

Project for Coursera course Applied Data Science Capstone (The Battle of Neighborhoods)

Introduction

Most important thing for establishing a great restaurant is choose true location. For choose true location you need to consider many parameters. First parameter is nearby restaurant to purpose society.

In this study we want to investigate about establishing a Filipino restaurant in a big city and my case study city is Toronto.

First group of my purpose society is Filipino and then other Asians, then I prefer to choose the locations of the restaurant nearby of this two groups.

Other important parameter is household income and we should choose a location that average of household income is enough four getting a food from restaurants.

Data

To answer this question, following data will be used:

- Population and Ethnic of each neighborhood (Toronto Census: <https://open.toronto.ca/dataset/neighbourhood-profiles/>)
- List of Toronto neighborhood (Wikipedia :https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)
- Household income of each neighborhood (Toronto Census: <https://open.toronto.ca/>)
- Toronto geospatial data (https://cocl.us/Geospatial_data)
- Number of Chinese restaurant (Foursquare API) – Google

Methodology

First all data such as neighborhood, postal code, Filipino population, income and, latitude, longitude ... combined. The statistical data are plot on Toronto map, which can give an initial impression of areas having highest Chinese population, and highest average income. Foursquare API was used to find the restaurant count.

K-Mean clustering algorithms are used to analyses a Filipino Population, restaurant count and people with Asian origin as the purpose society.

The result help for find best place to run a new Filipino restaurant plan.

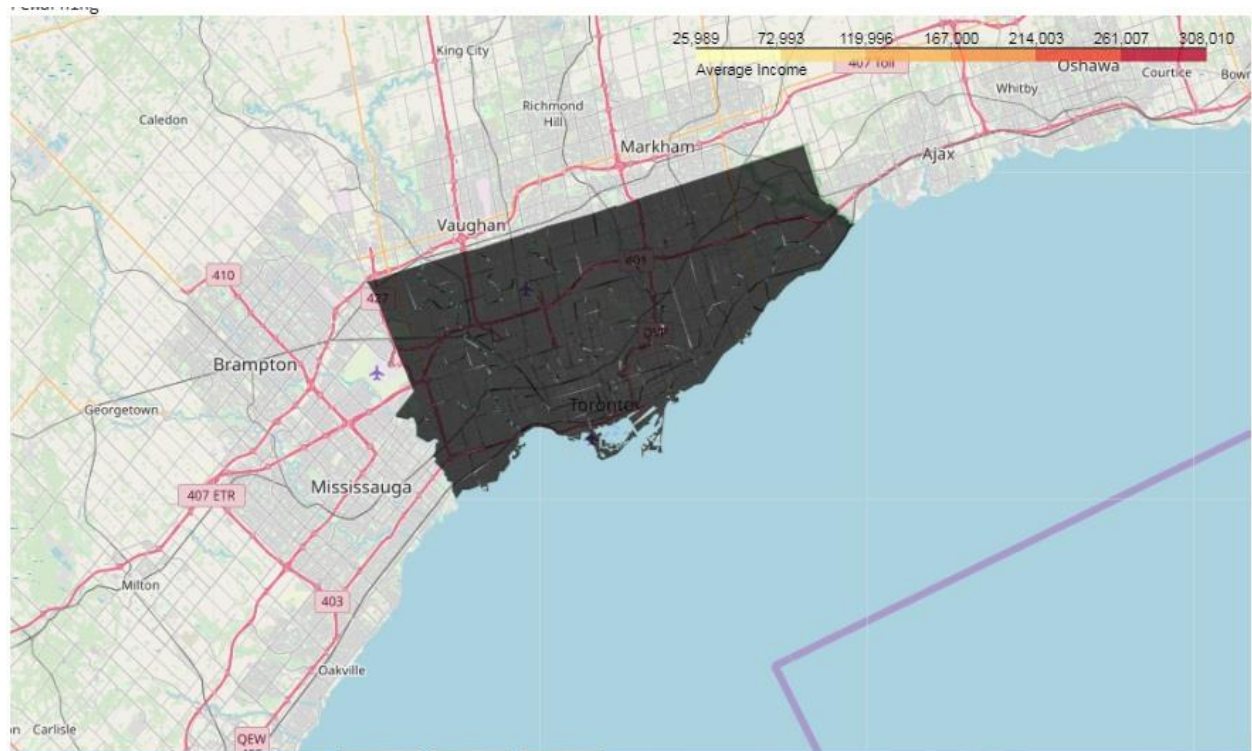
Tip: All source code will place on week2.

You can see some of results in below:

Statistics data about Filipino population and average income of each neighbourhood

index	Neighbourhood	Neighbourhood Number	Asian origins	Filipino	Total income: Average amount (\$)
16	Bridle Path-Sunnybrook-York Mills	41.0	3005.0	75.0	308010.0
104	Rosedale-Moore Park	98.0	3485.0	220.0	207903.0
44	Forest Hill South	101.0	1880.0	405.0	204521.0
69	Lawrence Park South	103.0	2510.0	285.0	169203.0
21	Casa Loma	96.0	1480.0	90.0	165047.0

Map of each neighborhood's average income.



Find corresponding postcode of each neighbourhood from wikipedia table.

index	Neighbourhood	Neighbourhood Number	Asian origins	Filipino	Total income: Average amount (\$)	Postcode
73	Malvern	132.0	28455.0	5095.0	29573.0	M1B
33	Downsview Roding CFB	26.0	11365.0	4790.0	34168.0	M3H
86	Newtonbrook West	36.0	14075.0	4475.0	34904.0	M2M
105	Rouge	131.0	28705.0	4365.0	39556.0	M1B
132	Woburn	137.0	32850.0	4345.0	30878.0	M1G
39	Englemount Lawrence	32.0	6685.0	4090.0	48134.0	M6A
31	Dorset Park	126.0	15965.0	3660.0	31692.0	M1P
24	Clairlea Birchmount	120.0	12705.0	3250.0	36232.0	M1K
11	Bendale	127.0	17890.0	3045.0	33256.0	M1P
61	Kennedy Park	124.0	9150.0	2750.0	30974.0	M1K

Combine statistics data and geospatial data

	Postcode	Borough	Neighbourhood	Latitude	Longitude	Asian origins	Filipino	Total income: Average amount (\$)
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353	57160.0	9460.0	34564.500000
5	M1K	Scarborough	East Birchmount Park, Ionview, Kennedy Park	43.727929	-79.262029	29645.0	8535.0	32863.000000
23	M3H	North York	Bathurst Manor, Downsview North, Wilson Heights	43.754328	-79.442259	16555.0	6820.0	40052.000000
8	M1P	Scarborough	Dorset Park, Scarborough Town Centre, Wexford ...	43.757410	-79.273304	33855.0	6705.0	32474.000000
11	M1V	Scarborough	Agincourt North, L'Amoreaux East, Milliken, St...	43.815252	-79.284577	107920.0	6030.0	33871.400000
17	M2M	North York	Newtonbrook, Willowdale	43.789053	-79.408493	62290.0	6000.0	41814.000000
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711	21485.0	5015.0	39605.666667
3	M1G	Scarborough	Woburn	43.770992	-79.216917	32850.0	4345.0	30878.000000
40	M6A	North York	Lawrence Heights, Lawrence Manor	43.718518	-79.464763	6685.0	4090.0	48134.000000
14	M2J	North York	Fairview, Henry Farm, Oriole	43.778517	-79.346556	28930.0	3625.0	36869.000000

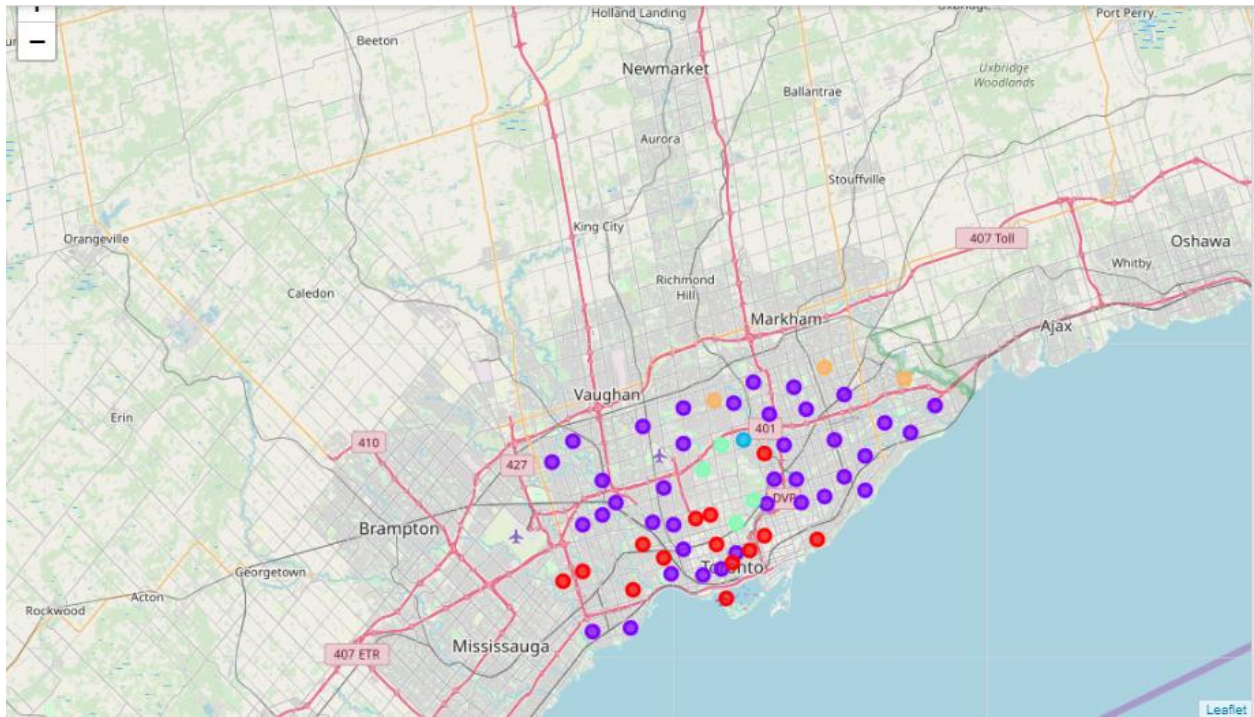
Full table of Toronto Neighbourhood with Postcode, statistics, and restaurant count

	Postcode	Borough	Neighbourhood	Latitude	Longitude	Asian origins	Filipino	Total income: Average amount (\$)	Filipino Restaurant Count
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353	57160.0	9460.0	34564.500000	2
1	M1K	Scarborough	East Birchmount Park, Ionview, Kennedy Park	43.727929	-79.262029	29645.0	8535.0	32863.000000	12
2	M3H	North York	Bathurst Manor, Downsview North, Wilson Heights	43.754328	-79.442259	16555.0	6820.0	40052.000000	11
3	M1P	Scarborough	Dorset Park, Scarborough Town Centre, Wexford ...	43.757410	-79.273304	33855.0	6705.0	32474.000000	16
4	M1V	Scarborough	Agincourt North, L'Amoreaux East, Milliken, St...	43.815252	-79.284577	107920.0	6030.0	33871.400000	84
5	M2M	North York	Newtonbrook, Willowdale	43.789053	-79.408493	62290.0	6000.0	41814.000000	19
6	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711	21485.0	5015.0	39605.666667	3
7	M1G	Scarborough	Woburn	43.770992	-79.216917	32850.0	4345.0	30878.000000	8
8	M6A	North York	Lawrence Heights, Lawrence Manor	43.718518	-79.464763	6685.0	4090.0	48134.000000	8
9	M2J	North York	Fairview, Henry Farm, Oriole	43.778517	-79.346556	28930.0	3625.0	36869.000000	28

Toronto Neighborhood with cluster labels.

	Cluster Labels	Postcode	Borough	Neighbourhood	Latitude	Longitude	Asian origins	Filipino	Total income: Average amount (\$)	Filipino Restaurant Count
10	4	M5P	Central Toronto	Forest Hill North, Forest Hill West	43.696948	-79.411307	28080.0	3330.0	77849.500000	12
12	4	M9B	Etobicoke	Cloverdale, Islington, Martin Grove, Princess ...	43.650943	-79.554724	17550.0	2495.0	66281.333333	5
17	4	M4K	East Toronto	The Danforth West, Riverdale	43.679557	-79.352188	20830.0	1765.0	61487.200000	24
22	4	M6C	York	Humewood-Cedarvale	43.693781	-79.428191	3020.0	1540.0	65274.000000	10
26	4	M3B	North York	Don Mills North	43.745906	-79.352188	12025.0	1280.0	67757.000000	9
34	4	M5V	Downtown Toronto	CN Tower, Bathurst Quay, Island airport, Harbo...	43.628947	-79.394420	8255.0	850.0	70623.000000	87
39	4	M8Y	Etobicoke	Humber Bay, King's Mill Park, Kingsway Park So...	43.636258	-79.498509	3845.0	545.0	64140.000000	6
41	4	M4X	Downtown Toronto	Cabbagetown, St. James Town	43.667967	-79.367675	2440.0	510.0	63012.000000	100
43	4	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383	15040.0	455.0	56526.000000	100
46	4	M5R	Central Toronto	The Annex, North Midtown, Yorkville	43.672710	-79.405678	6485.0	435.0	112766.000000	100
49	4	M6P	West Toronto	High Park, The Junction South	43.661608	-79.464763	3400.0	345.0	71204.000000	7
52	4	M4E	East Toronto	The Beaches	43.676357	-79.293031	2680.0	240.0	92580.000000	9
56	4	M6N	York	The Junction North, Runnymede	43.673185	-79.487262	1350.0	170.0	71888.000000	3
58	4	M9C	Etobicoke	Bloordale Gardens, Eringate, Markland Wood, Ol...	43.643515	-79.577201	1220.0	115.0	62378.000000	6

Divide Toronto neighborhood to 5 clusters based on the population and income.



Neighborhoods good to open a new high-class Filipino restaurant.

