

Finding the Right Neighborhoods for a Franchise in a New City

Capstone Presentation

Background

- Mitsuwa Marketplace, a Japanese market chain plan to expand their business to Toronto
- They have opened several stores in USA
- How to find right neighborhood to open their first Toronto store?



Mitsuwa

M A R K E T P L A C E

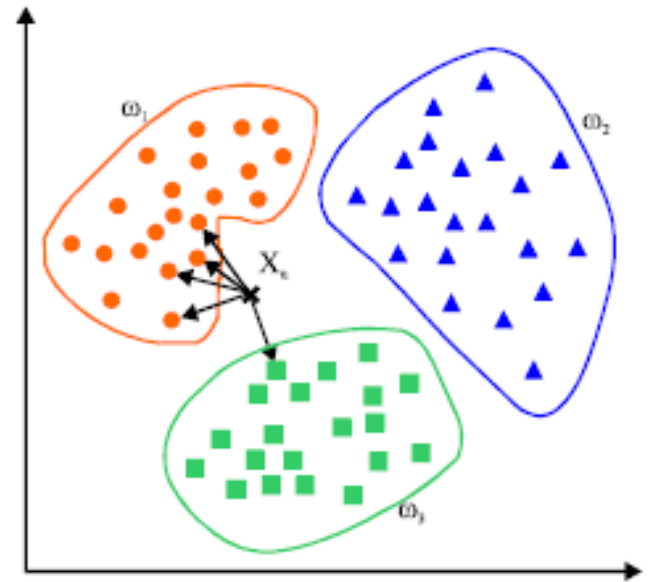
Methodology

Following data analytic steps are performed in this project:

- Data Acquisition
- Data cleaning and pre-processing
- Exploratory data analysis
- Machine learning modelling
- Conclusion

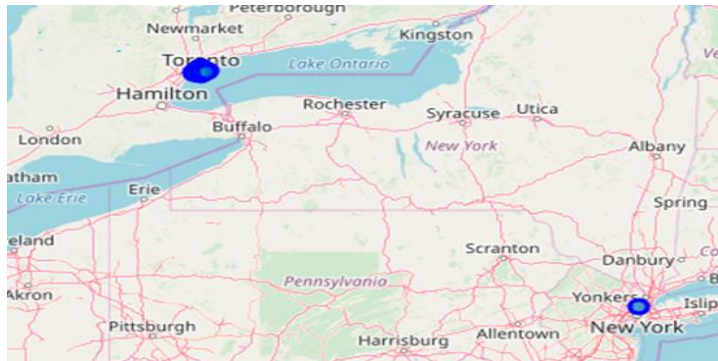
Algorithm

- Machine learning clustering algorithm can be applied to cluster Toronto neighborhoods and Mitsuwa New Jersey store
- KNN classifier algorithm is used in this project
- Major data sets for clustering are surrounding business environment, i.e. venues, around each neighborhood and Mitsuwa New Jersey.



Data Collection/Cleaning

- Mitsuwa New Jersey store's latitude and longitude values
- Each Toronto Neighborhood's latitude and longitude values



- In addition, Foursquare location data of Mitsuwa New Jersey store and Toronto neighborhoods are needed to explore nearby venues

Exploratory Data Analysis

- Study the venues categories distribution for each neighborhood and Mitsuwa New Jersey
- Calculate 5 most popular venue categories in each neighborhood.
- Partial result which includes Mitsuwa and other two Toronto neighborhoods are shown in the right table:

----Mitsuwa----

	venue	freq
0	Japanese Restaurant	0.12
1	Gym	0.06
2	Dessert Shop	0.04
3	Pizza Place	0.04
4	Cosmetics Shop	0.04

----Moore Park, Summerhill East----

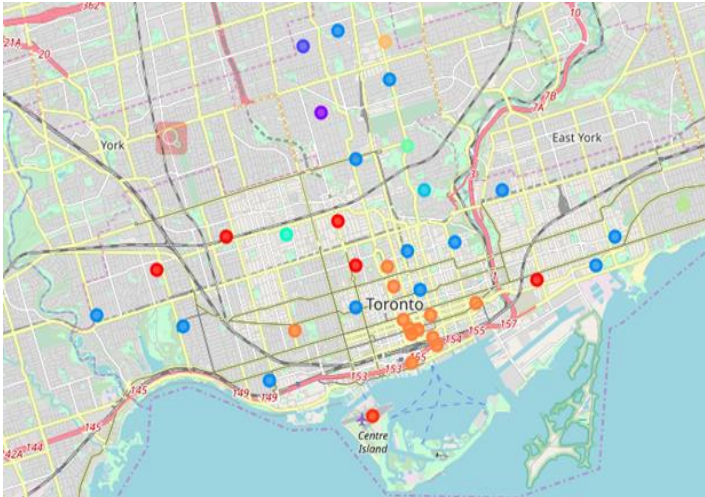
	venue	freq
0	Restaurant	0.33
1	Playground	0.33
2	Trail	0.33
3	Museum	0.00
4	Market	0.00

----North Toronto West----

	venue	freq
0	Clothing Store	0.19
1	Sporting Goods Shop	0.10
2	Coffee Shop	0.10
3	Gym / Fitness Center	0.05
4	Café	0.05

Clustering

- KNN Algorithm is used with set clusters $K=12$
- Clustering results are shown in left graph, partial result table is shown in right graph

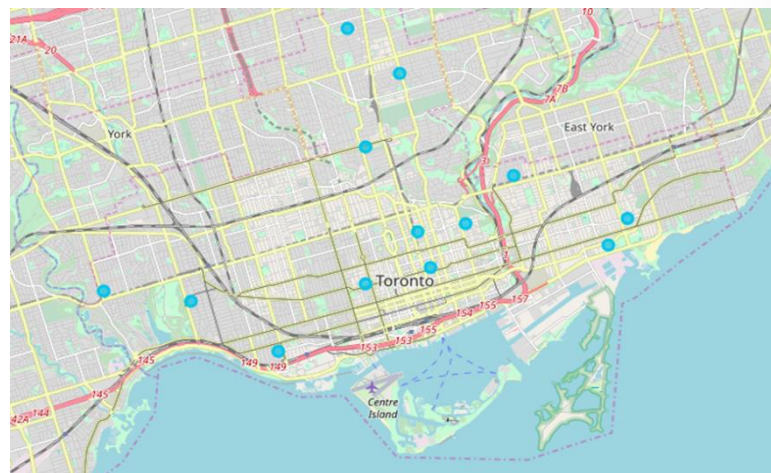


	Postcode	Borough	Neighbourhood	Latitude	Longitude	Cluster Labels
0	M5A	Downtown Toronto	Harbourfront	43.654260	-79.360636	10
1	M7A	Downtown Toronto	Queen's Park	43.662301	-79.389494	10
2	M5B	Downtown Toronto	Ryerson, Garden District	43.657162	-79.378937	3
3	M5C	Downtown Toronto	St. James Town	43.651494	-79.375418	10
4	M4E	East Toronto	The Beaches	43.676357	-79.293031	8
5	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306	10

Result - The Right Neighborhoods

- The clustering label for Mitsuwa New Jersey is 3
- The right neighborhoods to open a new Mitsuwa are the neighborhood with clustering label 3
- Names and locations of those neighborhoods are shown are below

Postcode	Borough		Neighbourhood	Latitude	Longitude	Cluster Labels
2	M5B	Downtown Toronto	Ryerson, Garden District	43.657162	-79.378937	3
12	M4K	East Toronto	The Danforth West, Riverdale	43.679557	-79.352188	3
14	M6K	West Toronto	Brockton, Exhibition Place, Parkdale Village	43.636847	-79.428191	3
15	M4L	East Toronto	The Beaches West, India Bazaar	43.668999	-79.315572	3
23	M4R	Central Toronto	North Toronto West	43.715383	-79.405678	3
25	M6R	West Toronto	Parkdale, Roncesvalles	43.648960	-79.456325	3
26	M4S	Central Toronto	Davisville	43.704324	-79.388790	3
28	M6S	West Toronto	Runnymede, Swansea	43.651571	-79.484450	3
30	M5T	Downtown Toronto	Chinatown, Grange Park, Kensington Market	43.653206	-79.400049	3
31	M4V	Central Toronto	Deer Park, Forest Hill SE, Rathnelly, South Hill, ...	43.686412	-79.400049	3
35	M4X	Downtown Toronto	Cabbagetown, St. James Town	43.667967	-79.367675	3
37	M4Y	Downtown Toronto	Church and Wellesley	43.665860	-79.383160	3
38	M7Y	East Toronto	Business Reply Mail Processing Centre 969 Eastern	43.662744	-79.321558	3
39	NaN	New Jersey	Mitsuwa	40.815989	-73.979970	3



Conclusion

- In this project, I study the similarities of Toronto neighborhoods and Mitsuwa New Jersey surrounding area
- Foursquare data are pulled to explore nearby venues for each neighborhood and perform KNN algorithm to cluster neighborhood and Mitsuwa New Jersey into 12 clusters.
- Finally, I locate the neighborhoods which contains same cluster label with Mitsuwa and provide location recommendations for Mitsuwa's stakeholder to open their first Mitsuwa in Toronto.