Candidate neighborhoods for opening new restaurants - Methodology and case study

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IBM/Coursera´s Applied Data Science Capstone course

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Finding good neighborhoods is key for new restaurants

- **The business problem is finding neighborhoods in a specific city that are potentially good candidates for opening new restaurants.**
- **Usually finding a good neighborhood for a new business is a time and resource-consuming effort and has some blind spots of factual data about demand and competition.**
- **This problem affects many companies and entrepreneurs in the restaurant industry who need timely information for decision-making when choosing a new business location.**
- **Foursquare geospatial data can is used to uncover these spots.**

Data Acquisition

- **The City of Toronto is the case study**
- **The Postal Code of Toronto´s neighborhoods are from this link: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M**
- **Latitude and Longitude Data come from geocoder.**
- **The geospatial data obtained from Foursquare (foursquare.com) about the different venues (not just restaurants) are engineered, tabulated and new statistical features are elaborated.**

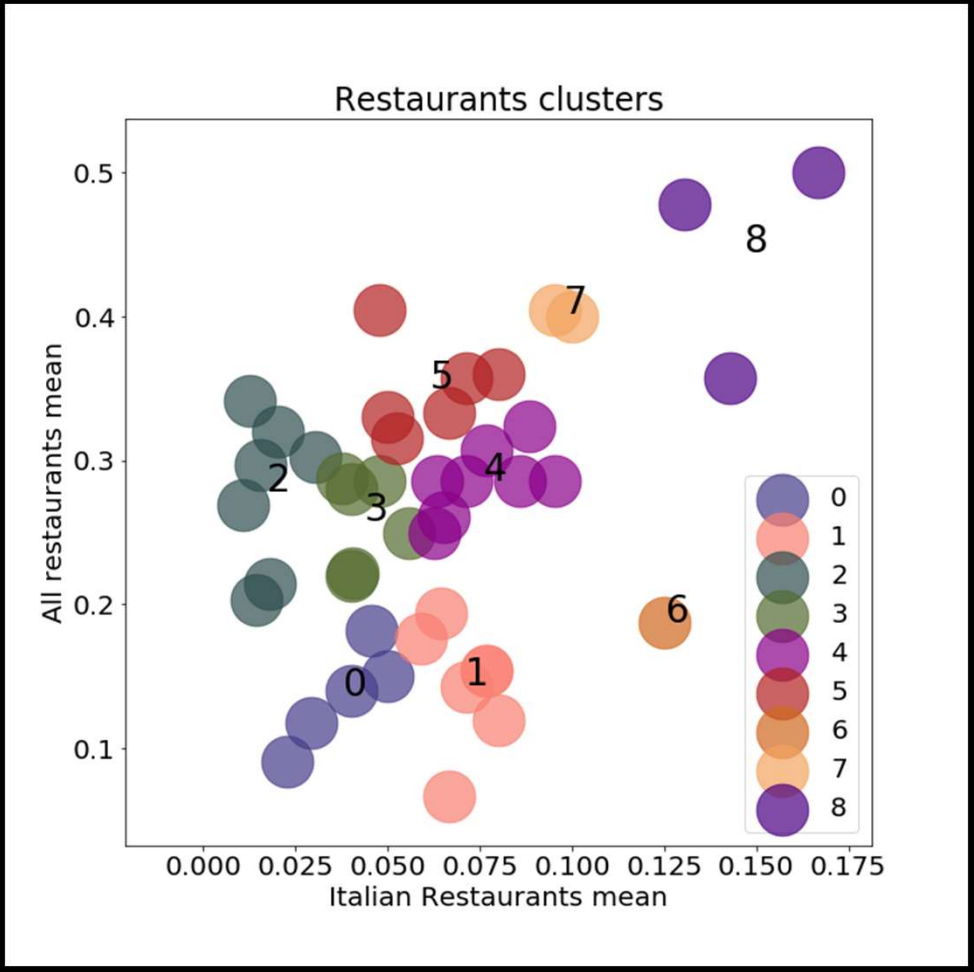
Methodology

Two new statistical features of high relevance are calculated from dozens of features:

- **Mean of restaurants by neighborhood (all categories of restaurants). The lower the mean the higher the need for restaurants in general.**
- **Mean of Italian restaurants by neighborhood. The lower the mean the higher the need for Italian restaurants.**

The Machine Learning K-Means is applied to cluster the neighborhoods using the features above. The final clusters are then sequenced by the size of the vector representing each cluster in ascending order.

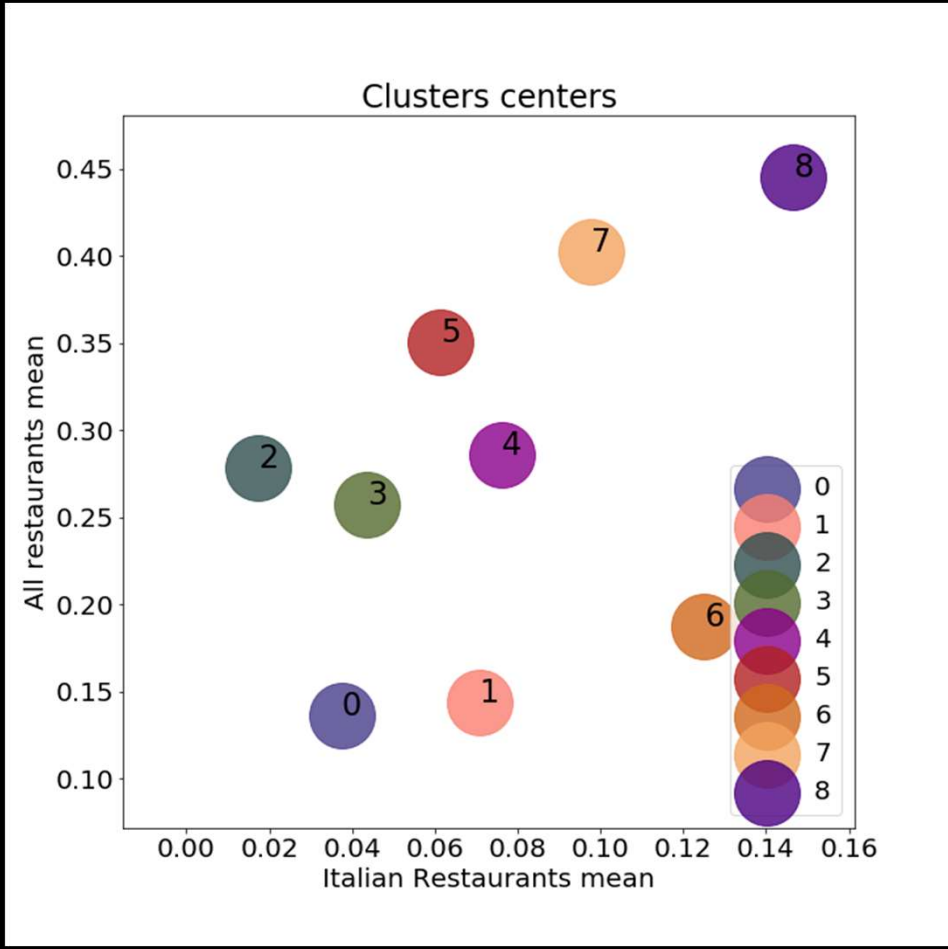
Visualization - Restaurants clusters



In the Toronto´s case study nine clusters are generated by K-Means. Its sequenced ascending (0 to 8).

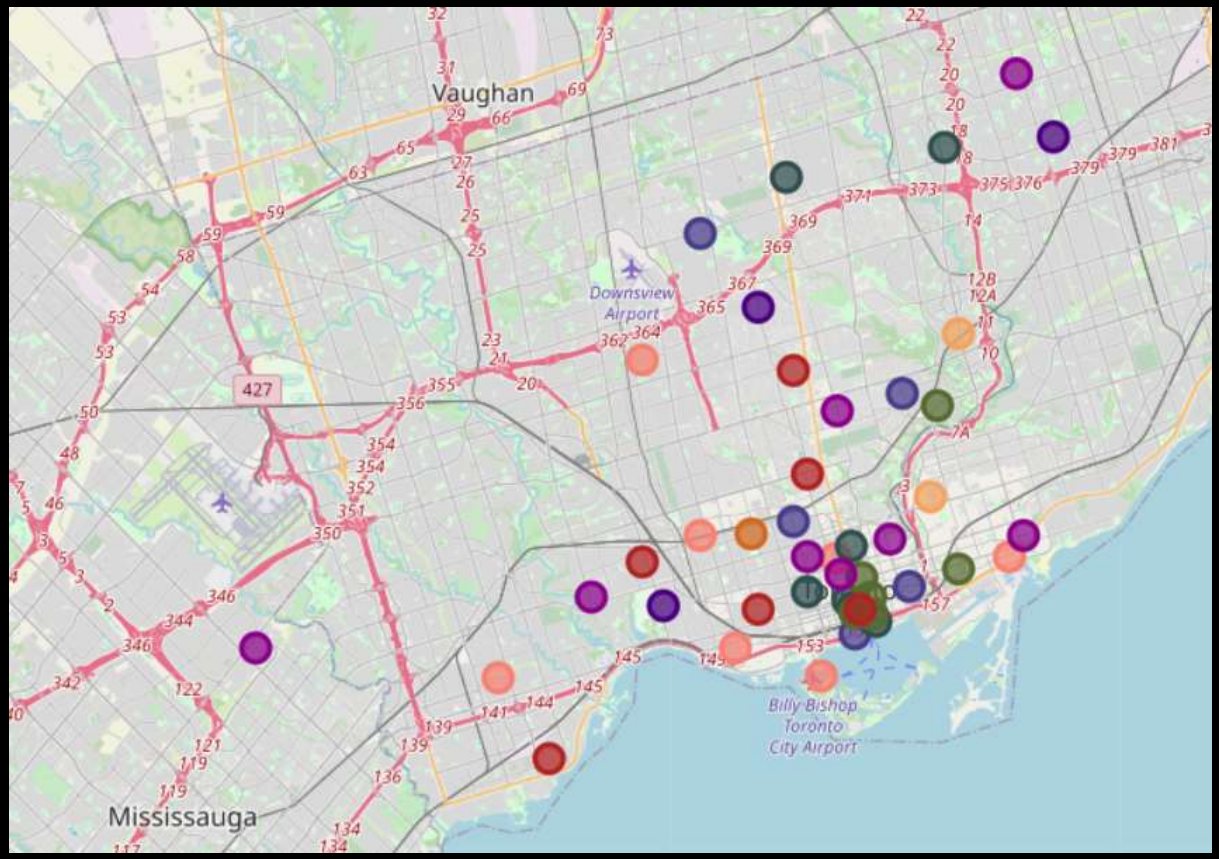
The clusters 0, 1, 2 and 3 are the most promissing good candidates.

Visualization - Clusters centers



The clusters´ centers give visual confirmation of the clusters' ascending sequence.
The sequence gives them meaning.

Visualization - Geospatial Map of Toronto´s clusters



The nine clusters are geographically sparsed.

Conclusion

Key aspects:

- **The updated geospatial data from Foursquare is definitely of high quality and high value**
- **Machine Learning K-Means for clustering is very fast and practical to discover important information in statistical features**
- **The vectorization of the clusters´ features´ average is an effective way to sequence the clusters and give them meaning.**

The objective of finding potentially good candidates neighborhoods to open a new restaurant was successfully achieved and is of high relevance to the business decision-making process.