# RESTAURANT RECOMMENDATION SYSTEM

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#### **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 and many delivery apps recommend restaurants based on their location which it may not meet the preferences of the customer enough. This project aims to increase the number users of food delivery apps by creating a restaurant recommendation system based on their preferences.



## Yelp Data Set: Arizona





2,339 restaurants



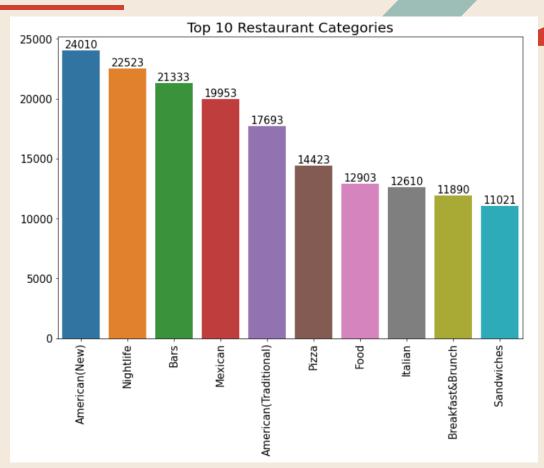
33,409 users



135,278 reviews



# **Restaurant Categories**



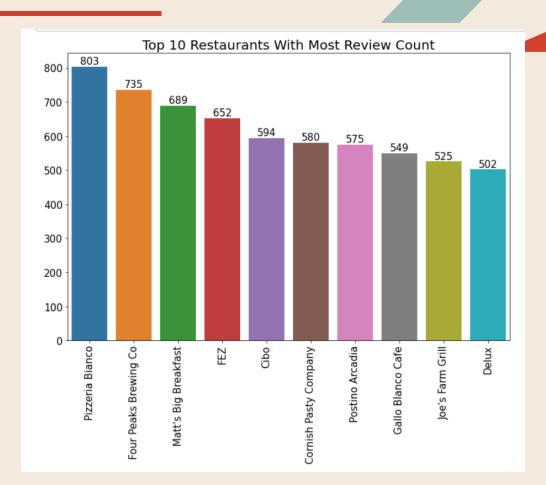


## **Restaurant Rating**



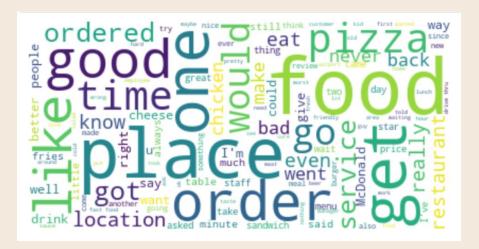


### **Restaurant Review Count**



### **Word Cloud**







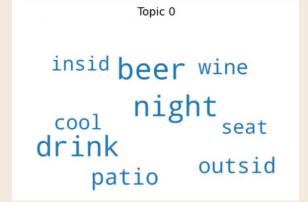
Negative reviews

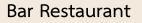
Positive reviews



### **Topic Modeling**

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







Pizza Restaurant



Mexican Restaurant



# Recommendation System

## **Building Recommendation System**



01

02

03

#### **Location-Based**

Recommend restaurants based on user location

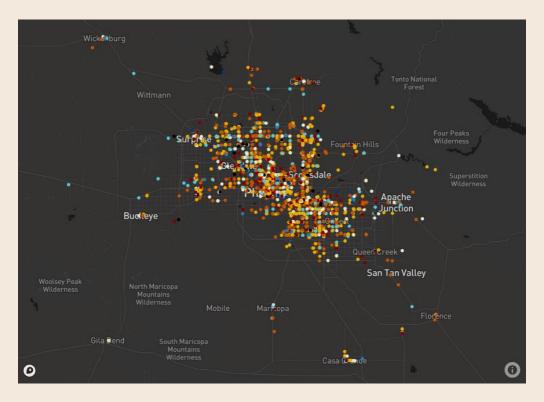
#### **Content-Based**

Recommend restaurants based on content of restaurants

#### **Collaborative Filtering**

Recommend restaurants based on similarities between user and items

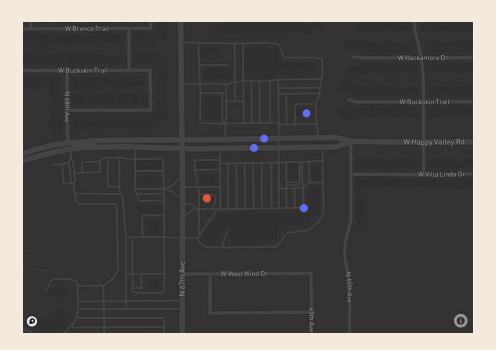
# **Location-Based Recommendation System**



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 museum, 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



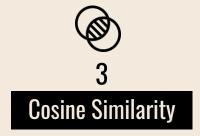
### **Content-Based Recommendation System**



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



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



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-Based Recommendation System**



Create pivot table using rating as a value





Find the similarity between restaurants

# 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.

#### Future Improvement:

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

# **THANKS**

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