



Getting Average Restaurant Rating based on Review Topics

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What Does Average 4 Stars Yelp Rating Say about a Restaurant?



- ✳️ Can we confidently say that the restaurant has very good food? Or, very good customer service?
- ✳️ We can't be sure because every customer rate restaurant differently for different reason.
- ✳️ The only way to find out what the ratings are based on is to read the reviews.



Haberdish Claimed

893 reviews

\$\$. Southern, Cocktail Bars [Edit](#)

A screenshot of a Yelp listing for "Haberdish". The listing shows a profile picture of a dish, the name "Haberdish" with a blue checkmark indicating it's claimed, a 5-star rating with 893 reviews, and the price range as "\$\$". The category is listed as "Southern, Cocktail Bars" with an "Edit" button.

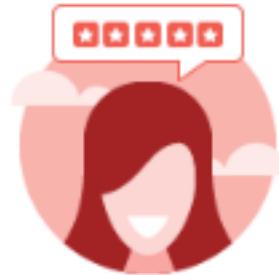
What if there are a lot of reviews?

Data Source



Yelp Open Dataset

An all-purpose dataset for learning



200,000 + Reviews



Restaurants in Charlotte NC
(2009 – 2018)



- IDs, Names
- Categories
- Ratings (1-5 ⭐)
- Customer Reviews

NLP & Topic Modeling



Preprocessing

TF-IDF

n-gram = 1 & 2

Stop Words

max_df = 0.8

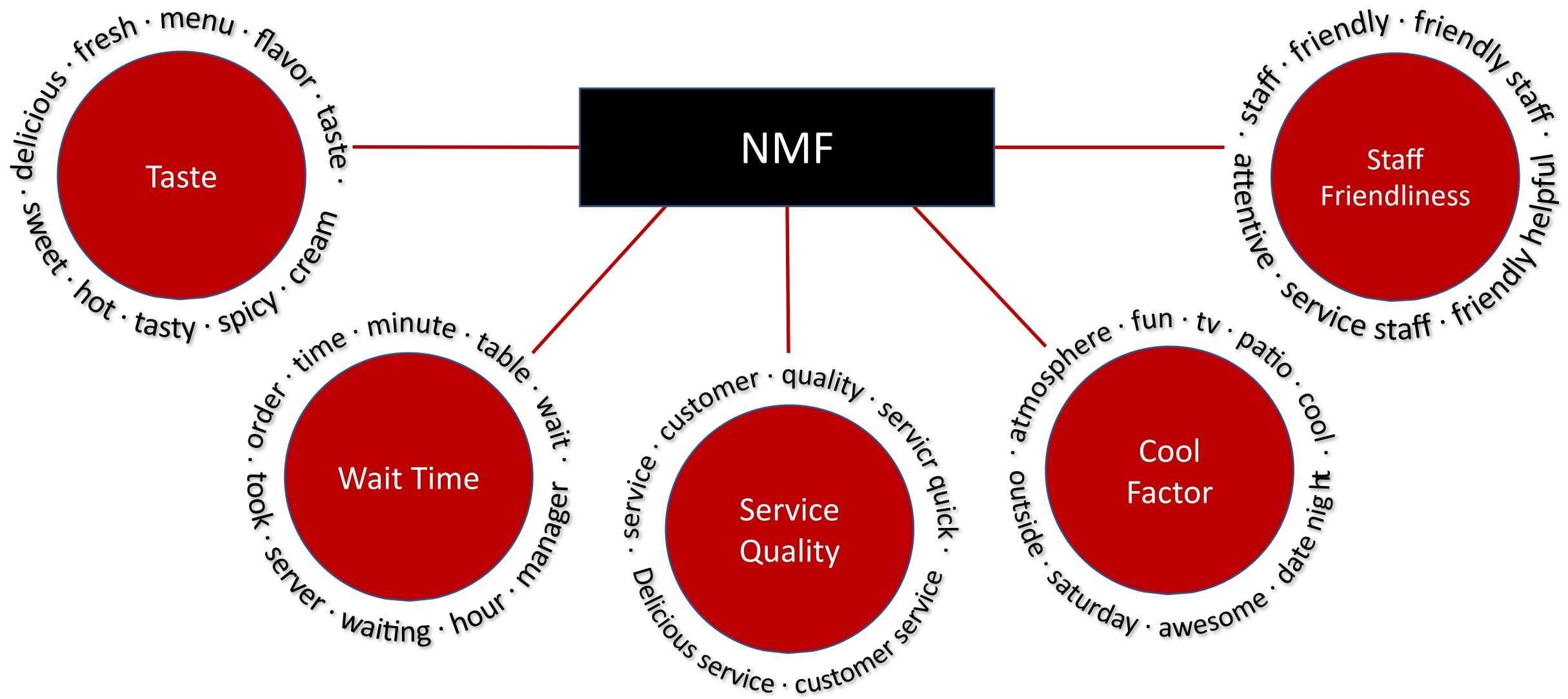
NLP & Topic Modeling



n_components = 5

NMF

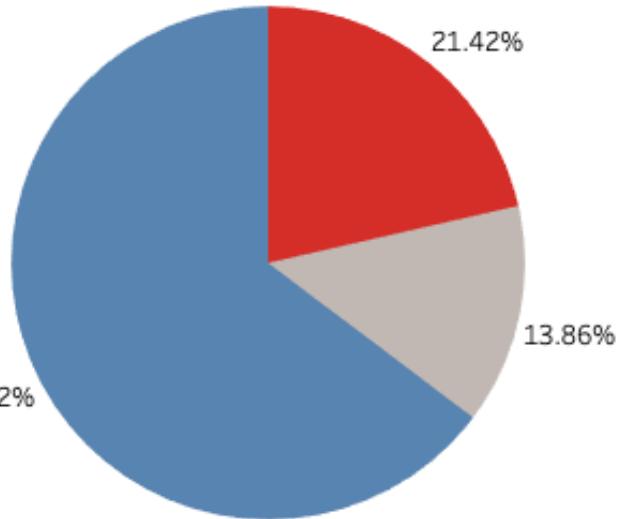
NLP & Topic Modeling



Review Topics

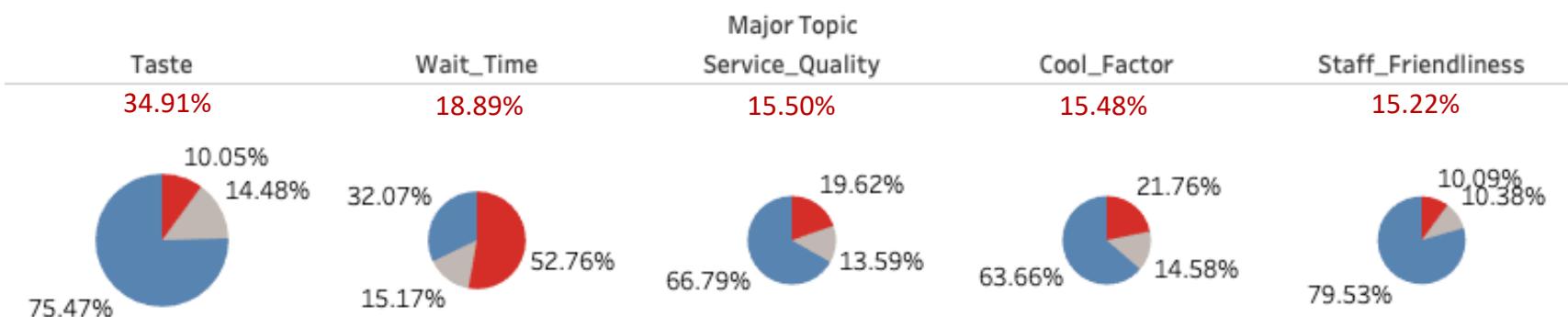


Sentiment of All Reviews



Sentiment
Negative (1-2★)
Neutral (3★)
Positive (4-5★)

% of Total Count of F1
100.00%



Assigning The Most Relevant Topic To Each Review



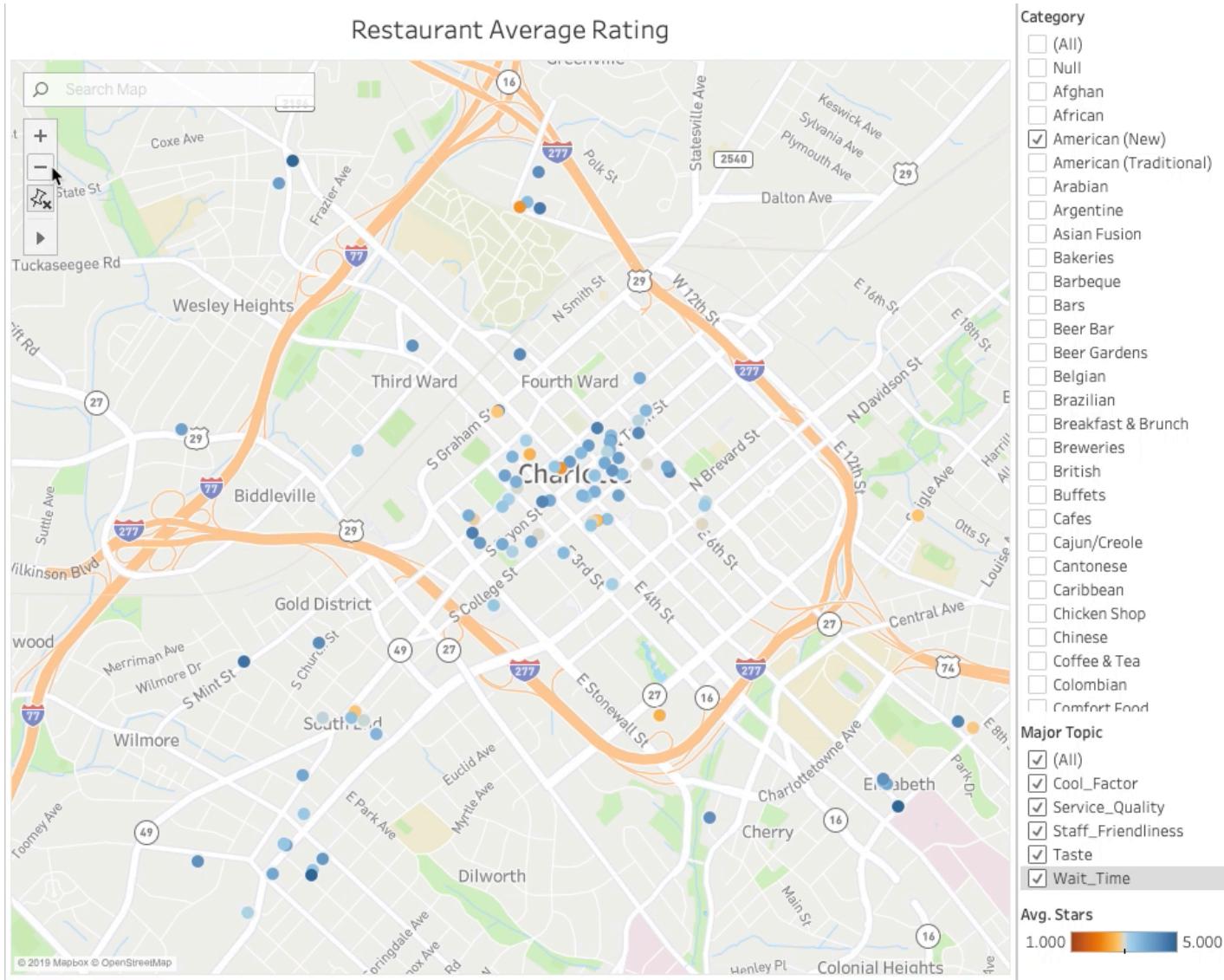
| name | latitude | longitude | Category | date | stars | Sentiment | text |
|------------------------|-----------|------------|----------------|---------------------|-------|-----------|---------------|
| Block & Grinder | 35.170504 | -80.806674 | American (New) | 2015-01-03 21:11:31 | 5.0 | Positive | relative t... |
| Paco's Tacos & Tequila | 35.156298 | -80.830796 | Mexican | 2015-09-13 02:37:33 | 3.0 | Neutral | This place |
| Living Kitchen | 35.209027 | -80.861156 | Vegan | 2017-10-14 00:28:16 | 3.0 | Neutral | If you w... |
| Futo Buta | 35.215379 | -80.855443 | Japanese | 2018-08-10 00:00:56 | 1.0 | Negative | Not a f... |
| Nolen Kitchen | 35.174088 | -80.839809 | American (New) | 2016-05-03 16:23:50 | 2.0 | Negative | great find. |

Assigning The Most Relevant Topic To Each Review



| name | latitude | longitude | Category | date | stars | Sentiment | Major_Topic |
|------------------------|-----------------|------------------|-----------------|---------------------|--------------|------------------|--------------------|
| Block & Grinder | 35.170504 | -80.806674 | American (New) | 2015-01-03 21:11:31 | 5.0 | Positive | Wait_Time |
| Paco's Tacos & Tequila | 35.156298 | -80.830796 | Mexican | 2015-09-13 02:37:33 | 3.0 | Neutral | Service_Quality |
| Living Kitchen | 35.209027 | -80.861156 | Vegan | 2017-10-14 00:28:16 | 3.0 | Neutral | Cool_Factor |
| Futo Buta | 35.215379 | -80.855443 | Japanese | 2018-08-10 00:00:56 | 1.0 | Negative | Taste |
| Nolen Kitchen | 35.174088 | -80.839809 | American (New) | 2016-05-03 16:23:50 | 2.0 | Negative | Wait_Time |

Using Review Topics To Get Relevant Rating



5 stars 3/29/2018

Incredibly rude and pretentious bouncer at the entrance/elevator. I do not normally leave reviews but this is an exception. I am a tourist to Charlotte and was treated very inferior because my brother had on (very nice) sneakers and shorts (it's warm this weekend!!). I was not aware Charlotte was so serious about attire to enter hotel bars....

4 stars 1/13/2018

5 photos 1 check-in

Ooh la la, Merchant & Trade is hands down my new favorite spot in uptown Charlotte. Entertaining out of towners on a weekday night, I decided to give M&T a try after seeing it pop up on my Yelp feed. I went with a group of four on a Thursday night. We were seated right away around 8:00-ish in a dimly lit open room with thumping music that wasn't overpowering. We didn't have to scream to have a conversation. The waitress was over immediately and took our drink orders. We had a blueberry cider, as I'm not a beer drinker that was delicious. Good pour, \$7. The waitress made great recommendations and we had kale chips, wings, and the lobster rolls. Kale chips (\$9) melted in my mouth. Very airy, as all decent kale chips are. Wings were a little suspect, as I've never seen a wing shaped like a ball at the end of a bone, but they were decent. I would not get the wings in the future. Last were the lobster rolls. I was expecting a lobster egg roll, but the mini sandwiches were GREAT. We shared, so I only had one. The dish came with two rolls (\$17 A little steep), but they were fresh and I had no regrets except that I couldn't keep it all to myself.

The best part of Merchant and Trade was the atmosphere. They did a great job with decor and the crowd was 30+ which is nice. Very sexy vibe and you can make it a date night, or come with friends to hang out. There were plenty of post work groups. Long story short, I'll be returning to Merchant & Trade soon.

Conclusion



- ✿ NLP and Topic Modeling can be used to uncover the main topics of customer review.
- ✿ With the extracted topics, we could get more accurate restaurant rating.