

Capstone Project - The Battle of Neighbourhoods

Introduction

Toronto a city with a diverse ethnicity. Toronto has an estimated population of just over 2.8 million in 2016, which makes it the 4th most populous city in North America and the most populous Great Lakes city. Toronto, which is located on Lake Ontario, is the most populous city in Canada and the provincial capital of Ontario.

According to the 2016 Census, the racial composition of Toronto was: White: 50.2% East Indian: 12.7% (10.8% Chinese, 1.4% Korean, 0.5% Japanese) South Asian: 12.3% Black: 8.5% Southeast Asian: 7.0% (5.1% Filipino) Latin American: 2.8% West Asian: 2.0% Arab: 1.1% Aboriginal: 0.7% (0.5% First Nations, 0.2% Metis) Two or more races: 1.5% Other race: 1.3%

The most common ancestry groups were: English (12.9%), Chinese (12.0%), Canadian (11.3%), Irish (9.7%), Scottish (9.5%), East Indian (7.6%), Italian (6.9%), Filipino (5.5%), German (4.6%), French (4.5%), and Polish (3.8%). Other common groups include Portuguese, Jamaican, Jewish, Ukrainian and Russian.

With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese, Indian, French etc.

So as part of this project, we will list and visualize all major parts of Toronto that has great Indian restaurants.

Question to be answered

1. What is best location in Toronto for Indian Cuisine?
2. Which areas have potential Indian Restaurant Market?
3. Which all areas lack Indian Restaurants?
4. Which is the best place to stay if I prefer Indian Cuisine?

Data Source

For this project we would require the below data sets:

Toronto Neighbourhood Data: List of Boroughs, Neighbourhoods along with latitudes and longitudes.

Data Source: 'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M'

Data Description: This Wikipedia page has a list of Boroughs, Neighbourhood and Postal Codes

Geographical Coordinates:

Data Source: http://cocl.us/Geospatial_data

Data Description: This has a list of coordinates based on postal code.

Foursquare API

Data Source: <https://api.foursquare.com>

Data Description: This will be used to get all the required details about the place and venue. Like ratings, likes, etc

Approach

- Collect Toronto data.
- Using Foursquare API, we will find all venues for each neighbourhood.
- Filter out all venues that are Indian Restaurants.
- Find rating, tips and like count for each Indian Restaurants using Foursquare API.
- Using rating for each restaurant, we will sort that data.

1. Data Collection

Toronto Boroughs, Neighbourhoods along with the postal codes are collected from the Wikipedia page. Then these postal codes are mapped with the details present in the CSV files (http://cocl.us/Geospatial_data) to get the required coordinates. We will have a data set like below.

	PostalCode	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Harbourfront	43.654260	-79.360636
3	M5A	Downtown Toronto	Regent Park	43.654260	-79.360636
4	M6A	North York	Lawrence Heights	43.718518	-79.464763

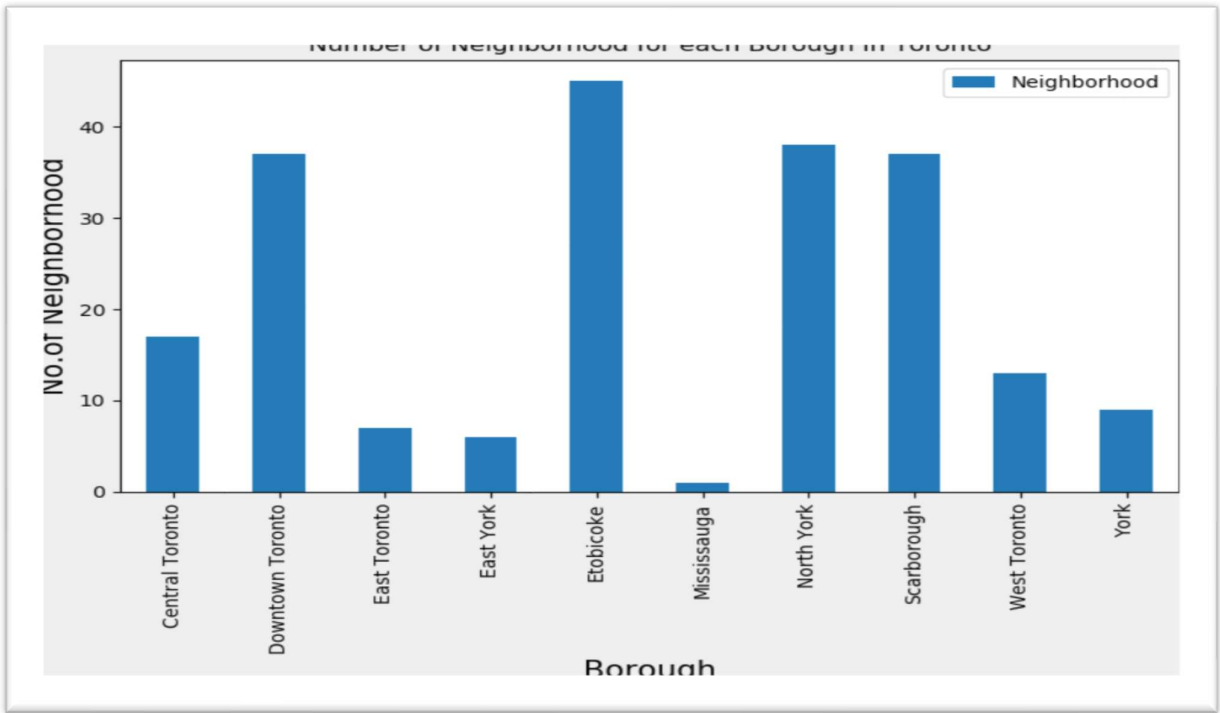
2. Data Cleaning

In this step we clean the data that is derived in the above step. We remove the records where Neighbourhood and Borough is "Not Assigned".

3. Data Analysis

We start our analysis in this step.

1. First, we check what is the distribution of Neighbourhood to Borough.



We see that Etobicoke has the highest number of neighbourhoods.

2. Then connect to the Foursquare API to find the different types of venues that are present in these neighbourhood.

0	Parkwoods	43.753259	-79.329656	4e8d9dcd5fbbb6b3003c7b	Brookbanks Park	43.751976	-79.332140	Park
1	Parkwoods	43.753259	-79.329656	4e6696b6d16433b9fff47c3	KFC	43.754387	-79.333021	Fast Food Restaurant
2	Parkwoods	43.753259	-79.329656	4cb11e2075ebb60cd1c4caad	Variety Store	43.751974	-79.333114	Food & Drink Shop
3	Victoria Village	43.725882	-79.315572	4c633acb86b6be9a61268e34	Victoria Village Arena	43.723481	-79.315635	Hockey Arena
4	Victoria Village	43.725882	-79.315572	4bba90da856b713d20d7167	Tim Hortons	43.725517	-79.315103	Coffee Shop

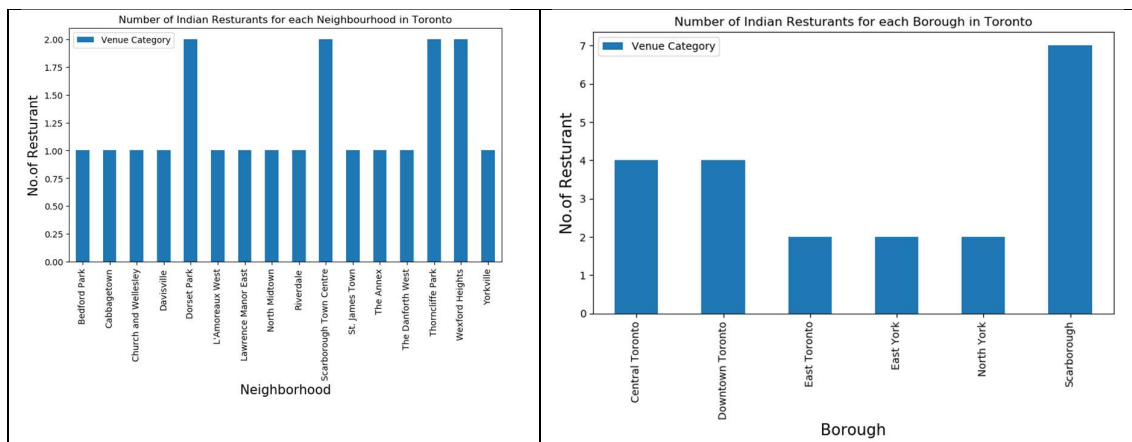
Our focus is on the “Indian Restaurants”.

3. Filter the “Indian Restaurants”.

		Latitude	Longitude		Latitude	Longitude		
527	Thorncliffe Park	43.705369	-79.349372	4daf08e66e81e2dffdd4fe40	Iqbal Kebab & Sweet Centre	43.705923	-79.351521	India Restaura
532	Thorncliffe Park	43.705369	-79.349372	4bed9f2fbac3c9b6ad93fee9	Hakka Garden	43.704578	-79.349770	India Restaura
973	The Danforth West	43.679557	-79.352188	4c1d5337eac020a1cb1048c2	Sher-E-Punjab	43.677308	-79.353066	India Restaura
1003	Riverdale	43.679557	-79.352188	4c1d5337eac020a1cb1048c2	Sher-E-Punjab	43.677308	-79.353066	India Restaura
1339	Bedford Park	43.733283	-79.419750	4d796616542ab1f75eb87c41	The Copper Chimney	43.736195	-79.420271	India Restaura

4. Get the number of “Indian Restaurants” against Neighbourhood and Boroughs.

Neighbourhood	Latitude	Longitude	Venue Name	Venue ID	Latitude	Longitude	Category	Neighbourhood	Borough	Latitude	Longitude
Thorncliffe Park	43.705369	-79.349372	4daf08e66e81e2dffdd4fe40	Iqbal Kebab & Sweet Centre	43.705923	-79.351521	Indian Restaurant	M4H	East York	43.705369	-79.34937
Thorncliffe Park	43.705369	-79.349372	4bed9f2fbac3c9b6ad93fee9	Hakka Garden	43.704578	-79.349770	Indian Restaurant	M4H	East York	43.705369	-79.34937
The Danforth West	43.679557	-79.352188	4c1d5337eac020a1cb1048c2	Sher-E-Punjab	43.677308	-79.353066	Indian Restaurant	M4K	East Toronto	43.679557	-79.35218
Riverdale	43.679557	-79.352188	4c1d5337eac020a1cb1048c2	Sher-E-Punjab	43.677308	-79.353066	Indian Restaurant	M4K	East Toronto	43.679557	-79.35218
Bedford Park	43.733283	-79.419750	4d796616542ab1f75eb87c41	The Copper Chimney	43.736195	-79.420271	Indian Restaurant	M5M	North York	43.733283	-79.41975



- **Etobicoke** has the maximum number of neighbourhoods
- Etobicoke does not have an **Indian Restaurant**
- **Scarborough** has 6 Indian Restaurant
- **Central Toronto** and **Downtown Toronto** has 4 Indian Restaurant each.

5. Get Venue Ratings by using Foursquare API

0	East York	Thorncliffe Park	4daf08e66e81e2dffdd4fe40	Iqbal Kebab & Sweet Centre	13	8.0	7
1	East York	Thorncliffe Park	4bed9f2fbac3c9b6ad93fee9	Hakka Garden	10	6.5	12
2	East Toronto	The Danforth West	4c1d5337eac020a1cb1048c2	Sher-E-Punjab	10	7.5	7
3	East Toronto	Riverdale	4c1d5337eac020a1cb1048c2	Sher-E-Punjab	10	7.5	7
4	North York	Bedford Park	4d796616542ab1f75eb87c41	The Copper Chimney	14	7.1	15
5	North York	Lawrence Manor East	4d796616542ab1f75eb87c41	The Copper Chimney	14	7.1	15
6	Scarborough	Dorset Park	5226562611d2cd49d83ef03b	Kairali	9	7.6	6
7	Scarborough	Dorset Park	4bf96c435317a593a23a017f	Karaikudi Chettinad South Indian Restaurant	27	6.1	23
8	Scarborough	Scarborough Town Centre	5226562611d2cd49d83ef03b	Kairali	9	7.6	6
9	Scarborough	Scarborough Town Centre	4bf96c435317a593a23a017f	Karaikudi Chettinad South Indian Restaurant	27	6.1	23
10	Scarborough	Wexford Heights	5226562611d2cd49d83ef03b	Kairali	9	7.6	6
11	Scarborough	Wexford Heights	4bf96c435317a593a23a017f	Karaikudi Chettinad South Indian Restaurant	27	6.1	23

6. Get the Venues with top rating. Find the average rating per borough.

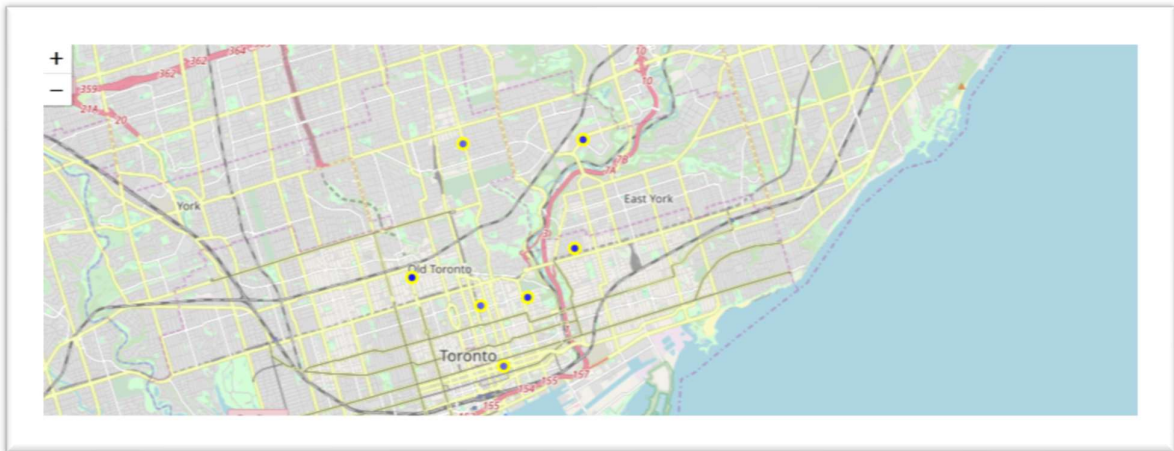
Top rating Restaurant:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
12	Central Toronto	The Annex	4c62c59ce1621b8dd0332453	Roti Cuisine of India	39	8.7	18
13	Central Toronto	North Midtown	4c62c59ce1621b8dd0332453	Roti Cuisine of India	39	8.7	18
14	Central Toronto	Yorkville	4c62c59ce1621b8dd0332453	Roti Cuisine of India	39	8.7	18

Average Rating of Restaurants:

	Rating
Borough	
Central Toronto	8.7
Downtown Toronto	8.5
East Toronto	7.5
East York	8.0
North York	7.1
Scarborough	7.6

7. Map the restaurants.



4. Conclusion

- **Etobicoke** has the maximum number of neighbourhoods. Etobicoke does not have an **Indian Restaurant**.
- **North York** has 2 Indian Restaurant with the lowest rating. North York are potential Borough to open new good Indian Restaurant
- **Scarborough** has 6 Indian Restaurant. It is the best place to stay if you prefer Indian Cuisine.
- **Central Toronto** and **Downtown Toronto** has good restaurants. These places need to be visited for good food.