Mining Quality Parameters from Yelp Reviews for Improving Businesses



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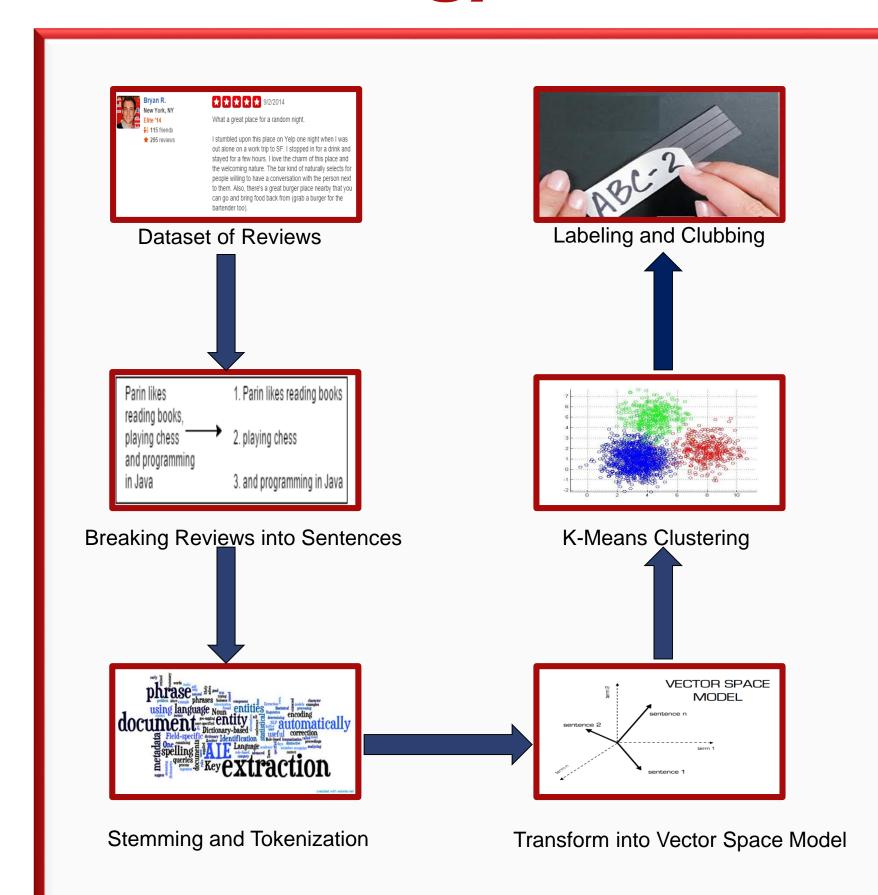




Background

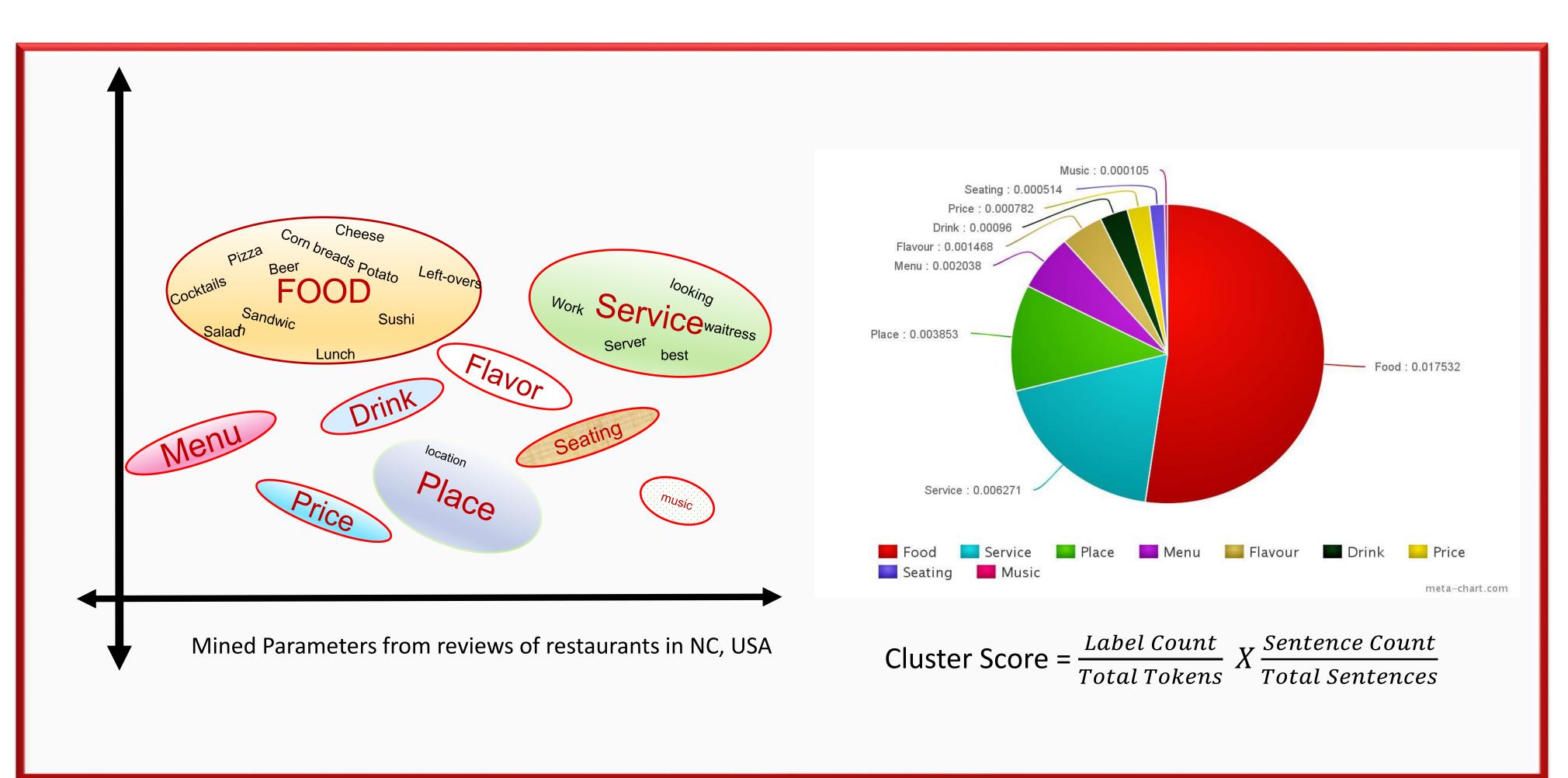
- Reviews not only guide people in making informed choices for their needs but also provide a feedback mechanism for businesses to improve themselves
- Yelp reviews have great potential in providing companies with insights to guide their business strategies
- We aim to mine parameters that give businesses better understanding of their user base and help them focus better on the CONSUMER insights

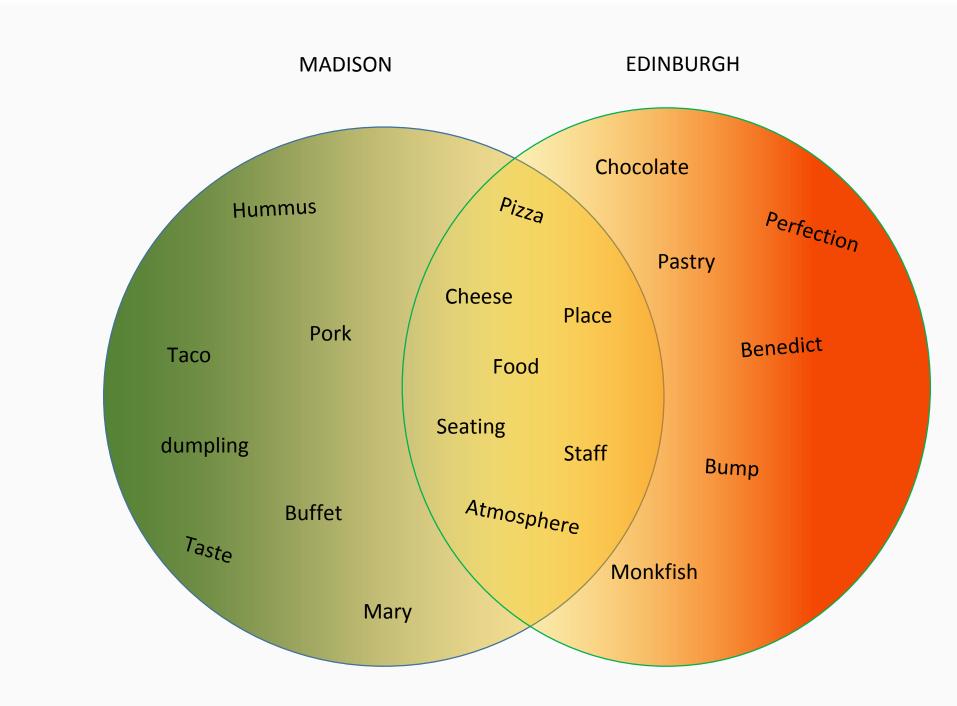
Methodology



- Decomposition of reviews into sentence fragments based on punctuations on the assumption that each fragment is representative of a single parameter.
- Vector space model is generated using TF-IDF for each token in the fragment.
- K-Means clustering algorithm (cluster size=100) is applied to this model.
- Clusters are labelled by the most frequent noun in the cluster.
- Clusters are grouped using hierarchical clustering using the Wordnet path similarity between cluster labels as distance measure.
- Clusters are ranked to signify the influence of each parameter on the business

Results

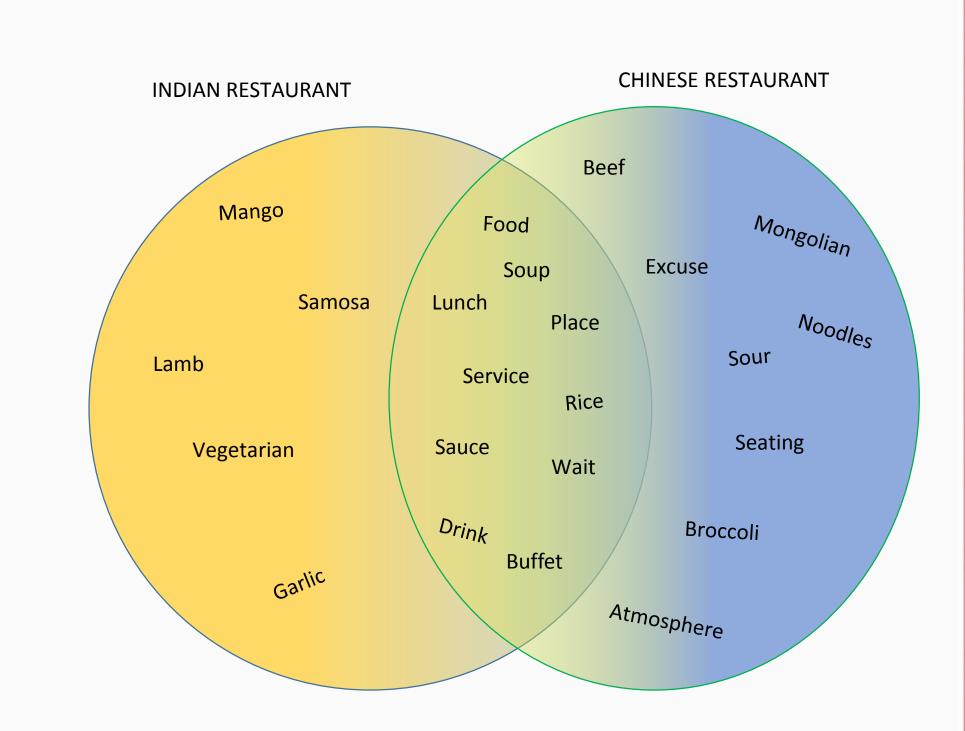




Comparison of mined parameters for restaurant in Madison, USA (left) and Edinburg, UK (right).

- Restaurant parameters significant to customers of Indian restaurants and Chinese restaurants is depicted in the right diagram.
- Geographical effect on cuisine can be observed by the fact that Mango native to India is available in Indian restaurants whereas Mongolian cuisine is available in Chinese restaurants.
- Indian preference for vegetarian cuisine is also captured in the diagram.
- Also, love for rice in both countries can be shown in the results.
- Signature dish of both countries (Samosa for India and Noodles for China) are talked about by Yelpers.

- Restaurant parameters significant to customers of UK and USA is depicted in the left diagram.
- Geographical effect on consumer habit can be observed by the fact that Monkfish is consumed in UK whereas Taco (Mexican) is preferred in USA.
- Parameters like food, staff, atmosphere etc. as expected, is important to Yelpers across these two countries.



Comparison of mined parameters for Indian Restaurant(left) and Chinese Restaurant(right)

Category-wise parameter

YOGA	ZOO	REAL ESTATE	FLORISTS	GYM
Schedule	Animal	Service	Arrangement	Workout
Water	Ride	Management	Service	Service
Sweat	Tiger	Landlord	Store	Charge
Energy	Food	Complex	Staff	Basketball
Breathing	Summer	Apartment	Cashier	Member
Meditation	Phoenix	Pool	Bouquet	Fitness
Class	Habitat	Safe	Wedding	Equipment
Folks	Aquarium	Time	Delivery	Shower
Studio	Care	Deposit	Price	Facility
Practice	Interaction	Unit	Chapel	Staff
Service	Lion	Adobe	Flower	Place
Massage	Bird	Lease	Minister	Locker
Teaching	Elephant	Water	Rose	Sauna
Atmosphere	Dolphin	Maintenance	Organic	Bathroom
Towel	Ticket	Rent	Lily	Yoga
Staff	Sting	Parking	Sale	Steam

Conclusion

- NLP and Data mining can be used to mine quality parameters from raw textual data.
- These mined parameters can help company owners plan their business strategies.
- Based on our results, we can say that, some parameters such as services and location are important to most business categories.
- Geographical and social influences on Yelpers can be inferred from their reviews

References

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