DATA EXPLORATION

IBM'S CAPSTONE PROJECT

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Introduction

Where could be the ideal place for a restaurant to open in toronto? In this project I'm going to answer this question by using the postal code dataset obtained from 'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M', 'https://en.wikipedia.org/wiki/Demographics_of_Toronto_neighbourhoods' for the average income of the population and number of people there and information obtained from Foursquare API. To determine the answer for this question some assumpsions will be made, such as the average income, of which, if they are high, then a Luxorious restaurant is most likely to succeed.

The problem

Examining the possibilities can give us a better insight of how to proceed, after looking through the data obtained from Foursquare API we can use the folium library to visualize, for example, how distributed the restaurants are, and if you're looking to open one you'll be able to determine the best place for it. By the end, we'll be able to determine the best location for opening a luxorious and a simple restaurant.

The data

In this Project i'm going to use two tables from wikipedia and turn them into datasets.

The first ''https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M', is a list that contains 3 columns:

1. **Postcode;**
   A list that contain the postcode of every Borough in Toronto.
2. **Borough;**
   A list with every borough in Toronto.
3. **Neighborhood;**
   A list that contain all the neighborhoods of Toronto.

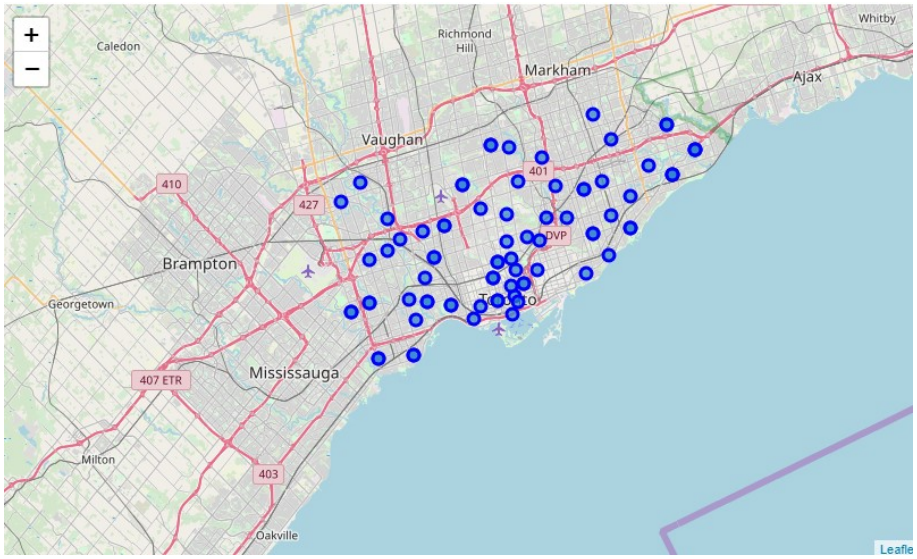
The second one 'https://en.wikipedia.org/wiki/Demographics_of_Toronto_neighbourhoods' contains some demographics of Toronto, but from this list i'm only using a few columns that are:

1. **Population;**
   Shows the number of people in each neighborhood.
2. **Average Income;**
   Determine the average income of the population of every neighborhood.

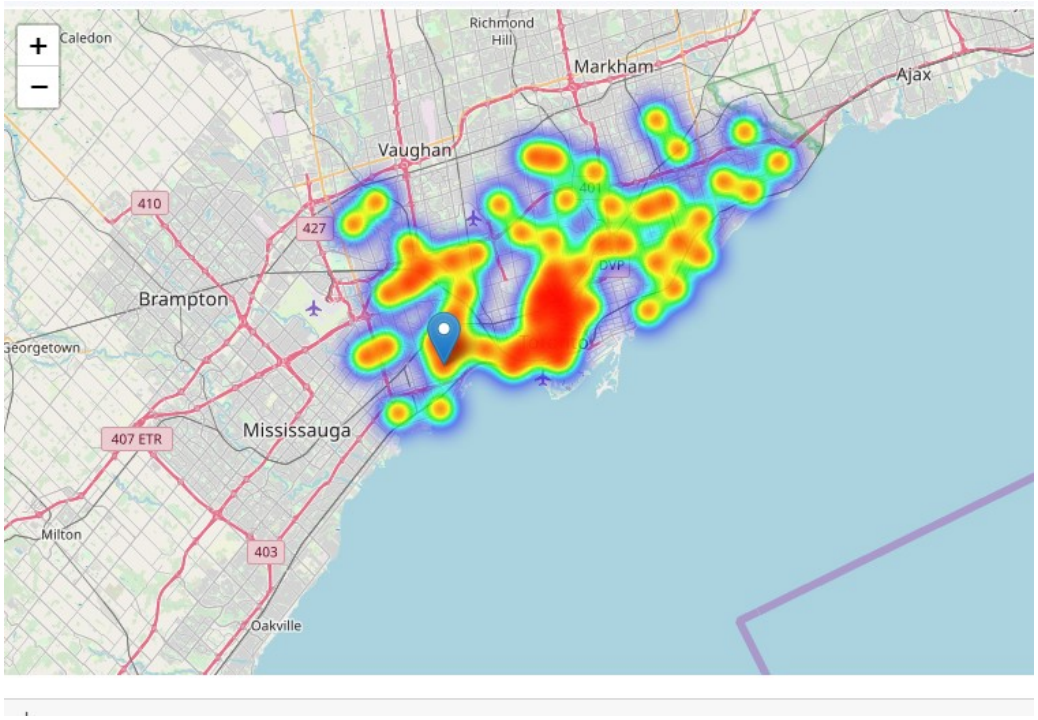
I'll also be using some data provided by foursquare API to determine the number of restaurants in each neighborhood.

Methodology

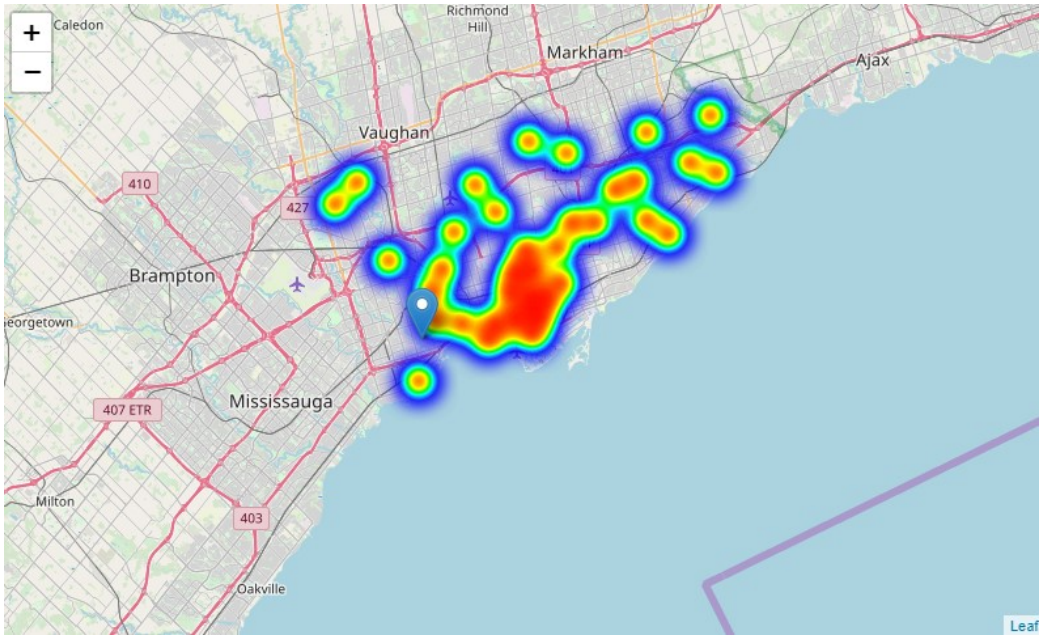
First I create a map that marks each neighborhood on the map.



Then i create a Heat map that calculates the average income of each neighborhood,



And another one that shows the amount of restaurants in each one as well,



As we can see, both maps look very similar, which indicates that the amount of restaurants in each area is related to the amount of income of said Neighborhood. From then we can determine where's the best place for a Luxurious restaurant and one from people with low income.

Results

Luxurious restaurant

Borough	Postcode	Neighborhood	Population	Average Income	Latitude	Longitude	count
Central Toronto	M4T	Moore Park	4474	154825	43.689574	-79.383160	1
Central Toronto	M4V	South Hill	6218	120453	43.686412	-79.400049	4
Central Toronto	M5R	Yorkville	6045	105239	43.672710	-79.405678	4
East York	M4G	Leaside	13876	82670	43.709060	-79.363452	4
North York	M5M	Bedford Park	13749	80827	43.733283	-79.419750	11
Central Toronto	M4V	Deer Park	15165	80704	43.686412	-79.400049	4
Central Toronto	M5R	The Annex	15602	63636	43.672710	-79.405678	4
West Toronto	M6S	Swansea	11133	58681	43.651571	-79.484450	10
North York	M2J	Henry Farm	2790	56395	43.778517	-79.346556	12
Central Toronto	M4S	Davisville	23727	55735	43.704324	-79.388790	10

As shown in the table above, the best place to open a Luxurious Restaurant would be Moore park, as it is the neighborhood with the highest average income and less competition. Even though it has a relatively low population, since the average income is really high it still pays off. For People that are less adventurous might want to open one in Bedford Park, as we can see, there are 11 restaurants there so we can presume it's most likely to succeed.

Restaurant for low income

Borough	Postcode	Neighborhood	Population	Average Income	Latitude	Longitude	count
Scarborough	M1G	Woburn	48507	26190	43.770992	-79.216917	1
Scarborough	M1S	Agincourt	44577	25750	43.794200	-79.262029	1
Scarborough	M1B	Malvern	44324	25677	43.806686	-79.194353	1
East Toronto	M4K	Riverdale	31007	40139	43.679557	-79.352188	17
West Toronto	M6R	Parkdale	28367	26314	43.648960	-79.456325	4
Scarborough	M1E	West Hill	25632	27936	43.763573	-79.188711	1
Central Toronto	M4S	Davisville	23727	55735	43.704324	-79.388790	10
Scarborough	M1B	Rouge	22724	29230	43.806686	-79.194353	1
North York	M3C	Flemingdon Park	21287	23471	43.725900	-79.340923	8
York	M6M	Mount Dennis	21284	23910	43.691116	-79.476013	1

In here we see that Scarborough would be the best place to open a low income restaurant, since there's only one in the area and it's the most populated Borough in Toronto. If you're not afraid of competition and secure about your Cheff skills, then you could open a restaurant in Riverdale as there'll be lots of competitors there, but with a quality product you're most likely to get more revenue.

Conclusion

In this study, I analyzed the relationship between the average income of Toronto citizens in their respective neighborhoods and the number of restaurants in said neighborhoods. I identified the best locations for you to open luxurious and for low income restaurants using only a few predictions. And gave multiple options depending on the style of entrepreneur you are.