

The Battle of the Neighborhoods - Report

Chapter 1. Introduction & Business Problem

1-1 Introduction:

New York City is the most populous and business-developed city in the United States. This city has a multicultural character and is also the financial capital of the United States. This city provides many job opportunities and a stable business environment, attracting many people from different cultural backgrounds to join the market. New York is also a global commercial center, which means that there is fierce market competition, and the cost of doing business is also one of the highest cities in the world. In terms of the external environment, the Covid-19 epidemic has impacted the original office style since 2020. The working areas where the crowds were initially concentrated during working hours have gradually spread to various residential areas in the urban area. Therefore, under the current environmental background, any new business development needs to be carefully evaluated. It can obtain better insights through data analysis, which will help reduce risks, accurately invest in the correct market, and generate a reasonable investment return.

1-2 Business Problem:

Affected by the epidemic, the transformation of the business office model is something that people who enter the market now need to pay attention to. It will also transform the traditional mode of drinking beverages in the office into working from home. And It will change the standard orders from the office small orders quantity, and a large amount of single order, which transformed into large orders quantity but a small amount in a single charge. Therefore, the key to winning against competitors is on-demand ability. We aim to maximize the coverage of bubble tea and find the newest store location in places with less coverage and fewer similar stores.

1-3 Expected Contribution

If you want to open a Bubble Tea shop now, the focus is to find places outside the traditional dense areas, and the traditional competitive model of finding sites with high traffic has also begun to change. Therefore, it is crucial to plan from scratch if you want to survive in the current sluggish economic environment. It is necessary to measure various factors in the entire region to determine the location of the final store.

My client will start a new business in Manhattan during the epidemic period in 2021, so I focused on this specific administrative region when analyzing. The goal is to recommend the best choice for opening a new store as decision support by suggesting a particular location for the management. At the same time, the direction can also use this analysis to understand the reason for the decision.

Chapter 2. Data Section

2-1. Exploratory data analysis

The neighborhood has a total of 5 boroughs and 306 neighborhoods. In order to segment the neighborhoods and explore them, we will essentially need a dataset that contains the 5 boroughs and the neighborhoods that exist in each borough as well as the latitude and longitude coordinates of each neighborhood. This dataset exists for free on the web. The link to the dataset is:

https://geo.nyu.edu/catalog/nyu_2451_34572

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

2-2. Feature Location Exploratory Analysis

New York city geographical coordinates data will be utilized as input for the Foursquare API, which will be leveraged to provision venue information for each neighborhood. We will use the Foursquare API to explore neighborhoods in New York City. The below is the image of the Foursquare API data. In addition, The Bubble Tea Shop category ID 52e81612bcbc57f1066b7a0c is used for retrieving data from Foursquare API.

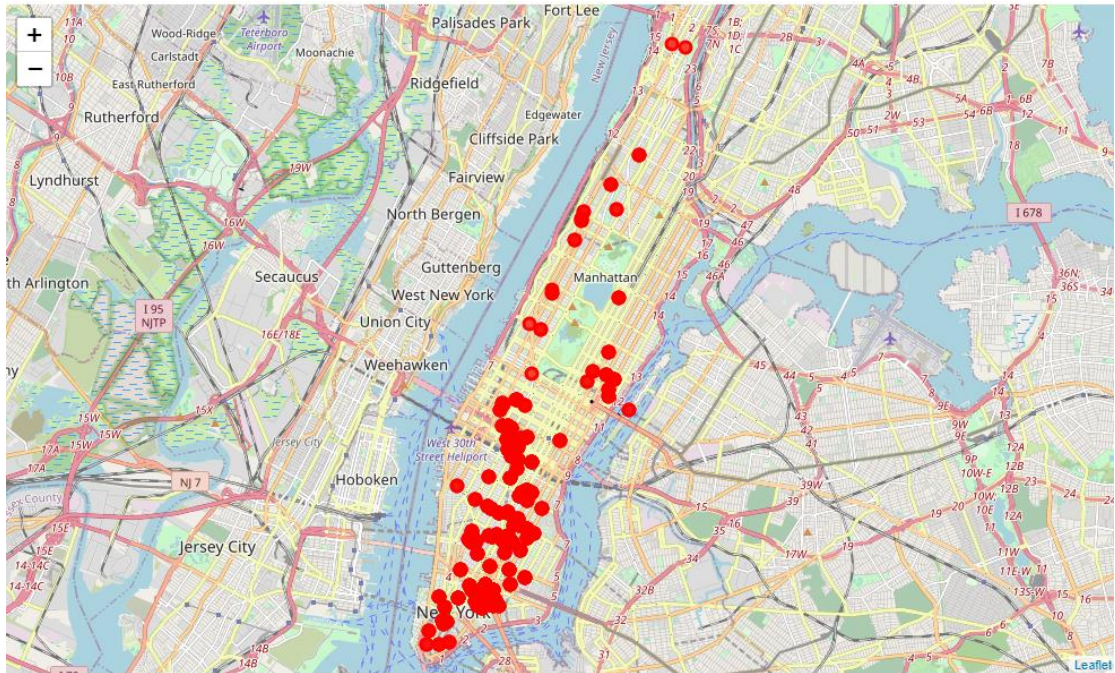
Chapter 3. Methodology

Following, I have done convert addresses into their equivalent latitude and longitude values. Then we will use the Foursquare API to explore neighborhoods in Manhattan, New York. After that, explore the function to get bubble tea shop categories in each neighborhood, as follow:

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

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newyork_venues_bubbleTeaShop.shape
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(639, 7)
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The Bubble Tea Shop located in Manhattan.

	Neighborhood	Asian Restaurant	Bubble Tea Shop	Café	Fried Chicken Joint	Juice Bar	Poke Place	Smoothie Shop	Tea Room	Vietnamese Restaurant
0	Chinatown	0	1	0	0	0	0	0	0	0
1	Chinatown	0	1	0	0	0	0	0	0	0
2	Chinatown	0	1	0	0	0	0	0	0	0
3	Chinatown	0	1	0	0	0	0	0	0	0
4	Chinatown	0	1	0	0	0	0	0	0	0

Then use this feature to group the neighborhoods into clusters K-means clustering algorithm will be used to complete this task. And it also, the Folium library to visualize the neighborhoods in Manhattan and their emerging clusters.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
0	Battery Park City	Bubble Tea Shop	Smoothie Shop	Juice Bar	Vietnamese Restaurant	Tea Room	Poke Place	Fried Chicken Joint	Café	Asian Restaurant
1	Carnegie Hill	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
2	Central Harlem	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
3	Chelsea	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
4	Chinatown	Bubble Tea Shop	Café	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Asian Restaurant



Chapter 4. Result

K-mean Cluster Using K-mean to clustering data area with less number of bubble tea shop.

4-1. Cluster 0.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
1	Chinatown	Bubble Tea Shop	Café	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Asian Restaurant
2	Washington Heights	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
4	Hamilton Heights	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
5	Manhattanville	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
6	Central Harlem	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
14	Clinton	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
15	Midtown	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
16	Murray Hill	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
18	Greenwich Village	Bubble Tea Shop	Café	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Asian Restaurant
22	Little Italy	Bubble Tea Shop	Café	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Asian Restaurant
23	Soho	Bubble Tea Shop	Café	Tea Room	Juice Bar	Vietnamese Restaurant	Smoothie Shop	Poke Place	Fried Chicken Joint	Asian Restaurant
24	West Village	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
25	Manhattan Valley	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
26	Morningside Heights	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
30	Carnegie Hill	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
35	Turtle Bay	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
36	Tudor City	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
38	Flatiron	Bubble Tea Shop	Tea Room	Fried Chicken Joint	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Café	Asian Restaurant

4-2. Cluster 1.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
8	Upper East Side	Bubble Tea Shop	Café	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Asian Restaurant
10	Lenox Hill	Bubble Tea Shop	Café	Asian Restaurant	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint
11	Roosevelt Island	Bubble Tea Shop	Asian Restaurant	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café
13	Lincoln Square	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
17	Chelsea	Bubble Tea Shop	Tea Room	Vietnamese Restaurant	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant
19	East Village	Bubble Tea Shop	Juice Bar	Fried Chicken Joint	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Café	Asian Restaurant
20	Lower East Side	Bubble Tea Shop	Juice Bar	Café	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Fried Chicken Joint	Asian Restaurant
21	Tribeca	Bubble Tea Shop	Tea Room	Juice Bar	Café	Vietnamese Restaurant	Smoothie Shop	Poke Place	Fried Chicken Joint	Asian Restaurant
27	Gramercy	Bubble Tea Shop	Juice Bar	Tea Room	Fried Chicken Joint	Vietnamese Restaurant	Smoothie Shop	Poke Place	Café	Asian Restaurant
28	Battery Park City	Bubble Tea Shop	Smoothie Shop	Juice Bar	Vietnamese Restaurant	Tea Room	Poke Place	Fried Chicken Joint	Café	Asian Restaurant
29	Financial District	Bubble Tea Shop	Smoothie Shop	Juice Bar	Vietnamese Restaurant	Tea Room	Poke Place	Fried Chicken Joint	Café	Asian Restaurant
31	Noho	Bubble Tea Shop	Juice Bar	Café	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Fried Chicken Joint	Asian Restaurant
32	Civic Center	Bubble Tea Shop	Café	Tea Room	Smoothie Shop	Juice Bar	Vietnamese Restaurant	Poke Place	Fried Chicken Joint	Asian Restaurant
33	Midtown South	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Fried Chicken Joint	Smoothie Shop	Poke Place	Juice Bar	Café	Asian Restaurant
34	Sutton Place	Bubble Tea Shop	Asian Restaurant	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café
39	Hudson Yards	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Café	Asian Restaurant

4-3. Cluster 2.

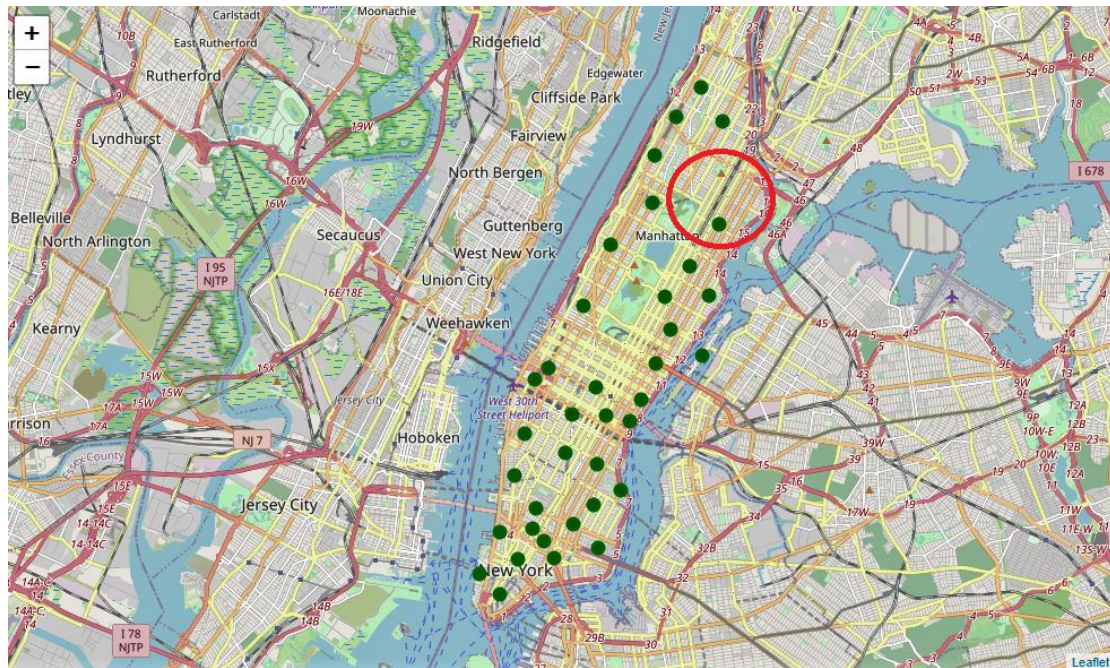
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
37	Stuyvesant Town	Bubble Tea Shop	Juice Bar	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Fried Chicken Joint	Café	Asian Restaurant

4-4. Cluster 3.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
9	Yorkville	Café	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Smoothie Shop	Poke Place	Juice Bar	Fried Chicken Joint	Asian Restaurant

4-5. Cluster 4.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
12	Upper West Side	Smoothie Shop	Poke Place	Juice Bar	Bubble Tea Shop	Vietnamese Restaurant	Tea Room	Fried Chicken Joint	Café	Asian Restaurant



Based on the analysis above Cluster Upper East Side areas is the best location to open a new bubble tea shop with a delivery service.

Chapter 5. Result & Conclusion

This chapter will discuss the results observed in this project study and the recommendations based on the results. This analysis is based on a limited data set. It has a certain degree of credibility, but it will have better research results if It can use more high-quality data or extract features from the data.

First of all, it can be found that there is still room for growth in the Financial District, and restaurants with relevant Asian cultures almost always accompany the current bubble tea shops. Through this factor, we can add other factors for analysis, such as the transportation logistics system and the population of residents. Statistics carry out further factor discussion. Finally, FourSquare proved to be a good data source, providing a sound data foundation in social network analysis and human-centered computing.