Capstone Project - The Battle of Neighborhoods

Introduction

The first known Chinese restaurant in America, Canton Restaurant, opened in San Francisco in 1849. Today, the cuisine (though much of it bears little resemblance to any dishes you'd find in China) has become a favorite throughout the country, with nearly 50,000 Chinese restaurants across the U.S.

It originally arrived with the flood of Chinese immigrants to California in the mid-nineteenth century—mostly from Canton province—drawn by the Gold Rush and fleeing economic problems and famine in China. By 1880, there more than 100,000 Chinese people living in the U.S; restaurants had begun to crop up to feed the growing population of workers, missing the flavors of home. Of course, the dishes had to be modified to use ingredients that were available in the U.S. to replace those found only in China; they also were tweaked to make them more familiar to American palates. Soon, America faced its own economic downturn, in the 1870s. White workers felt threatened by Chinese laborers, who would work for less money. As a result, the Chinese Exclusion Act, a law forbidding Chinese immigration, was passed in 1882.

An exception was available to a few select groups; starting in 1915, merchants, including high-end restaurateurs, could apply—and many did, exploiting the exception. According to the exhibit, the number of Chinese restaurants in New York City alone quadrupled between 1910 and 1920. Well before that, however, late-1800s versions of hipsters were heading into the city's Chinatown to seek new flavors to satisfy their adventurous palates. They discovered the novel flavors of Americanized Chinese dishes like chop suey and egg foo young, popularizing them to the point that they spread throughout the city. "By 1903," the exhibit says, "over 100 chop suey houses existed between 14th and 45th Streets, from the Bowery to Eighth Avenue." It spread across the nation, reaching a peak in the 1920s and '30s. Meanwhile, the restaurants also went upscale. That merchant visa available to Chinese restaurateurs? It was only for "high grade" restaurants, so the ones that opened featured high-end finishes and gilded carvings; going out for Chinese became a luxury experience.

The Chinese Exclusion Act was repealed in 1943. By that time, the cuisine had entered the mainstream and Chinese restaurants had become ubiquitous. Increased prosperity allowed Americans to dine out more often, and authenticity came into vogue. Classic Americanized dishes like chop suey were abandoned in favor of more-authentic regional Chinese dishes like General Tso's Chicken, invented by a Hunanese chef in the 1950s and brought to the U.S. soon after. Today, the dish is the most-ordered Chinese dish on grubhub.com and the fourth most-popular dish on the website.

In this project, we want to examine a good location to open a Chinese restaurant in New York City, which has a strong Chinese demographic.

Data and Methodology

To find the best location to open a Chinese restaurant, I use New York City data that contains the latitude and longitude of all Chinese restaurants in Manhattan. The data is public available: https://cocl.us/new_york_dataset. To have more information on each Chinese restaurant, I use the Foursquare API.

Firstly, the New York City data is downloaded, which includes neighborhood names and geo data. The latitude and longitude can be used to create the map later.

Then I use Foursquare API to query the Chinese restaurant information for each of the neighborhood. The popularity and the rating of the Chinese restaurants in every neighborhood will be analyzed. I plot a figure to understand how many Chinese restaurants in each neighborhood in New York. Also, I examine the ranking for tips, ratings, and likes for all Chinese restaurants. Then, I examine the average rating for each neighborhood to see if the local people like Chinese food or not.

Finally I will try to conclude which is the best location to open a new Chinese restaurant based on the data on hand.

Restaurant Data Analysis

Data

The first step of the project is to use the function to get the geographical data of the neighborhoods in New York City. The head of results are displayed below.

Out[3]:

	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
5	Bronx	Kingsbridge	40.881687	-73.902818
6	Manhattan	Marble Hill	40.876551	-73.910660
7	Bronx	Woodlawn	40.898273	-73.867315
8	Bronx	Norwood	40.877224	-73.879391
9	Bronx	Williamsbridge	40.881039	-73.857446

The next step is to build the function to get the Chinese restaurant ID and names in neighborhood using Foursquare API. Then we use the function to get the Chinese restaurant ID and names in each borough. The results are shown below.

Out[30]:

	Borough	Neighborhood	ID	Name
0	Manhattan	Chinatown	4db3374590a0843f295fb69b	Spicy Village
1	Manhattan	Chinatown	5894c9a15e56b417cf79e553	Xi'an Famous Foods
2	Manhattan	Chinatown	4a96bf8ff964a520ce2620e3	Wah Fung Number 1 Fast Food 華豐快飯店
3	Manhattan	Chinatown	3fd66200f964a52067e61ee3	Joe's Shanghai 鹿鳴春
4	Manhattan	Chinatown	3fd66200f964a520b1ea1ee3	Great N.Y. Noodletown
5	Manhattan	Chinatown	5c965dad5455b2002c058659	Yi Ji Shi Mo Noodle Corp
6	Manhattan	Chinatown	3fd66200f964a520ede41ee3	Big Wong King 大旺
7	Manhattan	Chinatown	59ad625a2619ee5cdded881f	House Special 甘來飯店
8	Manhattan	Washington Heights	4b292f38f964a520939a24e3	Yang Garden
9	Manhattan	Washington Heights	4b3fe94af964a520e2b125e3	No. 1 Chinese Restaurant
10	Manhattan	Inwood	4b9aeeedf964a52086e435e3	Lotus Express
11	Manhattan	Inwood	4bd5f4d229eb9c74c64594e1	"U" Like
12	Manhattan	Hamilton Heights	4cd76fd7dfb4a1cd7195645c	King's Wok
13	Manhattan	Hamilton Heights	4c0b25636071a59342ece032	Golden Wok
14	Manhattan	Manhattanville	4b21974df964a520833e24e3	China Place
15	Manhattan	Manhattanville	4f177ab5e4b01130e70c27cf	New Home Sing
16	Manhattan	Central Harlem	4bd1f6909854d13a38a2fa4d	88 Chinese Restaurant
17	Manhattan	Central Harlem	4bf348fce5eba593c8711e90	Crispy Bamboo Village
18	Manhattan	Upper East Side	5465906e498e0cb221c063e1	Pig Heaven
19	Manhattan	Yorkville	4b53bfb3f964a5202daa27e3	Charley Mom
20	Manhattan	Lenox Hill	4ea5be4af5b9efc002cccdea	Shanghai
21	Manhattan	Upper West Side	5529bfd8498ec6ce692d8015	Han Dynasty
22	Manhattan	Clinton	4aa707ccf964a520d84b20e3	Ollie's Sichuan Restaurant
23	Manhattan	Midtown	517021ffe4b0ad9829ae7815	Xi'an Famous Foods

Then we plot the number of Chinese restaurants in each neighborhood. China Town has most Chinese restaurants which is eight, while Bensonhurst, Flushing and Little Neck has five.

Number of Chinese Resturants for each neighborhood

Then we build the function to get the restaurant stats in New York City using Foursquare API. The stats of 'ID', 'Name', 'Likes', 'Rating' and 'Tips' are downloaded.

The head of raw data is shown below. Notice there are some invalid records where Foursquare did not return any data, so they are removed.

Out[12]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Manhattan	Chinatown	4db3374590a0843f295fb69b	Spicy Village	493	8.7	177
1	Manhattan	Chinatown	5894c9a15e56b417cf79e553	Xi'an Famous Foods	97	8.9	27
2	Manhattan	Chinatown	4a96bf8ff964a520ce2620e3	Wah Fung Number 1 Fast Food 華豐快飯店	181	8.3	91
3	Manhattan	Chinatown	3fd66200f964a52067e61ee3	Joe's Shanghai 鹿鳴春	1296	8.5	566
4	Manhattan	Chinatown	3fd66200f964a520b1ea1ee3	Great N.Y. Noodletown	535	8.0	285
5	Manhattan	Chinatown	5c965dad5455b2002c058659	Yi Ji Shi Mo Noodle Corp	13	8.2	2
6	Manhattan	Chinatown	3fd66200f964a520ede41ee3	Big Wong King 大旺	414	8.3	185
7	Manhattan	Chinatown	59ad625a2619ee5cdded881f	House Special 甘來飯店	21	8.1	13
8	Manhattan	Washington Heights	4b292f38f964a520939a24e3	Yang Garden	6	7.7	2
9	Manhattan	Washington Heights	4b3fe94af964a520e2b125e3	No. 1 Chinese Restaurant	3	6.7	5
10	Manhattan	Inwood	4b9aeeedf964a52086e435e3	Lotus Express	7	7.5	4
11	Manhattan	Inwood	4bd5f4d229eb9c74c64594e1	"U" Like	11	6.8	7
12	Manhattan	Hamilton Heights	4cd76fd7dfb4a1cd7195645c	King's Wok	5	7.4	4
13	Manhattan	Hamilton Heights	4c0b25636071a59342ece032	Golden Wok	6	6.6	5
14	Manhattan	Manhattanville	4b21974df964a520833e24e3	China Place	4	6.4	6
15	Manhattan	Manhattanville	0	0	0	0.0	0
16	Manhattan	Central Harlem	4bd1f6909854d13a38a2fa4d	88 Chinese Restaurant	8	7.7	4
17	Manhattan	Central Harlem	4bf348fce5eba593c8711e90	Crispy Bamboo Village	9	7.4	2
18	Manhattan	Upper East Side	5465906e498e0cb221c063e1	Pig Heaven	51	7.8	16
19	Manhattan	Yorkville	4b53bfb3f964a5202daa27e3	Charley Mom	11	7.3	8

Then we sort the data to find the most popular Chinese restaurant in New York City with most likes.

Out[66]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
26	Manhattan	Chelsea	44e9b421f964a520a5371fe3	Buddakan	1461.0	9.2	514.0
3	Manhattan	Chinatown	3fd66200f964a52067e61ee3	Joe's Shanghai 鹿鳴春	1296.0	8.5	566.0
25	Manhattan	Murray Hill	4e3484038877beb5e9a22a0b	Café China	1027.0	8.9	273.0
23	Manhattan	Midtown	517021ffe4b0ad9829ae7815	Xi'an Famous Foods	930.0	8.8	253.0
31	Manhattan	East Village	4c2a81398abca59393c8fe1f	Xi'an Famous Foods	861.0	8.9	319.0
39	Manhattan	West Village	4e1df590b61c7cb34d9735a8	RedFarm	701.0	8.8	283.0
4	Manhattan	Chinatown	3fd66200f964a520b1ea1ee3	Great N.Y. Noodletown	535.0	8.0	285.0
0	Manhattan	Chinatown	4db3374590a0843f295fb69b	Spicy Village	493.0	8.7	177.0
6	Manhattan	Chinatown	3fd66200f964a520ede41ee3	Big Wong King 大旺	414.0	8.3	185.0
32	Manhattan	East Village	5647ee82498e8bfc0ddef53d	Málà Project	412.0	9.0	90.0

So Buddakan, Joe's Shanghai, Cafe China and two Xi'an Famous Foods are the five most popular Chinese restaurants in New York.

Then try to find Chinese restaurants with highest quality.

Out[67]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
26	Manhattan	Chelsea	44e9b421f964a520a5371fe3	Buddakan	1461.0	9.2	514.0
46	Manhattan	Flatiron	59035bc43d47912d4b97f3fc	Xi'an Famous Foods	201.0	9.2	43.0
38	Manhattan	West Village	526eeb54498e9674b5d9034a	Decoy	325.0	9.1	105.0
154	Queens	Long Island City	5c9a607d25fb7b002c724043	Xi'an Famous Foods	19.0	9.1	3.0
32	Manhattan	East Village	5647ee82498e8bfc0ddef53d	Málà Project	412.0	9.0	90.0
34	Manhattan	Lower East Side	5b380f649deb7d00399fdf9d	Kings County Imperial	57.0	9.0	8.0
25	Manhattan	Murray Hill	4e3484038877beb5e9a22a0b	Café China	1027.0	8.9	273.0
31	Manhattan	East Village	4c2a81398abca59393c8fe1f	Xi'an Famous Foods	861.0	8.9	319.0
116	Brooklyn	North Side	58df00318cfe546addb99246	Birds of a Feather	316.0	8.9	65.0
119	Brooklyn	South Side	58df00318cfe546addb99246	Birds of a Feather	316.0	8.9	65.0

Buddakan, Xi'an Famous Foods, Decoy and Málà Project have highest ratings.

Summary

If we look the top 10 of both ratings, Buddakan, Xi'an Famous Foods, Málà Project are in both lists.

We can see the location of the restaurant is very important. For Example, Xi'an Famous Foods in Flatiron has rating of 9.2, but only has 201 likes and 43 tips. In comparison with Joe's Shanghai in China Town, even the rating is 8.5, it has 1296 likes and 566 tips.

We can also notice Shanghai cuisine, Xi'an cuisine and Sichuan cuisine is quite popular in New York. Joe's Shanghai offers Shanghai cuisine; Xi'an Famous Foods offers Xi'an cuisine, while Spicy Village and Málà

Project offer Sichuan Cuisine. So if we want to open a Chinese restaurant in New York, we can consider there three cuisines.

Neighborhood Data Analysis

Data

In next step, let's see the Chinese restaurant stats in each neighborhood. We average the Likes, Rating and Tips of the Chinese restaurants for each neighborhood. Then sort the data.

Out[61]:

	Neighborhood	Likes	Rating	Tips	ID
13	Chelsea	1461.000000	9.200000	514.000000	1
51	Midtown	930.000000	8.800000	253.000000	1
53	Murray Hill	521.000000	8.550000	136.500000	2
74	West Village	513.000000	8.950000	194.000000	2
14	Chinatown	381.250000	8.375000	168.250000	8
23	East Village	358.500000	8.650000	111.000000	4
69	Tribeca	342.000000	8.800000	83.000000	1
71	Upper West Side	312.000000	8.900000	65.000000	1
48	Manhattan Valley	294.000000	8.500000	78.000000	1
56	North Side	272.000000	8.400000	97.000000	2
28	Flatiron	201.000000	9.200000	43.000000	1
65	South Side	192.666667	8.266667	68.000000	3
16	Clinton	149.000000	7.500000	58.000000	1
75	Windsor Terrace	132.000000	8.900000	49.000000	1
22	Downtown	88.500000	8.750000	19.500000	2
68	Sutton Place	83.500000	7.900000	31.000000	2
18	College Point	71.000000	8.100000	37.000000	1
58	Park Slope	69.000000	7.700000	28.000000	1
62	Queensboro Hill	64.333333	7.066667	26.666667	3
17	Clinton Hill	57.000000	6.950000	41.500000	3
45	Little Neck	56.333333	7.233333	17.666667	5
70	Upper East Side	51.000000	7.800000	16.000000	1
35	Greenwich Village	48.333333	8.500000	7.000000	3
11	Carnegie Hill	47.000000	7.400000	40.000000	1
76	Woodside	47.000000	8.200000	26.000000	2
24	Elmhurst	36.000000	8.033333	19.000000	3
29	Flushing	35.750000	7.775000	16.500000	5

Now we can see the average likes, rating and tips in each neighborhood.
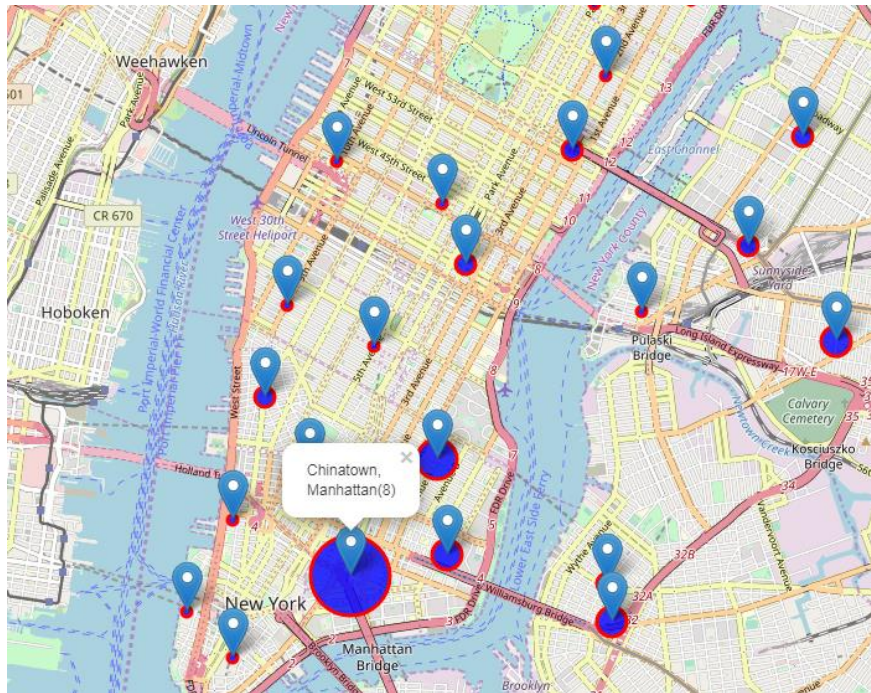
Summary

Chelsea has the only Chinese restaurant Buddakan which is the top Chinese restaurant in New York, so it has highest number of likes, rating and tips.

Midtown has another good Chinese restaurant Xi'an Famous Food, so it has second highest number of likes.

The Chinese restaurants in Murray Hill, West Village, Chinatown and East Village are also quite popular in average. So to open a new Chinese restaurant, we can consider these areas based on the data we have.

Then we look into the data for these neighborhoods.

Chinatown

Out[15]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Manhattan	Chinatown	4db3374590a0843f295fb69b	Spicy Village	493	8.7	177
1	Manhattan	Chinatown	5894c9a15e56b417cf79e553	Xi'an Famous Foods	97	8.9	27
2	Manhattan	Chinatown	4a96bf8ff964a520ce2620e3	Wah Fung Number 1 Fast Food 華豐快飯店	181	8.3	91
3	Manhattan	Chinatown	3fd66200f964a52067e61ee3	Joe's Shanghai 鹿鳴春	1296	8.5	566
4	Manhattan	Chinatown	3fd66200f964a520b1ea1ee3	Great N.Y. Noodletown	535	8.0	285
5	Manhattan	Chinatown	5c965dad5455b2002c058659	Yi Ji Shi Mo Noodle Corp	13	8.2	2
6	Manhattan	Chinatown	3fd66200f964a520ede41ee3	Big Wong King 大旺	414	8.3	185
7	Manhattan	Chinatown	59ad625a2619ee5cdded881f	House Special 甘來飯店	21	8.1	13

There are eight Chinese restaurants in Chinatown, which makes the neighborhood competitive. Three of them are good restaurants: Joe's Shanghai has 1296 likes, Xi'an Famous Food has 8.9 rating, Spicy Village has 8.7 rating. So we need careful consideration if want to open a another Chinese restaurant in Chinatown.

East Village
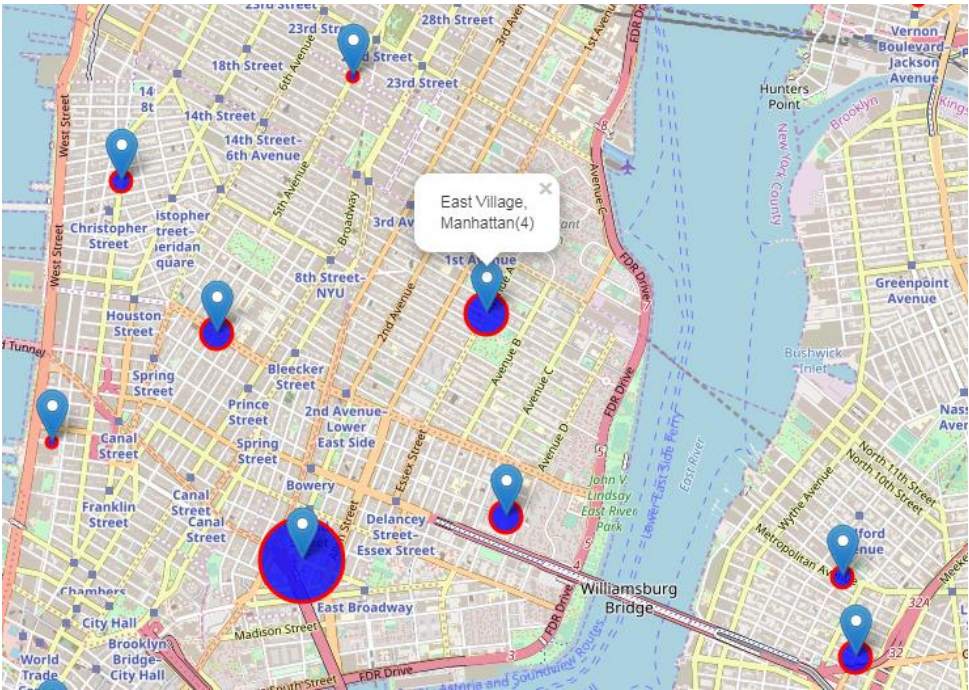

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Out[63]:
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	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
30	Manhattan	East Village	5c831f04029a550039fcca38	Chinese Graffiti	10.0	8.4	1.0
31	Manhattan	East Village	4c2a81398abca59393c8fe1f	Xi'an Famous Foods	861.0	8.9	319.0
32	Manhattan	East Village	5647ee82498e8bfc0ddef53d	Málà Project	412.0	9.0	90.0
33	Manhattan	East Village	58d176db0b56560b9cad4cef	Little Tong Noodle Shop	151.0	8.3	34.0

There are four Chinese restaurants in East Village. Two of them are good restaurants: Xi'an Famous Food has 8.9 rating and 861 likes; Málà Project has 9.0 rating and 412 likes. So if we want to open a Chinese restaurant here, we can try to open a Shanghai cuisine restaurant.

Murray Hill
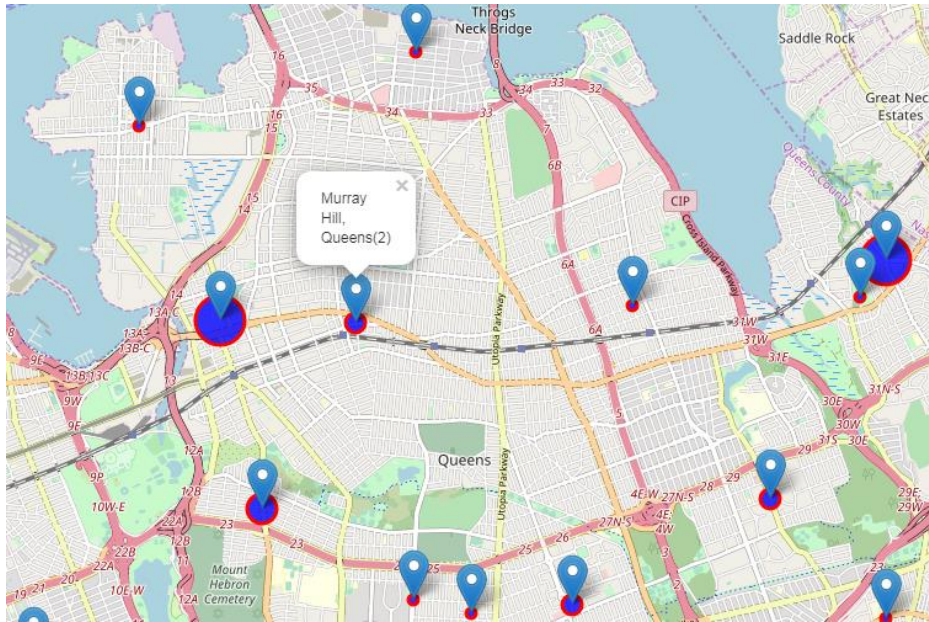
Out[64]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
24	Manhattan	Murray Hill	5bd497a9f427de003989e9d8	Dun Huang	15.0	8.2	0.0
25	Manhattan	Murray Hill	4e3484038877beb5e9a22a0b	Café China	1027.0	8.9	273.0

There are two Chinese restaurants in Murray Hill. Café China has 8.9 rating and 1027 likes. So we can try to open a Shanghai cuisine, Xi'an cuisine or Sichuan cuisine restaurant here.

West Village
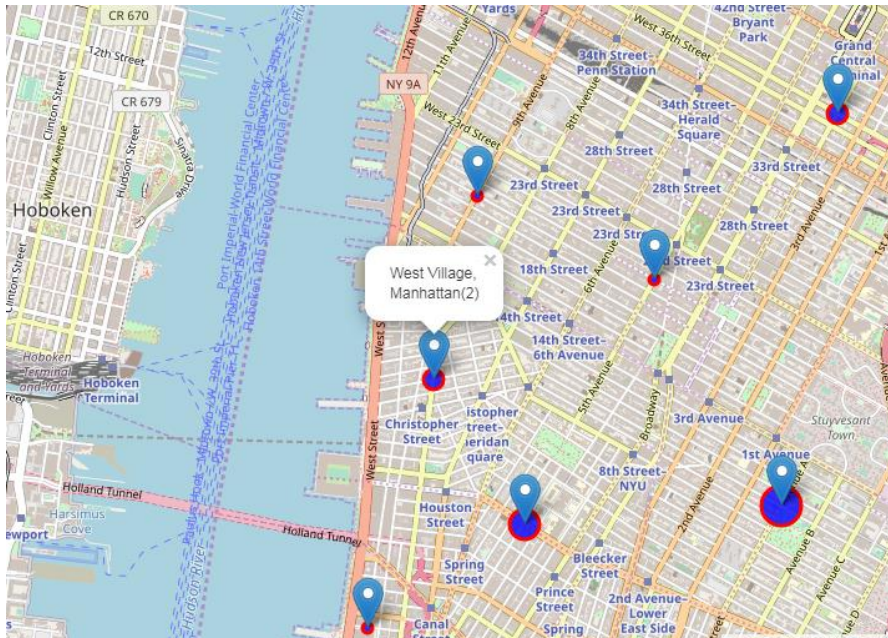
	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
38	Manhattan	West Village	526eeb54498e9674b5d9034a	Decoy	325.0	9.1	105.0
39	Manhattan	West Village	4e1df590b61c7cb34d9735a8	RedFarm	701.0	8.8	283.0

There are also two Chinese restaurants in West Village. Both of them have high ratings, which makes the neighborhood competitive. However, neither of them belongs to Shanghai cuisine, Xi'an cuisine or Sichuan cuisine, so we can also try to open one restaurant here.

Conclusion

By analyzing the data we have, we can find that the Chinese restaurants in Murray Hill, West Village, and East Village are popular in average; also these neighborhoods are not so competitive comparing with Chinatown for Chinese restaurants. Also Shanghai cuisine, Xi'an cuisine and Sichuan cuisine are popular in New York, because many top Chinese restaurants offers these cuisines. Finally, we can consider opening a Shanghai cuisine restaurant in East Village, or opening a Shanghai cuisine, Xi'an cuisine or Sichuan cuisine in Murray Hill or West Village.