

CAPSTONE PROJECT - *INVESTMENT OF NEW RESTAURANT IN TORONTO*

COURSERA

APPLIED DATA SCIENCE CAPSTONE

WEEK5_FINAL ASSIGNMENT



INTRODUCTION



- ✓ Canada is one of the world's top immigration destinations
- ✓ Canada Immigration benefits include having access to a safe and clean environment, a well-developed public transport system, healthcare, education, and good working conditions.
- ✓ Meanwhile, immigrants are a necessary component to achieve economic growth and keep taxpayer-funded systems such as pensions and health care stable and balanced.
- ✓ ***More immigrants and local residents have desired to establish business or investment in Canada.***

BUSINESS PROBLEM

- ❑ Review the immigrant history to Canada, thus exploring the potential popular cuisines based on the immigrant's background.
- ❑ Provide the new investor a comprehensive understanding of the current restaurant market in Toronto. And deliver guidance on where to locate the restaurant using the information obtained through the Foursquare API, along with the traffic information, in order to decide an appropriate location.
- ❑ Additionally, with accessibility of 'tips' and 'rating' of each restaurant by Foursquare API, the further improvement advice could be addressed to enhance the success of the new restaurant investment for the investor.



DATA COLLECTION

1. Canada immigration history

https://s3-api.us-geo.objectstorage.softlayer.net/cf-courses-data/CognitiveClass/DV0101EN/labs/Data_Files/Canada.xlsx

2. List of postal codes of Canada

https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

3. Geographical coordinates with latitude and longitude of each postal code

http://cocl.us/Geospatial_data

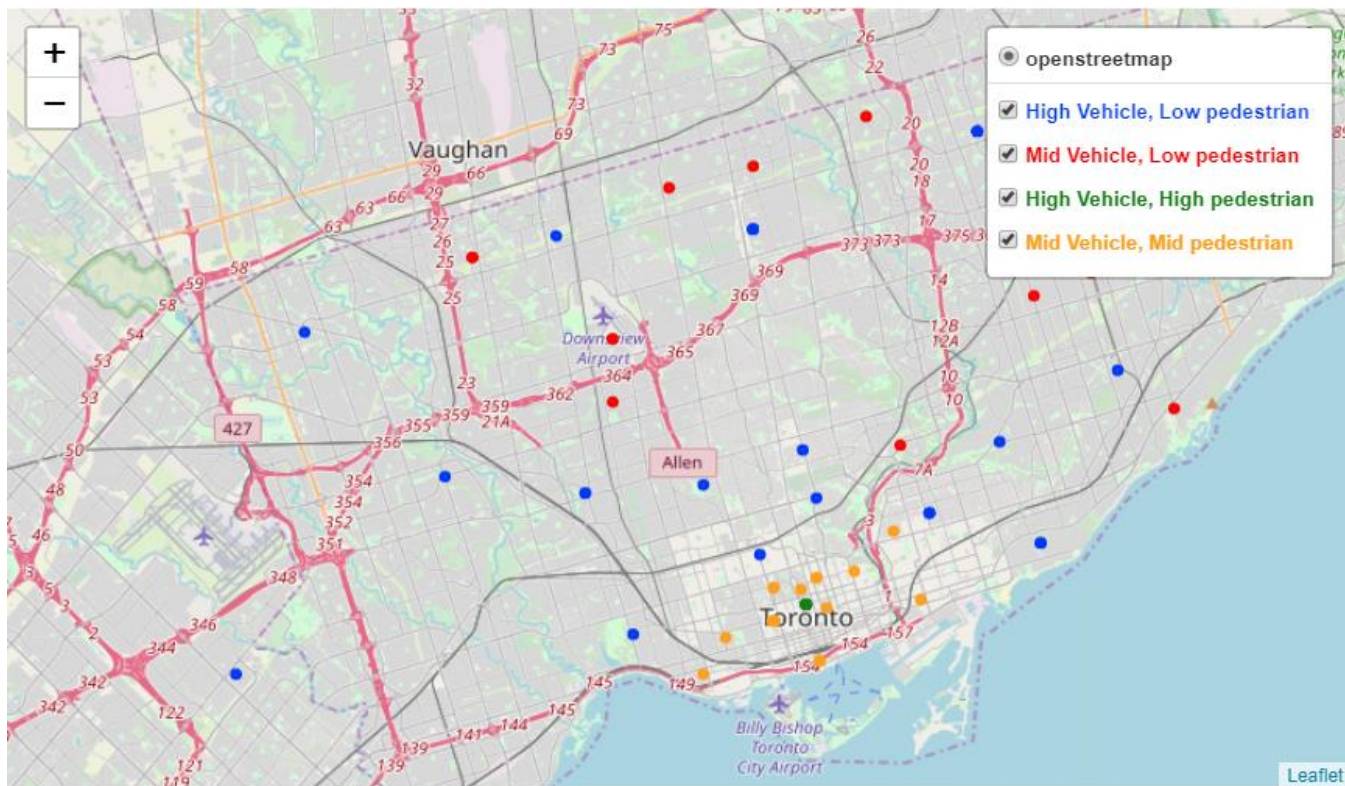
4. Information of 8 peak hours' vehicle and pedestrian volume

https://www.toronto.ca/ext/open_data/catalog/data_set_files/8hr_Veh&PedVolume_6-Mar-2018.xlsx

5. Foursquare API

METHODOLOGY

- K-means clustering method is used to partition the areas of restaurants based on specified conditions (ratings or traffic flow).
- K-means clustering is one of the simplest and popular unsupervised **machine learning algorithms**.

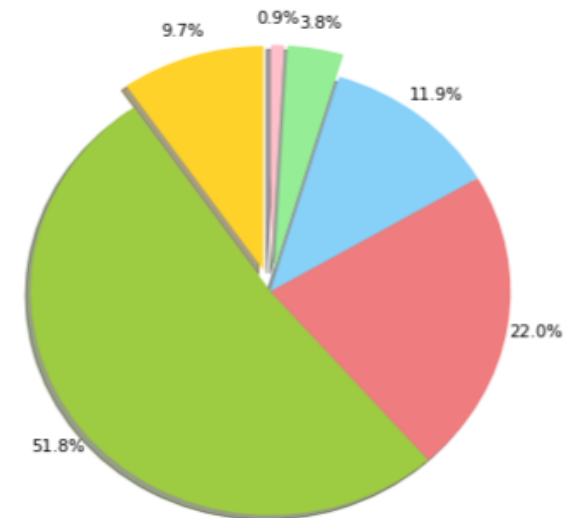


RESULTS & DISCUSSION

Canada is one of the world's top immigration destinations, attracting new immigrants with pleasant environment, safe neighbourhood, well-developed public transport system, healthcare, education, and good working conditions



Immigration to Canada by Continent [1980 - 2013]

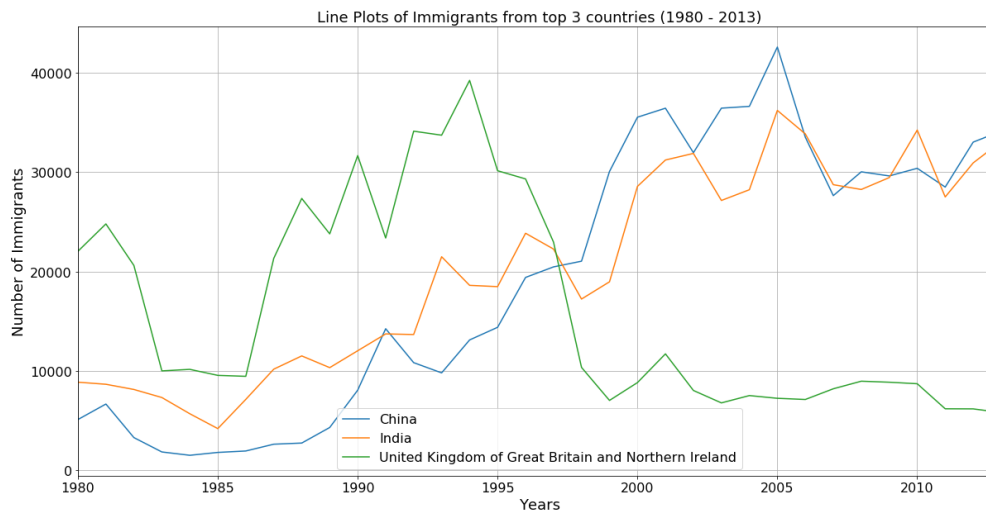


- ✓ The immigrants from Asia take major proportions in the total immigrations.

RESULTS & DISCUSSION

Country	Continent	1980s	1990s	2000s	Total
India	Asia	82154	180395	303591	658817
China	Asia	32003	161528	340385	625833
United Kingdom of Great Britain and Northern Ireland	Europe	179171	261966	83413	545673
Philippines	Asia	60764	138482	172904	481847
Pakistan	Asia	10591	65302	127598	228997
United States of America	Northern America	76824	56915	75173	232621
Iran (Islamic Republic of)	Asia	21477	54871	65794	164632
Sri Lanka	Asia	14796	70421	49678	145964
Republic of Korea	Asia	16259	38189	68183	138072
Poland	Europe	57602	64864	13629	138389

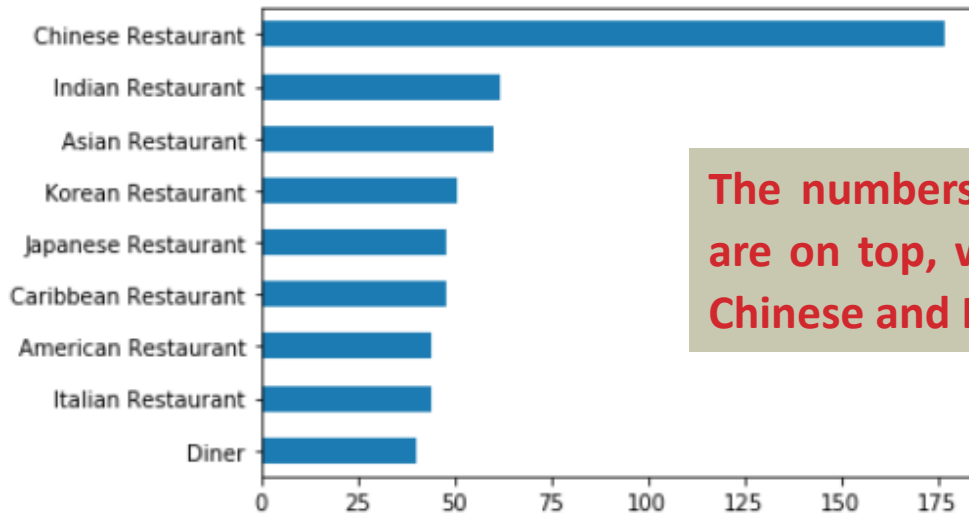
- Immigrations from India, China and United Kingdom of Great Britain and Northern Ireland are the top 3



- The cuisines of Indian and Chinese food will be popular because of the density of populations of Indian and Chinese immigrants in Canada.

RESULTS & DISCUSSION

Number of different categories of restaurant in Toronto



The numbers of Chinese and Indian restaurants are on top, which also implies the popularity of Chinese and Indian cuisines in Toronto.



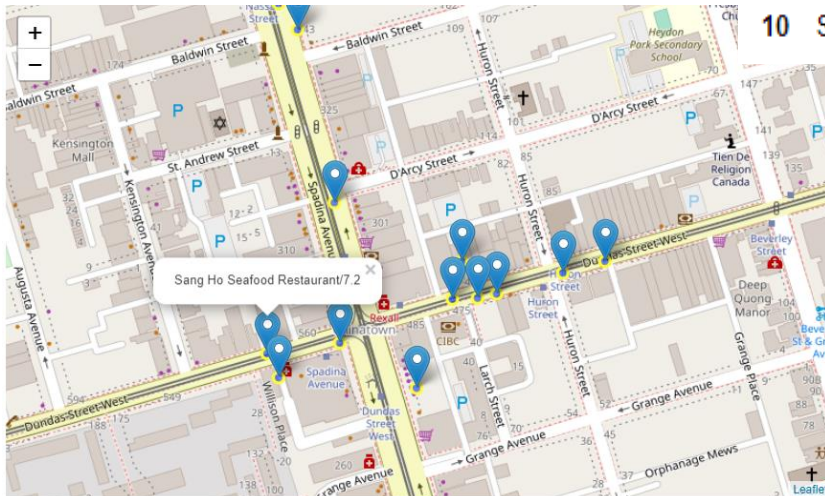
Borough	Number of Chinese Restaurants
Downtown Toronto	34
Scarborough	32
North York	13
East York	5
East Toronto	4
Central Toronto	3
West Toronto	3
York	3
Etobicoke	2
Mississauga	1

RESULTS & DISCUSSION

- It is easy to search the venue of a restaurant by clicking the popup menu, with returned information like restaurant's name and rating.
- A quick and direct visualization is able to be provided for the investors for accurate information.

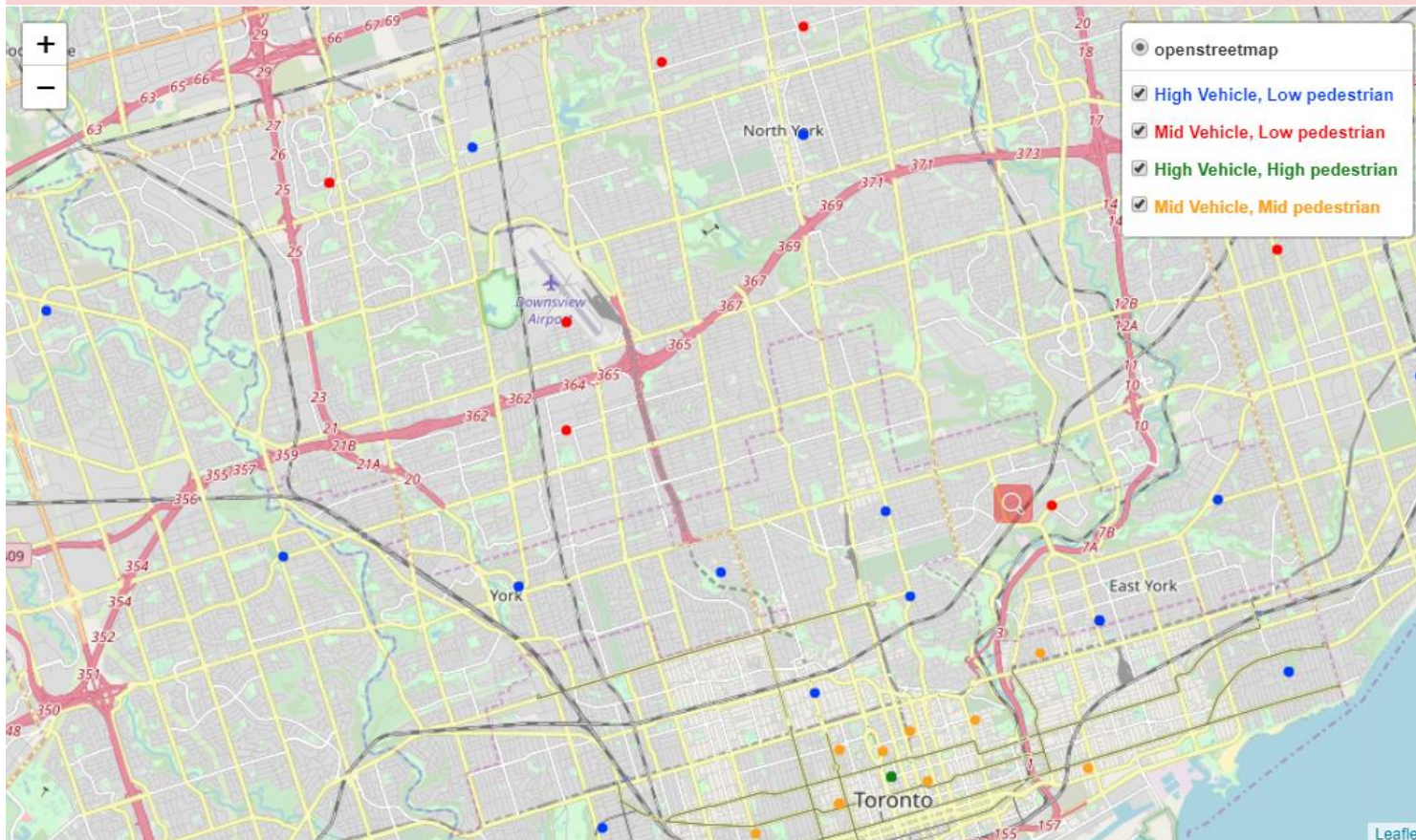
Chinese Restaurants in Toronto with top rating

	Borough	name	rating	numbertips
1	Scarborough	The Royal Chinese Restaurant 避風塘小炒	7.7	11.0
2	Scarborough	Kim Kim restaurant	7.4	29.0
3	Scarborough	Super Hakka Restaurant	7.1	5.0
4	Scarborough	Phoenix Restaurant 金鳳餐廳	6.9	4.0
5	North York	Szechuan Gourmet Restaurant	6.9	8.0
6	Scarborough	Lucky Chinese (Haka) Restaurant	6.7	5.0
7	North York	Lee Town Restaurant	6.5	6.0
8	Scarborough	Perfect Chinese Restaurant 雅緻海鮮酒家	6.3	42.0
9	Scarborough	Lucky Hakka	6.0	9.0
10	Scarborough	Fortune Restaurant	5.8	1.0



RESULTS & DISCUSSION

- ❖ Downtown Toronto has more Chinese restaurants available because of more coming visitors.
- ❖ Elsewhere, Chinese restaurants are scattered located, but many are accessible by vehicle.



CONCLUSION

1. By analysing the Canada immigration history, the potential popular cuisines based on the immigrant's background are found to be *Chinese and Indian food*.
2. Borough of *Scarborough* has more high rated Chinese restaurants, which implies the relative mature and developed catering industry of Chinese restaurants so far. Moreover, combined with analysis of traffic flow by K-means method, more Chinese restaurants are available in *Downtown Toronto* because of more coming visitors.

