Analysis and Selection of Neighborhood in Toronto for Indian Restaurants

Applied Data Science Capstone Project

Introduction

- The increasing population of South Asian community in Toronto has provided greater platform for business related to Indian cuisines and restaurants.
- Due to Increasing demands, stakeholder are unable to identify proper location to open new Indian restaurants.
- The density of similar types of restaurants within the neighborhood has hindered the profitability and increased competition.
- The objective of this project is to identify the best location for opening new restaurant.

Data Acquisition and Cleaning

- Data related to neighborhoods were obtained from Wikipedia and CSV file for geographical information were extracted from Kaggle.
- The scraped HTML data from web were converted into Dataframe using suitable functions.
- Only the neighborhoods of Downtown Toronto were considered to address the scope of the project.

FourSquare API

- All venues around Downtown, Toronto were obtained using FourSquare API and visualized using Folium map.

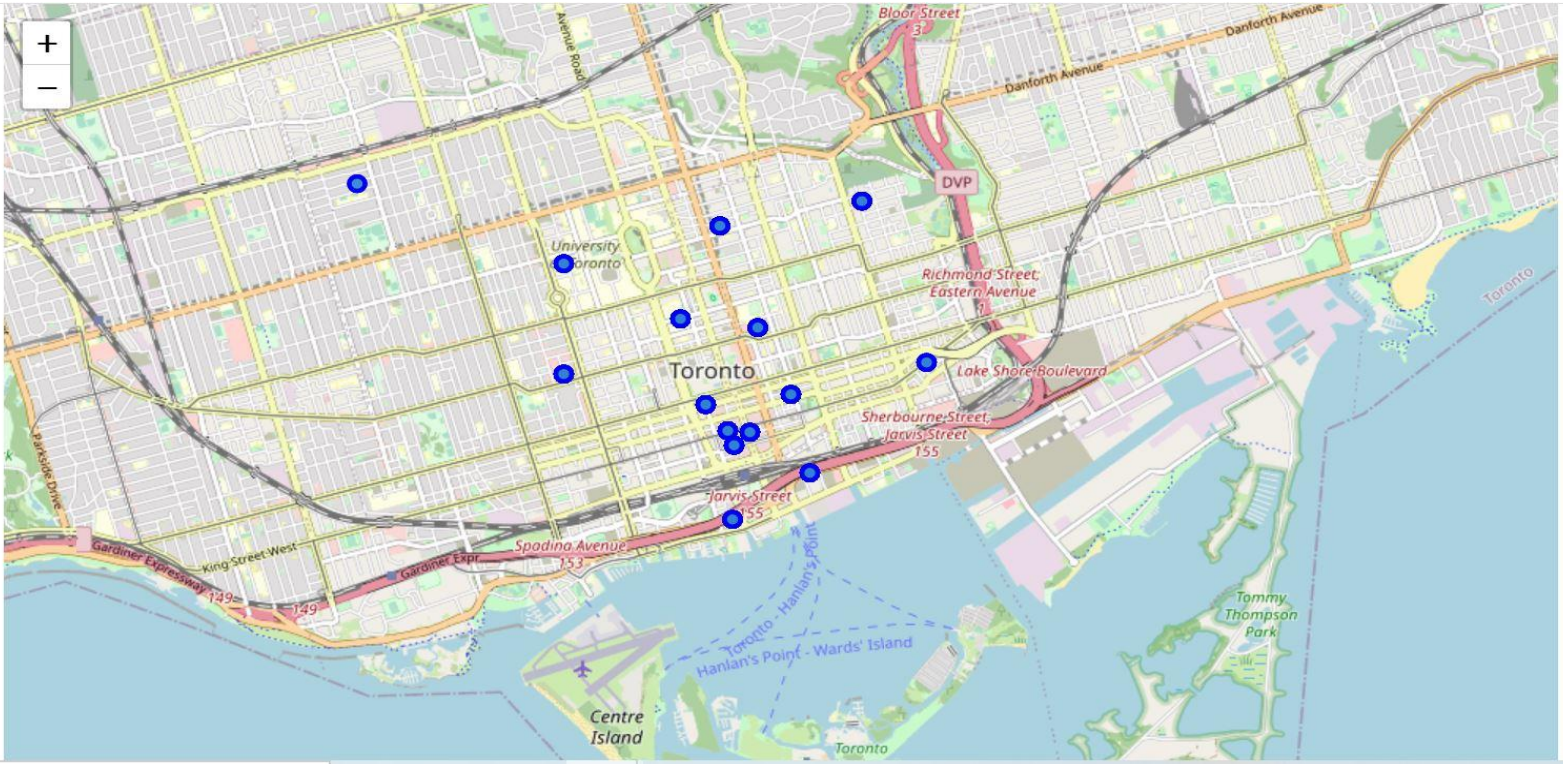
Filtered Dataset for Restaurants from Venue Category

Out[26]:

	Neighborhood	Neighborhood_Latitude	Neighborhood_Longitude	Venue	Venue_Latitude	Venue_Longitude	Venue_Category
0	Regent Park, Harbourfront	43.65426	-79.360636	Impact Kitchen	43.65636850543279	-79.356980	Restaurant
1	Regent Park, Harbourfront	43.65426	-79.360636	Souvlaki Express	43.65558391537734	-79.364438	Greek Restaurant
2	Regent Park, Harbourfront	43.65426	-79.360636	Izumi	43.6499697935016	-79.360153	Asian Restaurant
3	Regent Park, Harbourfront	43.65426	-79.360636	Cluny Bistro & Boulangerie	43.650565116074695	-79.357843	French Restaurant
4	Regent Park, Harbourfront	43.65426	-79.360636	El Catrin	43.650600737116996	-79.358920	Mexican Restaurant

Distribution of Restaurants within Toronto

Out[33]:



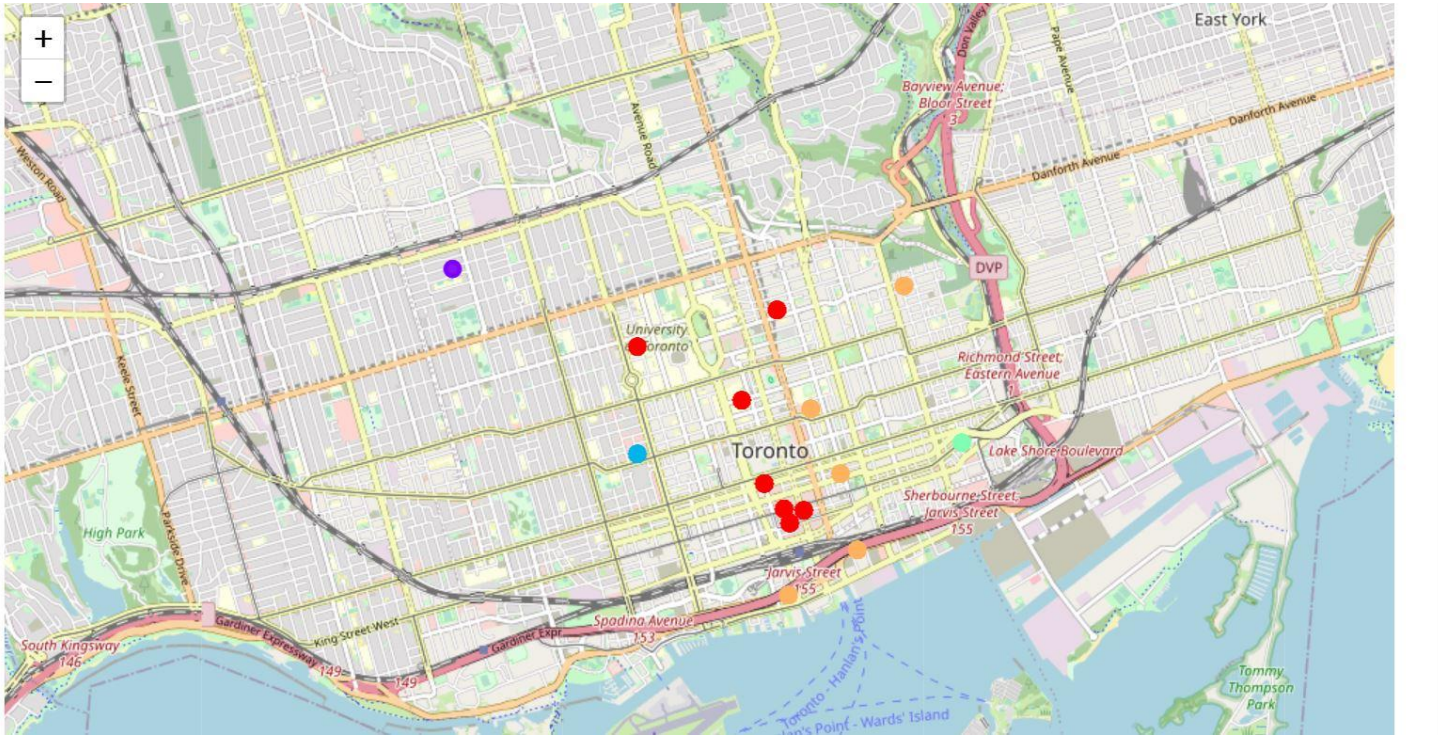
Transformation and Normalization of Categorical Dataset

Out[35]:

	Neighborhood	Afghan Restaurant	American Restaurant	Asian Restaurant	Belgian Restaurant	Brazilian Restaurant	Caribbean Restaurant	Chinese Restaurant	Colombian Restaurant	Comfort Food Restaurant	Doner Restaurant	Ethi Resta
0	Berczy Park	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.00	0.083333	0.000000	0.000
1	Central Bay Street	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.00	0.000000	0.000000	0.000
2	Christie	0.000000	0.000000	0.000000	0.000000	0.000000	0.0	0.000000	0.00	0.000000	0.000000	0.000
3	Church and Wellesley	0.037037	0.037037	0.000000	0.000000	0.000000	0.0	0.000000	0.00	0.000000	0.000000	0.037
4	Commerce Court, Victoria Hotel	0.000000	0.074074	0.111111	0.000000	0.000000	0.0	0.000000	0.00	0.000000	0.000000	0.000
5	First Canadian Place, Underground city	0.000000	0.086957	0.130435	0.000000	0.043478	0.0	0.043478	0.00	0.000000	0.000000	0.000

K-mean Clustering of Restaurants within 5 clusters

Out[40]:



Selection of Cluster 3 as best location

Out[44]:

tude	Venue_Category	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
	Restaurant	3	Mexican Restaurant	Asian Restaurant	Greek Restaurant	Restaurant	French Restaurant	Portuguese Restaurant	Middle Eastern Restaurant	Modern European Restaurant	Molecular Gastronomy Restaurant	Moroccan Restaurant
	Greek Restaurant	3	Mexican Restaurant	Asian Restaurant	Greek Restaurant	Restaurant	French Restaurant	Portuguese Restaurant	Middle Eastern Restaurant	Modern European Restaurant	Molecular Gastronomy Restaurant	Moroccan Restaurant
	Asian Restaurant	3	Mexican Restaurant	Asian Restaurant	Greek Restaurant	Restaurant	French Restaurant	Portuguese Restaurant	Middle Eastern Restaurant	Modern European Restaurant	Molecular Gastronomy Restaurant	Moroccan Restaurant
	French Restaurant	3	Mexican Restaurant	Asian Restaurant	Greek Restaurant	Restaurant	French Restaurant	Portuguese Restaurant	Middle Eastern Restaurant	Modern European Restaurant	Molecular Gastronomy Restaurant	Moroccan Restaurant
	Mexican Restaurant	3	Mexican Restaurant	Asian Restaurant	Greek Restaurant	Restaurant	French Restaurant	Portuguese Restaurant	Middle Eastern Restaurant	Modern European Restaurant	Molecular Gastronomy Restaurant	Moroccan Restaurant

Result and Discussion

- Cluster 0, 2 and 4 were found to have higher overall restaurant and Indian restaurant density.
- The industry was dominated by Japanese Restaurant.
- Cluster 1 has lowest restaurant density but the neighborhoods were not famous among South Indian Community.
- Cluster 3 has lower restaurant density with mixed type restaurants, so these neighborhoods were identified as best location to open new Indian restaurant.

Concussion

- Although the best neighborhoods were identified but the decision to open restaurant is sole decision of stakeholder.
- Only few variables like density of restaurants, famous neighborhoods among South Asian Community were considered.
- Other variables to consider which makes our result more precise could be neighborhood type, proximity to community, access to major roads, price and so on.

Thank You