Exploring Chinese Restaurants in each neighborhood in Toronto and find a optimal community to start business

The intro to the business problem

- In this project we are going to find a location in Toronto to open a restaurant. This report will be targeted to stakeholders interested in opening an **Chinese restaurant** in **Toronto**, Canada.
- Since Toronto is a well-diversified city, you can find cuisines from all over the world. Toronto has handreds of thousands Chinese people. There are lots of authentic Chinese food in Greater Toronto Area. We are looking for locations where there are few Chinese food and locations near city centre
- We are going to use data science to observe neighborhoods that meet our criterias.We will deliver the advantages of each locations so the stakeholders can make best possible decisions

Our criteria is:

- where there are few Chinese food

- locations near city centre

Data acquisition

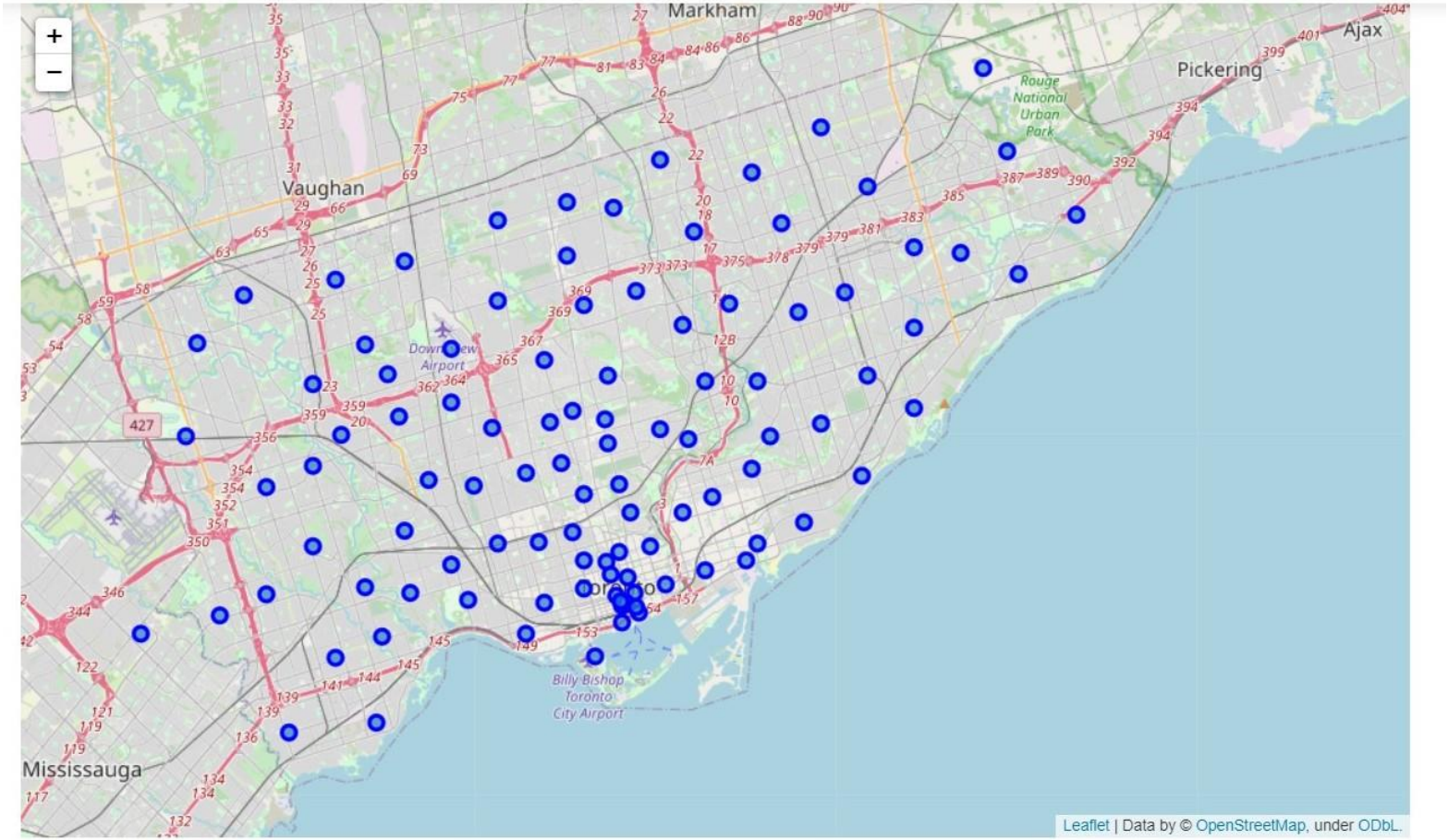
What information do we need?

- the number of restaurants in each neighborhood
- number of and distance to Chinese restaurants
- the distance from Chinese restaurants to the city centre

How we acquire these data:

Foursquare (Foursquare API) location data

Take a look of neighborhoods in Toronto on the map



Methodology

- Find out how many Chinese restaurants in each neighborhood and the distance of each neighborhood to Toronto city centre (Yonge-Dundas Square)
- Find out the distance of each restaurant to Toronto centre(Yonge-Dundas Square), grouped by neighborhood ,find the mean value of the distance to Toronto centre within each neighborhood

The partial result of the first method

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In [22]: grouped_rest_by_neigh[["Neighborhood","id","distance to neighborhood/KM"]]
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	Neighborhood	id	distance to neighborhood/KM
6	Toronto Dominion Centre, Design Exchange	49	1.045900
7	Garden District, Ryerson	47	0.827280
8	St. James Town	46	1.039831
9	Commerce Court, Victoria Hotel	46	0.971820
10	Willowdale, Willowdale East	45	18.867945
11	Agincourt	39	26.571952
12	Church and Wellesley	38	1.983309
13	Milliken, Agincourt North, Steeles East, L'Amo...	33	28.309320
14	Stn A PO Boxes	31	1.545560
15	Harbourfront East, Union Station, Toronto Islands	26	2.043592
16	Berczy Park	21	1.863131
17	The Annex, North Midtown, Yorkville	15	3.981595
18	Steeles West, L'Amoreaux West	13	24.554913
19	Clarks Corners, Tam O'Shanter, Sullivan	13	22.477924

we selected Berczy Park, The Annex, North Midtown, Yorkville and East Toronto, Harbourfront East, Union Station, Toronto Islands, Broadview North (Old East York)

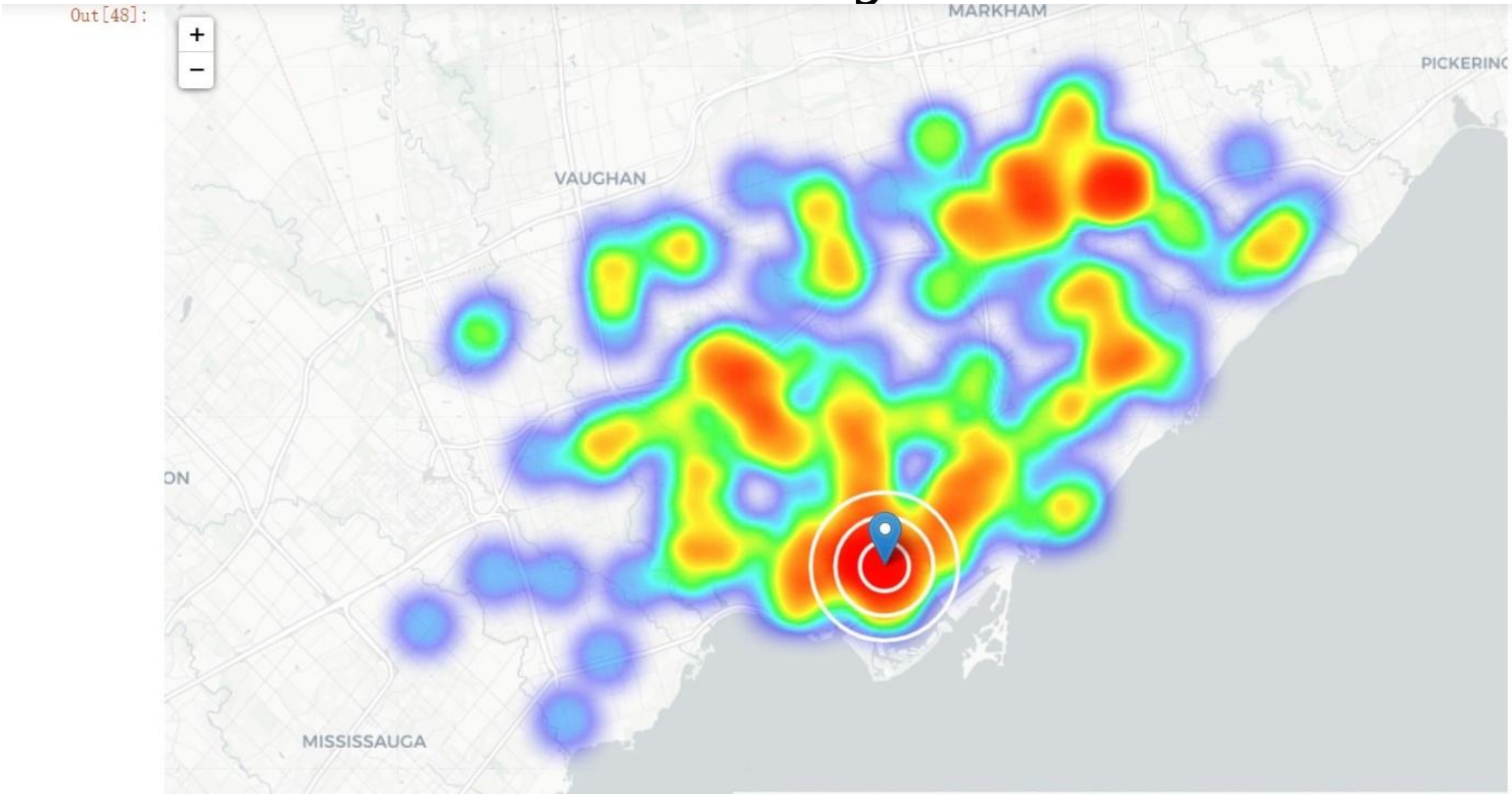
The partial result of the second method

Out[46]:

	Neighborhood	location.lat	location.lng	Latitude	Longitude	distance to Toronto centre/KM	num of Chinese restaurant
0	Garden District, Ryerson	43.655793	-79.382815	43.657162	-79.378937	0.891494	47
1	Commerce Court, Victoria Hotel	43.650770	-79.382495	43.648199	-79.379817	0.915078	46
2	St. James Town	43.653109	-79.380153	43.651494	-79.375418	0.931716	46
3	Richmond, Adelaide, King	43.653658	-79.387705	43.650571	-79.384568	0.968876	49
4	Toronto Dominion Centre, Design Exchange	43.651893	-79.386897	43.647177	-79.381576	1.036200	49
5	First Canadian Place, Underground city	43.651893	-79.386897	43.648429	-79.382280	1.036200	49
6	Stn A PO Boxes	43.649058	-79.379251	43.646435	-79.374846	1.184906	31
7	Berczy Park	43.647321	-79.379142	43.644771	-79.373306	1.212020	21
8	Central Bay Street	43.656292	-79.392754	43.657952	-79.387383	1.384786	50
9	Harbourfront East, Union Station, Toronto Islands	43.645527	-79.383315	43.640816	-79.381752	1.408815	26
10	Queen's Park, Ontario Provincial Government	43.658249	-79.391901	43.662302	-79.389494	1.505390	50
11	Kensington Market, Chinatown, Grange Park	43.654458	-79.396894	43.653206	-79.400049	1.594382	49

We selected Berczy Park, Harbourfront East, Union Station, Toronto Islands, Harbourfront,St.,Regent Park, Harbourfront, James Town, Cabbagetown,The Annex, North Midtown, Yorkville

Take a look of the density on a heat map



- We can see there are lots of in **downtown Toronto** and **North York Centre Station** (the centre of North York)

Ensemble the two methods by taking intersection

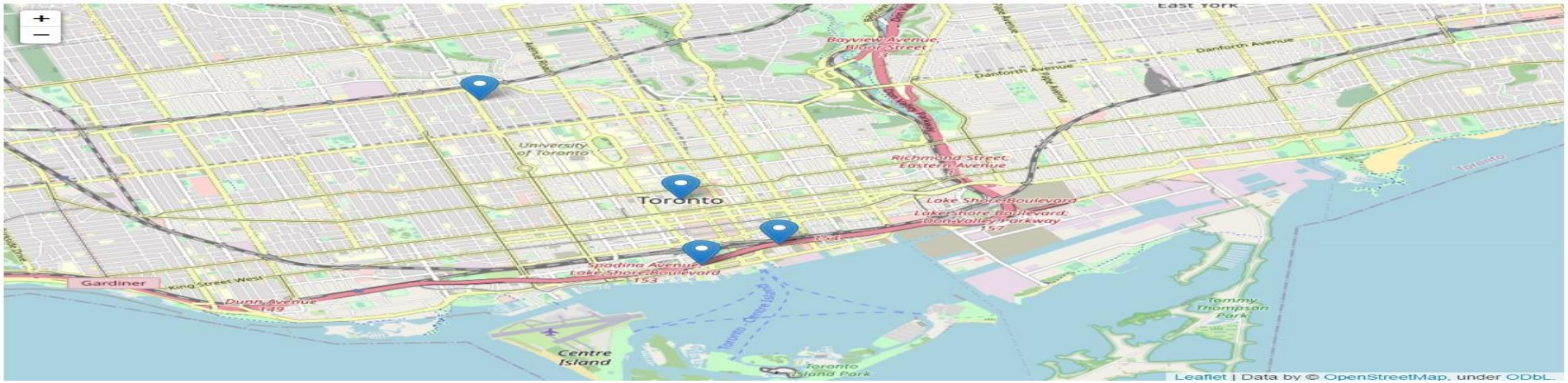
Berczy Park,(The Annex,North Midtown,Yorkville),(Harbourfront East,Union Station, Toronto Islands).

Narrow down the previous result

In [58]:
```
my_neighborhood=["Berczy Park","The Annex, North Midtown, Yorkville","Harbourfront East, Union Station, Toronto Islands"]
my_restaurant_df=pd.DataFrame(columns=grouped_2_neighborhood.columns)
for i in my_neighborhood:
    df=grouped_2_neighborhood[grouped_2_neighborhood["Neighborhood"]==i]
    my_restaurant_df=pd.concat([my_restaurant_df,df])
my_restaurant_df
```

Out[58]:

	Neighborhood	location.lat	location.lng	Latitude	Longitude	distance to Toronto centre/KM	num of Chinese restaurant
7	Berczy Park	43.647321	-79.379142	43.644771	-79.373306	1.212020	21
17	The Annex, North Midtown, Yorkville	43.666104	-79.401670	43.672710	-79.405678	2.969228	15
9	Harbourfront East, Union Station, Toronto Islands	43.645527	-79.383315	43.640816	-79.381752	1.408815	26



Final result

From the map as well as the data frame we observe that Harbourfront East, Union Station, Toronto Islands and Berczy Park neighborhoods have similar number of Chinese restuarants and similar distance to city centre but Berczy Park is much better because it is much near and the number is fewer than Harbourfront East, Union Station, Toronto Islands neighborhood. The Annex, North Midtown, Yorkville is much further (more than 2 times) but the it is less competitive.

conclusions

The purpose of this project is to find the best neighborhood to start business based on the number of Chinese restaurants nearby and the distance to city centre. By calculating the distance with two methods and the number of Chinese restaurants in the neighborhood and narrow down analysis, we choose The Annex,North Midtown,Yorkville neighborhood. But we have to take considerations of other factors such as rent, population densities and target customers whether it nears bus stations or subway stations.