# MINING YELP REVIEW DATA FROM LATENT RATINGS TO A RECOMMENDATION SYSTEM

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# DATASET

## **Review Object**

Field	Description
user_id	Unique user id
business_id	Unique business id
stars	Star rating
date	date
text	Review text

## Restaurant Object

Field	Description
business_id	Unique business id
name	Business name
city	city
is_open	0 or 1 for closed or open
stars	Star rating
attributes	Business attributes
categories	Categories business belongs to

# YELP REVIEWS



Jae L. Elite '20

5 STARS

★ ★ ★ ★ 9/20/2020

This place is rich with history as well as rich with delicious flavor. Ive been to Mexico a few times (from the city to southern region of Veracruz and puebla) and each place i went to, Ive always tried tacos. This place is the exact type of flavor and texture as i had back in the native land.

Read more



Johnny L. Elite '20



9/15/2020

tried the amazing, notoriously good lamb tacos.. one question, have you had a lamb taco before? I have because I went to this place and it was tender, not too gamey.. pretty interesting

the only thing is it could've used a little more salt for the meat.. but indeed a goo... Read more

4 STARS

# PROBLEMS WITH THE RAW STAR RATING

- 1. User give rating based on number latent criterias
  - a. Opinion about aspects of restaurant experience (e.g. location, quality of food)
- 2. Star rating cannot reflect those criteria
- 3. Need a way to extract useful information about different aspects of restaurant experience from text

# WORD CLOUDS OF TEXT REVIEW

#### 1-Star Review

#### 5-Star Review

```
place plate MexicanName bar another money service Maybe fo fami basement food try will save lunch Worst went re Well Today tell dtype restaurant standards defiantly overpriced fastreview_text long pic bought object line Hopefully
```

```
describe the place perfect super gr object sauce words friend of the place object sauce words homemade loved time find Name excited stay due
```

# TOPIC MODELING OF FOOD CATEGORIES



Pizza Breakfast Sandwich

Thai Beer

Sweets Mexican

Vegetarian Buffet

> Greek Drinks

American

Italian Vietnamese

Japanese

# TOPIC MODELING OF LATENT ASPECTS

#### PRICE

Worth Check Price Reasonable Pay Size

Small

#### AMBIENCE

Atmosphere
Vibe
Spot
Clean
Location
Decor
smell

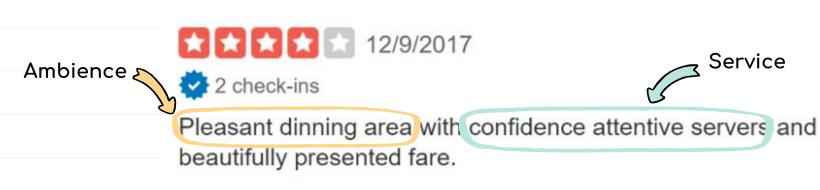
#### SERVICE

Time
Service
Slow
Fast
Bartender
Seat
Waitress

#### FOOD

Quality Order Appetizer Delicious Chicken Dish Meal

# TOPIC MODELING OF LATENT ASPECTS



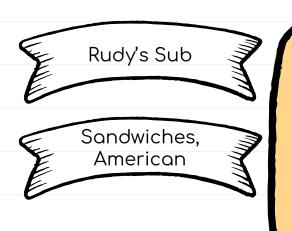
I have always found the Toro & Maguro very fresh here.
The smoked Salmon is always delight as well as the oysters.

The Tempura is plentiful yet never greasy.

# RECOMMENDATION SYSTEM

- 1. User picks a type of food from 15 categories
  - Calculate relative weights user has placed on each aspect for each text review
- 3. Find users with a set of similar importance on each aspect
- 4. Pick N users from similarity list who have rated the same restaurant and calculate the recommendation rating
- 5. Recommend Top 5 restaurants

# LOOKING AT SPECIFIC USER



"THE FOOD HERE IS SO GREAT THAT I WON'T EAT SUBS ANYWHERE ELSE. IT'S FAMILY OWNED AND THE STAFF IS AWESOME. IF YOU HAVEN'T TRIED THIS PLACE YET, YOU'RE DEFINITELY MISSING OUT.

# RECOMMENDED RESTAURANTS

BISTROS, SERVICE: 0.3 AMBIENCE: 0.36 FOOD: 0.42 PRICE: 0.14 BISTRO 19 AMERICAN BURGERS, DIVE BAR AND FOOD: 0.32 SERVICE: 0.29 PRICE: 0.19 AMBIENCE: 0.47 AMERICAN GRILLE PATRICK'S PUB AMERICAN, SERVICE: 0.43 PRICE: O.Z FOOD: 0.37 AMBIENCE: 0.25 AND GRILLE BAR5 AMERICAN, FOOD: 0.39 SERVICE: 0.31 SAVOY AMBIENCE: 0.39 PRICE: 0.14 BARS SUNSERI JIMMY AMERICAN, AMBIENCE: 0.38 FOOD: 0.31 SERVICE: 0.41 PRICE: 0.15 + NINO SANDWICH

# THANK YOU!

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