Optimal Location for opening Supermarket

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IBM Capstone Data Science Project

16th July' 21

Introduction:

An opening of a Supermarket is an interesting and high profit-making business avenue. However, it depends on how successfully you can run business of the Supermarket Store.

Important factors:

- **Right location of Store to make sure that customers can easily purchase products**
- **Customer base**
- **Demand**

Objective:

In this project, we will attempt to solve the problem of a supermarket chain owner/ franchise owner and help them to identify which area / neighborhood in Toronto, Canada, they can open their new store. This will cater to supermarket chain owner, franchise owner for supermarket.

Data:

Through this project, focus will be on below factors to decide optimal neighborhood for opening the store.

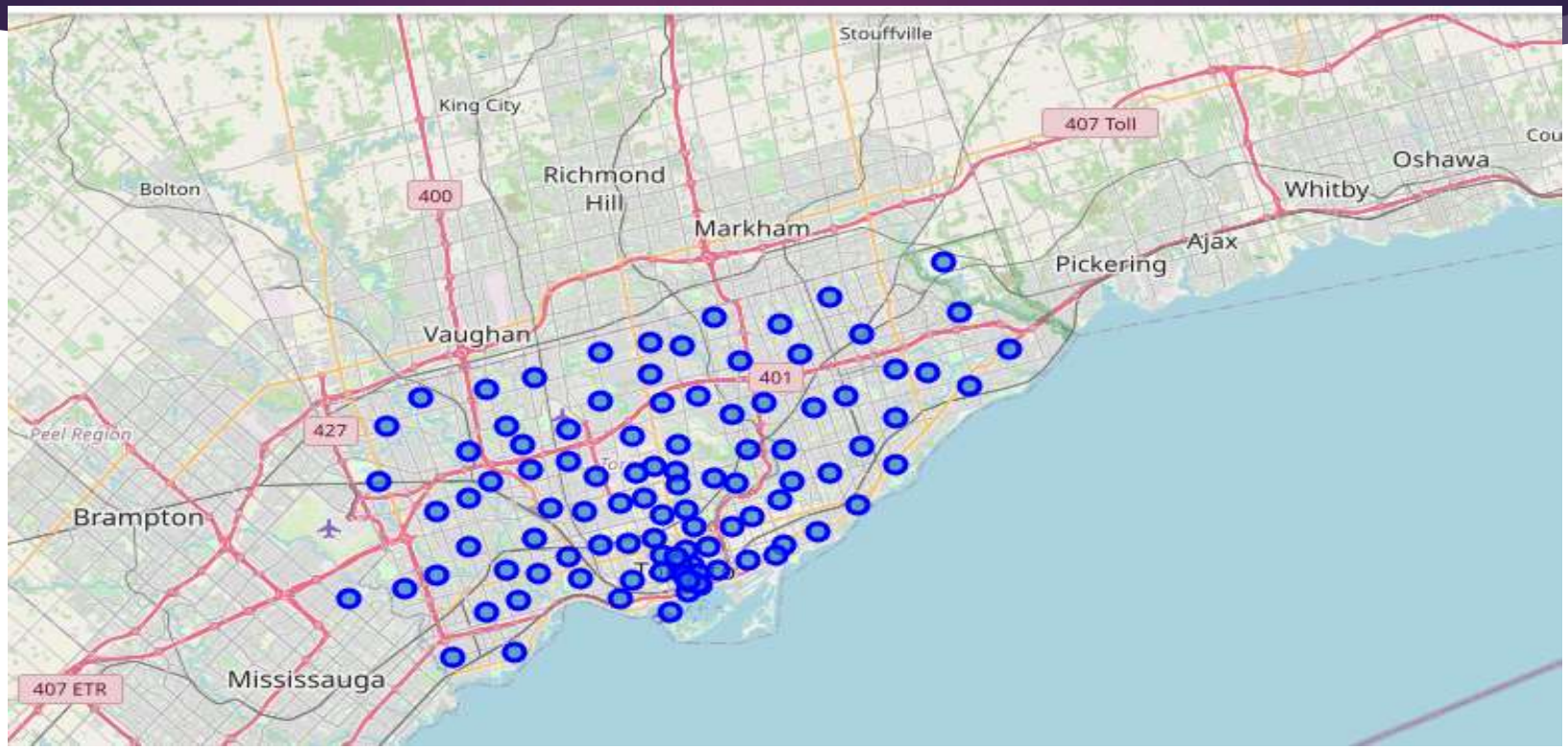
Data Source:

- **Foursquare API**
- **Census data for Toronto**

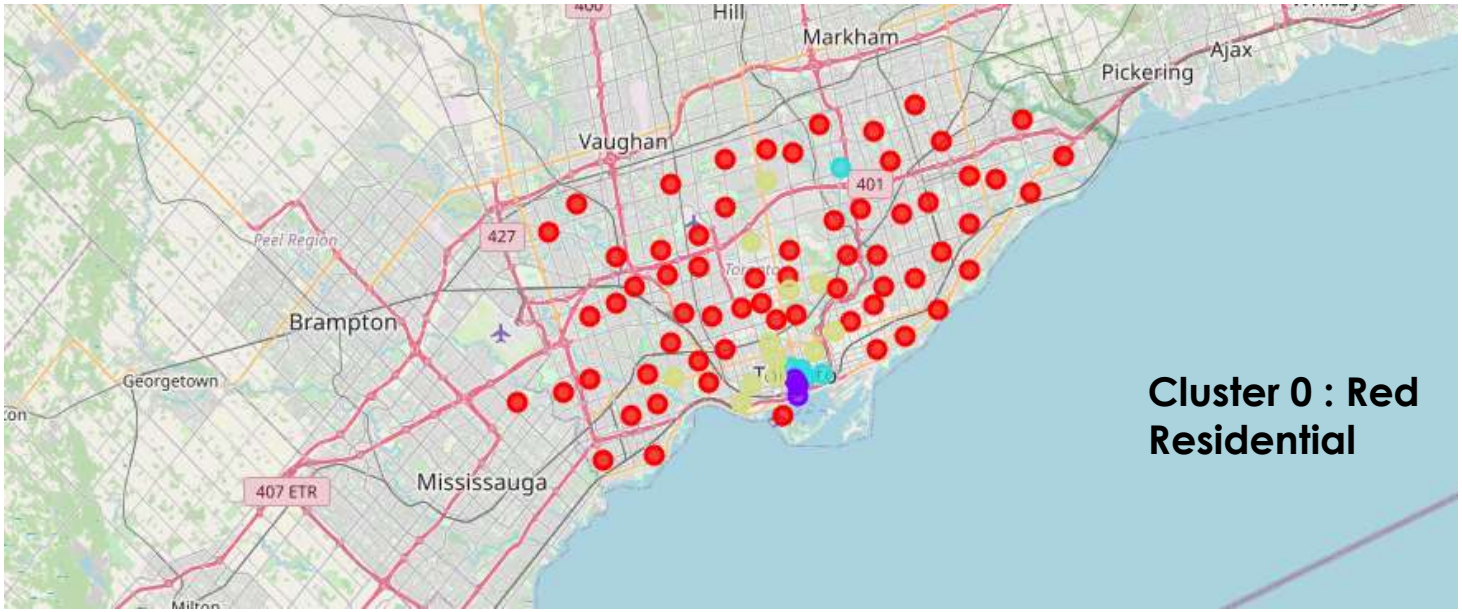
Data Analysis and Strategy:

- **We will use three-digit postal code to identify neighborhood.**
- **Next, to use foursquare location API, to explore each neighborhood.**
- **Census data to be used find out population per neighborhood and household income. This is needed to understand potential market for opening the Supermarket.**

Toronto Neighborhood:



Clustering using K-Means:



Final Data frame:

Below snapshot gives Neighbourhood, Number of markets, population and Average Income.

	Borough_x	Neighborhood	Latitude	Longitude	Total_Markets	Avg_Income	Population
0	Scarborough	Rouge, Malvern	43.806686	-79.194353	0	86923.112768	90290
1	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497	0	107307.432432	12494
2	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711	0	76125.031478	54764
3	Scarborough	Woburn	43.770992	-79.216917	0	67249.254541	53485
4	Scarborough	Cedarbrae	43.773136	-79.239476	0	71081.049698	29960
5	Scarborough	Scarborough Village	43.744734	-79.239476	0	63167.229730	16724
6	Scarborough	East Birchmount Park, Ionview, Kennedy Park	43.727929	-79.262029	2	63864.956438	13641
7	Scarborough	Clairlea, Golden Mile, Oakridge	43.711112	-79.284577	0	65490.384615	56512
8	Scarborough	Cliffcrest, Cliffside, Scarborough Village West	43.716316	-79.239476	0	70337.788131	55834
9	Scarborough	Birch Cliff, Cliffside West	43.692657	-79.264848	0	87915.760870	22291
10	Scarborough	Dorset Park, Scarborough Town Centre, Wexford ...	43.757410	-79.273304	0	72272.105743	51575
11	Scarborough	Maryvale, Wexford	43.750072	-79.295849	0	75048.243444	27917

From the table we can see that, Rouge, Malvern region has

a. Above average per capita income and represents good purchasing power
b. Highest number of people per market

Result & Discussion

The optimal location to open a supermarket in Toronto, Canada would be the **Rouge, Malvern** area.

Further, it would be furthermore interesting to see, what are other shopping avenues are available in the all the neighbourhoods of entire Toronto as in general we found lesser number of markets.

Conclusion:

In this project, the neighbourhoods of Toronto were analysed to find optimal location for Supermarket.

We used:

1. Foursquare API to get location details like venues and venue category in each neighbourhoods
2. K-means Clustering Machine learning algorithm to find different clusters.
3. Based on venue categories we tried to identify residential zone as it has maximum customer base for Supermarkets.
4. We also analysed population data, income distribution and existing market penetration to find most suitable location.

There is always room of improvement in any project. Some important pointers here could be more accurate classification of cluster to identify residential zones. Or in other words, there were not very suitable venue categories to pinpoints residential zones.

Although this project focuses particularly for supermarket, it could easily be extended for other cities and avenues like Restaurant, coffee shops etc..

Thank You!