RESTAURANT RECOMMENDATION SYSTEM

By Peerawat Wattanchareekul

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Good Service

Delicious Food

Nice View

Price

Good Service

Delicious Food

Nice View

Price

01

PROBLEM STATEMENT

Problem Statement

Since the pandemic of covid 19 many people have decreased their visits to restaurants and have turned to online food delivery services for their daily meals, causing many restaurants to run out of customers and orders from online services. As a result, some of them had to shut down. This project aims to increase the number of customer and online order to the restaurants by using the recommendation system to recommend new user to the restaurant.

02

DATA SET

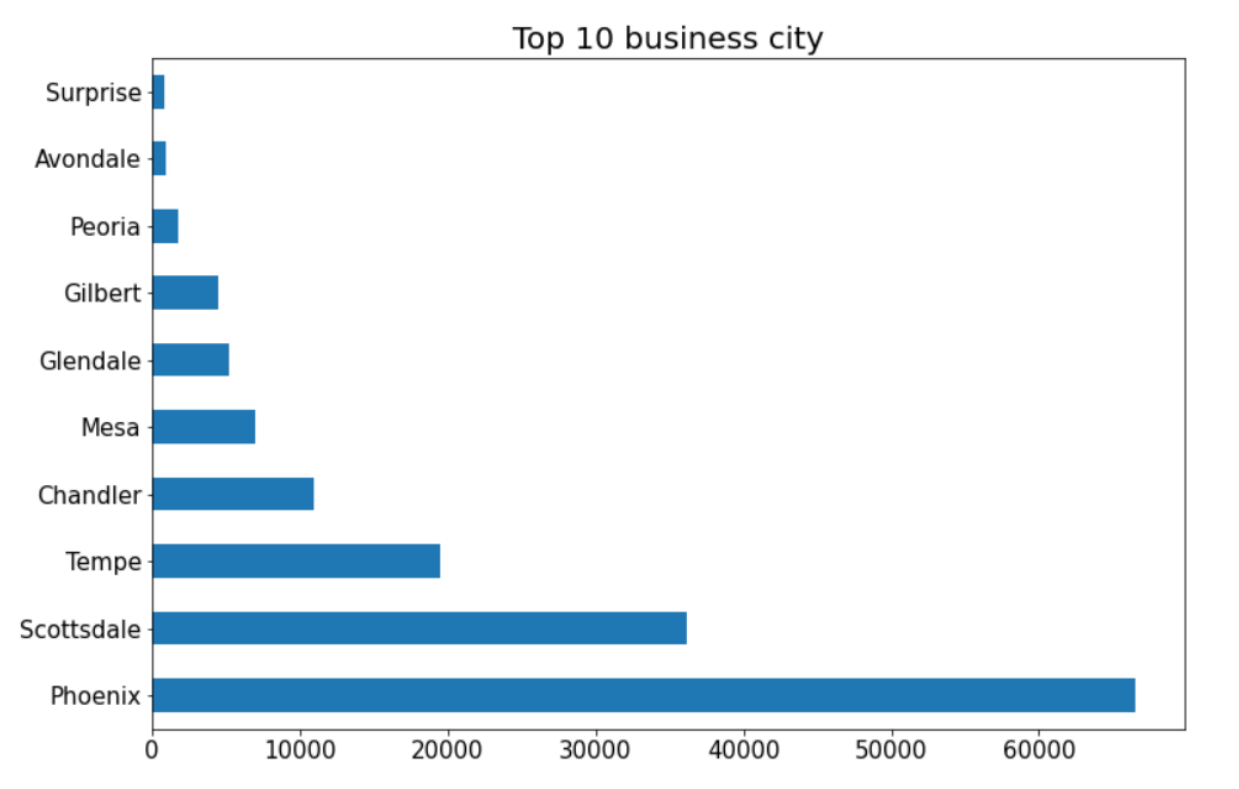
Yelp Data Set: Arizona

2,339 restaurants

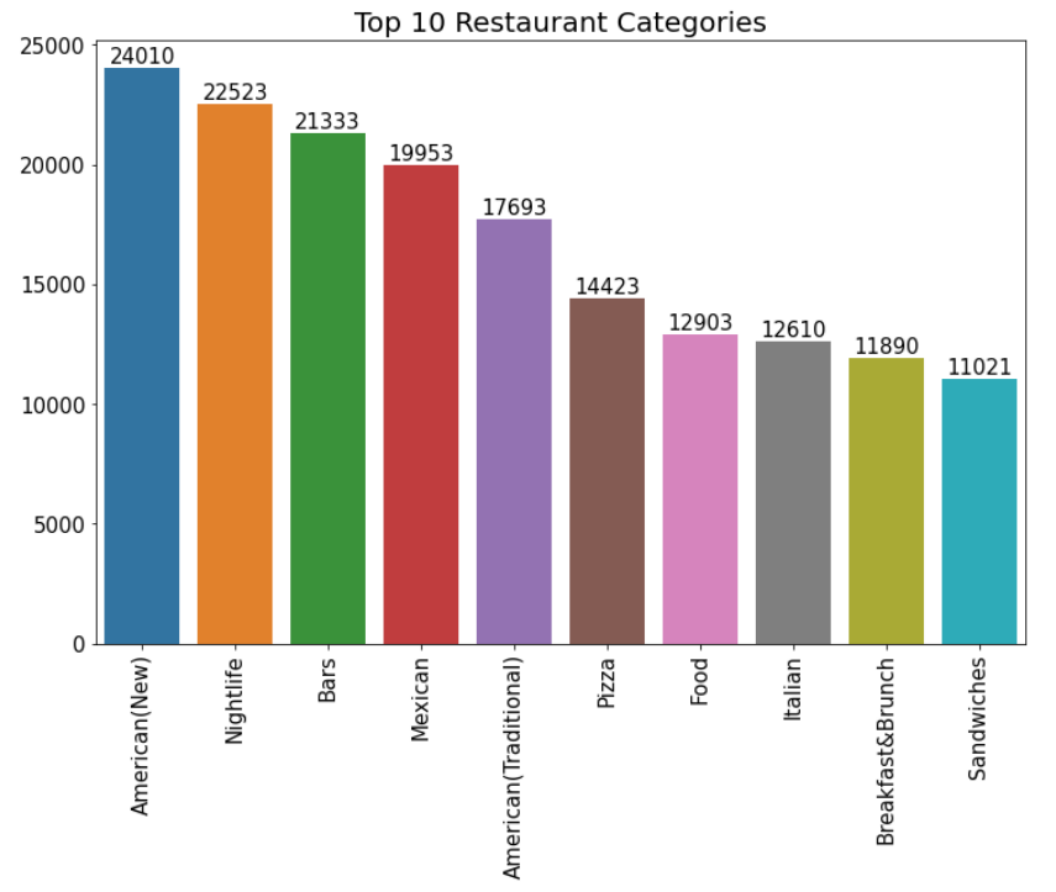
33,409 users

135,278 reviews

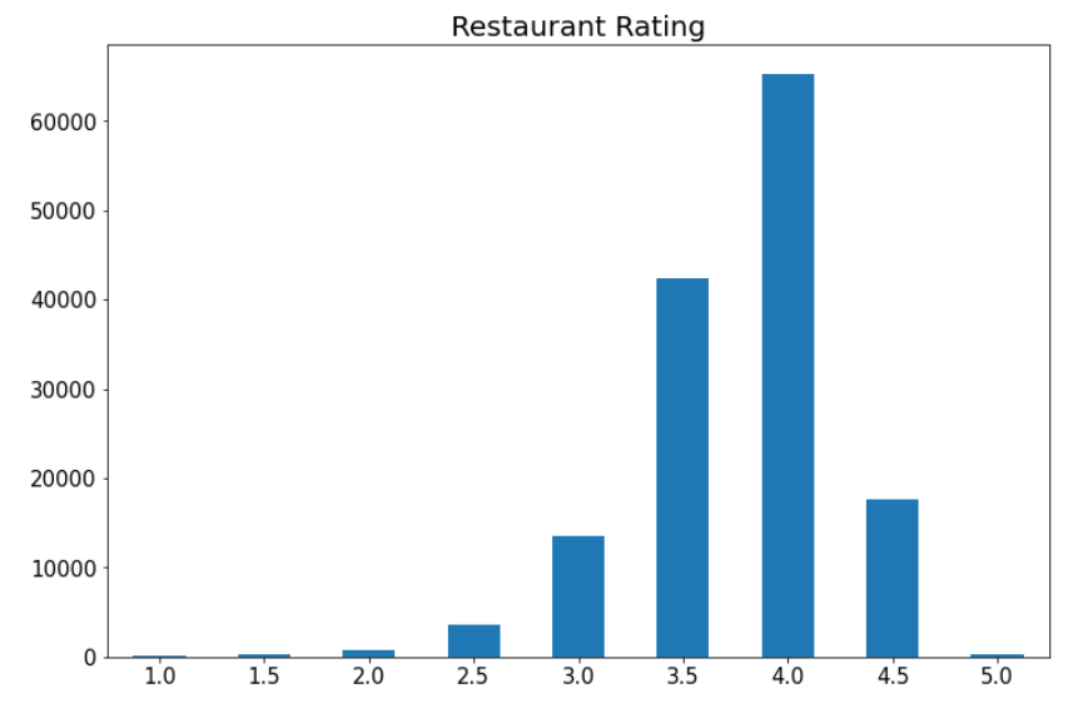
Restaurant Cities



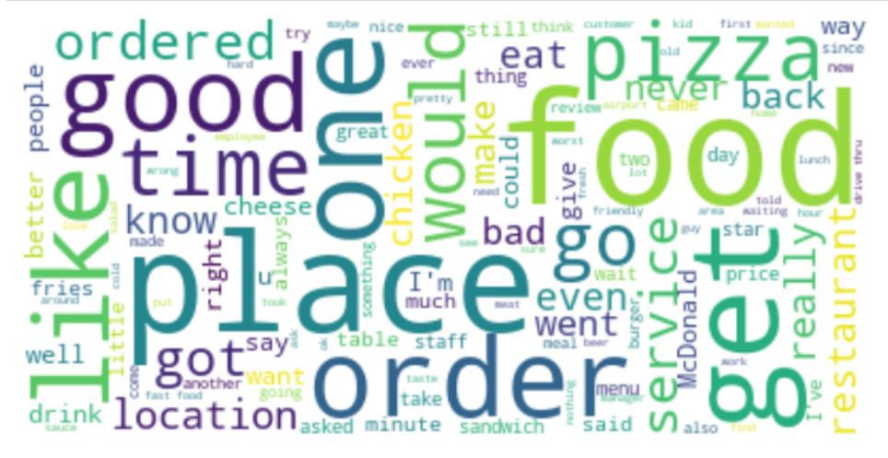
Restaurant Categories



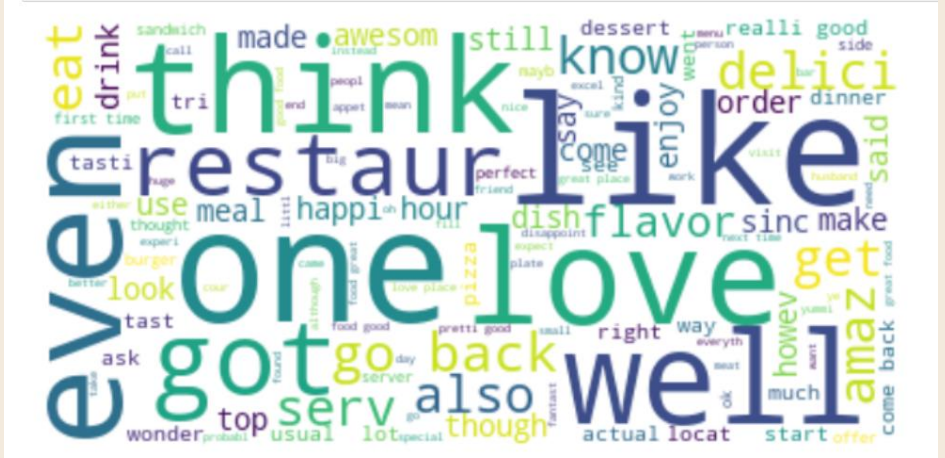
Restaurant Rating



Word Cloud



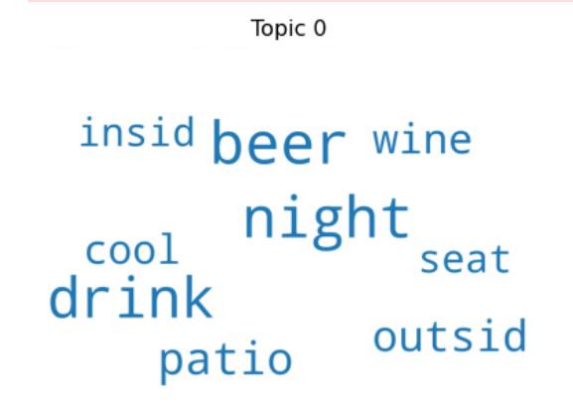
Negative reviews



Positive reviews

Topic Modeling

Do topic modeling in review text from user to get the keyword and dominant topic for each restaurant .



Bar Restaurant

Pizza Restaurant

Mexican Restaurant

03

Recommendation System

Building Recommendation System

01

Location-Based

Recommend restaurants based on user location

02

Content-Based

Recommend restaurants based on content of restaurants

03

Collaborative Filtering

Recommend restaurants based on similarities between user and items

Feature Used

Location-Based

Latitude and
Longitude

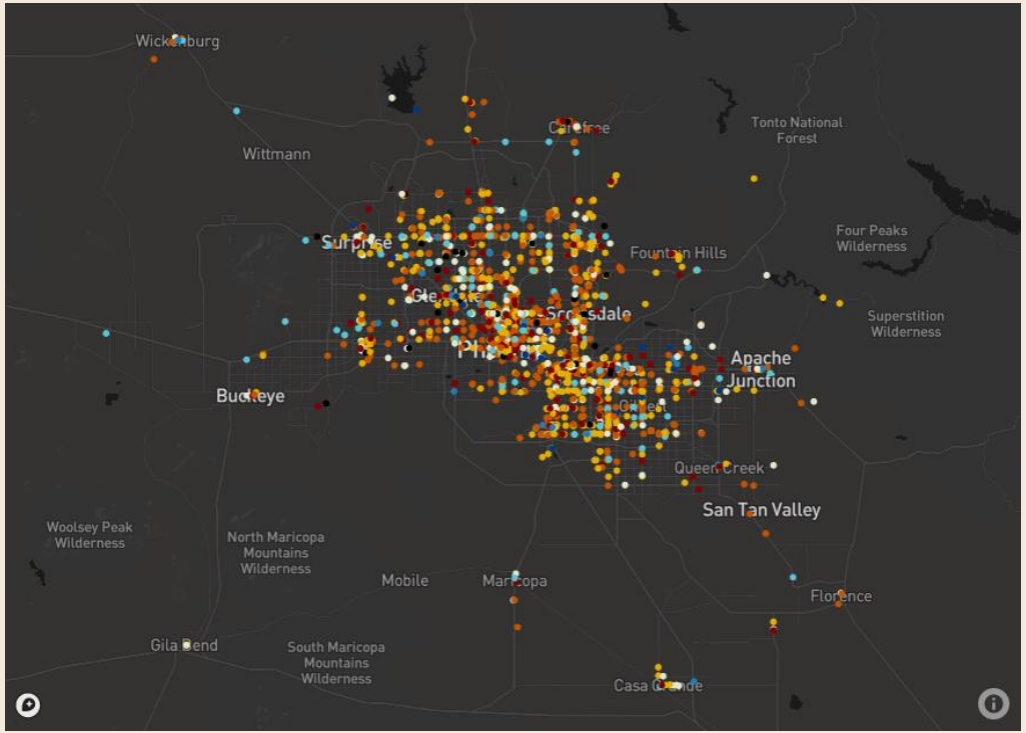
Content-Based

Keyword from
topic modeling
and cuisine style

Collaborative Filtering

User rating

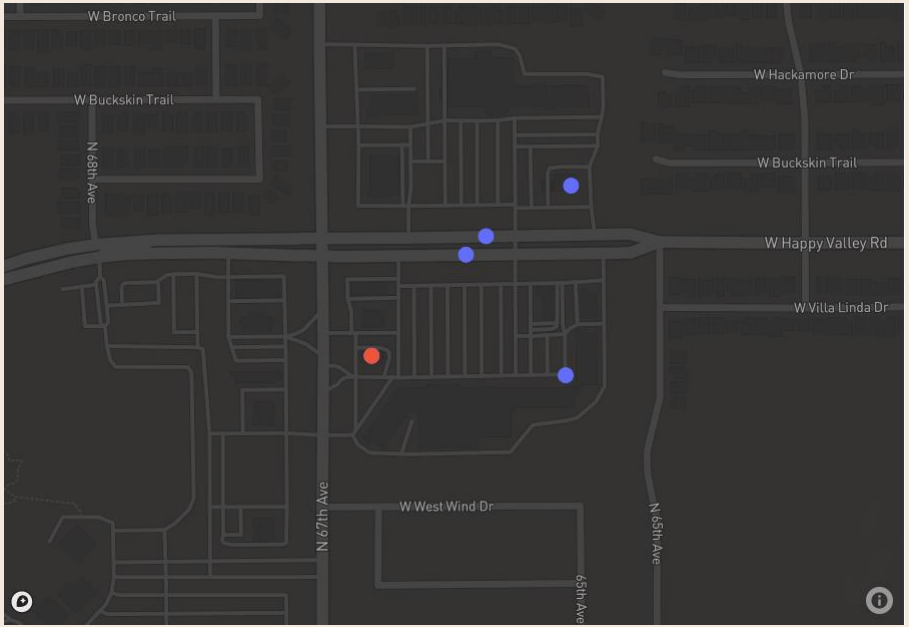
Location-Based Recommendation System



Restaurant in Arizona states

Location-Based Recommendation System

- Use latitude and longitude to calculate distance between point then recommend top 5 nearest restaurants.

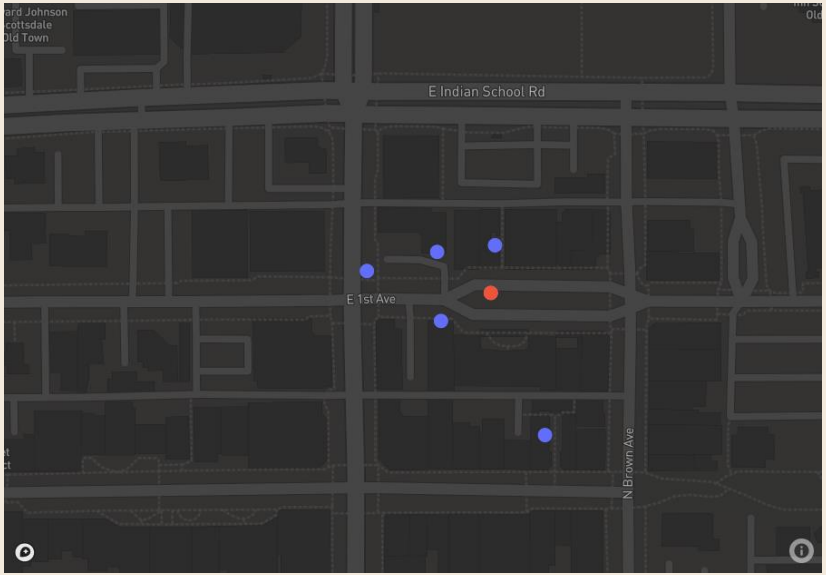


Example: Oldtown Scottsdale

- Assume that a user has just visited the Old Town in Scottsdale city. After visiting the Oldtown Scottsdale, he wants to have a lunch but is unsure what restaurants are around him.

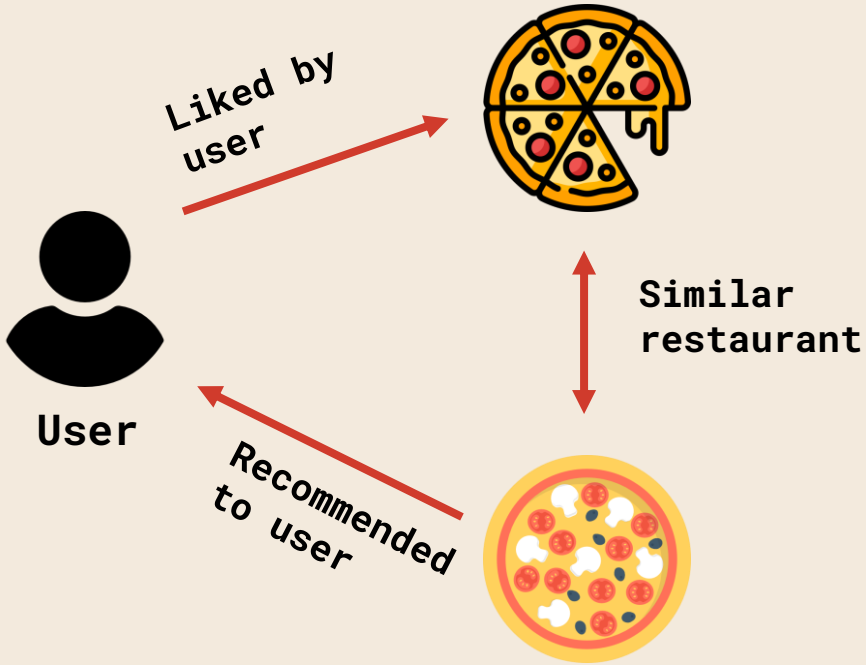
Example: Oldtown Scottsdale

	business_name	categories	business_stars	distances
1	Cien Agaves Tacos & Tequila	Mexican, Restaurants	3.5	0.025488
2	Big Earl's BBQ	Barbeque, Restaurants	3.5	0.030460
3	Pita House	Middle Eastern, Restaurants	3.5	0.035992
4	Jewel of the Crown	Pakistani, Indian, Restaurants	4	0.067009
5	The Cider Mill Gourmet Market & Sandwich Shop	Food, Specialty Food, Sandwiches, Restaurants	4	0.081029



Content-Based Recommendation System

Recommend restaurants based on content of restaurants



Content-Based Recommendation System

1

Topic Modeling

Analyzes text data to determine cluster words for a set of documents.

2

Count Vectorizer

Transform a given text into a vector based on the frequency (count) of each word that occurs in the entire text.

3

Cosine Similarity

Find the similarity between restaurants

Example: Mabel's On Main

	restaurant	res_categories	rating	review_count
0	Cafe ZuZu	Bars, American (Traditional), Nightlife, Loung...	4.0	130
1	Bliss ReBAR	Bars, American (New), Nightlife, Restaurants	4.0	202
2	Jt's Bar & Grill	Bars, American (Traditional), Nightlife, Resta...	4.0	43
3	T. Roosevelt's Tavern	Bars, Restaurants, Nightlife, Italian	4.0	64
4	Upper Crust Pizza Patio Lounge & Wine Bar	Bars, Restaurants, Nightlife, Pizza, Sports Ba...	4.0	119
5	T Cook's Restaurant & Lounge	Bars, Mediterranean, Nightlife, Lounges, Ameri...	4.0	136
6	Astor House	Bars, American (New), Nightlife, Restaurants	4.0	32
7	FEZ	Bars, Mediterranean, Nightlife, Lounges, Ameri...	4.0	652
8	AZ 88	Bars, American (Traditional), Nightlife, Loung...	4.0	299
9	Karsen's Grill	Bars, American (New), Nightlife, Restaurants	4.5	31

Mabel's On Main

Style: Bars, Nightlife, American (New), Lounges

Keywords: Pizza, Night, Beer, Drink , Wine, ...

Café ZuZu

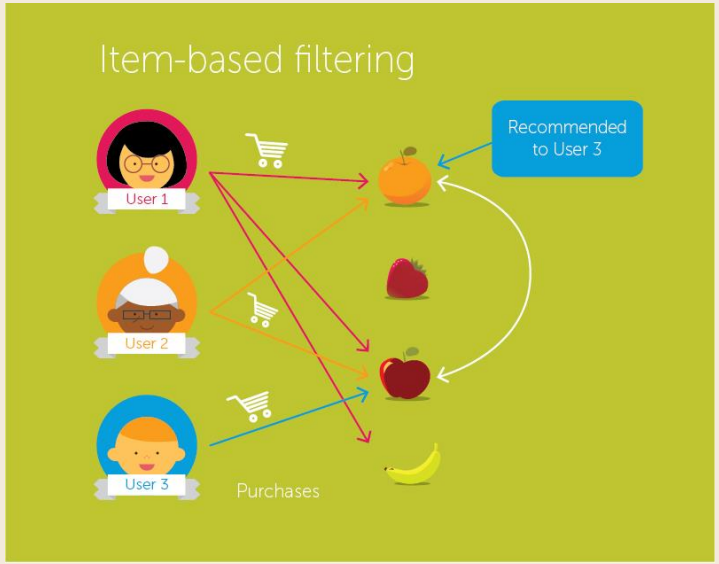
Style: Bars, Nightlife, American (New)

Upper Crust Pizza Patio Lounge & Wine Bar

Style: Bars, Nightlife, Italian, Pizza

Collaborative-Filtering Recommendation System

- Collaborative filtering finds a smaller set of user with tastes similar to a particular user. It looks at the restaurant they like and combines them to create a ranked list of suggestion.
- Item based filtering looks for similar items based on the items users have already liked or positively interacted with.



Example: Mabel's On Main

	restaurant	res_categories	rating	review_count
0	Lalibela Ethiopian Cafe	Ethiopian, Restaurants	4.0	179
1	T Cook's Restaurant & Lounge	Bars, Mediterranean, Nightlife, Lounges, Ameri...	4.0	136
2	Feeney's Restaurant and Bar	Bars, Nightlife, Restaurants	4.0	64
3	La Grande Orange Pizzeria	Pizza, Restaurants	4.5	292
4	Coronado Cafe	American (New), Restaurants	4.0	128
5	Lon's At the Hermosa	American (Traditional), Restaurants	4.0	125
6	deseo	Latin American, Restaurants	4.5	82
7	Fuego Bistro	Latin American, Restaurants	4.0	258
8	Al-Hana	Mediterranean, Middle Eastern, Halal, Restaurants	4.5	52
9	Wright's	Breakfast & Brunch, American (New), Restaurants	4.5	24

Mabel’s On Main

Style: Bars, Nightlife, American (New), Lounges

Lalibela Ethiopian Cafe

Style: Ethiopian

T Cook's Restaurant & Lounge

Style: Bars, Nightlife, Mediterranean, Lounges, American (New)

Conclusion

Conclusion and Future Improvement

Conclusion:

- For content-based recommendation system will provide similar restaurant based on the content of restaurant like cuisine style, topic from review text.
- While collaborative filtering using rating data to find similarity between user or items it will recommend different restaurant from content-based recommendation system.
- This model can be used on others city if we got the similar dataset.

Future Improvement:

- Do sentiment analysis in review text
- Incorporate Neural Network and Deep Learning Concepts into collaborative filtering recommendation system.

THANKS

CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by **Freepik**