




The Battle of Neighborhoods

Location for new Chinese Restaurant in city of Toronto



Toronto and the search for successful new Chinese restaurant location

- Toronto, the capital of the province of Ontario, is the largest city of Canada with population over 2,826,498, and it is one of the most multicultural cities in the world, with immigrants bringing in their traditions, languages and especially their food culture into the city.
- Food service industry is one of the very important and yet competitive industries in Toronto to serve this highly populated and diversified city. And finding of the best places for opening up new restaurants in Toronto are particularly important for restaurant investors to minimize their risk when entering into the restaurant food service sector.
- Due to Toronto's historical immigration reasons and multicultural nature, different ethnic groups would have established their own ethnic community areas and preferred activity neighborhoods; this might affect new restaurants' success and might add risks for the investors if restaurant location to their target restaurant clients are not matching properly.
- We would like to use the tools of Data Science to find the best possible successful location for a new restaurant for a new Chinese restaurant



Data acquisition and cleaning

- **1) Pseudo-Household Demographic Distribution data from the Government of Canada Open Government site**
(i.e. <https://open.canada.ca/data/en/dataset/b3a1d603-19ca-466c-ae95-b5185e56addf>)
- **2) FourSquare API data** - to get existing restaurant ethnic style information in Toronto.
- **3) Geocoder OpenStreetMap Nominatim database** - to handle geometric data lookup on getting the actual physical proposed restaurant locations.
- **4) Outside of Toronto data are dropped.**



Methodology

- 1. Descriptive statistics:

Univariate statistics** (i.e. mean, minimum, maximum and standard deviation)
Feature Engineering:

- 2. Feature Engineering:

Domain knowledge of restaurant operation

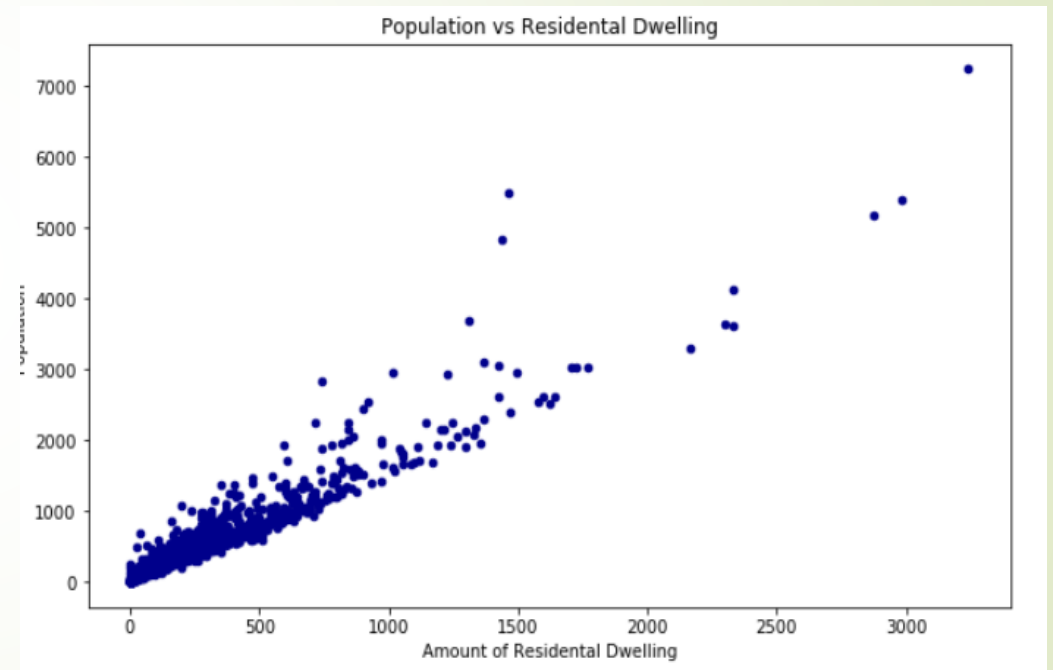
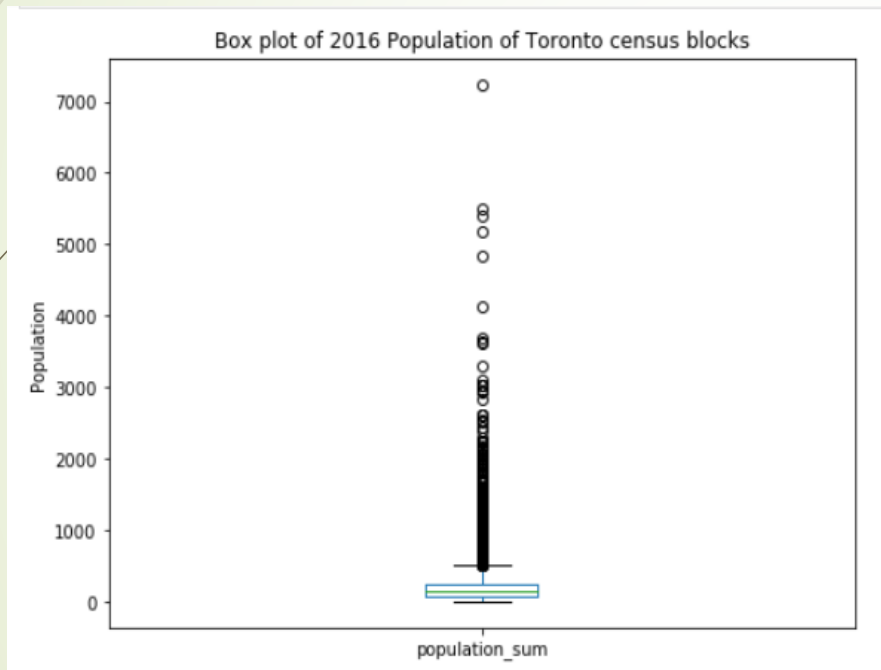
Understanding of data sources from descriptive statistics analysis

create features that make the machine learning algorithms work

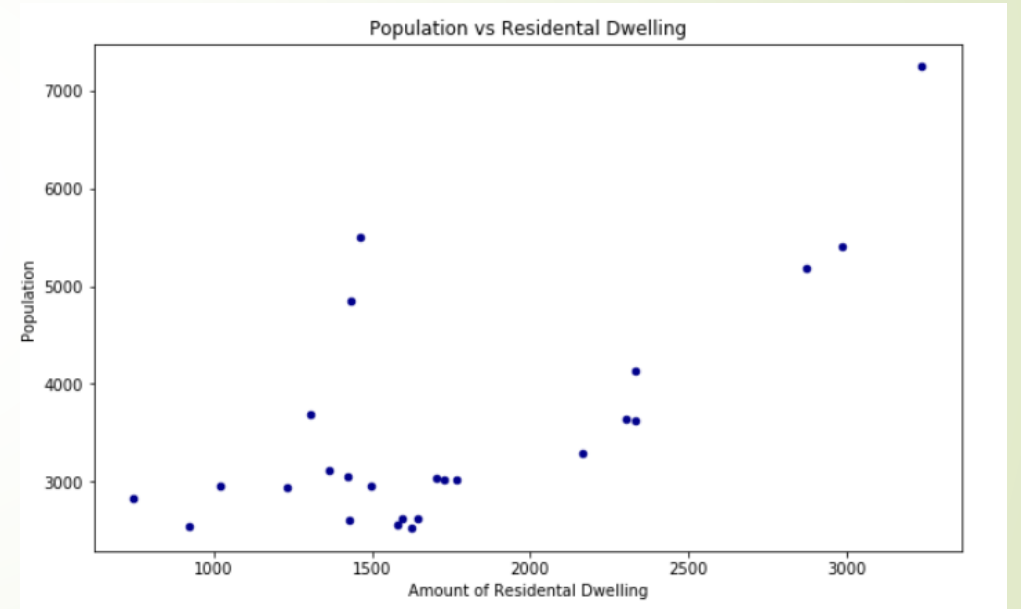
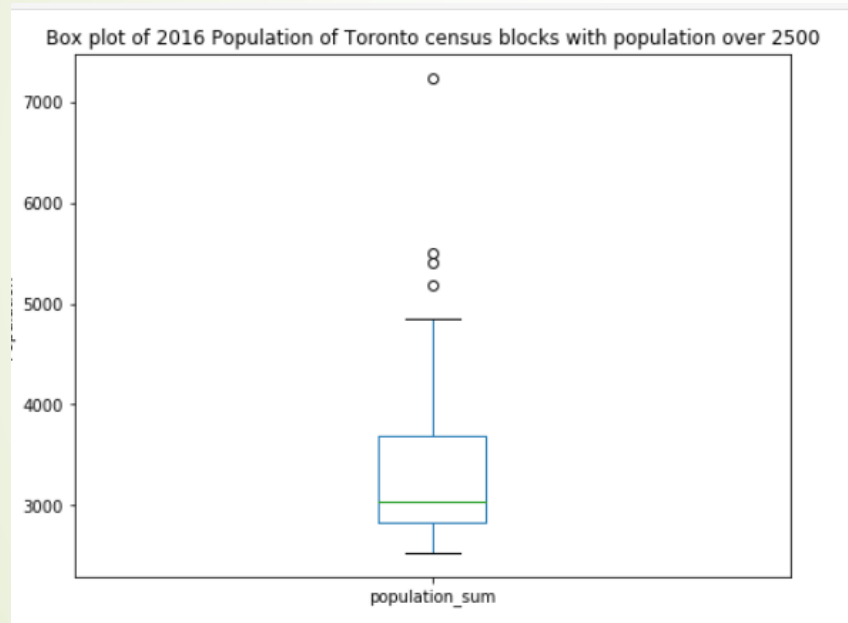
- 3. Model Evaluation: K-MEANS clustering

- 4. Data Visualization: Folium Map, Histogram

Toronto's population distribution is not even.
Focus would be on higher populated areas.



Focus on location areas with population greater than 2500



Location candidates of the 25 most populated blocks in Toronto




Data from Foursquare on various Oriental style restaurants (similar to Chinese)

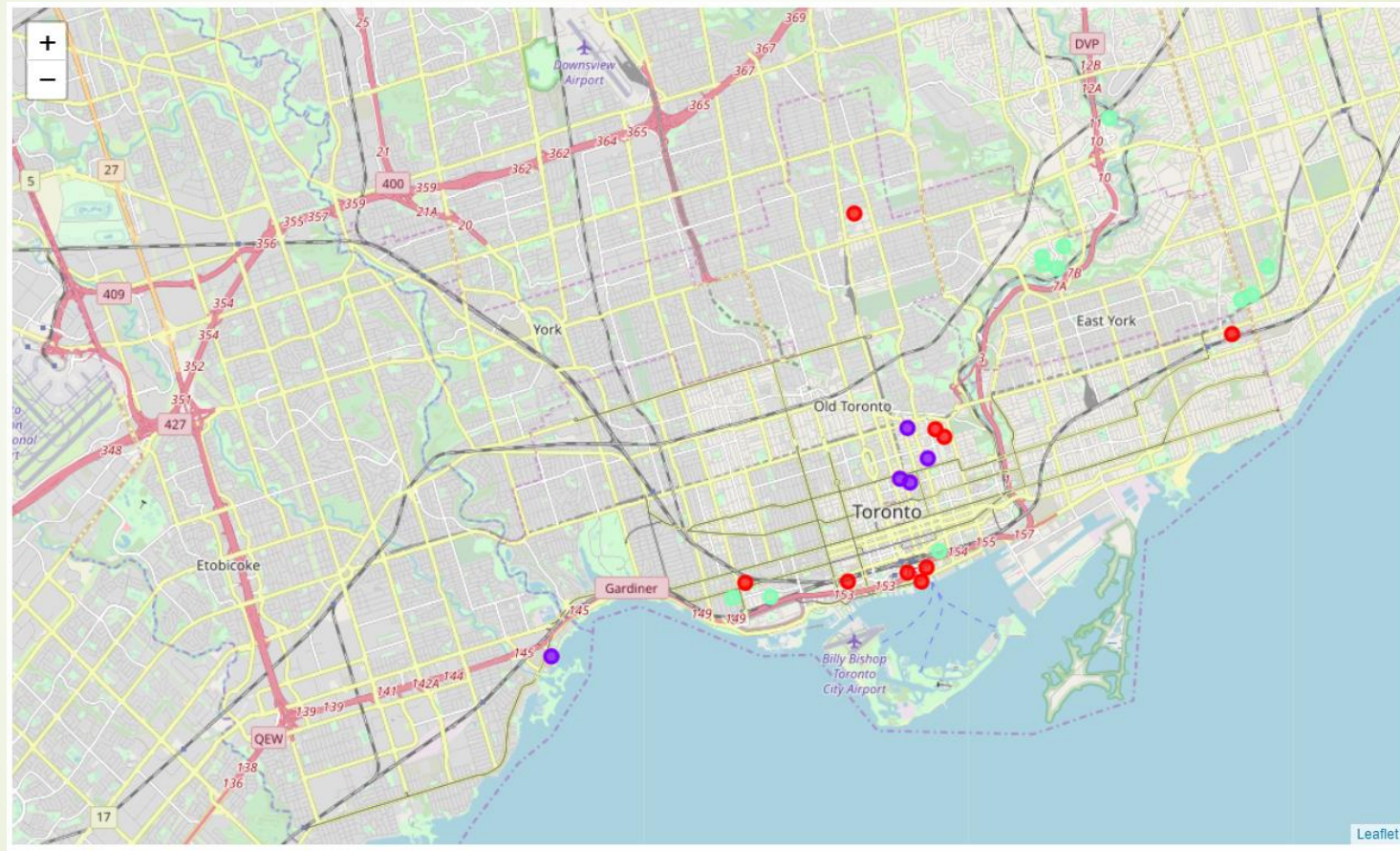
	Neighborhood	Style Oriental Chinese	Style Oriental Japanese	Style Oriental Korean	Style Oriental Thai	Style Oriental Vietnamese
0	35203520005	0.000000	0.000000	0.000000	0.000000	0.000000
1	35204004002	0.000000	0.089552	0.000000	0.014925	0.014925
2	35204024001	0.000000	0.000000	0.000000	0.000000	0.000000
3	35204049014	0.000000	0.000000	0.000000	0.000000	0.000000
4	35204072006	0.000000	0.000000	0.000000	0.000000	0.000000
5	35204073006	0.000000	0.000000	0.000000	0.000000	0.000000
6	35204074001	0.000000	0.000000	0.000000	0.000000	0.000000
7	35204367001	0.000000	0.000000	0.000000	0.000000	0.000000
8	35204371001	0.000000	0.000000	0.000000	0.000000	0.000000
9	35204380001	0.000000	0.027027	0.000000	0.000000	0.027027
10	35204464001	0.032258	0.032258	0.000000	0.000000	0.000000



K-Means clustering into three clusters

- Cluster 0 : Neighborhood with ****MEDIUM**** interest in Oriental style food in general.
 - Cluster 1: Neighborhood with ****HIGH**** interest in Oriental style food with not as much existing Chinese Oriental style restaurant.
 - Cluster 2: Neighborhood with ****LOW**** interest to Oriental Food.
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K-Means clusters – Toronto Map



Cluster 1, the Highest preference to Oriental Food – Five recommended locations for new Chinese restaurant

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Addresses of recommended locations for new Chinese Restaurant:

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Census Block: 35204606002

Geo Coordinate: 43.660529, -79.383812

Address : College Park, Underground walkway, Discovery District, University-Rosedale, Old Toronto, Toronto, Ontario, M5G 2C8, Canada

Census Block: 35204676002

Geo Coordinate: 43.625756, -79.478291

Address : Annie Craig Drive, Mimico By-The-Lake, Etobicoke-Lakeshore, Etobicoke, Toronto, Golden Horseshoe, Ontario, M8V 4C5, Canada

Census Block: 35204004002

Geo Coordinate: 43.664486, -79.376103

Address : 437, Jarvis Street, Church-Wellesley Village, Toronto Centre, Old Toronto, Toronto, Ontario, M4Y 2G6, Canada

Census Block: 35204588001

Geo Coordinate: 43.659753, -79.381041

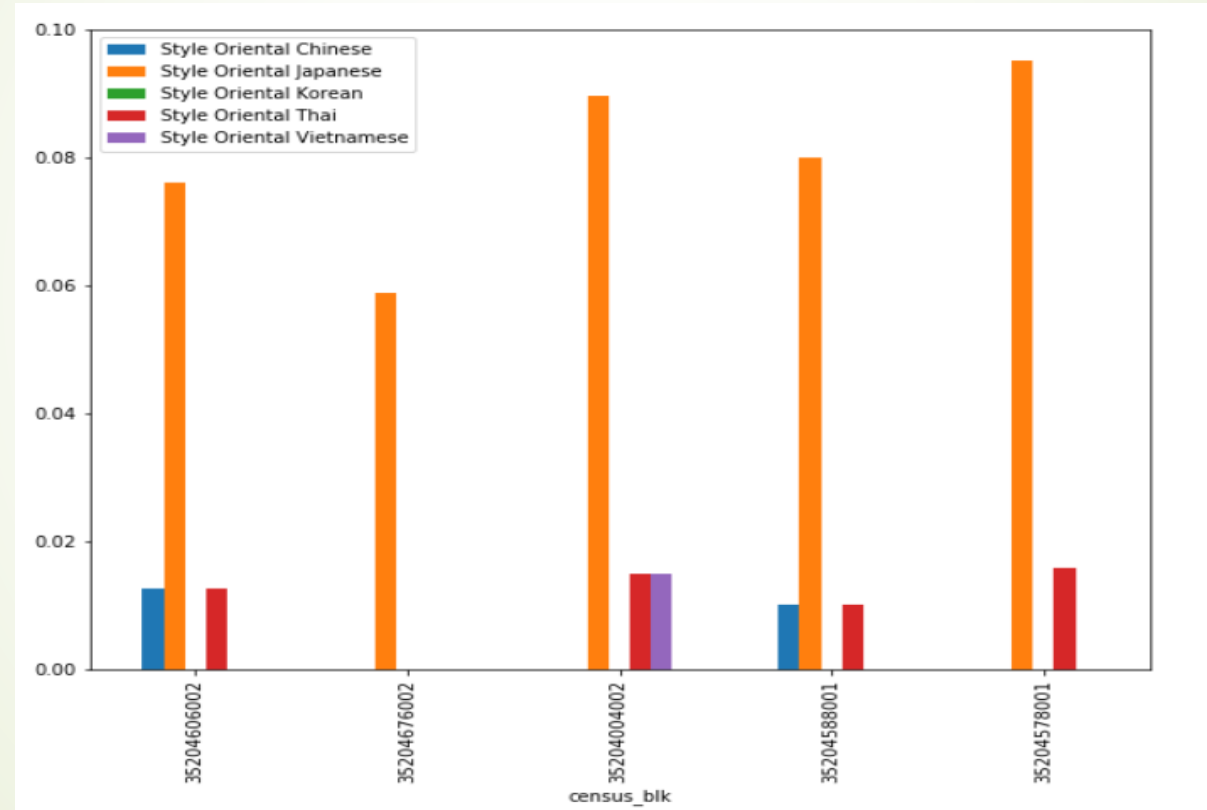
Address : Ronald McDonald House, 26, Gerrard Street East, Downtown Yonge, Toronto Centre, Old Toronto, Toronto, Ontario, M5B 1G7, Canada

Census Block: 35204578001

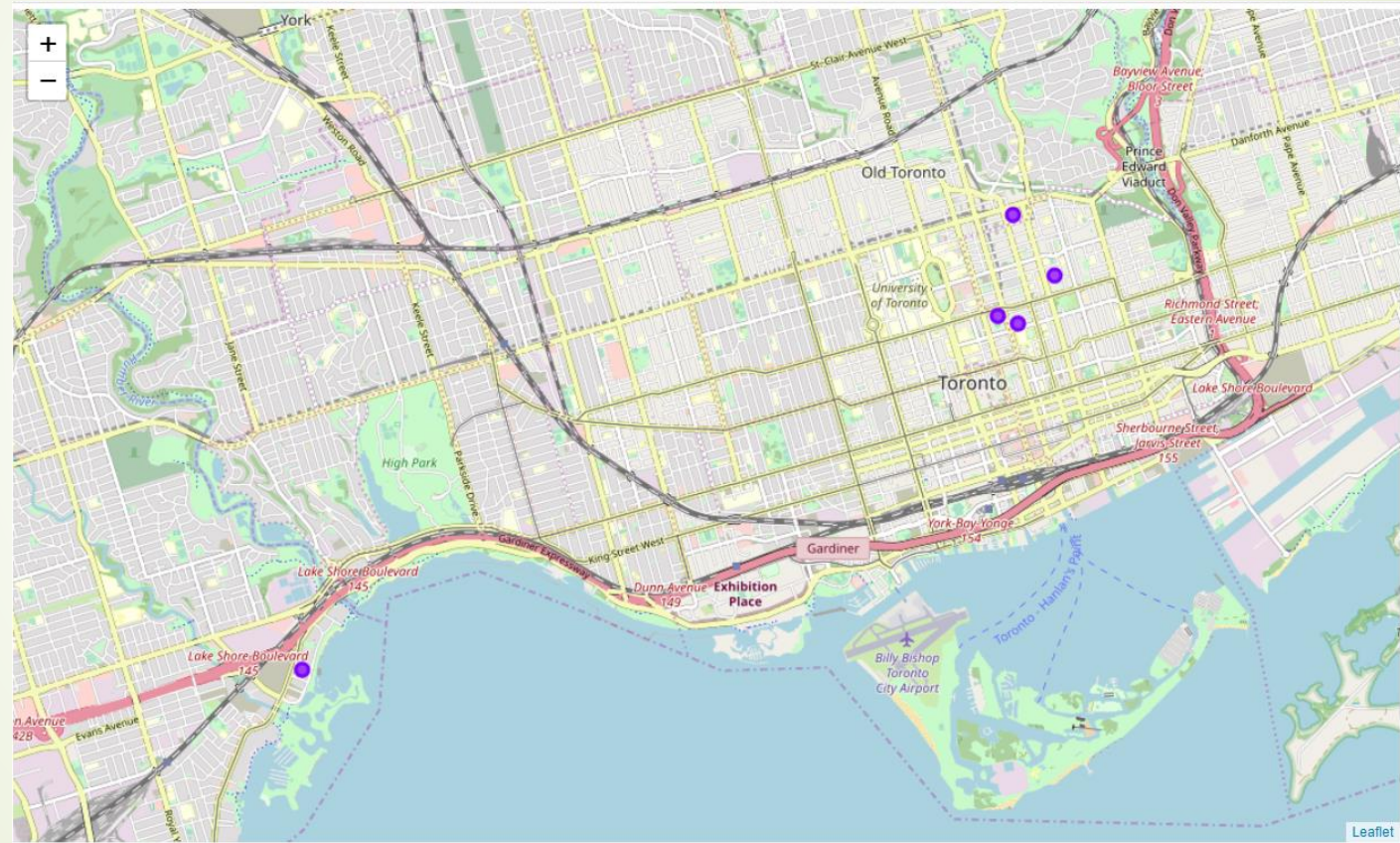
Geo Coordinate: 43.670429999999996, -79.381745999999999

Address : Bloorwalk, Hayden Street, University-Rosedale, Old Toronto, Toronto, Ontario, M4Y 3G2, Canada

Five recommended locations' existing Oriental Food preference



Five final Chinese Restaurant location candidates in map





Conclusion and Next Steps



- ▶ Purpose of this project is to utilize Foursquare location and venue data, together with Government of Canada census population data, to aid stakeholder in finding recommended location candidates for new Chinese restaurant using various Data Science methodology and model.
- ▶ Five recommended location candidates had been identified with their high population and strong existing preference trend to Oriental food style similar to Oriental Chinese food.
- ▶ Recommend to use these five recommended location candidates as starting point for final exploration by stakeholders through actual site visit, and may want to consider further analysis on real estate availability, rental cost, parking facilities etc to further fine tuning on the final decision to optimize the success of the new Chinese restaurant startup.