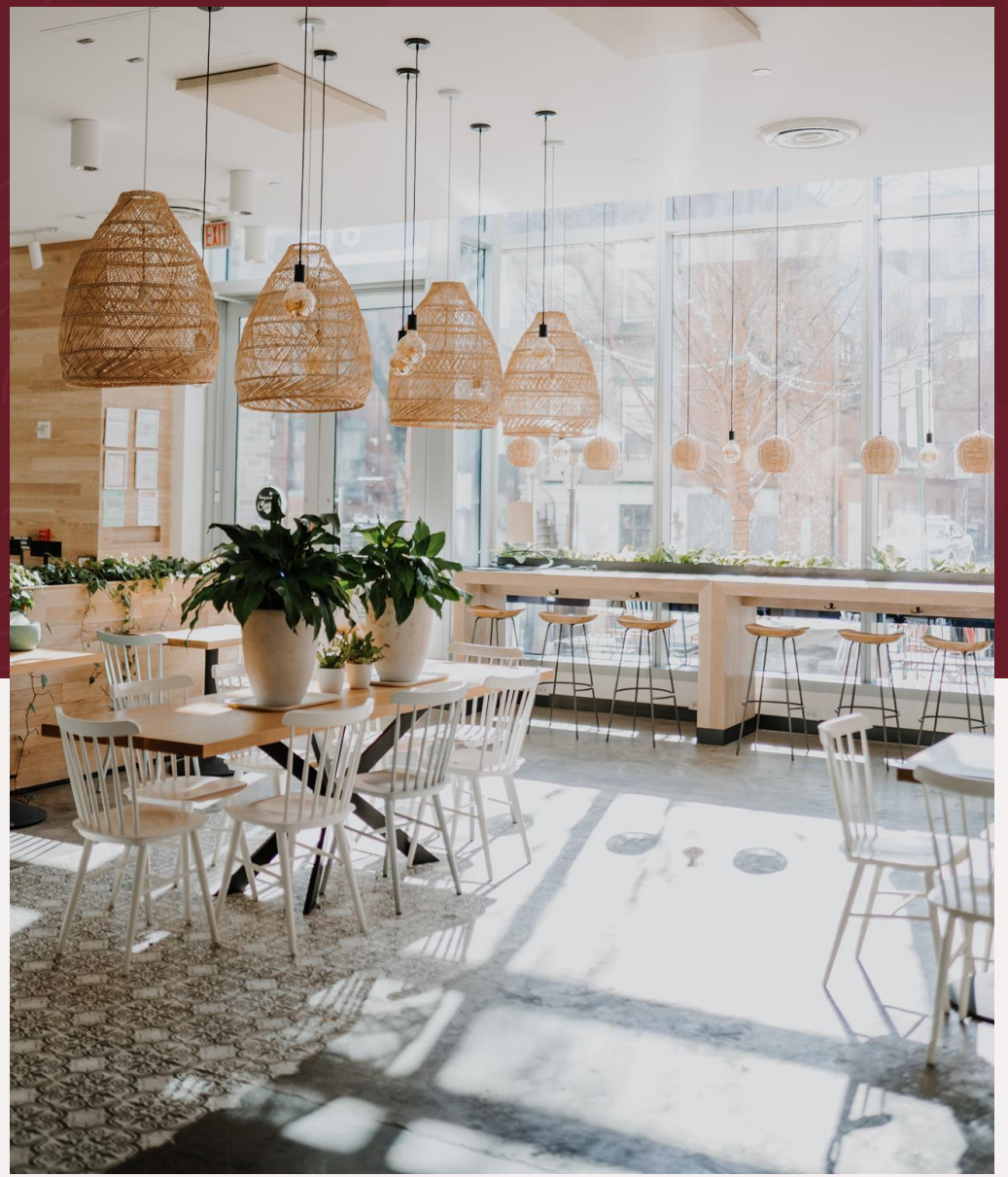
TASTY TRAIL

Restaurant Recommendation



CAPSTONE PROJECT

BrainStation

Diane Lu

PROBLEM STATEMENT

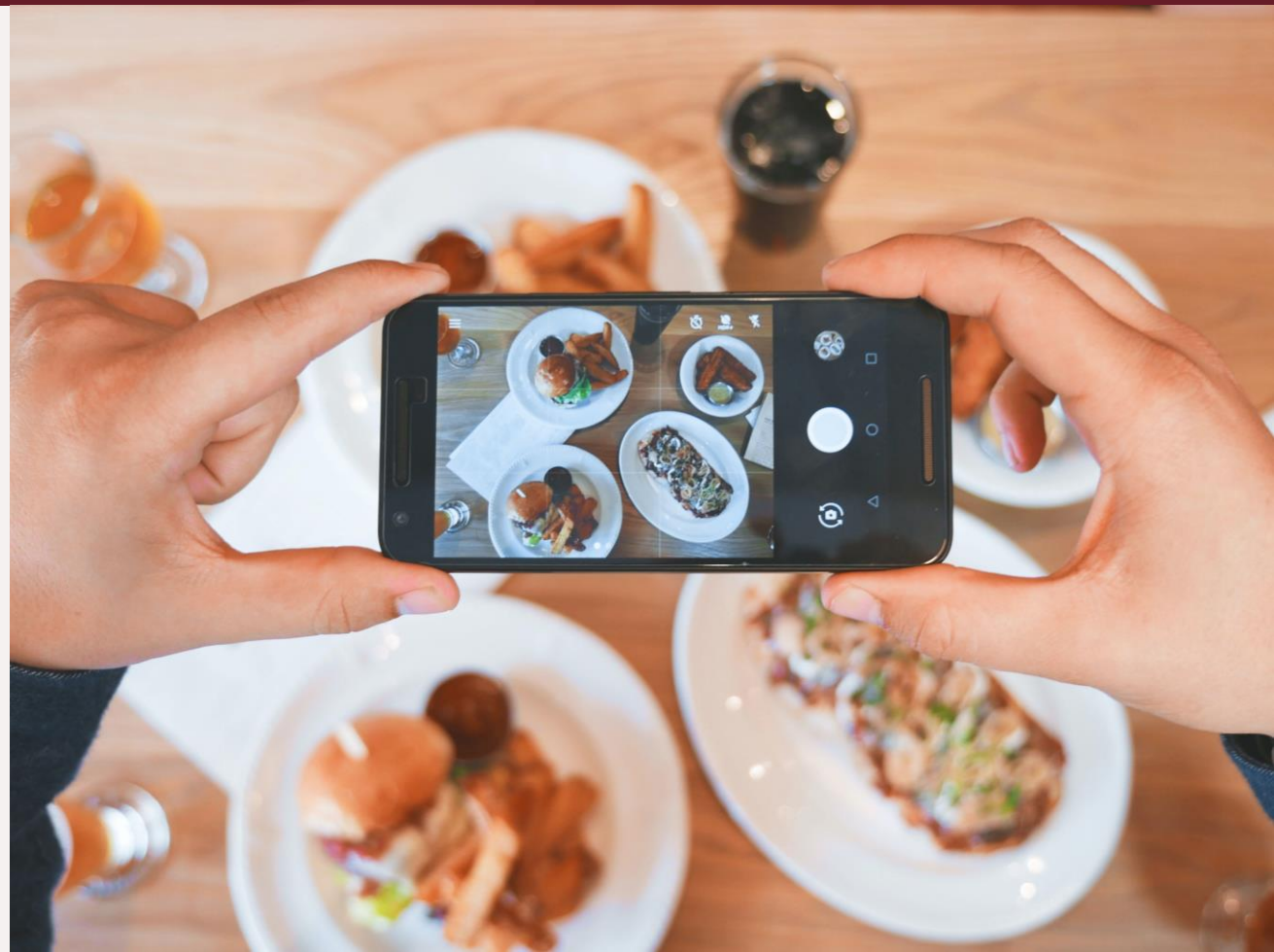
"

Craft a **user-friendly** restaurant recommendation system that understands individual preferences, resulting in **delightful dining experiences** and stronger customer loyalty.

"

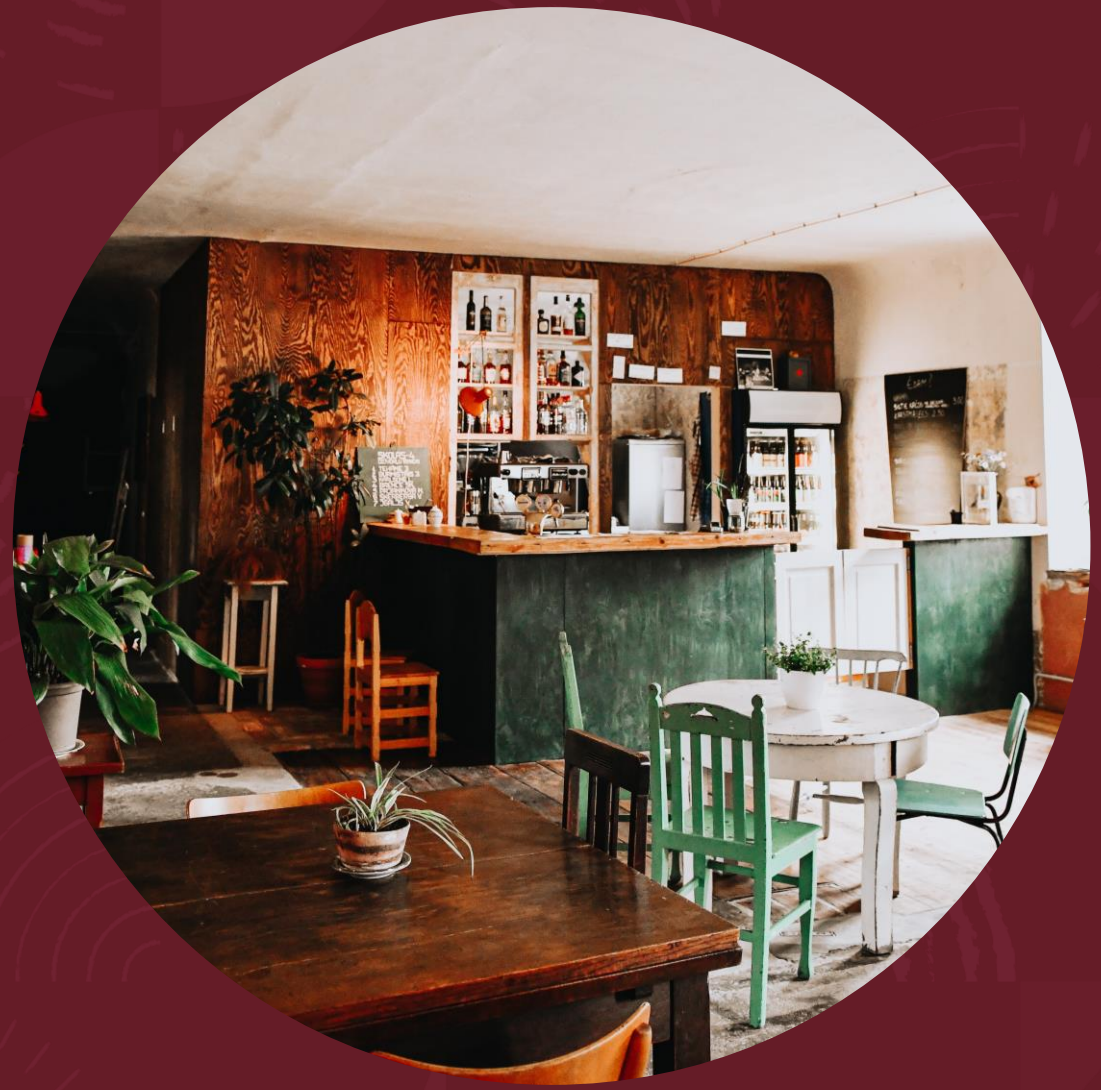
VALUE IN RESTAURANTS

- Personalized **dining suggestions** based on individual preferences
- Potential to **attract new patrons** through targeted recommendations
- Improved **user engagement** and exploration of new dining options
- Valuable **insights** into customer behavior and dining preferences



DATA COLLECTION

- Data sourced from **Yelp**, a renowned platform for business reviews and recommendations
- Our analysis will primarily utilize datasets related to Yelp's **businesses**, **reviews**, and **users** to gain valuable insights

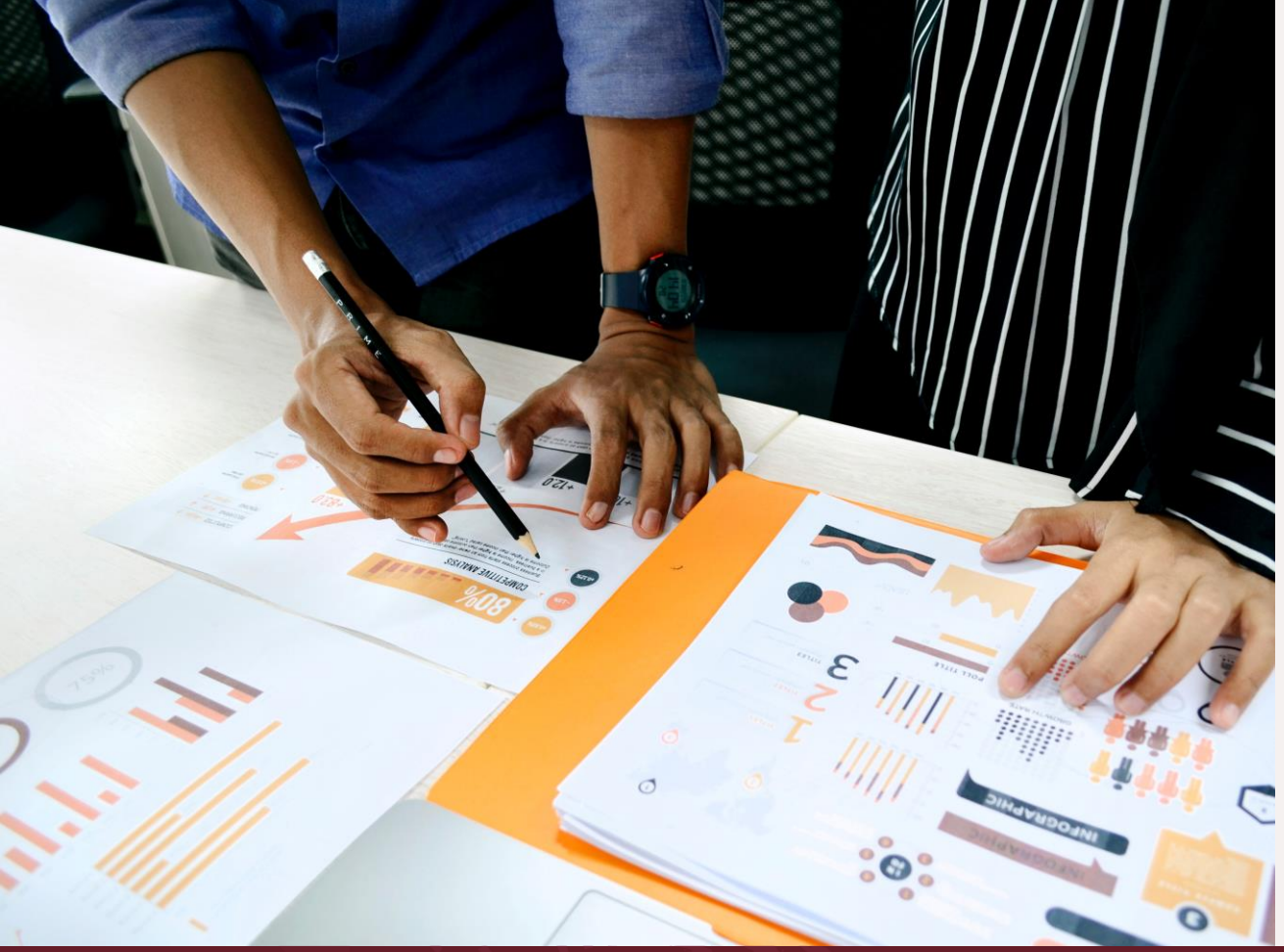


USER-BASED INFORMATION

Goal: Provide personalized restaurant suggestions to enhance the user's dining experience

Features: Ratings or interactions given by users to different restaurants

Target: Recommending restaurants that a specific user might like based on their past interactions and preferences



The **Business dataset**: 50,764 entries with 12 columns

The **User dataset**: 2,189,457 entries with 3 columns

The **Review dataset**: 8,635,400 entries with 5 columns

The **Final dataset**: 5,574,714 entries with 18 columns

OVERVIEW OF DATASETS

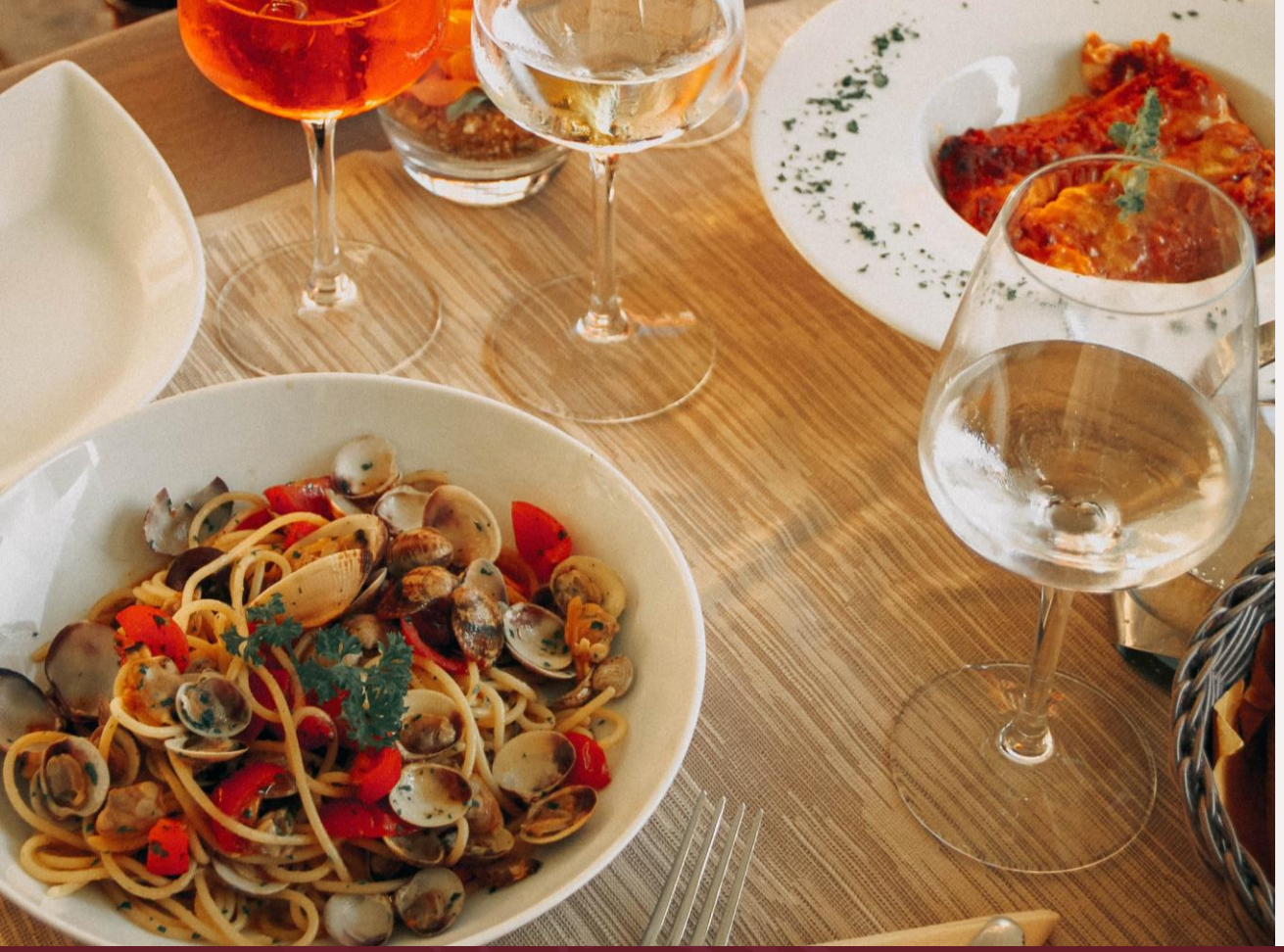
CONTENT-BASED RECOMMENDER

- The **content-based** model analyzes the attributes and characteristics of restaurants
- It considers factors such as **cuisine type**, ambiance, menu items, and user reviews to understand each restaurant
- If you prefer Korean cuisine, the content-based recommender will focus on **recommending new Korean restaurants**

CONTENT-BASED RECOMMENDER

- Content-based recommender in action, recommending **Japanese restaurants similar to Suika** based on attributes.
- Attributes considered: cuisine type, ambiance, and menu offerings.
- **Lack of location** evaluation leads to recommendations from random locations.
- Recommendations align with user preferences in terms of cuisine and ambiance.

	restaurant	similarity
78485	Suika	1.000000
39556	Izakaya Amu	0.781389
49712	Lola 42	0.760751
88189	Imperium Food & Wine	0.640402
29483	Savin Bar & Kitchen	0.622994
22038	Kyoto Sushi	0.620734
157113	Yui Japanese Bistro	0.620734
3344	Sushi Junai 2	0.620734
121566	Sushi Hurray	0.620734
38504	Sushi Town	0.620734



- The **matrix factorization** model's goal is to predict how users would rate restaurants they haven't visited
- Analyzing patterns in user preferences and restaurant ratings, the model attempts to estimate **how a user might rate a particular restaurant**
- The accuracy of the predictions is measured based on how closely they align with the actual ratings provided by users

MATRIX FACTORIZATION RECOMMENDER

MATRIX FACTORIZATION RECOMMENDER

- Successful prediction of some ratings, but room for improvement in accuracy
- Achieved approximately **1% accuracy in ratings prediction**, with a **50% success rate with margin of 1** point
- Demonstrates **potential effectiveness and reliability** in estimating user preferences and generating restaurant ratings predictions

	user_id	restaurant_name	actual	prediction
0	4056	Parallel 49 Brewing	5.0	5.000000
1	4056	French Made Baking	5.0	5.000000
2	4056	French Made Baking	5.0	5.000000
3	4056	French Made Baking	5.0	5.000000
4	4056	Kissa Tanto	5.0	5.000000
...	...	...	...	...
267	4056	Sushi Coen	3.0	1.847063
268	4056	CaliBurger Vancouver	5.0	1.843023
269	4056	Showcase Restaurant & Bar	5.0	1.625779
270	4056	Just Waffles	5.0	1.000000
271	4056	The Northern Cafe and Grill	5.0	1.000000

FUTURE CONSIDERATIONS

Incorporate location-based filtering to provide restaurant recommendations within a specific range or area

Address the current system's limitation of offering random suggestions from different locations

Explore a hybrid recommender system that combines Content-Based Filtering and Collaborative Filtering

Leverage the strengths of both approaches to deliver more diverse and precise restaurant recommendations, enhancing user experience


THE END