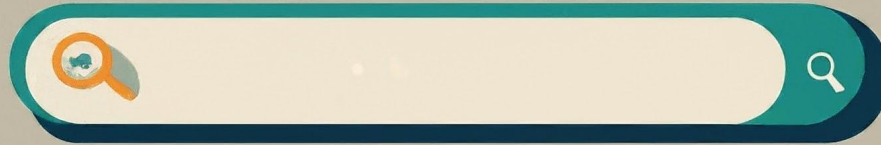


What's On The Menu?



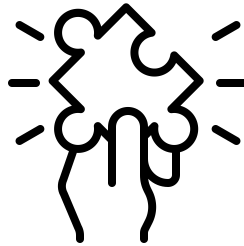
Crystal Gil Herrera

Problem



Households often struggle with efficiently managing food resources.

Solution



Recipe recommendation tool

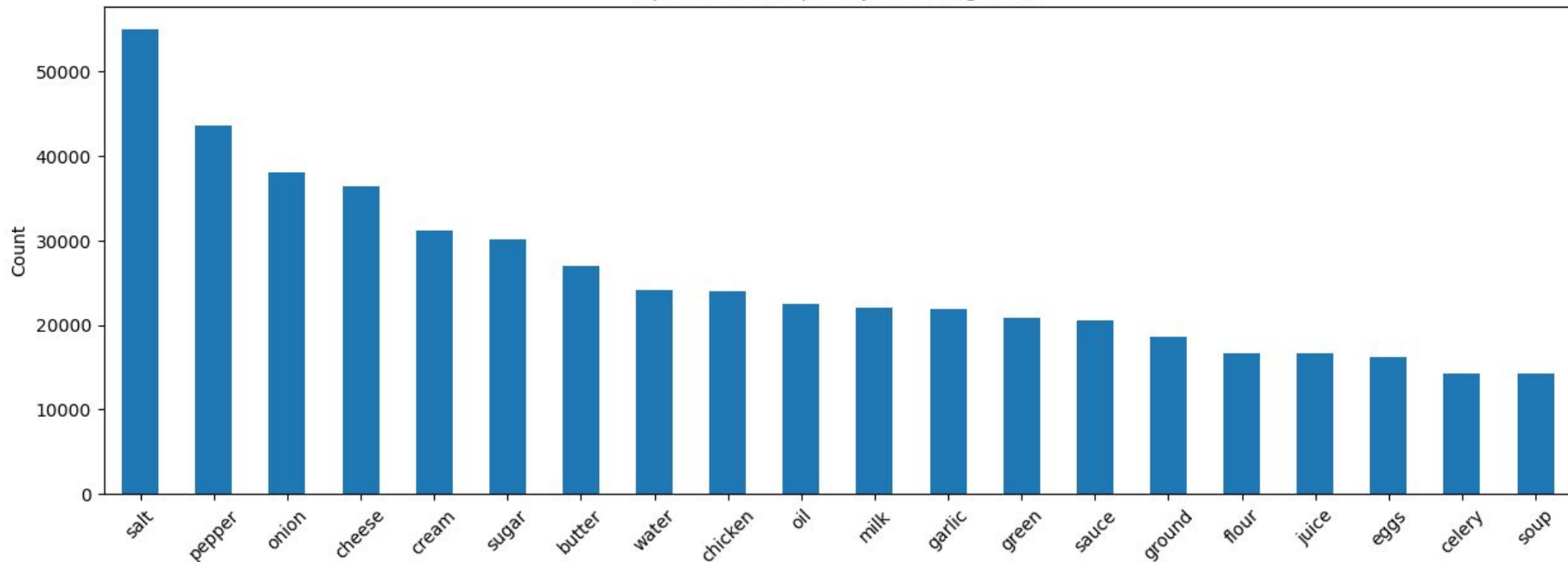
Impact



Reduce expenses and food waste

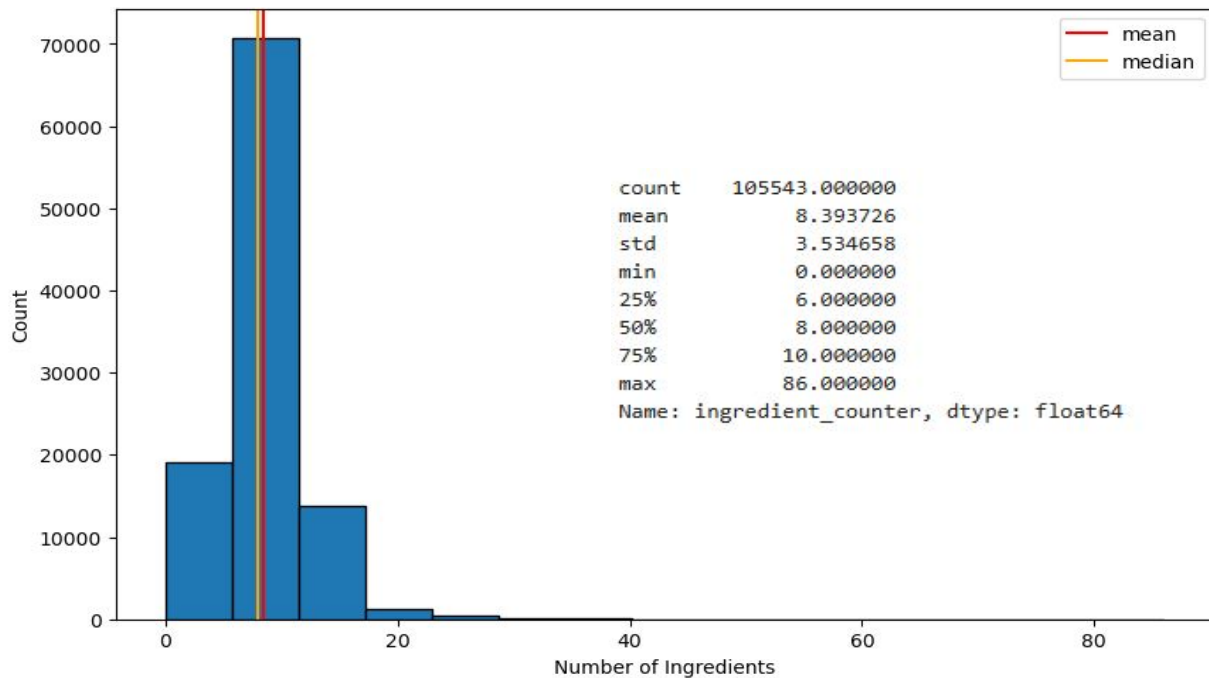
Dataset Description

Top 20 most frequently occurring words



- Mostly text data, 105,543 unique recipes with 5,529 unique tokens.
- Common ingredient staples include: salt, pepper, onion, cheese, sugar, butter, etc.

Distribution of Number of Ingredients in Recipes



- Average number of ingredients per recipe is ~8.

Preprocessing: Recipes Labelling

1. **First** round of labelling using the name of recipes in the dataset with **.loc method**.
2. **Second** round of labelling involved training a **Random Forest Classifier** model with supervised learning.

	Precision	Recall	F1-Score
Breakfast	0.83	0.65	0.73
Dessert	0.83	0.91	0.87
Dinner	0.76	0.85	0.80
Drink	0.89	0.84	0.87
Lunch	0.83	0.72	0.77
Salad	0.82	0.85	0.84

Sparse Matrix to One Hot Encoded Dataframe

```
<Compressed Sparse Row sparse matrix of dtype 'int64'  
with 1261886 stored elements and shape (105543, 5529)>
```



	__	__	__	__	abalone	absolut	abt	aburaage	aburage	acacia	...	zesty	zinfandel	zinger	ziplock	ziti	zone	zucchini	zucchini	zucchini	zwieback
0	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
...
105538	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
105539	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
105540	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
105541	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
105542	0	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0

105543 rows × 5529 columns

Content-Based Recommendation System

Cosine_similarity.

Dissimilar

Test → Recipe Title: "Pumpkin Dream Pie".

Similar

	recipe	similarity
60806	BBQ Chicken Quesadillas	0.0
42	Poached Chicken Breast In Wine	0.0
40	Rhubarb Cake	0.0
39	Reuben Casserole	0.0
37	Ambrosia Mold	0.0
36	Black-Eyed Mullet	0.0
60800	Bogart's Scalloped Carrots Recipe	0.0
60798	Alaska Snow Crab Potato Salad Recipe	0.0
60797	Baked Enchilada Chicken Recipe	0.0
60796	Beef Roast in Gravy	0.0

	recipe	similarity
35	Pumpkin Dream Pie	1.000000
4540	Quick Pumpkin Pudding	0.790569
24717	Fat-Free Pumpkin Dessert	0.744208
13758	Pumpkin Mousse	0.744208
4069	Gingersnap Pumpkin Pie	0.700000
34547	Pumpkin Pudding	0.657376
17125	Banana Pudding	0.645497
8662	Banana Pudding	0.645497
34074	No Crust Pumpkin Pie	0.645497
519	Dream Pie	0.632456

Content-Based Recommendation System

user_input = “**dinner** which contains **beef, carrots, onion, potato**”

Recipe	Ingredients List	Similarity
Tender Pot Roast	beef, onion, carrots, potato, onion	1.00
Mother's Lentil Soup Recipe	beef, onion , dry lentils, potato, carrots	0.89
Lo-Cal, Low-Fat Hot Dog Stir-Fry	potato , zucchini, carrots, onion	0.75
Easy Pattie Dish	hamburger, potato, carrots, onion	0.75
Microwave Corned Beef And Cabbage	beef, potatoes, carrots , head cabbage, onion	0.67

Next Steps

- Add an additional output to indicate missing ingredients (like a grocery list of the remaining ingredients that would be needed to prepare that recipe).
- Streamlit.