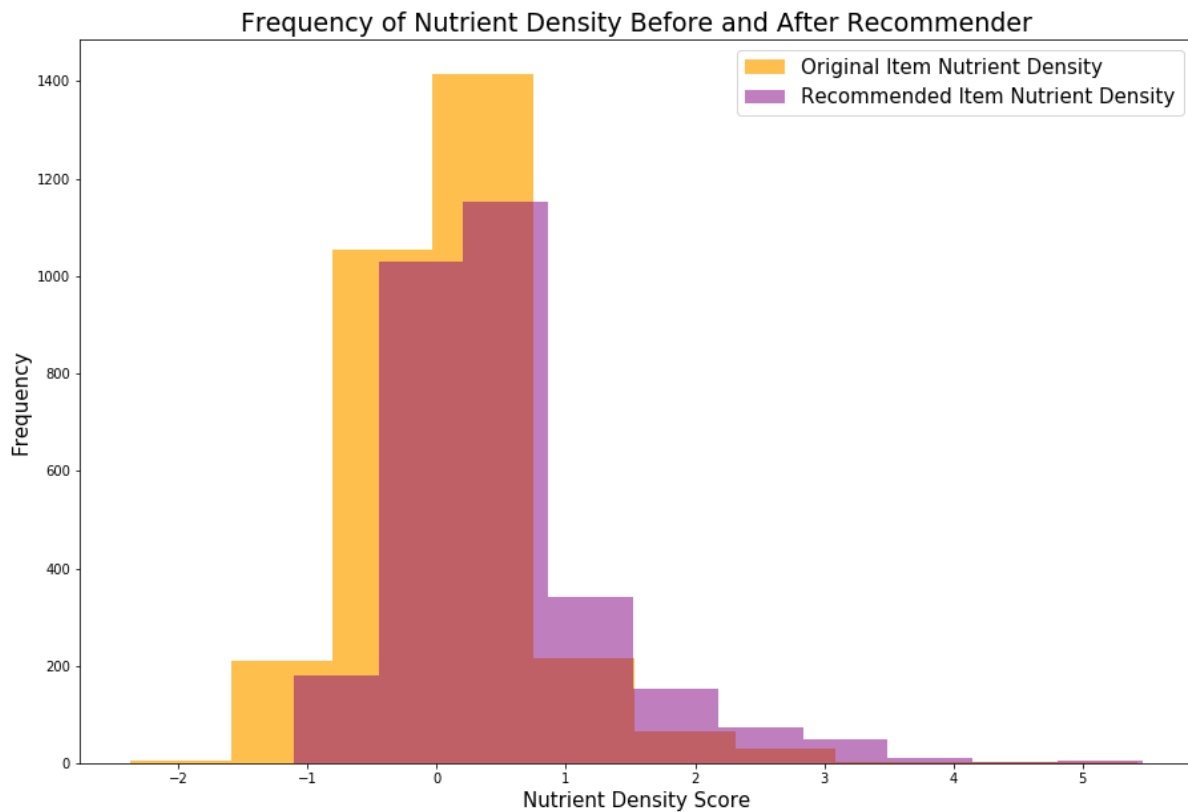


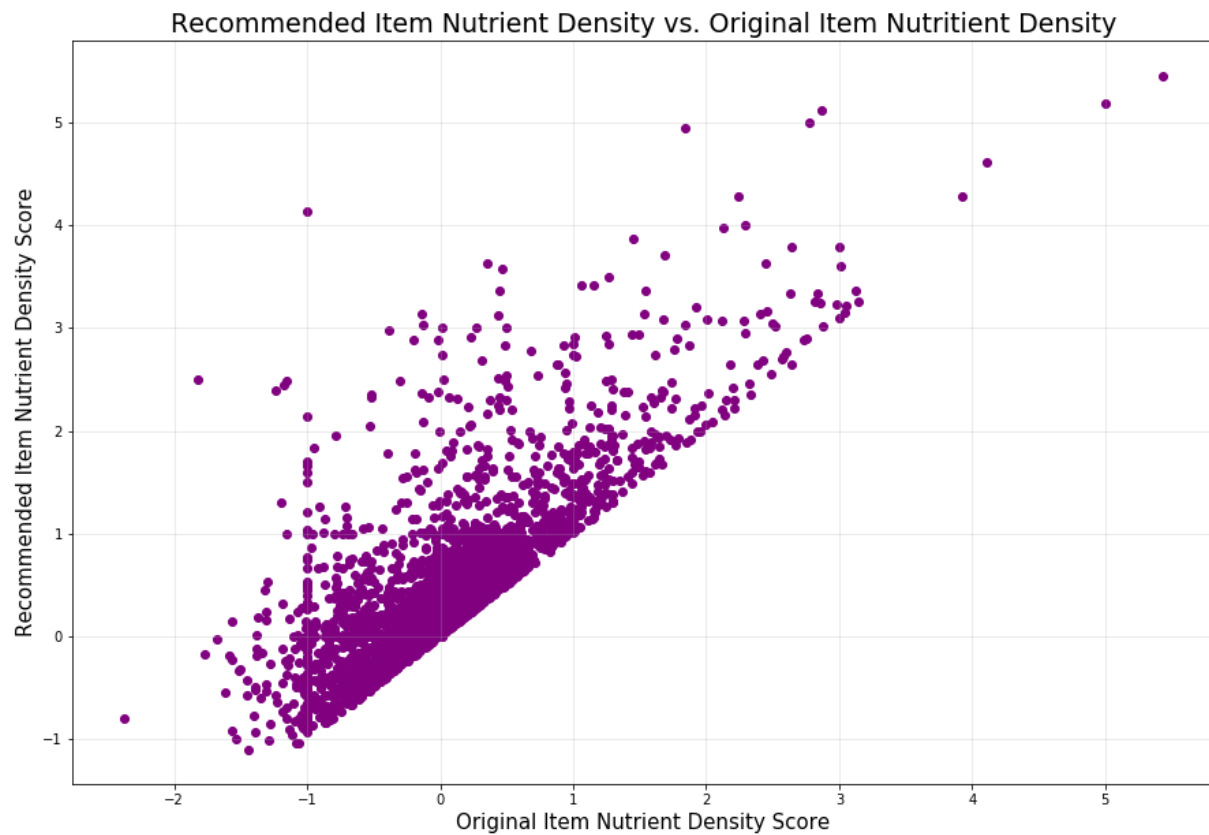
Your original food selection was FRIENDLY'S, PREMIUM ICE CREAM, FORBIDDEN CHOCOLATE with a nutrition index of -0.20. Would you consider one of the following healthier options?														
Alternative Food Option	Nutrition Index	Protein %DV	Fiber %DV	Monounsaturated Fat %DV	Vitamin A %DV	Vitamin C %DV	Calcium %DV	Iron %DV	Potassium %DV	Saturated Fat %DV	Trans Fat %DV	Sugar %DV	Sodium %DV	
SCANDAL-LESS CHOCOLATE LOW FAT ICE CREAM BAR, CHOCOLATE	0.62	23.34	6.8	0.0	0.00	0.00	35.0	5.56	6.20	8.35	0.0	4.00	2.08	
LOW FAT CHOCOLATE ICE CREAM	0.61	18.46	24.8	0.0	0.00	0.00	23.1	9.22	0.00	7.70	0.0	4.92	1.92	
GIANT CHOCOLATE FUDGE ICE CREAM BARS	0.51	8.82	29.6	0.0	5.88	0.00	14.7	5.89	9.26	3.70	0.0	15.30	3.67	
DELUXE CHURNED ICE CREAM	0.38	12.50	6.4	0.0	12.50	3.17	23.4	6.22	0.00	15.60	0.0	6.25	3.92	
BREYERS, DELIGHTS, LOW FAT ICE CREAM, CREAMY CHOCOLATE	0.33	15.56	4.4	0.0	0.00	0.00	21.1	2.44	6.66	8.35	0.0	6.22	3.00	
CHOCOLATE LIGHT ICE CREAM, CHOCOLATE	0.24	15.90	9.2	0.0	0.00	0.00	15.5	6.33	3.60	11.35	0.0	9.09	6.17	

Recommender Results

- ✕ Craving **Cupcakes**? Try **Donuts**:
More calcium, Less sugar
- ✕ Out of **Louisiana Hot Sauce**? Try **Hot Pepper Sauce**:
More iron, less sodium
- ✕ Need **Pinto Beans**? Try **Black Beans**:
More potassium, protein, calcium and iron
- ✕ Ordering **Cheddar Cheese**? Try **Italian Blend Cheese**:
More vitamin A, less sodium





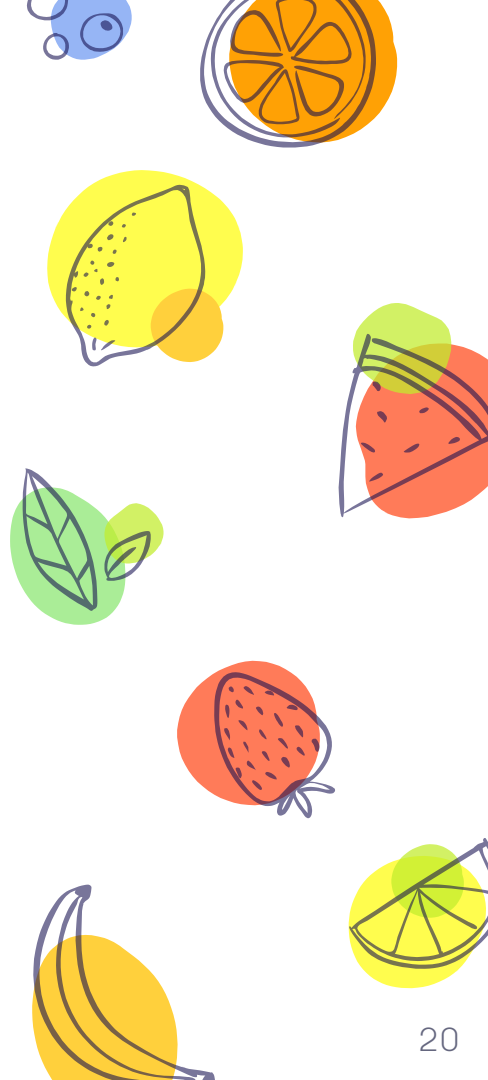


5. Next Steps



Next Steps

- Refine tagging foods into categories
- Allow users to customize nutrient formula
- Deploy on webpage



References

- **Food Data Central** - <https://fdc.nal.usda.gov/download-datasets.html>
- **Nutrient Rich Food Index** - <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1753-4887.2007.00003.x>
- **Scientific Report of the 2015 Dietary Guidelines Advisory Committee** - <https://health.gov/dietaryguidelines/2015-scientific-report/>
- **Instacart Kaggle Dataset** - <https://www.kaggle.com/c/instacart-market-basket-analysis/data>





Thanks!

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