The battle of neighborhood: choosing right location for new Chinese restaurant in Toronto
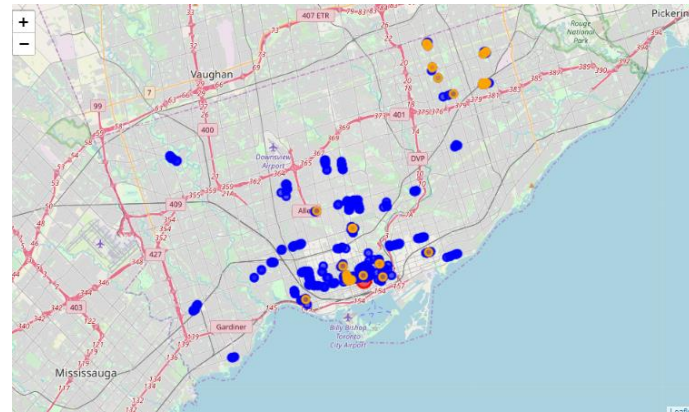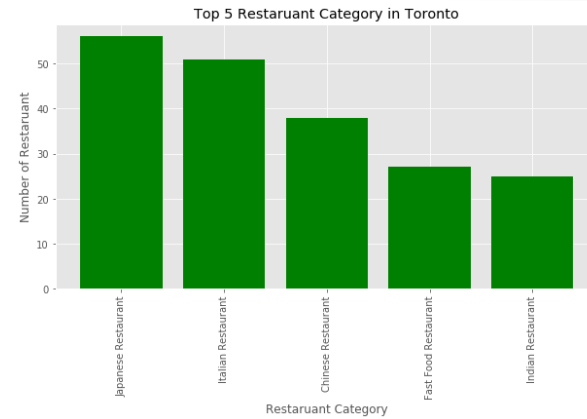
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Introduction

City of Toronto

- provincial capital of Ontario and the most populous city in Canada, with a population of 2,731,571 in 2016

- 140 neighborhoods

- Diverse ethnic origins
  - European
  - Asian
  - Latin
  - African

https://en.wikipedia.org/wiki/Toronto

Chinese Cuisine in Toronto

- Number of Chinese Restaurant ranked 3 in Toronto

- Location show both overlapping and non-overlapping with other restaurant categories

Blue: All restaurants in Toronto
Orange: Chinese restaurants in Toronto
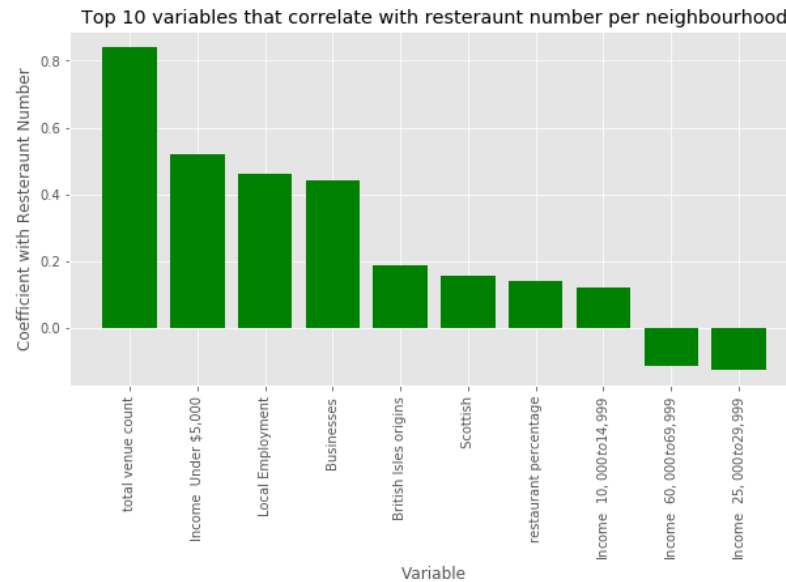
Goal of this project

- The social status of Toronto can be analyzed by looking at the demographics, economic, income characteristics. And then by getting better understanding of the social factors that impact location of Chinese restaurant in Toronto, we could use it as guidance to choose right location when opening a Chinese restaurant in Toronto.

Data source

- Neighborhood profile data such as demographic, income, economic and geo data would be downloaded from Toronto open data website. Here are the links for each datasets:

- Neighborhood Profiles dataset:

- https://ckan0.cf.opendata.inter.prod-toronto.ca/download_resource/ef0239b1-832b-4d0b-a1f3-4153e53b189e?format=csv#xd_co_f=NTFiZjBmMTQtOTk0My00ZDdlLWE5YjctN2JiNjZiY2Q5Zjgx~

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- Neighborhood geography coordinates dataset:

- https://ckan0.cf.opendata.inter.prod-toronto.ca/download_resource/a083c865-6d60-4d1d-b6c6-b0c8a85f9c15?format=csv&projection=4326#xd_co_f=NTFiZjBmMTQtOTk0My00ZDdlLWE5YjctN2JiNjZiY2Q5Zjgx~

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- Wellbeing Toronto – Economics:

- < https://ckan0.cf.opendata.inter.prod-toronto.ca/download_resource/78cf2678-8cd9-442b-a8e7-ed9ae6e82e01#xd_co_f=NTFiZjBmMTQtOTk0My00ZDdlLWE5YjctN2JiNjZiY2Q5Zjgx~>
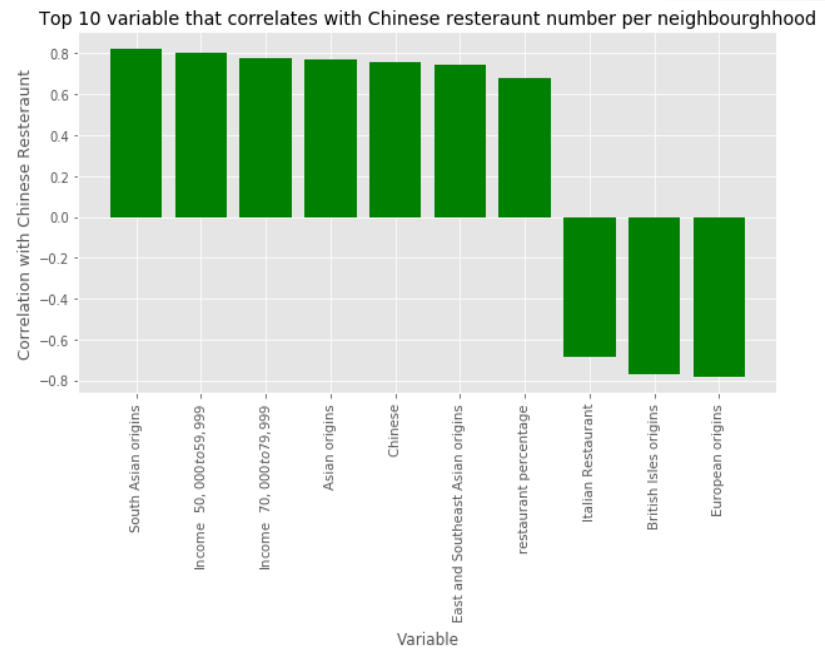
Results and Discussion

Restaurant per neighborhood is correlated with total venue count, economic factors such as local employment and certain income ranges

Top 10 variables that correlate with resteraunt number per neighbourhood

Results and Discussion

Number of Chinese restaurant per neighborhood is strongly positively correlated with Asian ethnic origins, middle class income ranges and negatively correlated with European origins and Italian restaurant

Top 10 variable that correlates with Chinese resteraunt number per neighbourghhood
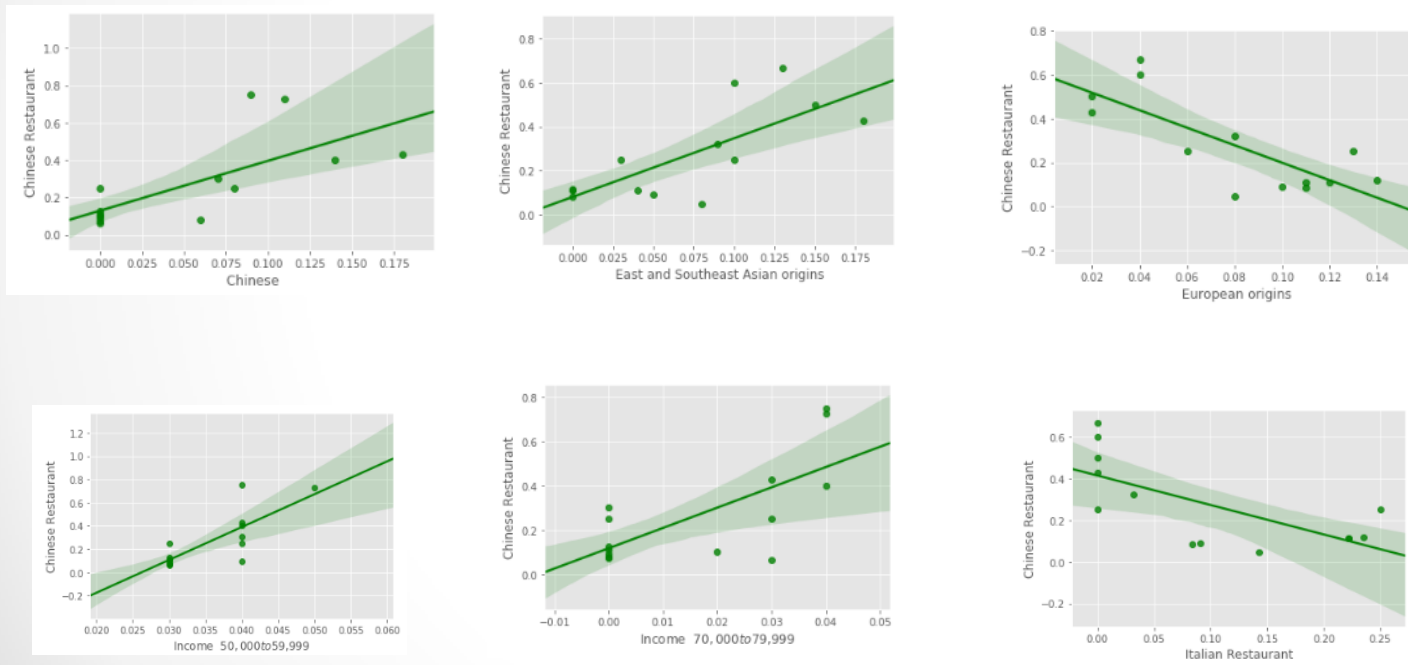
Results and Discussion

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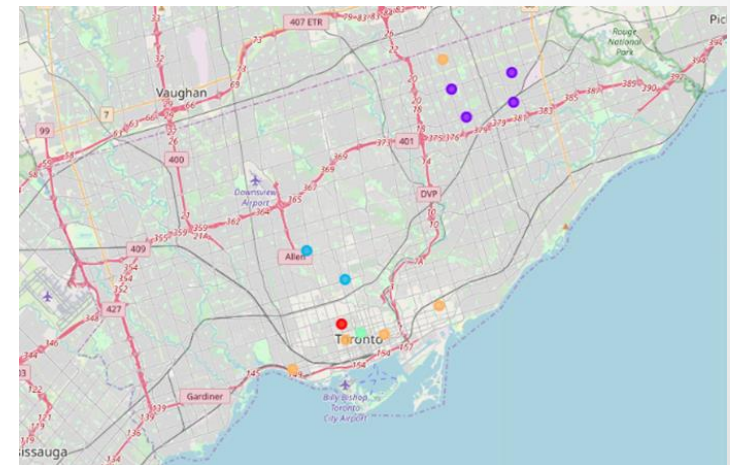
Results and Discussion

K mean clustering

cluster	Chinese Restaurant	South Asian origins	Asian origins	Chinese	East and Southeast Asian origins	Italian Restaurant	restaurant percentage	Income $60,000 to $69,999	Income $70,000 to $79,999	Income $80,000 to $89,999	Income $200,000 and over	total venue count	Home Prices
1	0.50416667	0.04	0.1725	0.105	0.12	0.0625	0.435	0.04	0.0375	0.0225	0	16.25	368649.5
4	0.20730112	0.004	0.1	0.05	0.064	0.085744542	0.378	0.026	0.006	0.012	0.014	42.6	473435
2	0.18382353	0	0.025	0	0.015	0.117647059	0.275	0.03	0.03	0	0.09	36	976652
0	0.11111111	0	0.06	0	0.04	0.222222222	0.22	0.03	0	0	0.05	40	773920
3	0.04761905	0	0.12	0.06	0.08	0.142857143	0.24	0.03	0	0	0.04	92	457787

Cluster 0: red;
Cluster 1: purple
Cluster 2: blue
Cluster 3: light green
Cluster 4: orange

Conclusion

- In this project, the distribution of Chinese restaurants and correlation with social factors in the city of Toronto was studied. Chinese restaurant is shown to be top 3 popular ethnic cuisines in the city. Correlation analysis suggests that Chinese restaurant is strongly associated with Asian ethnic origins, people with income range representative of the middle class.

- Finally K mean clustering method was used to take all the features such as ethnicity, purchasing ability, housing price, competiveness within or between each restaurant categories etc. into consideration and cluster the neighborhoods with Chinese restaurant. Therefore it can be used as guidance for choosing right location for new Chinese restaurant and fit specific business needs.