

Yelp for Restaurateurs

Mirae Kim





Currently, Yelp is primarily
geared towards




Restaurant Seekers
and not for

Restaurant Owners

Yelp Search view has limited information





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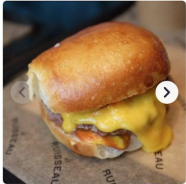
[Restaurants](#) [Home Services](#) [Auto Services](#) [More](#)

Best burger in Paris, France


Sort: Recommended

All

Open Now




1. Le Ruisseau - Burger Joint


 39

€€ · Burgers

"This **burger** spot is highly talked about, but the space is very limited. No more than 20 people are able to sit in the restaurant give or take a few. Outside of it being very tight, it's a..." [more](#)

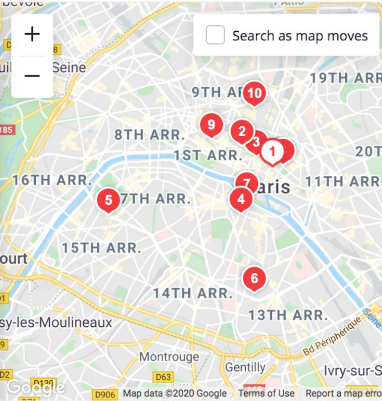



2. Blend


 242

€€ · Burgers, Breakfast & Brunch, American (Traditional)

"Pleasantly surprised by the **burgers**, fries, and service. The restaurant seats about six to eight tables but was very busy with cyclists picking up Grub Hub..." [more](#)






 just-eat.fr

Livraison de Burgers - N°1 de la Livraison de Repas

Faites-vous livrer par les Meilleurs Restaurants à proximité avec Just Eat l'Offre Exclusives. Livraison sans contact. CB, Espèces, Ticket Resto. Plus de 10000 Restaurants. Garantie Prix Identiques. 0€ de minimum de commande. Commandez 24h/24 et 7J/7. Types: Italien, Pizzas, **Burgers**, Chinois, Healthy, Vietnamiens, Japonais, Indien.

 arabianightsf.com


Arabian Nights Restaurant - Best Mediterranean Food in SF


Reserve Your Table Now. Enjoy our Lebanese authentic dishes with a special outside seating.




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3

Yelp Search view has limited information





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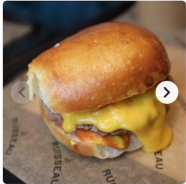
[Restaurants](#) [Home Services](#) [Auto Services](#) [More](#)

Best burger in Paris, France







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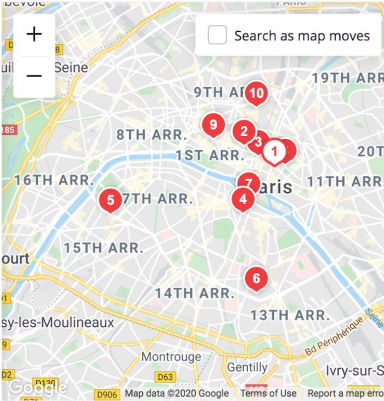
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242

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+

-


Seine

☐ Search as map moves

9TH ARR. 10TH ARR. 19TH ARR. 8TH ARR. 20TH ARR. 1ST ARR. 11TH ARR. 16TH ARR. 7TH ARR. 15TH ARR. 14TH ARR. 13TH ARR. Paris


sy-les-Moulineaux Montrouge Gentilly Ivry-sur-Se

Map data ©2020 Google Terms of Use Report a map error



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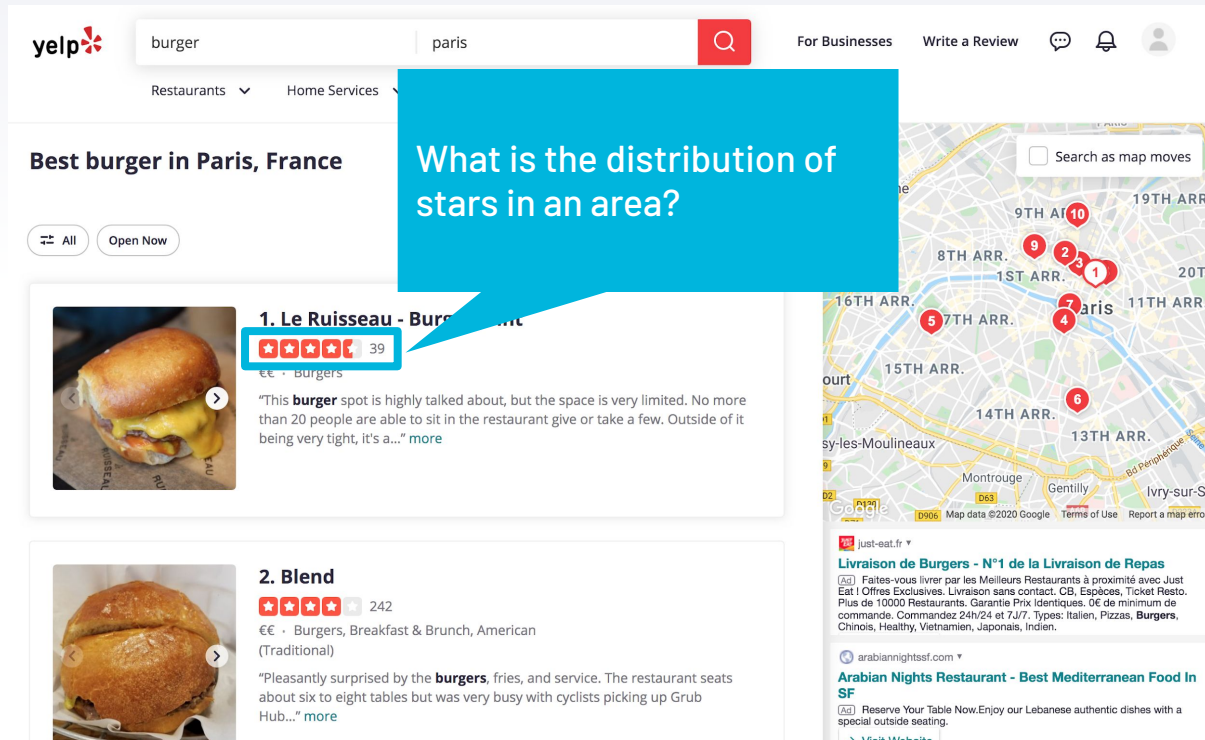


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Yelp Search view has limited information



Yelp logo

Search: burger paris

For Businesses Write a Review

Restaurants Home Services

Best burger in Paris, France

All Open Now

1. Le Ruisseau - Burgers

4.5 stars 39 reviews

€€ • Burgers

"This **burger** spot is highly talked about, but the space is very limited. No more than 20 people are able to sit in the restaurant give or take a few. Outside of it being very tight, it's a..." [more](#)

2. Blend

4.5 stars 242 reviews

€€ • Burgers, Breakfast & Brunch, American (Traditional)

"Pleasantly surprised by the **burgers**, fries, and service. The restaurant seats about six to eight tables but was very busy with cyclists picking up Grub Hub..." [more](#)

What is the distribution of stars in an area?

Search as map moves

Map showing star distribution in Paris (1st to 20th Arr.)

just-eat.fr

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For Businesses

Write a Review







Restaurants

Home Services

Auto Services

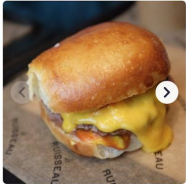
More

Best burger in Paris, France






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All

Open Now




1. Le Ruisseau - Burger Joint



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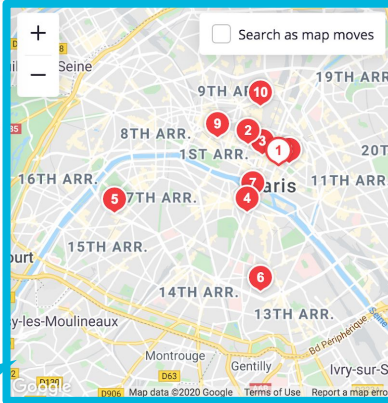
• Burgers

"This **burger** spot is highly talked about, but the space is very limited. No more than 20 people are able to sit in the restaurant give or take a few. Outside of it being very tight, it's a..." [more](#)



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Where are the highest stars?



just-eat.fr

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arabiannightssf.com

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Yelp Search view has limited information

The screenshot displays the Yelp search interface for 'restaurant' in Paris, France. The top navigation bar includes the Yelp logo, search filters, and user options. The main content area shows the 'Best restaurant in Paris, France' with a 'Sort: Recommended' dropdown. Below this are filter buttons for 'All', 'Open Now', 'Outdoor Seating', 'Good for Dinner', and 'Good for Groups'. The first restaurant listed is '1. Le Comptoir de la Gastronomie', which has a 4.5-star rating (1085 reviews) and a price range of '€€ • French'. A blue callout box points to the star rating and price range, asking 'What kind of restaurants have the highest stars?'. The second restaurant listed is '2. Bistro des Augustins', which has a 4.5-star rating (412 reviews) and a price range of '€€ • Bistros, Wine Bars'. A map on the right shows the location of the restaurants in Paris.

Best restaurant in Paris, France

Sort: Recommended

All Open Now Outdoor Seating Good for Dinner Good for Groups

1. Le Comptoir de la Gastronomie

★★★★★ 1085

€€ • French

"LOVED this place. I had my... I could re-experience this place again... reservation..." more

2. Bistro des Augustins

★★★★★ 412

€€ • Bistros, Wine Bars

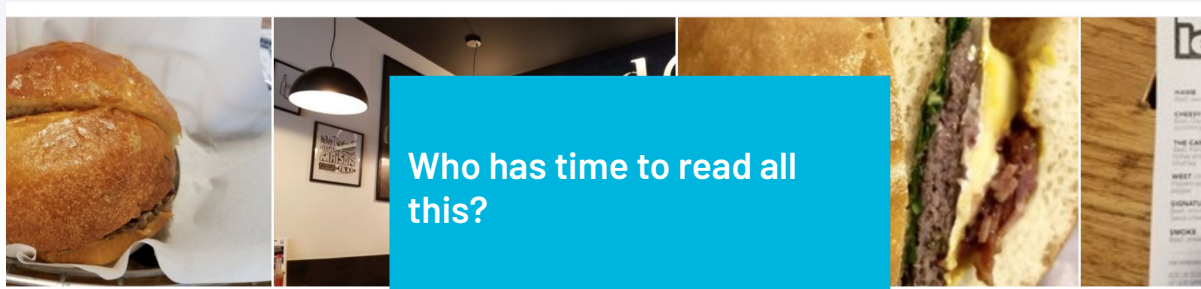
What kind of restaurants have the highest stars?

Map data ©2020 Google

Boeuf de Kobe - Restaurant gastronomique

Restaurant gastronomique - cuisine de saison - Visit Website

No holistic view of Restaurant Reviews



Who has time to read all this?


Blend ✓ Claimed


★ ★ ★ ★ ★ 242 reviews [View Details](#)


€€ · Burgers, Breakfast & Brunch, American (Traditional) [Edit](#)

[★ Write a Review](#) [Add Photo](#) [Share](#) [Save](#)

Review Highlights

 "We went here after a visit to the [Louvre museum](#)." in 2 reviews

 "If you're a sucker for barbeque sauce like me, go for the [cheesy burger](#)." in 6 reviews

 "Tried the ["west"](#) which is basically a cheeseburger squeezed between sourdough bread slices." in 4 reviews

[blendhamburger.com](#)

+33 1 40 26 84 57

[Get Directions](#)

[Full menu](#)

[Message the Business](#)

Project Objectives

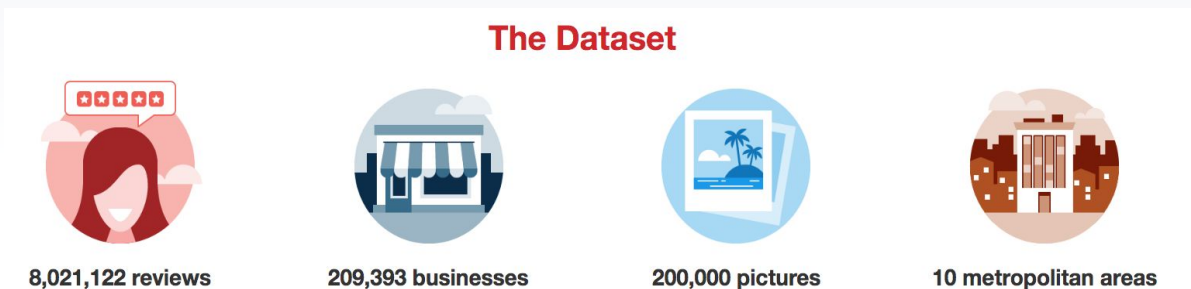
- ▶ Create a view for **potential** Restaurant Owners
 - ▷ Optimize Location
 - ▷ Optimize Category
 - ▷ Optimize Characteristics
- ▶ Create a view for **current** Restaurant Owners
 - ▷ Understand Reviews
 - ▷ Optimize Characteristics

Personal Objectives

- ▶ Familiarize with **Natural Language Processing** (NLP)
- ▶ Learn how to develop an **interface** from scratch
 - ▷ Data Storage and Serving
 - ▷ Model Storage and Serving
 - ▷ User Interface Creation

Data Sources

- ▶ **Yelp Reviews Dataset:** Downloadable Dataset with large corpus of text



- ▶ **Yelp Fusion API:** Extra information about restaurants

Yelp Reviews Dataset: <https://www.yelp.com/dataset>

Yelp Fusion API: <https://www.yelp.com/fusion>

Use Latent Dirichlet Allocation to summarize the texts by Topics

Goal: Finds latent topics in a corpus of text

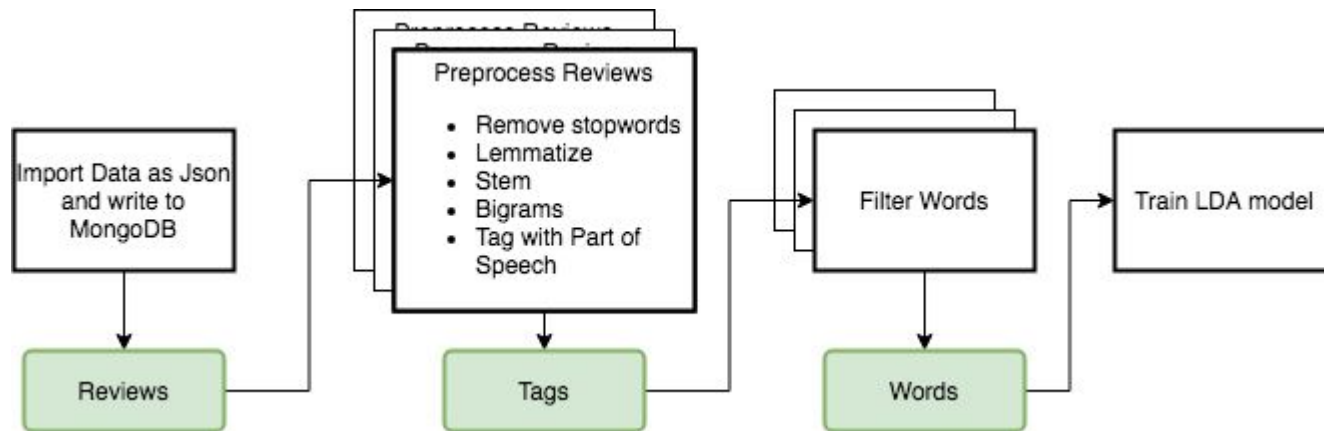
Main assumption: Text documents are a mix of topics and each topic is a mix of words

Technologies:

- ▶ Gensim
- ▶ NLTK

Data Processing

- ▶ Failed to use spark implementation of LDA due to data engineering issues
- ▶ [Multiprocessing](#) python library used to create threads of concurrent processing
- ▶ [MongoDB](#) NoSql database used to store intermediary results



Green represents Mongoddb Collection

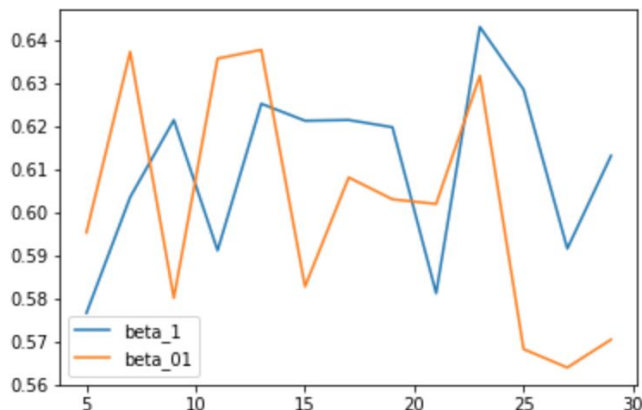
Finetuning and Results

Main Hyperparameters:

- ▶ **Alpha:** document-topic density
- ▶ **Beta:** topic-word density
- ▶ **Number of Topics:** Number of topics LDA should produce

Chosen Hyperparameters:

- ▶ **Alpha:** "Asymmetric"
- ▶ **Beta:** 0.1
- ▶ **Number of Topics:** 13



Evaluation Metric:

- ▶ **Coherence:** measures the degree of semantic similarity among the highest scoring words in each topic

Final Coherence Score: 0.6377

Topics produced

```
#0: (0, '0.034*place" + 0.018*"coffee" + 0.018*"breakfast" + 0.016*"food" + 0.015*"time" +  
0.012*"staff" + 0.012*"service" + 0.010*"day" + 0.008*"love" + 0.008*"spot"')  
  
#1: (1, '0.061*"food" + 0.049*"service" + 0.032*"place" + 0.022*"restaurant" + 0.022*"time" +  
0.014*"experience" + 0.013*"dinner" + 0.012*"staff" + 0.010*"menu" + 0.010*"quality"')  
  
#2: (2, '0.017*"salad" + 0.013*"sauce" + 0.011*"meal" + 0.011*"bread" + 0.010*"chicken" +  
0.010*"menu" + 0.010*"dinner" + 0.009*"restaurant" + 0.009*"side" + 0.008*"steak"')  
  
#3: (3, '0.045*"bar" + 0.037*"place" + 0.032*"beer" + 0.027*"drinks" + 0.024*"night" +  
0.023*"food" + 0.021*"music" + 0.017*"selection" + 0.015*"drink" + 0.014*"patio"')  
  
#4: (4, '0.063*"food" + 0.046*"place" + 0.028*"service" + 0.022*"chicken" + 0.017*"staff" +  
0.016*"tacos" + 0.015*"chips" + 0.014*"lunch" + 0.014*"time" + 0.011*"love"')  
  
#5: (5, '0.062*"cream" + 0.049*"ice" + 0.039*"chocolate" + 0.018*"cake" + 0.015*"dessert" +  
0.014*"flavors" + 0.013*"la" + 0.011*"vanilla" + 0.010*"cookies" + 0.010*"desserts"')  
  
#6: (6, '0.030*"selection" + 0.030*"quality" + 0.025*"price" + 0.022*"prices" + 0.013*"variety" +  
0.013*"foods" + 0.012*"place" + 0.010*"options" + 0.010*"wall" + 0.010*"items"')  
  
#7: (7, '0.068*"fries" + 0.057*"burger" + 0.031*"burgers" + 0.021*"sandwich" + 0.019*"bbq" +  
0.017*"meat" + 0.015*"ribs" + 0.013*"bun" + 0.012*"cheese" + 0.011*"beef"')  
  
#8: (8, '0.025*"order" + 0.024*"time" + 0.019*"minutes" + 0.016*"service" + 0.015*"people" +  
0.014*"food" + 0.013*"customer" + 0.011*"place" + 0.010*"manager" + 0.009*"location"')  
  
#9: (9, '0.049*"vegas" + 0.027*"strip" + 0.023*"buffet" + 0.023*"hotel" + 0.017*"las" +  
0.015*"room" + 0.011*"casino" + 0.011*"club" + 0.011*"night" + 0.010*"floor"')  
  
#10: (10, '0.108*"pizza" + 0.029*"toppings" + 0.028*"store" + 0.027*"crust" + 0.020*"slice" +  
0.015*"wings" + 0.014*"pizzas" + 0.013*"place" + 0.012*"delivery" + 0.012*"shopping"')  
  
#11: (11, '0.033*"rice" + 0.025*"chicken" + 0.023*"soup" + 0.021*"spicy" + 0.018*"beef" +  
0.017*"pork" + 0.017*"noodles" + 0.016*"sauce" + 0.015*"food" + 0.014*"thai"')  
  
#12: (12, '0.020*"watch" + 0.018*"tables" + 0.017*"room" + 0.015*"tv" + 0.015*"game" +  
0.015*"area" + 0.015*"bar" + 0.014*"games" + 0.013*"chairs" + 0.012*"sports"')
```

Topics produced

Topic0



Breakfast

Topic1



Dinner

Topic2



Main Dish

Topic3



Bar

Topic4



Mexican

Topic5



Dessert

Topic6



Value

Topic7



Burgers

Topic8



Service/Waiting Time

Topic9



Vegas

Topic10



Pizza

Topic11



Asian

Topic12

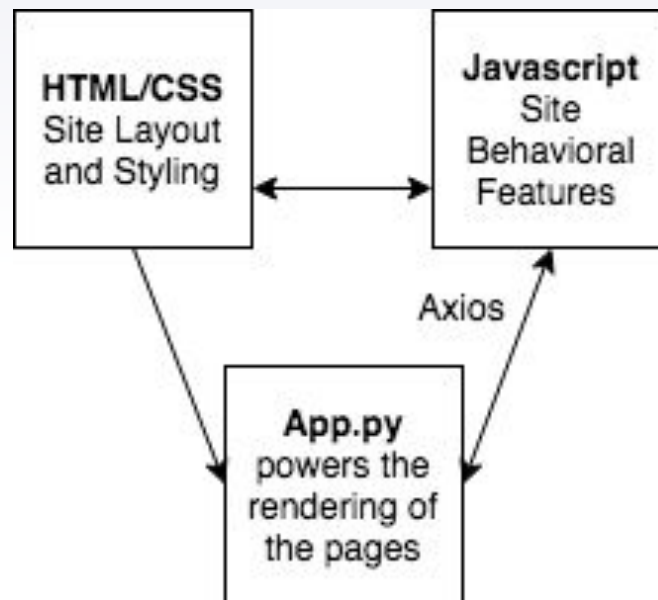


Sports Bar

Create a User Interface to showcase results

Technology:

- [Flask](#): Framework for developing web applications
- [Leaflet](#): Map API
- [Bootstrap](#): HTML/CSS framework
- [MongoDB](#): Database



Search restaurant for in depth analysis on your review content

RESTAURANT EXPLORE

GETTING STARTED

SEARCH

EXPLORE MARKET

EXPLORE TOPICS

Search Restaurant

RESTAURANT NAME:
the bird

LOCATION: san francisco

Submit

Restaurant Information

SHOW ENTRIES

SEARCH:

Field	Value
address	115 New Montgomery St San Francisco US
categories	Chicken Shop, Sandwiches
is_closed	No
name	The Bird
phone	(415) 872-9825
price	\$
rating	4
total_review_count	1772

Showing 1 to 8 of 8 entries

Previous

1

Next

Review Stars Distribution

1.0

0.9

of Restaurants

Topic Distribution

1.0

0.9

of Restaurants

Explore the review stars on a map

RESTAURANT EXPLORE

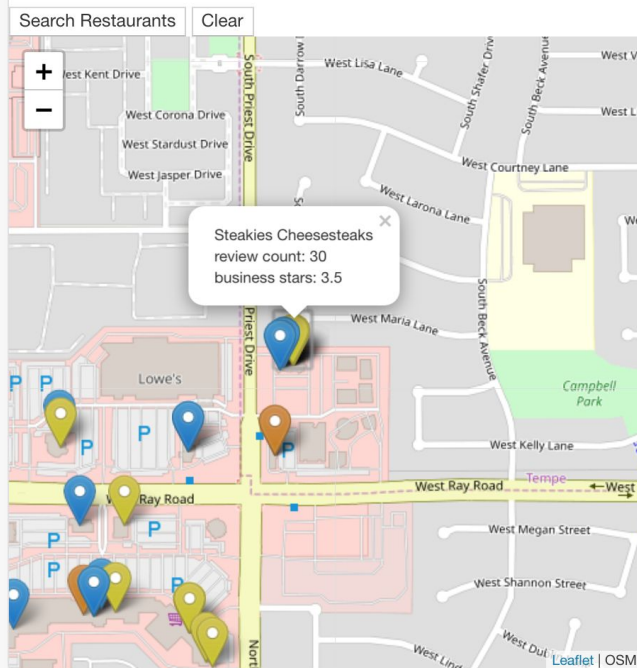
GETTING STARTED

SEARCH

EXPLORE MARKET

EXPLORE TOPICS

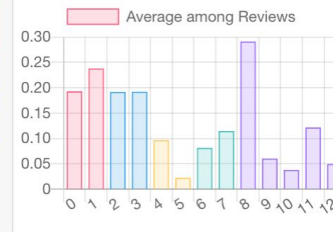
Explore on the map



Distribution of Stars



Conversation Topics



Explore Topics on a map

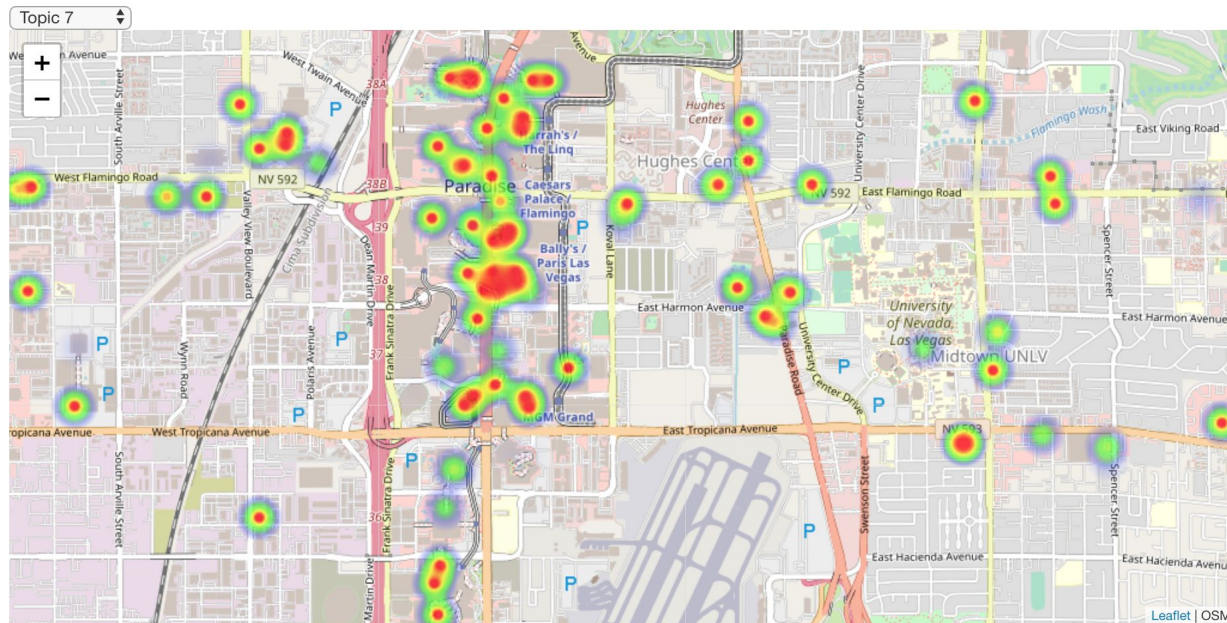
RESTAURANT EXPLORE

GETTING STARTED

SEARCH

EXPLORE MARKET

EXPLORE TOPICS



Next steps

Data

- ▶ Make a model for each city or for each category to have more precise topics

Application

- ▶ Database Optimization
 - ▶ Slow Record Retrievals
- ▶ UX/UI Design
 - ▶ More intuitive UX
- ▶ Page that analyzes per category and topic