

Open Asian Food Restaurant in Toronto

Introduction:

Many people love Asian food or try to taste it, so if someone decide to open Asian food restaurant then he must put in his consideration the location where he could open it because the location is one of the most important business decisions. So this project provide a suggestion of the best locations for open a new restaurant that provide an Asian food in Toronto to everyone wants to open an Asian food restaurant in Toronto.

Business problem:

The objective of this project is to analyze and find the best location that is to be suitable for Asian food restaurant in Toronto, using data science concepts and machine learning methods , and this project aims to answer the question that: Where is the best place to open a new Asian food restaurant in Toronto ?

Target audience:

This project is useful for everyone wants to invest on opening a restaurant that provide Asian food in Toronto.

Data:

- To solve this problem, we need this data:
 1. List of neighborhoods in Toronto, Canada.
 2. Latitude and longitude of those neighborhoods.
 3. venue data related to Asian restaurant.
- Source of data:
 1. Toronto neighborhoods via Wikipedia.
 2. Latitude and longitude of neighborhoods using geocoder package.
 3. venue data related to those neighborhoods using Foursquare API.

Methodology:

The **first** step is to scrape Toronto Data from Wikipedia and put it in dataset using pandas, then clean the dataset to be suitable for using in analysis by removing null and Boroughs that are not assigned, then add the geospatial coordinates that contain the latitude and Longitude to the dataset and create the map of Toronto using latitude and longitude values.

Second filter borough names that contain the word Toronto and create a new dataframe with only boroughs that contain the word Toronto from the previous dataframe and create a map of Toronto using this dataframe.

Third define Foursquare Credentials and Version and get the top 200 venues that are within a radius of 2000 meters and convert the venues list into a new dataframe and find out how many unique categories can be curated from all the returned venues in order to Analyze Each Area.

Fourth create the new dataframe and display the top 10 venues for each Postalcode and Calculate the total number of restaurants in each region and create dataframe that calculate the sum of all restaurants in the Neighborhoods the the number of the Asian restaurant in the same Neighborhoods , then combine the two dataframes in final dataframe that will be use in clustering.

Finally cluster the area using 5 clusters and create map that visualize the resulting clusters and examine the cluster to determine the best place to build an Asian restaurant base on other restaurants and Asian restaurants locations.

Results:

As shown bellow the map and the analysis fined that cluster 5(label4) is the best choice of allocation to open Asian restaurant

Data from neighborhood belongs to cluster 1:

[58]:

	Borough	Cluster Labels	Total Restaurants	Asian Restaurants
10	Downtown Toronto	0	30	0
18	Downtown Toronto	0	29	0
36	West Toronto	0	30	0
3	East Toronto	0	28	1
4	Central Toronto	0	29	2
17	Downtown Toronto	0	28	0
24	Central Toronto	0	31	0
25	Downtown Toronto	0	29	0
13	Downtown Toronto	0	29	0
35	West Toronto	0	29	1
12	Downtown Toronto	0	31	0
34	West Toronto	0	29	0

Data from neighborhood belongs to cluster 2:

[59]:

	Borough	Cluster Labels	Total Restaurants	Asian Restaurants
22	Central Toronto	1	45	0
8	Central Toronto	1	41	0
7	Central Toronto	1	46	1
6	Central Toronto	1	45	1
5	Central Toronto	1	43	1
1	East Toronto	1	41	2
23	Central Toronto	1	45	0

Data from neighborhood belongs to cluster 3:

[60]:

	Borough	Cluster Labels	Total Restaurants	Asian Restaurants
31	West Toronto	2	25	0
19	Downtown Toronto	2	27	0
29	Downtown Toronto	2	26	0
20	Downtown Toronto	2	24	0
37	Downtown Toronto	2	24	0
15	Downtown Toronto	2	25	0
21	Downtown Toronto	2	25	0

Data from neighborhood belongs to cluster 4:

[61]:

	Borough	Cluster Labels	Total Restaurants	Asian Restaurants
32	West Toronto	3	36	3
30	Downtown Toronto	3	35	1
33	West Toronto	3	35	3
0	East Toronto	3	34	1
26	Downtown Toronto	3	34	1
14	Downtown Toronto	3	34	0
11	Downtown Toronto	3	33	1
9	Central Toronto	3	39	0
2	East Toronto	3	36	1
38	East Toronto	3	39	1

Data from neighborhood belongs to cluster 5:

[62]:

	Borough	Cluster Labels	Total Restaurants	Asian Restaurants
27	Downtown Toronto	4	17	0
16	Downtown Toronto	4	19	0
28	Downtown Toronto	4	18	0

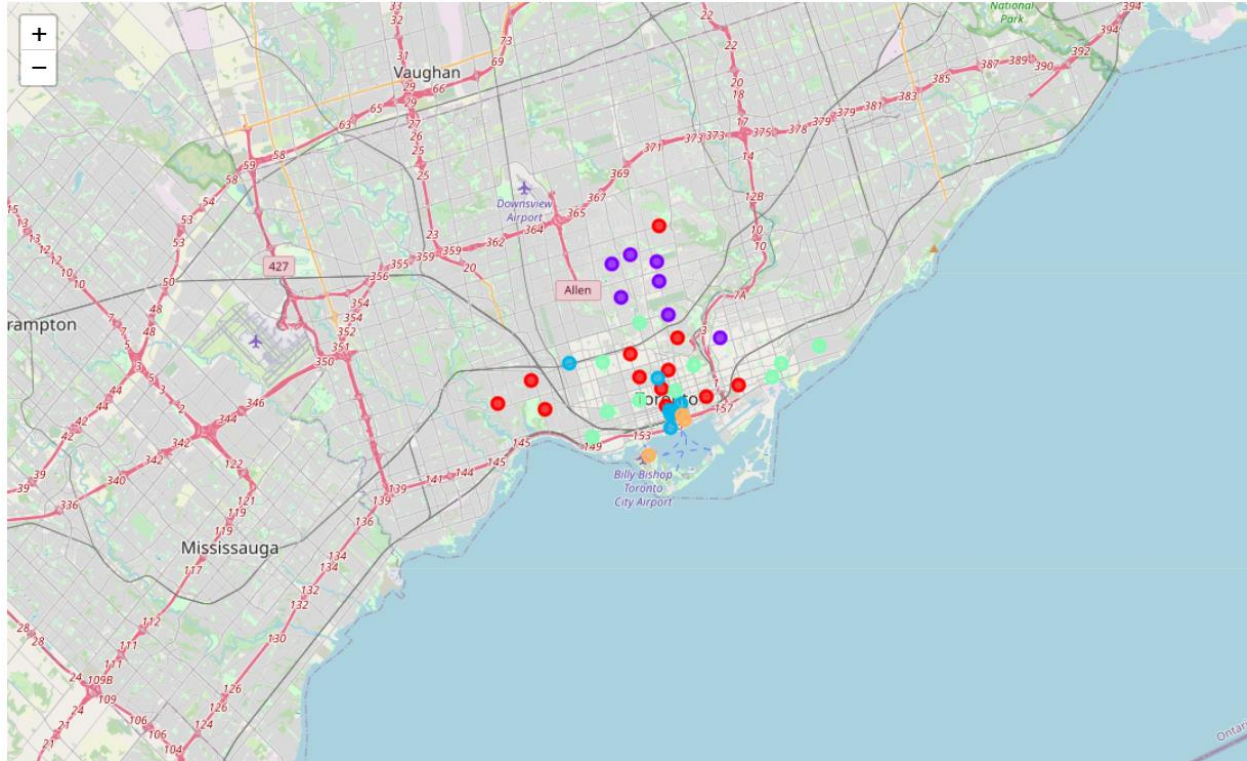
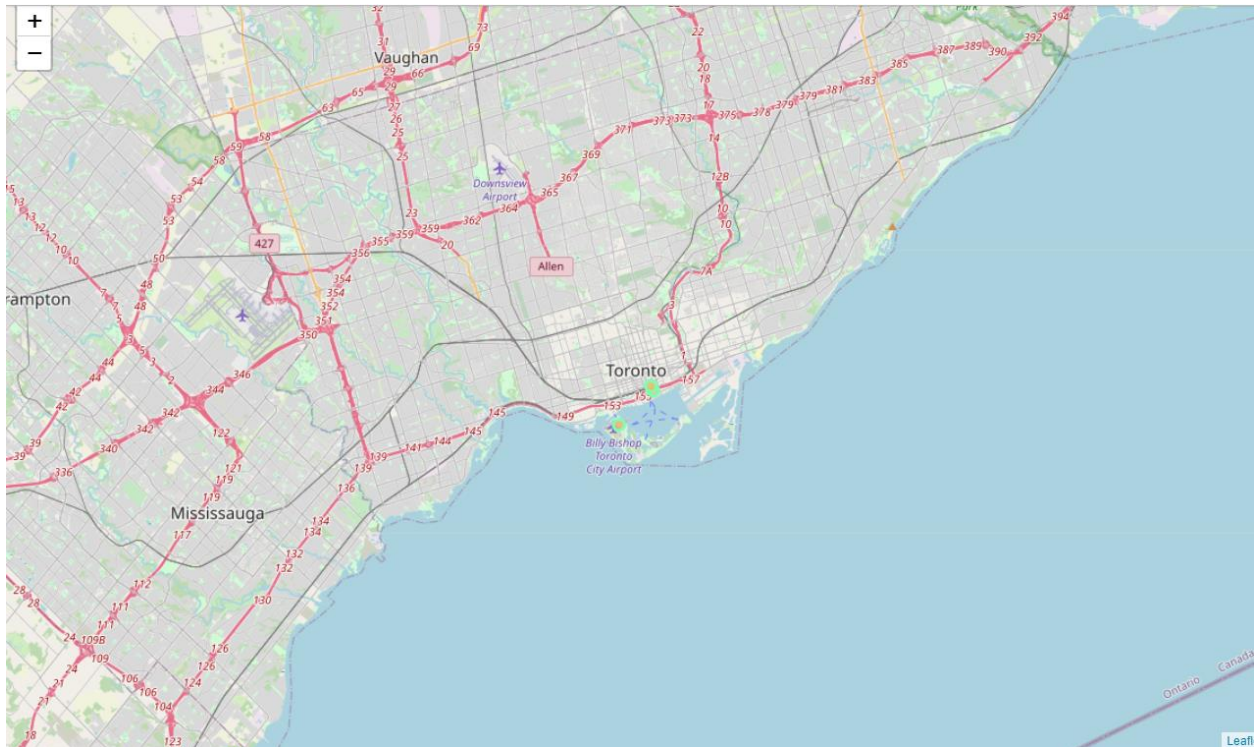


Figure 3: Result of the clustering algorithm. Cluster 0 = Red Cluster 1 = Purple Cluster 2 = Blue Cluster 3 = Turquoise Cluster 4 = Orange

Discussion:

The above result of clustering determined that the neighborhoods corresponding to cluster 5(label 4) the best choice for opening Asian restaurant base on distribution of other restaurants, the map below show the map of Toronto with the neighborhoods in cluster 5:



Limitation and future works:

This search is just based on other restaurants and Asian restaurants location, with some limitation that I couldn't gain the population data of Toronto, so future works could base on the population of each area specially people who love Asian food and where they lives.

Conclusion:

Invest in new business like open a restaurant is a sensitive decision and the determine its location is one of the most important thing in this business decisions, so it's important to do some research to choice the location where can you open a restaurant in order to guarantee the success of the business.

References:

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