NEIGHBORHOOD RECOMMENDATION FOR ASIA FINE DINING RESTAURANT CHAIN EXPANSION PROJECT

Capstone Project





AGENDA

- Introduction
- Data
- Methodology
- Result and Discussion
- Conclusion

INTRODUCTION

Background

- Client is an Asian restaurant group specialized in Chinese cuisine and considered to pick a location among their neighborhoods to open their flag ship restaurant in order to boost up their reputation further.
- The sponsor of this project from this Asian Restaurant Group would be the Target Audience.

Problem – Where is the best neighborhood for this flag ship restaurant?

- With the business goal established, client has further illustrated their criteria on what's "the best neighborhood":
  1. It should be a prime location, where it is popular to the crowd.
  2. It should have many good restaurants surrounding, so that people could recognize it is a good dining area.
  3. It is preferred to have similar kind of restaurant (i.e. Asian fine dining) around the area.

DATA REQUIRED

	Data	Details of Data Source
1	Neighborhood Information	Neighbourhood list around the two cities (New York & Toronto) from Wikipedia and Toronto City Government Website
2	Geometry Information	The geometry information (i.e. latitude and longitude) of each neighborhoods from the OpenCage Geocoding AP
3	Location Information of Venues around Neighborhood	Venue information around each neighborhood is the key elements for the analysis. By adopting the FourSquare API, the following set of location information are obtained such as: 1. Venue List of neighborhood 2. Geometry Information of Neighborhood 3. Venue Category 4. Like Count 5. Price Range, etc

METHODOLOGY

- Based on the criteria illustrated, the key is to establish the popularity and what type of dining areas for each neighbourhood.
- The analysis is mainly relied on the location data provided by Four Square: by submitting the latitude and longitude of each neighbourhood in scope (i.e. within Toronto and New York), Four Square returned a list of venues (specifically, we are interested in restaurants only in this study) around such neighbourhood with relevant attributes.
- By exploring these attributes and accessing their distribution, their relationship with each other in order to establish their connection with the analysis.
- Then, based on comparing & aggregating these attributes of venues within the neighbourhood, we would further establish our understanding to the neighbourhood and further conclude our recommendation to the problem above.

RESULTS AND DISCUSSION

Comparison of Two Cities

1. There are 318 neighbourhood in New York (vs. 140 in Toronto)
2. There are 4163 restaurants in New York (vs. 1858 in Toronto)… over 2 times more
3. Chinese Restaurant is the 2nd most popular category in New York (vs. 7th place in Toronto)

Top 10 Venue Categories in New York (NY) and Toronto (TO)

Venue Category	NY %	NY
Pizza Place	9.09%	383.0
Chinese Restaurant	7.88%	332.0
Bakery	5.44%	229.0
Food Truck	5.27%	222.0
Food	4.18%	176.0
Italian Restaurant	3.89%	164.0
Coffee Shop	3.75%	158.0
Café	3.39%	143.0
Mexican Restaurant	3.25%	137.0
Caribbean Restaurant	2.87%	121.0

Venue Category	TO %	TO
Coffee Shop	7.44%	139.0
Pizza Place	6.64%	124.0
Bakery	5.03%	94.0
Restaurant	4.82%	90.0
Café	4.60%	86.0
Italian Restaurant	4.55%	85.0
Chinese Restaurant	4.50%	84.0
Fast Food Restaurant	4.18%	78.0
Sandwich Place	3.91%	73.0
Caribbean Restaurant	2.62%	49.0

RESULTS AND DISCUSSION (CON'T)

Exploring the Attribute – "Like Count"

"Like Count" is how many FS users like the places.

1. ~50% of restaurants receive 1 or no likes
2. Only top 0.56% of restaurants received 501 likes or above and all are located in New York
3. Therefore, we are going to use "Like count" to identify the top 10 neighbourhoods

Range	cnt	cnt %	NY	NY %	TO	TO %
0	2640	43.41%	1759	41.75%	881	47.16%
1	924	15.19%	661	15.69%	263	14.08%
2	439	7.22%	302	7.17%	137	7.33%
3	266	4.37%	174	4.13%	92	4.93%
4 - 10	677	11.13%	437	10.37%	240	12.85%
11 - 100	864	14.21%	630	14.95%	234	12.53%
101 - 500	177	2.91%	166	3.94%	11	0.59%
501 or above	34	0.56%	34	0.81%	0	0.00%
Total	6021	100%	4163	100%	1858	100%

RESULTS AND DISCUSSION (CON'T)

Top 10 Neighbourhoods

With aggregation "Like Count", we would be able to identify the top 10 neighbourhoods for 2nd round screening.

1. All of them are in New York, especially in the Manhattan borough
2. These are 250 restaurants in these top 10 neighbourhoods. That covered 49 of top 100 restaurants (in term of like count) among two cities

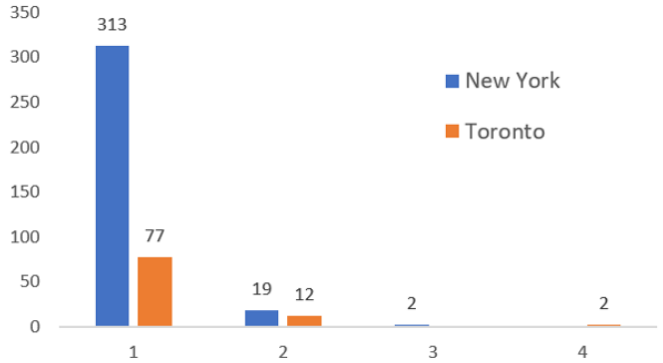
Neighborhood	like_count	cnt	no_of_list
East Village(Manhattan)	8078.0	28	82.0
Mount Hope(Bronx)	6522.0	41	94.0
Greenpoint(Brooklyn)	4485.0	39	89.0
Prospect Heights(Brooklyn)	3578.0	28	79.0
SoHo(Manhattan)	3428.0	16	18.0
Upper West Side(Manhattan)	3245.0	21	48.0
West Village(Manhattan)	3020.0	14	39.0
Tribeca(Manhattan)	2940.0	29	49.0
Fish Bay(Bronx)	2940.0	20	44.0
Dumbo(Brooklyn)	2898.0	14	35.0

RESULTS AND DISCUSSION (CON'T)

Distribution of Chinese Restaurants (1)

1. Chinese Restaurant are more popular in New York (vs. Toronto)
2. Majority are in low price range. Only 4 high-end Chinese restaurants are in both cities.
3. Similarly, those Chinese restaurants with high "Like count" are all in New York.

Count of each price tier

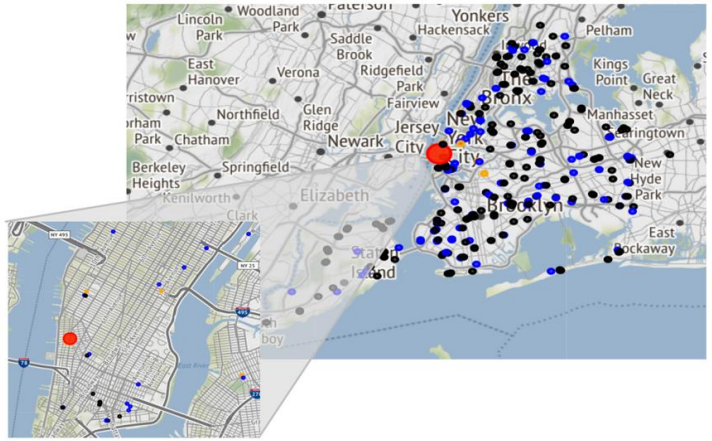


Count of each restaurant for various Like count Range

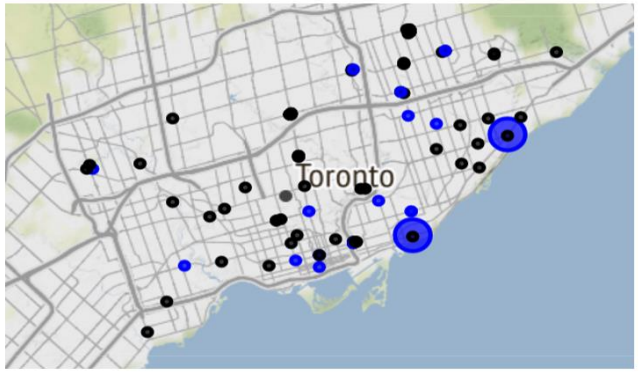
city		NY	TO
0	0	147.0	62.0
1	1	83.0	15.0
2	2	42.0	10.0
3	3 - 10	52.0	8.0
4	11 - 100	12.0	8.0
5	101 - 500	7.0	0.0
6	500 or above	1.0	0.0

RESULTS AND DISCUSSION (CON'T)

New York



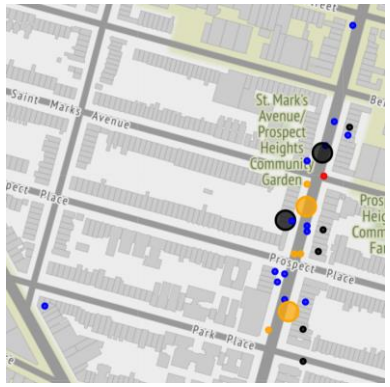
Toronto



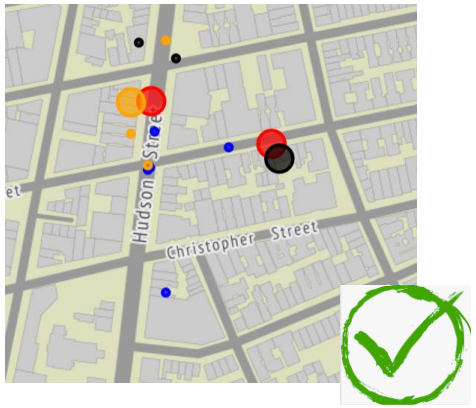
1. Chinese Restaurant are blooming across the entire New York; while it is only sparsely spread in Toronto.
2. The only two Chinese restaurant with high "like count" (indicated by Red / Orange) and higher price-tier (indicated with large circle) are all located in the West Village in Manhattan.

RESULTS AND DISCUSSION (CON'T)

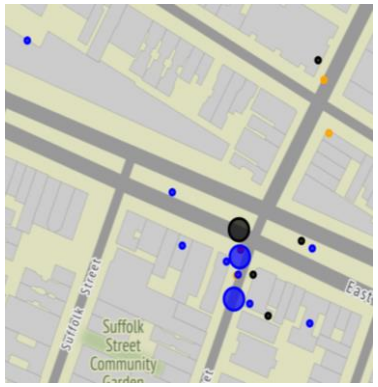
Prospect Heights (Brooklyn)



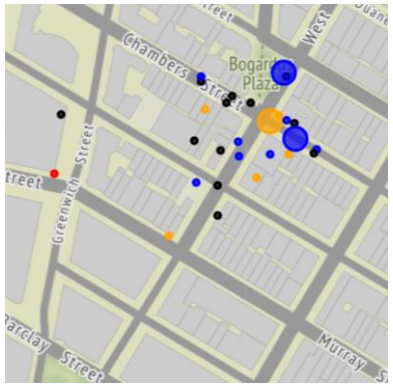
West Village (Manhattan)



Fish Bay (Bronx)



Tribeca (Manhattan)



- It is recommended that the "West Village (Manhattan)" is preferable neighborhood because

1. It is the top10 neighborhood in term of like-count.
2. It is a high-end dining area. It has 4 restaurants with price tier 3 or above.
3. Among those 4 restaurants, three have received quite a lot of like counts and two of them are Chinese Restaurants. It could help to establish a Chinese Fine Dining area to draw potential customers.

CONCLUSION

- In the analysis, we have compared the neighborhoods among New York & Toronto and recommended the best neighborhood to open a new the high-end Chinese Restaurant. Throughout the project, while there is no complicated algorithm and data modeling involved, most of the effort was spent are on data collecting, understanding & cleaning. It reflected what this course said before: 80% of effort is on those area. After all the data are tidy up, the analysis is almost completed.
- At the same time, it is important to note that the analysis result is highly relied to the quality of Four Square location data and its availability of data. We would need to assume that Four Square would have a good coverage and representation for the venues in both cities. At the same time, the users from both cities are equally active and familiar with the tools from Four Square