

# Coffee SHOP RECOMMENDER SYSTEM

IBM Data Science Capstone  
Project

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# PROBLEM :

“ To develop a recommender system that will help the restaurant manager to find the best suitable place to open an Coffee Shop. “

# INTRODUCTION

- Toronto is the provincial capital of Ontario and the most populous city in Canada, with estimated population of 2,956,024 and an estimated population of 6,341,935 in the Toronto region.
- The city has many restaurants, coffee shops, cafe, hotels. The variety of food items are provided by these shops.
- One of the popular item is an Coffee. Thus, there are many Ice Cream Shops in the various areas of the city.
- Therefore, if someone decides to open an Coffee Shop in the city, he would select the best suitable place for the shop.
- To get the information about this suitable place, the recommender system can be used

# The questions that should be answered

- Which place is the most suitable and popular for the Coffee Shop ?
- What type of Coffee should be provided ? What type is preferred by people in that area ?
- What type of people live in that area ( students, company employees, etc ) ?
- How many similar shops are present in that area ?
- What other specialities should be provided to attract customers ?
- What should be the cost of the Coffee provided ?

# TARGET AUDIENCE

Target audience for this system are the managers or people who want to open an Coffee Shop in the specific city or area. These people expect the place which is most popular and well known in the city.

# DATA

To open a shop, following things are required –

- Geographical coordinates of the area
  - The population of the neighbourhood
  - The type of people in the neighbourhood
  - Average income of the people nearby that area
  - The preference of people towards the type of food
  - Other service details such as juice, transport, taxi, etc.
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- The above information was obtained from the various websites such as Wikipedia, Foursquare API, census report websites, csv data, etc.

# METHODOLOGY

The following steps were followed –

- get the data of neighbourhoods in Toronto
- use the pandas HTML table scraping method for web scraping
- get the longitude and latitude coordinates of the areas from csv file
- match the areas and the coordinates
- visualize the map of Toronto using the Folium library package
- get the list of top nearest venues using Foursquare API
- group the venues by their categories
- selected the category as “ Coffee Shop”
- use the K-Means clustering method to form the clusters of the data.
- by analysing the results, the final results were obtained

Initial data :

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[3]:
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	Postal code	Borough	Neighborhood
0	M1A	NaN	NaN
1	M2A	NaN	NaN
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park / Harbourfront

Dataframe after matching venues and the coordinates :

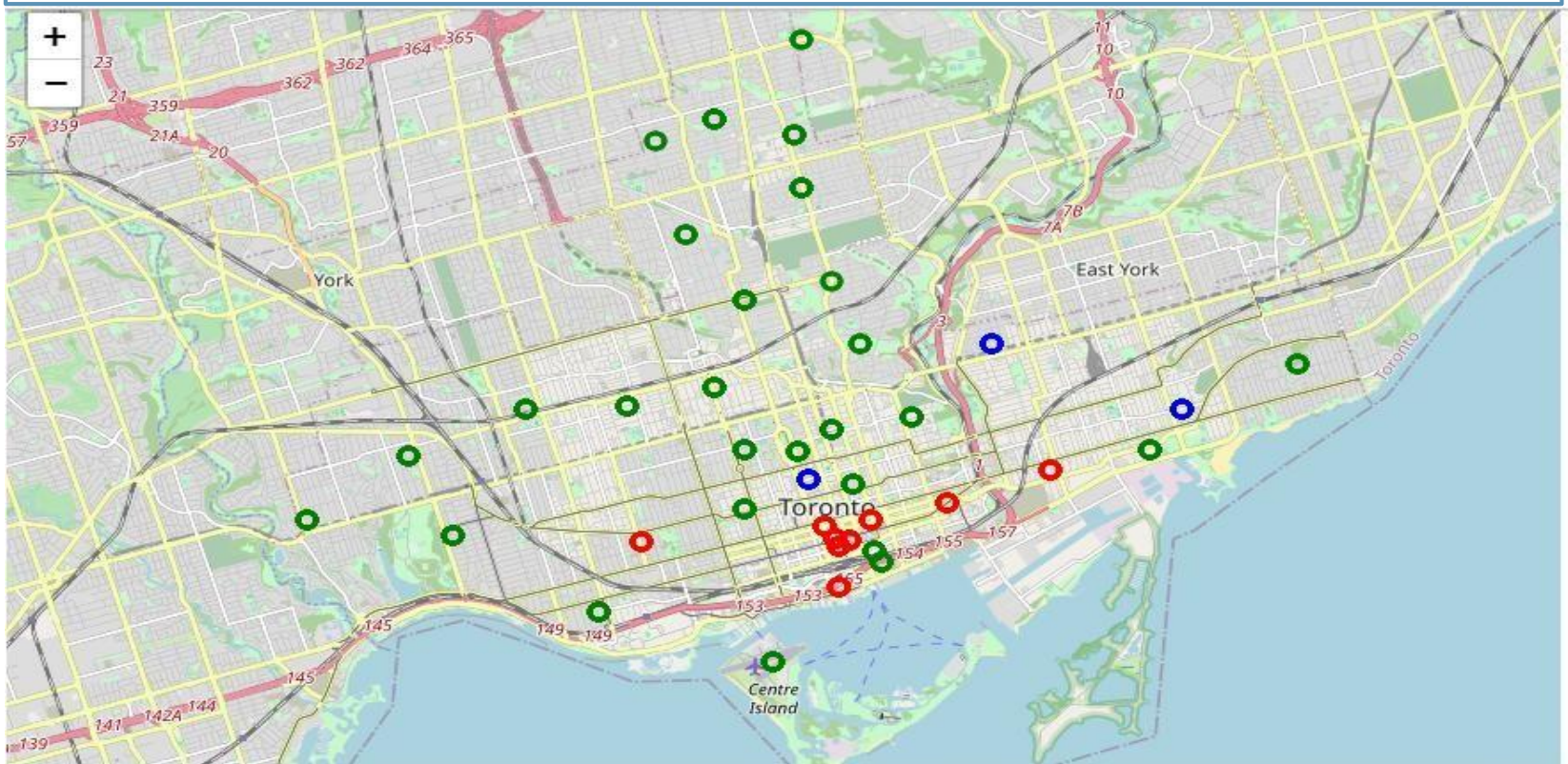
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	Postal code	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Malvern / Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill / Port Union / Highland Creek	43.784535	-79.160497
2	M1E	Scarborough	Guildwood / Morningside / West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476



# RESULTS

Map showing the clusters :



# RESULTS

Table – Cluster 0 :

	Neighborhood	Coffee Shop	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
28	Runnymede / Swansea	0.055556	0	43.651571	-79.484450	Wibke's Espresso Bar	43.649132	-79.484802	Coffee Shop
28	Runnymede / Swansea	0.055556	0	43.651571	-79.484450	Tim Hortons	43.648526	-79.485066	Coffee Shop
25	Richmond / Adelaide / King	0.095745	0	43.650571	-79.384568	Starbucks	43.646891	-79.381871	Coffee Shop
25	Richmond / Adelaide / King	0.095745	0	43.650571	-79.384568	Dineen @CommerceCourt	43.648251	-79.380127	Coffee Shop
25	Richmond / Adelaide / King	0.095745	0	43.650571	-79.384568	Starbucks	43.649028	-79.381593	Coffee Shop
...	...	...	...	...	...	...	...	...	...
13	Garden District, Ryerson	0.090000	0	43.657162	-79.378937	Hailed Coffee	43.658833	-79.383684	Coffee Shop
13	Garden District, Ryerson	0.090000	0	43.657162	-79.378937	Balzac's Coffee	43.657854	-79.379200	Coffee Shop
13	Garden District, Ryerson	0.090000	0	43.657162	-79.378937	Nordstrom Ebar	43.654649	-79.380574	Coffee Shop
1	Brockton / Parkdale Village / Exhibition Place	0.086957	0	43.636847	-79.428191	Starbucks	43.639090	-79.427622	Coffee Shop
1	Brockton / Parkdale Village / Exhibition Place	0.086957	0	43.636847	-79.428191	Louie Craft Coffee	43.639284	-79.425620	Coffee Shop

# RESULTS

Table – Cluster 1 :

	Neighborhood	Coffee Shop	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
19	Little Portugal / Trinity	0.02381	1	43.647927	-79.41975	Jimmy's Coffee	43.644521	-79.418908	Coffee Shop

# RECOMMENDATION

- By analyzing nearby venues, we can conclude that the cluster 1 does not have many Coffee shops in that areas. Thus, it would be suitable to select these locations for opening ice cream shops.
- Therefore, locations like Central Bay Street, Riverdale, The Beaches West, Commerce court will be good to open a new Ice Cream Shop.

# CONCLUSION

- The recommender system correctly recommends the most suitable place to open an Coffee Shop. Thus, it can provide good results to the users of the system.
- The system can also be used as recommendation system for opening the restaurants, coffee shops, street food shop, etc.
- Using this method the recommendation system for malls, theatres, shops can also be designed.