Applied Capstone Project Report

Setting up an Indian Restaurant at Toronto

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BUSINESS PROBLEM:

The Business problem framed for this task to identify the best location for setting up an "Indian Restaurant" in Toronto by an entrepreneur.

TARGET AUDIENCE:

People who wish to start an Indian Restaurant in Toronto.

Data Required for Analysis:

1. Neighbourhood dataset of Toronto city (could be obtained by Scraping the Wikepdiausing BeautifulSoup)

2. Latitude and Longitude values of the neighbourhoods (using Geocode Package)

3. Data associated with Indian Restaurant (using Foursquare calls)

Procedure:

1.The list of neighbourhoods in Toronto can be obtained by web scraping the table from the Wikipedia page List of postal codes of Canada: M. This could be done by using the package called “Beautifulsoup” in Python.

2.To obtain the latitude and longitude location values of a particular location available in the table, a package called “Geocoder” could be used.

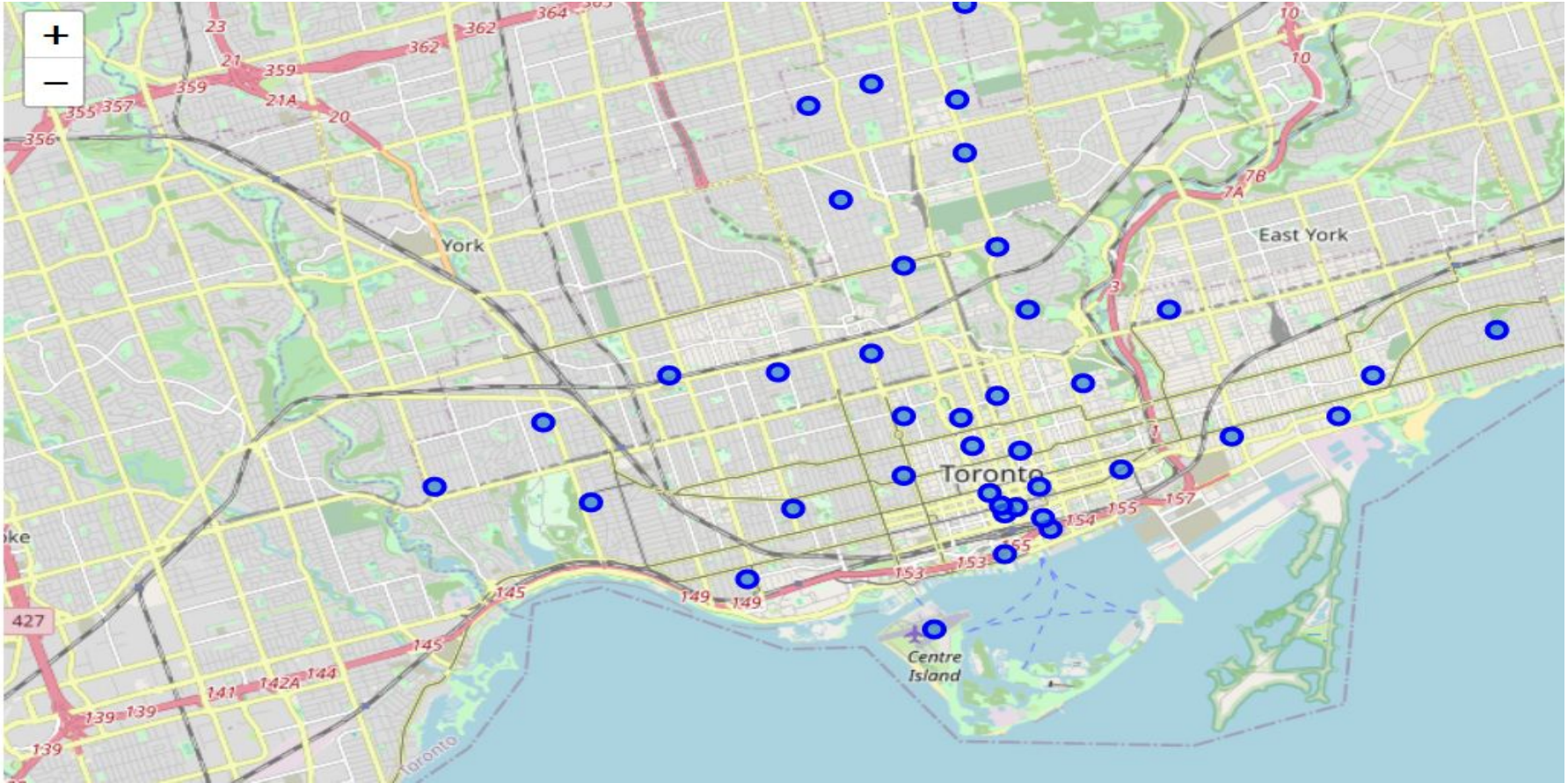
3.The “Folium package” could be used to visualize the geographical maps in python.

4.Foursquare API calls could be used to pull information about the nearest location of a specified venue. Eventually, name, category, latitude and longitude location nearby locations are obtained and tabulated.

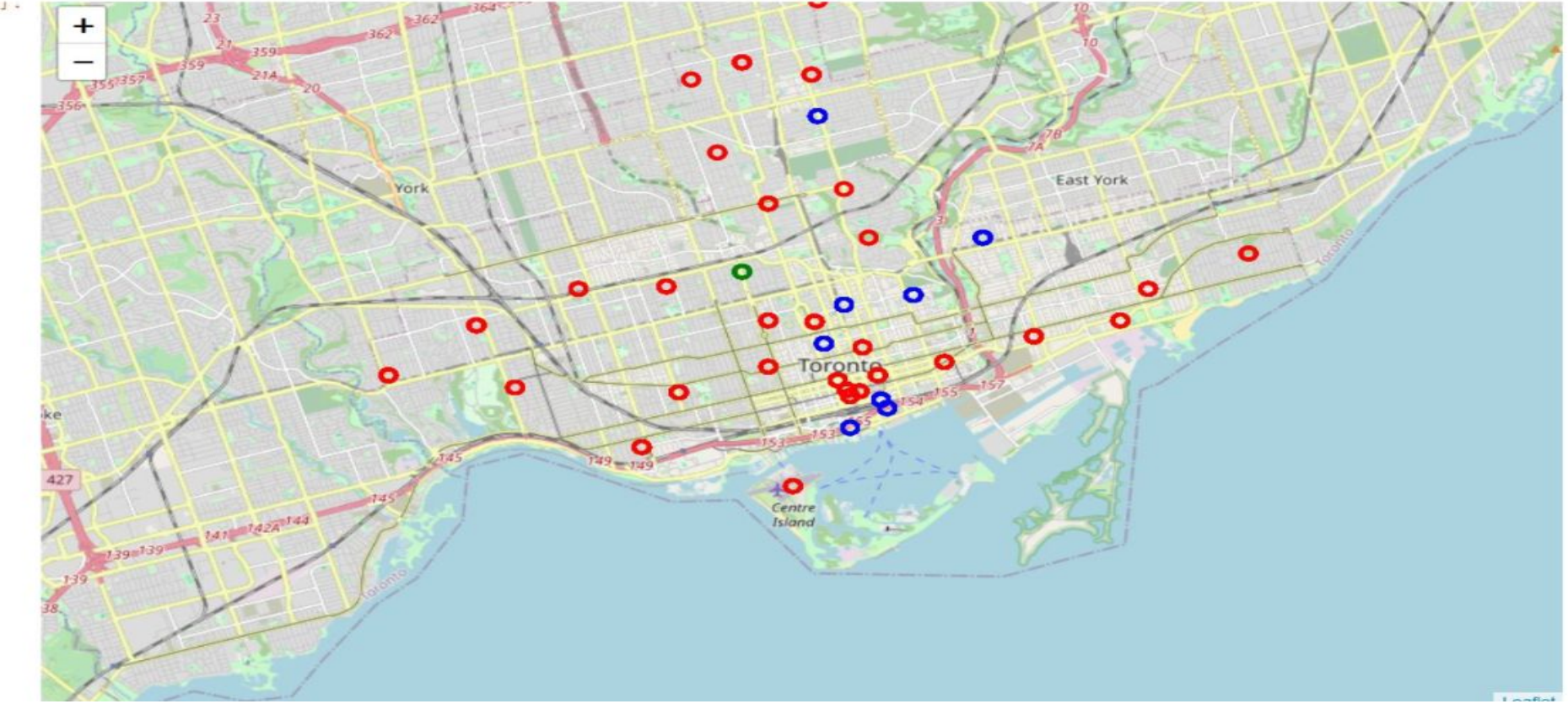
5.Each neighbourhood could be analyzed by using the “Groupby” function in thepandas library.

6.Unsupervised machine learning algorithm called “K means clustering” could beemployed to do a clustering based on their frequency of occurrence of “Indian Restaurants”.

Map of Toronto:



Results obtained by Kmeans clustering:



Cluster 1:

n [35]:

```
# cluster 1 ----- Too much Indidan Restaurants
to_merged.loc[(to_merged['Cluster Labels'] ==1) & (to_merged['Venue Category'] == 'Indian Restaurant') ]
```

ut[35]:

	Neighborhood	Indian Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
4	Central Bay Street	0.015625	1	43.657952	-79.387383	Colaba Junction	43.660940	-79.385635	Indian Restaurant
31	Stn A PO Boxes	0.010204	1	43.646435	-79.374846	Bindia Indian Bistro	43.648559	-79.371816	Indian Restaurant
0	Berczy Park	0.017241	1	43.644771	-79.373306	Bindia Indian Bistro	43.648559	-79.371816	Indian Restaurant
36	The Danforth West, Riverdale	0.023810	1	43.679557	-79.352188	Sher-E-Punjab	43.677308	-79.353066	Indian Restaurant
8	Davisville	0.029412	1	43.704324	-79.388790	Marigold Indian Bistro	43.702881	-79.388008	Indian Restaurant
14	Harbourfront East, Union Station, Toronto Islands	0.010000	1	43.640816	-79.381752	Indian Roti House	43.639060	-79.385422	Indian Restaurant
6	Church and Wellesley	0.013158	1	43.665860	-79.383160	Kothur Indian Cuisine	43.667872	-79.385659	Indian Restaurant
30	St. James Town, Cabbagetown	0.023256	1	43.667967	-79.367675	Butter Chicken Factory	43.667072	-79.369184	Indian Restaurant

Cluster 2:

In [36]:
```
# Cluster 2 only 1 Indian Restaurant
to_merged.loc[(to_merged['Cluster Labels'] ==2) & (to_merged['Venue Category'] == 'Indian Restaurant') ]
```

Out[36]:

	Neighborhood	Indian Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
34	The Annex, North Midtown, Yorkville	0.047619	2	43.67271	-79.405678	Roti Cuisine of India	43.674618	-79.408249	Indian Restaurant

Cluster 0:

In [37]:
```
# Cluster 0 --- no Indian Restaurant
to_merged.loc[(to_merged['Cluster Labels'] ==0) & (to_merged['Venue Category'] == 'Indian Restaurant') ]
```

Out[37]:

Neighborhood	Indian Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category

Recommendation to setup a Restaurant at Cluster location 0

It is noted that there is an **Indian Movie Theater** at "Runnymede, Swansea". Hence setting up an Indian Restaurant at that location would attract the customers to dine in their restaurant after the movie time **as there is no Indian restaurant nearby.**

In [38]:
```
to_merged[(to_merged['Venue Category'] =="Indie Movie Theater") & (to_merged['Cluster Labels'] ==0)]

#Venue Category Indie Movie Theater ---- The best choice for setting up a restuarant
```

Out[38]:

	Neighborhood	Indian Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
28	Runnymede, Swansea	0.0	0	43.651571	-79.48445	Humber Cinema	43.649118	-79.484818	Indie Movie Theater

The results obtained by K means clustering are visualized using Folium above.

1. Cluster 1 - 8 locations with Indian Restaurants
2. Cluster 2 - 1 locations with Indian Restaurants
3. Cluster 0 - no results with Indian Restaurants

Recommendations:

1. Setting up a Restaurant at locations pertaining to Cluster 1 will be a very badchoice as it has a number of restaurants already.

2. Location of cluster 2 has only 1 restaurant, hence it would be a good choice.

3. Location cluster 0 has no restaurant, hence it would be a very great choice.It is noted that there is an Indian Movie Theater at "Runnymede, Swansea".

Hence setting up an Indian Restaurant at that location would attract the customers to dine in their restaurant after the movie time as there is no Indian restaurant nearby.

Conclusion:

The task of choosing a best location for setting up an Indian Restaurant was analyzed using the given dataset and Foursquare API.

A meaningful recommendation was drawn from the analysis results.

The location of Runnymede Swansea would be an Ideal location for setting up an Indian restaurant can be suggested to the businessman who wishes to start in Toronto.