

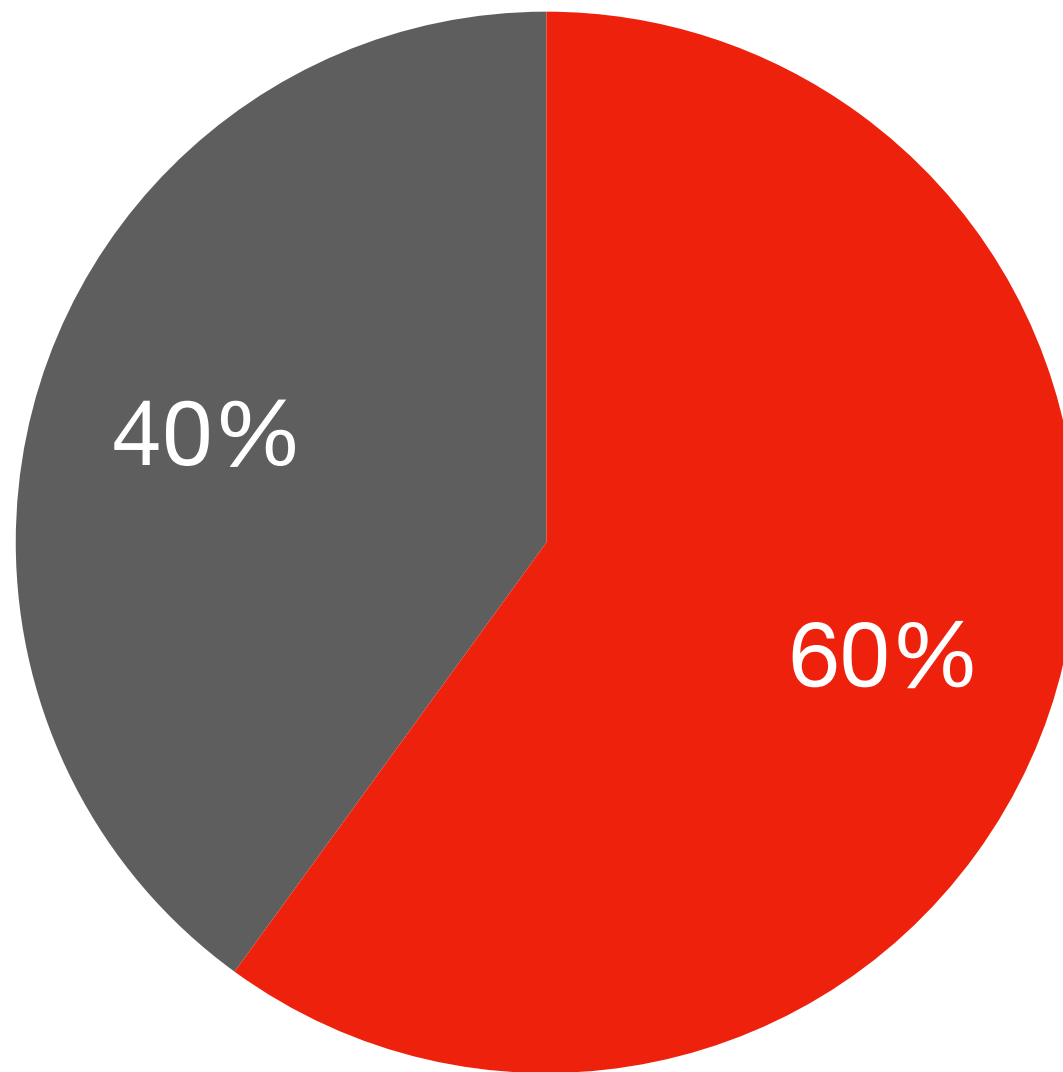


# NLP Analysis of Yelp Reviews\*

Ankur Vishwakarma

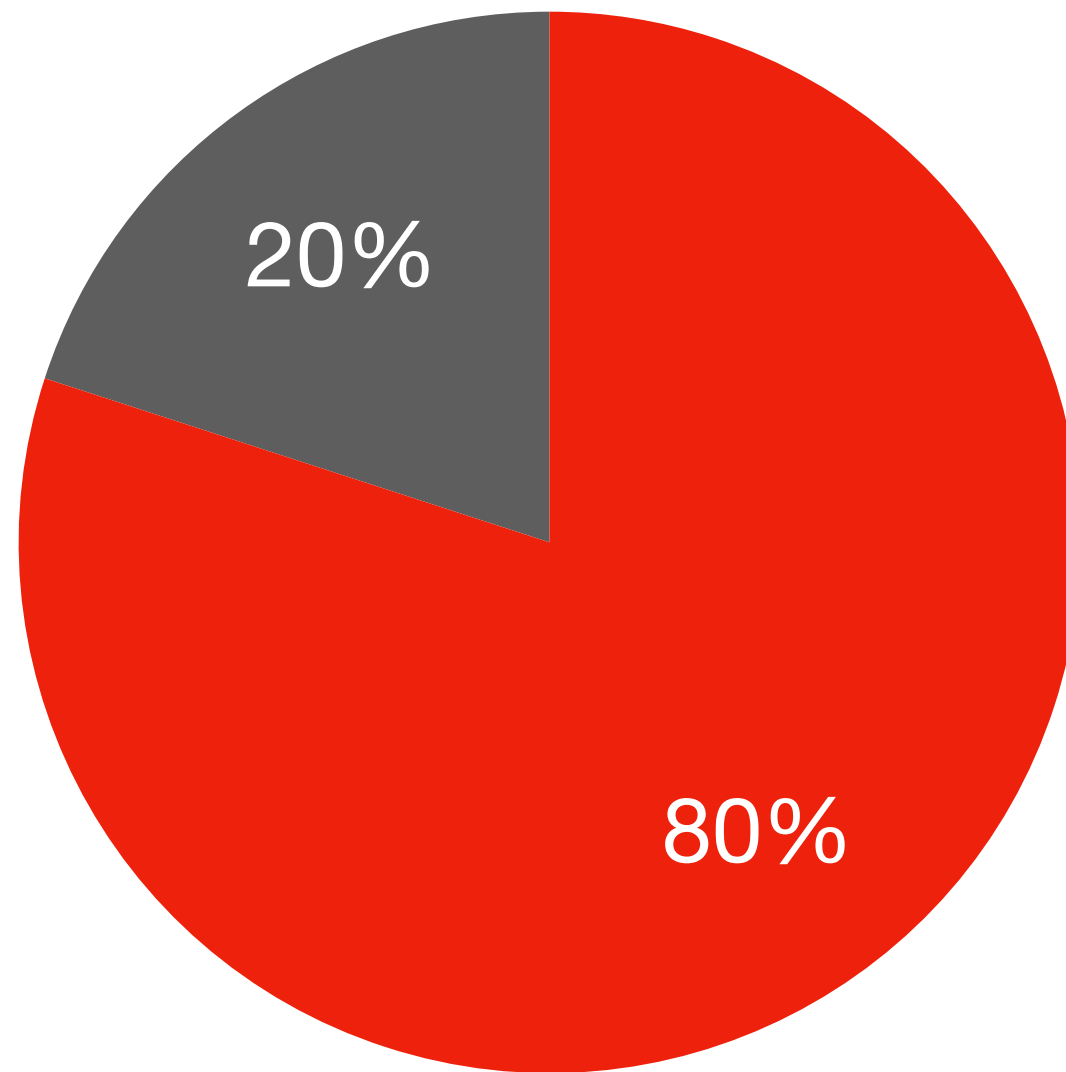
# Many Restaurants Fail

Closures within 1 year

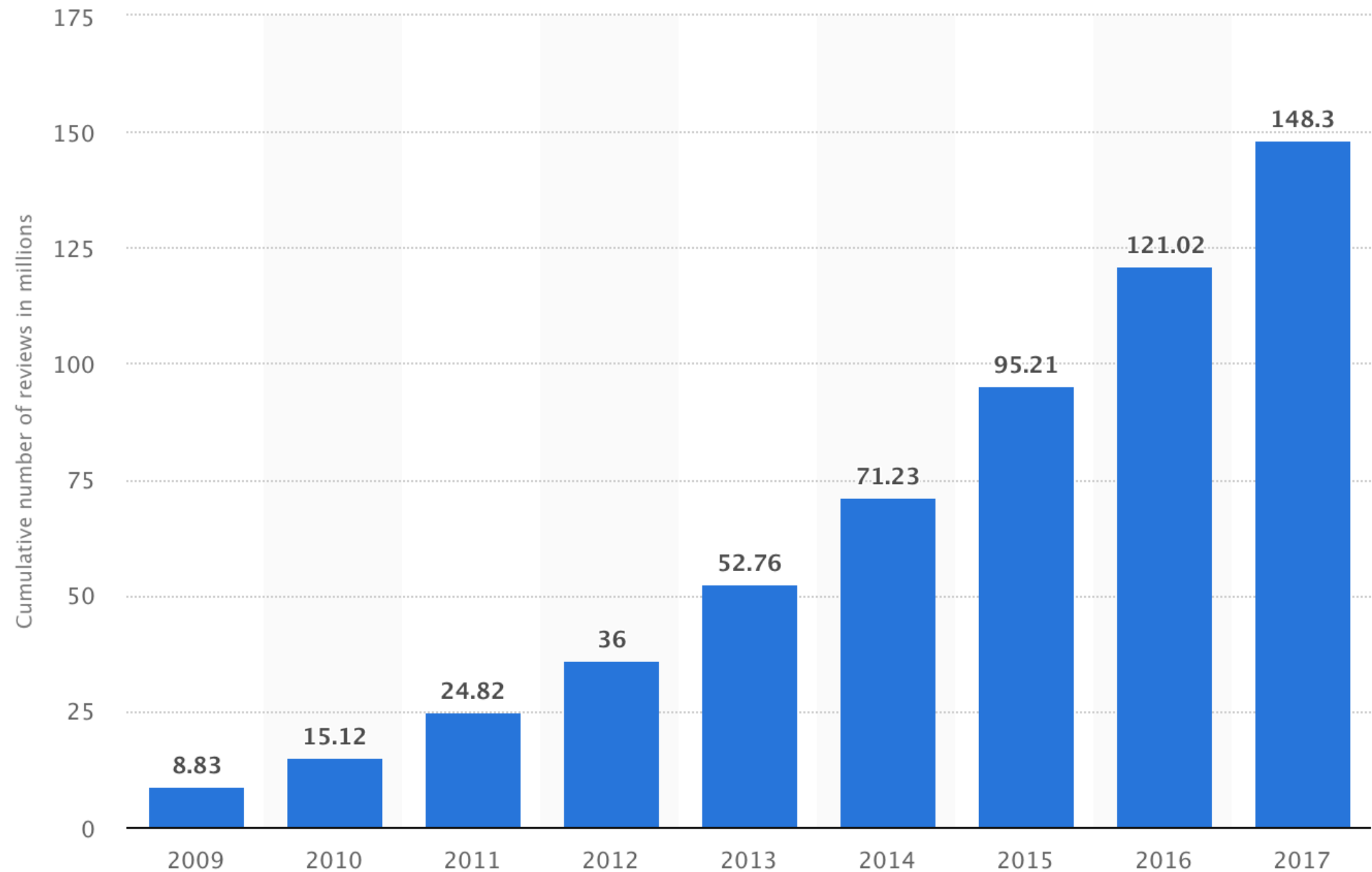


# Many Restaurants Fail

Closures within 5 years



# Total Reviews on Yelp



# Too Many Reviews



## Onefold

\$\$ · Coffee & Tea, Breakfast & Brunch, Cafes  
1420 E 18th Ave  
Denver, CO 80218

★ ★ ★ ★ ★ 2/21/2016 · Updated review

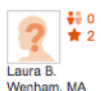
Food was boring. Never thought something cooked in duck fat could taste so bland. Staff has a big head on their shoulders but nothing to show for it. Bitter coffee with a bitter environment. I think it's time for the owner to get off his high horse. I have also been reading the yelp comments and to see an owner of a business act so childish and unprofessional on a site meant for customers to voice their opinions is shameful. I would not recommend this place to my friends visiting Denver. Denver is known for great, innovative restaurants-- this is not one of them.



Sandra P.  
Wilmington, MA

★★★★★ 4/11/2013

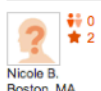
Best place in Boston to get a burrito!! Absolutely love this place.



Laura B.  
Wenham, MA

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Amazing. I highly recommend the El Guapo burrito.



Nicole B.  
Boston, MA

★★★★★ 2/20/2013

The best mexican food in Boston  
the food is fresh, the place is clean, the staff is friendly and efficient.



Deviant S.  
Boston, MA

★★★★★ 1/22/2013

What's to say that hasn't already been said? Fish Burrito's #1!!! Friendly and fast. Clean and cool. I eat their far to guess parking might be tough?, but that's just another good reason to go by bike, or walk!



Jeremy M.  
East Taunton, MA

★★★★★ 1/14/2013

Great Mexican in Boston for cheap!  
I've never had good fish tacos in my life, except here! They were amazing.  
The guac was fresh and delicious.  
The tacos are awesome too!

highly recommended.



## Bryan R.

New York, NY

Elite '14

115 friends

295 reviews

★★★★★ 9/2/2014

What a great place for a random night.

I stumbled upon this place on Yelp one night when I was out alone on a work trip to SF. I stopped in for a drink and stayed for a few hours. I love the charm of this place and the welcoming nature. The bar kind of naturally selects for people willing to have a conversation with the person next to them. Also, there's a great burger place nearby that you can go and bring food back from (grab a burger for the bartender too).

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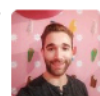
I was there. I was really, really there. I couldn't have been more there, and I am in no making this up. This is NOT made up, OK? What I'm telling you is, I also have God on side.

Or at least I thought I did. On this day - this day that I was really there, this day that I am making up or fabricating in any way - he abandoned me. He forsook me.

The pizza gave me cancer.

The flourless mini-cakes WERE pretty good. But, again...the pizza gave me cancer. T cancer prevents me from giving this place five stars. You should not - I repeat, you sh NOT - get cancer from pizza-foods at a restaurant. Cancer from flourless mini-cakes' understandable. But that's not where my cancer came from. It came from the pizza.

Parking is impossible.



## Bryan M.

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I'll admit it, I have been coming here a lot ever since I started this low carb diet. It's predictable, and I need that for my diet, Chipotle is just a safe bet, and its tasty.

Regarding this location:

The line can get very long starting around 12:10PM. If your going for lunch, I would recommend going just before noon, or exactly at noon. 10 minutes later and you will be too late, stuck at the back a line that seems to snake around the inside of the store.

The employees there are usually very friendly to me, after all, they see me nearly every day M-F. I have never had a problem with the quality of the ingredients, nor have I ever gotten sick here. Sometimes sure, I wish I had a little more meat in the Salad bowl.. don't we all, but thats life.

Share review

Embed review

Compliment

Send message

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This place is a gem and they know it. They've got the best pizza in town at a great location. I hope they don't get complacent and lose the business of their regulars.

Was this review ...?

Useful 1

Funny

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## Comment from Mark H. of Mother Bear's Pizza

Business Owner

10/28/2013 · Hi Anna,

While I'm glad to hear you think we have the best pizza in town, I'm alarmed to hear that you experienced rude service recently. The last thing I want is for our customers to feel like we don't appreciate them. Do you mind letting me know what happened in more detail? Rather than being complacent, I want to address your experience directly with the staff.

Hope to hear back from you soon,  
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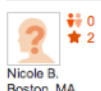
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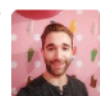
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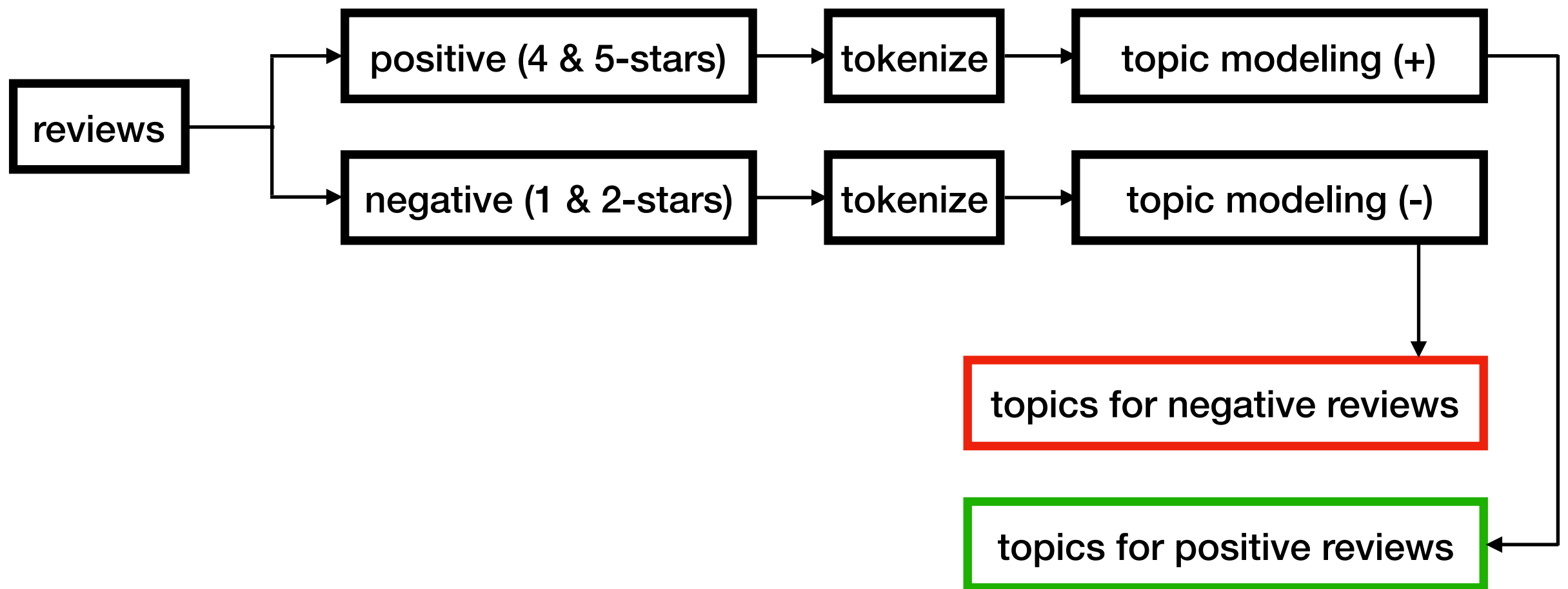
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Hope to hear back from you soon,  
Mark Hajduk, General Manager [Read less](#)

# NLP To The Rescue



# yelp.\* Academic Dataset

- JSON objects imported into MongoDB
- 5.2 million reviews total
- 130,000 analyzed
  - Restaurants only
  - State of Ohio



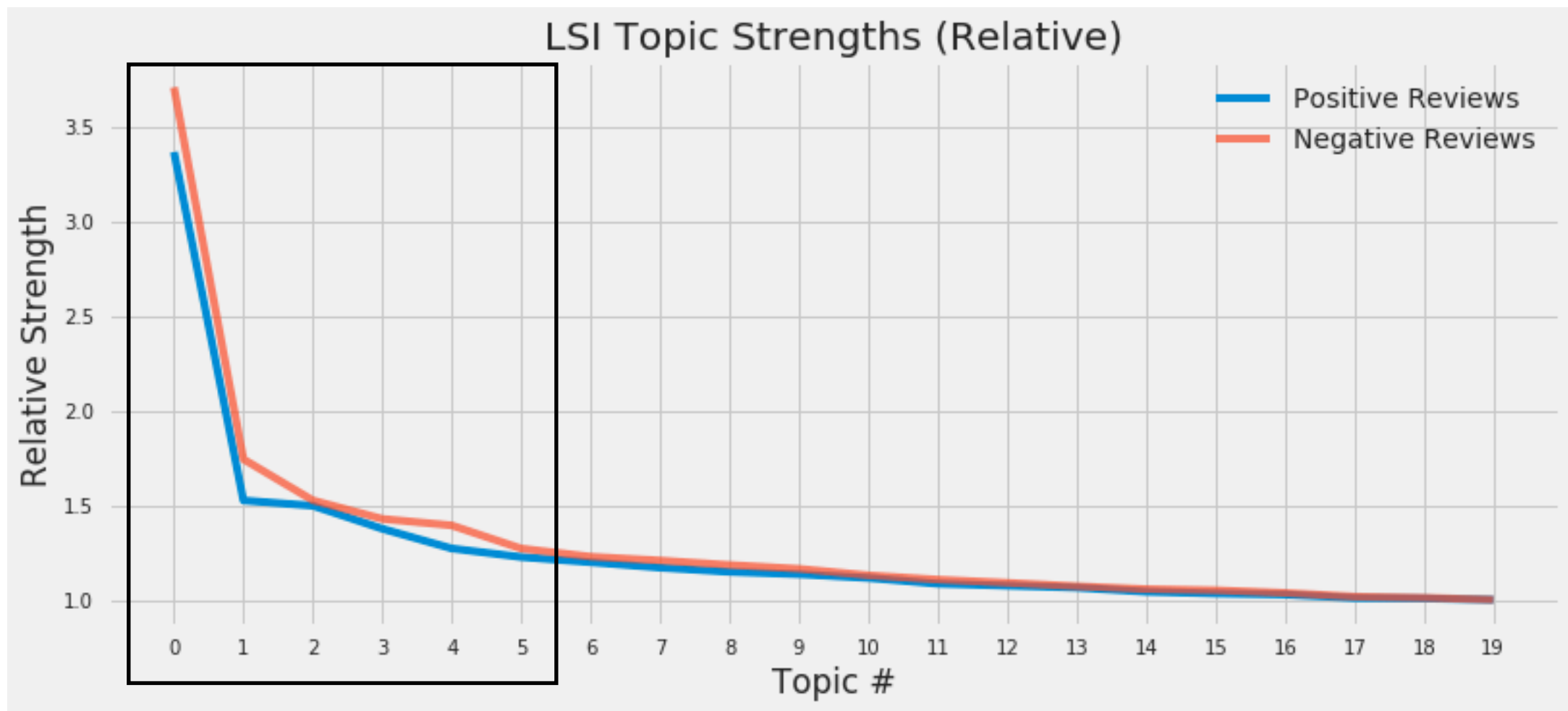


# Length of Reviews



# LSI Topics

- Tokenization via TFIDF using 1-grams



# LSI Topics

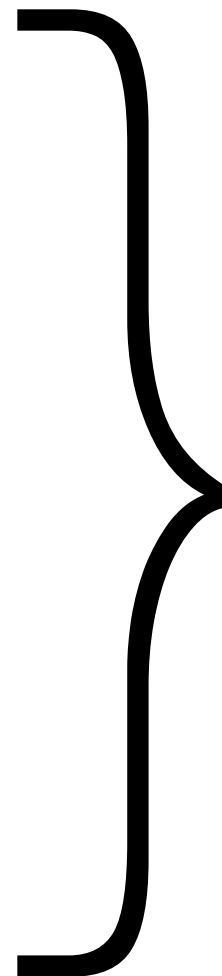
- Negative word weights hard to interpret
- One example
  - **-0.732 \* "pizza"**
  - +0.404 \* "great"
  - +0.184 \* "service"
  - **-0.147 \* "crust"**
  - **-0.119 \* "order"**
  - +0.117 \* "atmosphere"
  - **-0.115 \* "sauce"**

# NMF Topics

- Much more interpretable results

- One example

- 2.295 \* beer,
- 2.214 \* bar,
- 1.432 \* selection,
- 1.147 \* nice,
- 1.144 \* happy,
- 1.048 \* hour

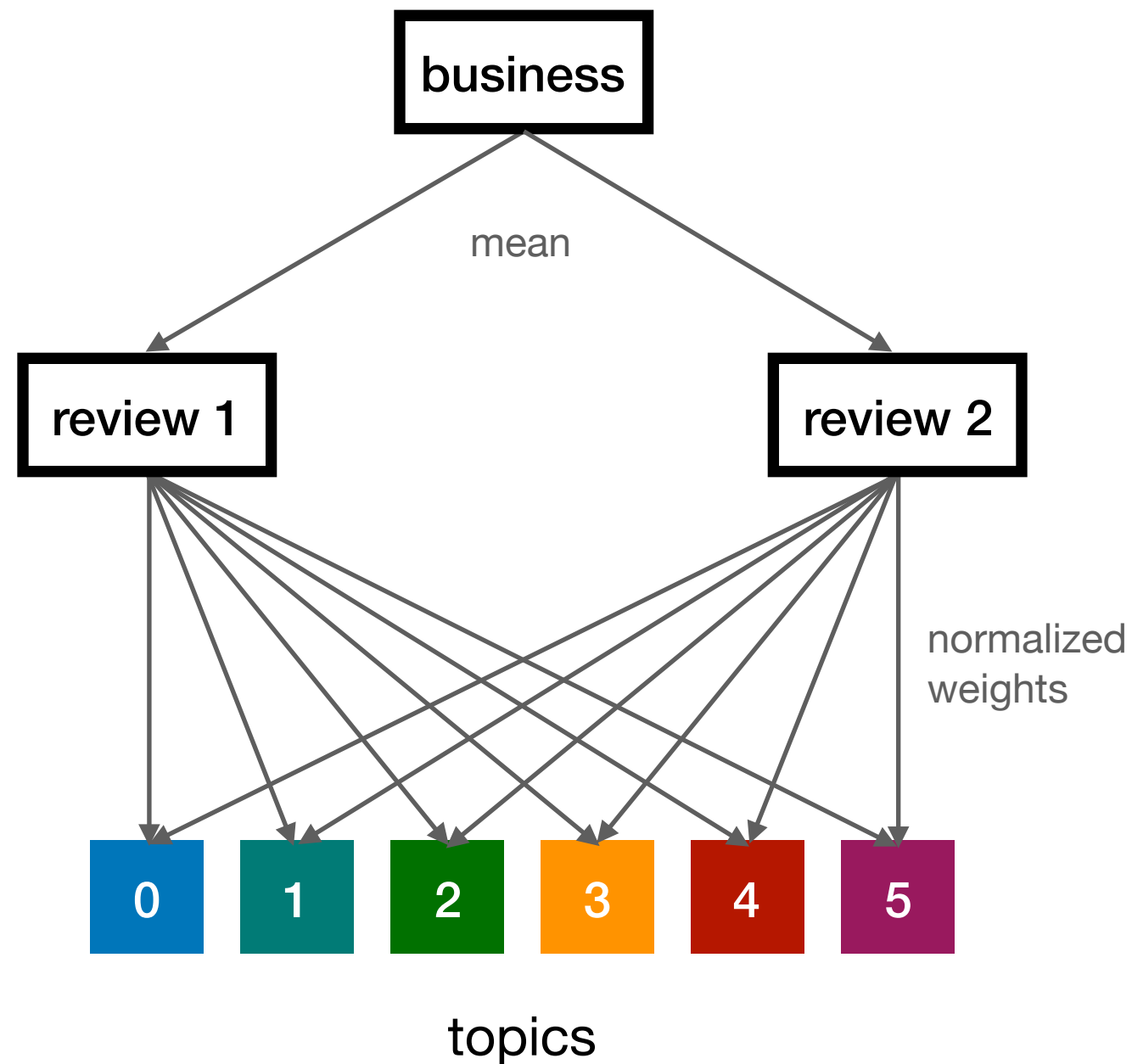


beer & happy hour

# NMF Topics

POSITIVE	NEGATIVE
beer & happy hour	beer & crowd
food: pizza	food: chicken & salads
service & atmosphere	food: pizza
food: burgers & fries	long wait for a table
friendly staff	food: burgers & fries
food: chicken & salads	bad service

# Mapping All Reviews





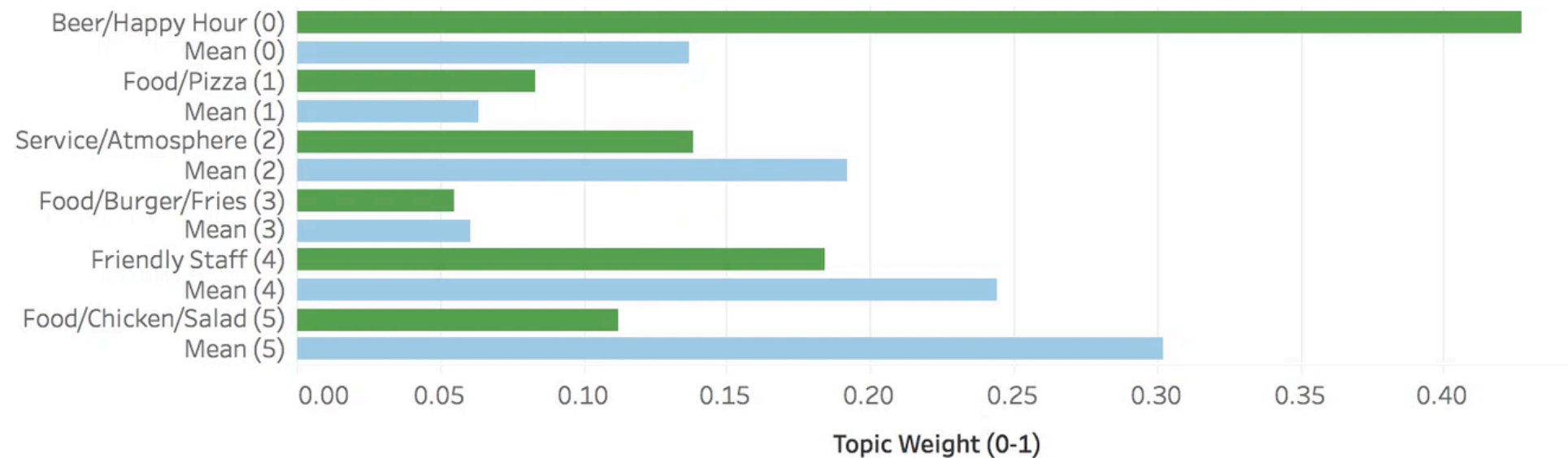
# Dashboard

Choose Business ID

C3GUi1zAtJdDBWrPoPZ...

Fat Head's Brewery & Tap House - 4.5 stars

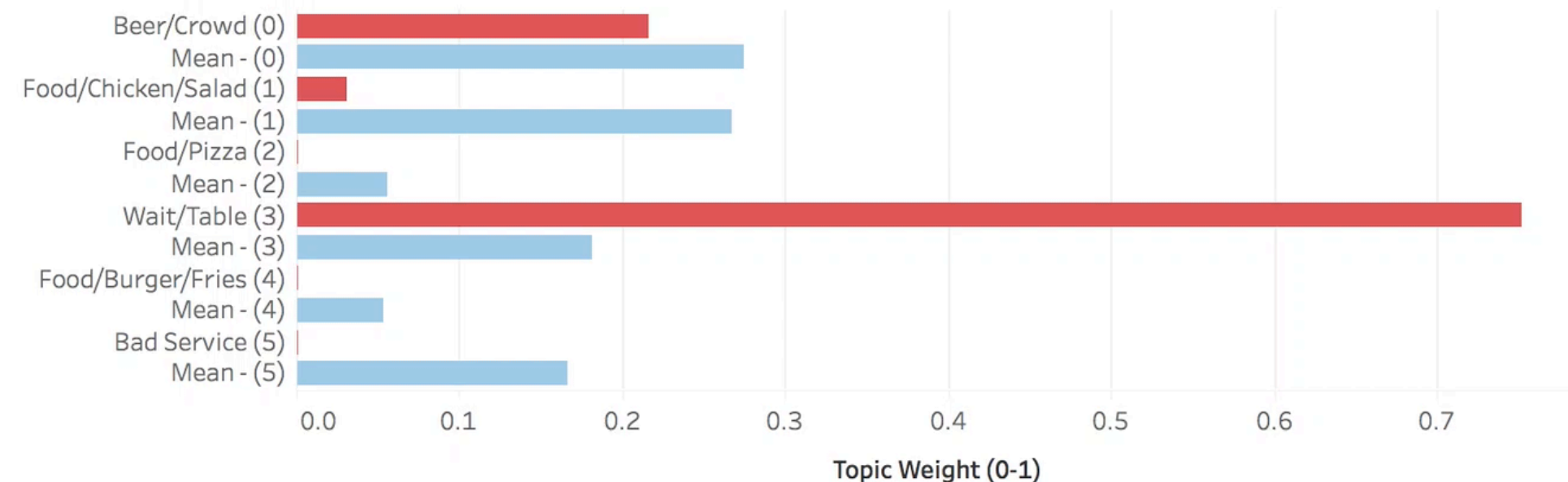
## Positive Reviews - Topic Distribution



## Restaurants with similar positive reviews

1. Ohio Brewing Company - Cuyahoga Falls
2. Winking Lizard Tavern - Cleveland Heights
3. Winking Lizard Tavern - Independence

## Negative Reviews - Topic Distribution



## Restaurants with similar negative reviews

1. Mitchell's Homemade Ice Cream - Avon - Avon
2. Campbell's Sweets Factory - Cleveland
3. Kelly's Cafe - Brunswick

# Conclusions

- NLP+topic modeling are great tools for actionable business insights.
- Room for improvement:
  - Better tokenization for more specific topics.
  - Sentiment analysis - look at each individual sentence in a review, positive or negative.