

Coursera Capstone

IBM Applied Data Science Capstone (Week 4: The Battle of Neighborhoods)

Opening a New Chinese Restaurant in NYC, USA

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(IMAGE SOURCE: WWW.BAIDU.COM)

Introduction

New York City (abbreviated as: NYC), located on the Atlantic coast of southeastern New York State, is the largest city and largest port in the United States. New York is a world-class city that directly influences the global economy, finance, media, politics, education, entertainment and fashion industries. The headquarters of many international organizations, multinational companies and banks in the world, including the United Nations headquarters, are located in New York. As of 2017, New York City has a total area of 1214.4 square kilometers and a population of approximately 8.62 million. The food culture of New York is influenced by many immigrants, so it is very diverse. New York City is also a gathering place for fine restaurants. Common exotic foods in New York City include Italian, French, Spanish, Russian, British, Greek, Moroccan, Chinese, Brazilian, and Japanese dishes.

Business Problem

This project finally explored the best locations for Chinese restaurants throughout New York City. New York is a cosmopolitan city, where people of all nationalities blend together, so it has a long tradition of restaurants of different nationalities. In recent decades, there have been a lot of Chinese tourists and immigrants in New York, so Chinese restaurants are very popular. So if I want to open a new Chinese restaurant in New York, what factors do I need to consider? Everyone understands that the location of a restaurant is one of the most important factors affecting the success or failure of a restaurant. Therefore, it is our project that will try to answer the question "Where should I open a Chinese restaurant in New York?"

The target audience of this project

This project is very beneficial to investors who wish to open or invest in new Chinese restaurants in New York or other international metropolises. New York's population is extremely mobile, with over 10,000 restaurants, and no other city can match it. At the same time, there are also a group of tasteful diners in this city, and many experienced

and imaginative chefs together constitute this colorful gastronomic city. New York Restaurant Those famous chefs in New York work hard, and they create all kinds of magical cuisine. They can make the best food in the world. Although the epidemic has dealt a blow to the catering industry in New York, from a long-term trend, the catering industry in New York will definitely be thriving.

Data

In order to answer the above questions, data on New York City's neighborhoods and administrative districts are needed, including boundaries, latitude, longitude, restaurants, and restaurant ratings and tips. New York City data including neighborhoods and administrative districts, latitude and longitude will be obtained from the data source: https://cocl.us/new_york_dataset. All data related to the location and quality of Chinese restaurants will be obtained through the FourSquare API used by the request library in Python.

Methodology

Data will be collected from https://cocl.us/new_york_dataset and cleaned and processed into a dataframe. FourSquare be used to locate all venues and then filtered by Chinese restaurants. Ratings, tips, and likes by users will be counted and added to the dataframe. Data will be sorted based on "Likes". Finally, the data will be visually assessed using graphing from Python libraries.

Exploratory Data Analysis

Initial NYC data

First, we need to Get initial NYC data. Considering the length of the picture, we only display the first five rows of the table.

	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

Figure 1. Initial NYC data

Relationship between Neighborhoods and Borough

Then analyze the form "Neighborhoods per Borough". From the table, we can see that Manhattan has the least number of neighborhoods, and Queens has the most neighborhoods (Neighborhoods per Borough: NYC).

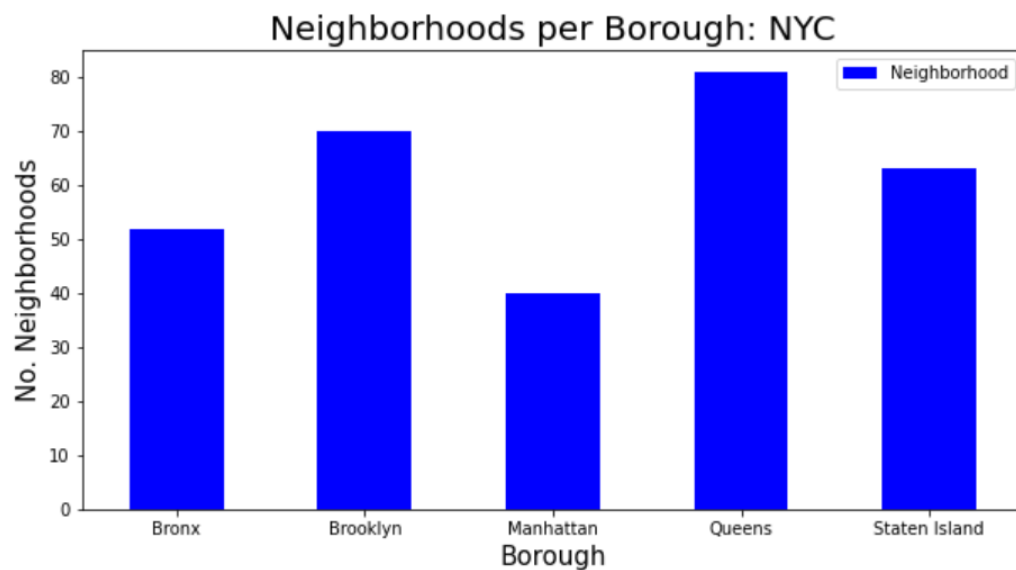


Figure 2. Analyze Neighborhoods per Borough

Next, we need to check how many Chinese restaurants there are in each neighborhood and borough. After data screening and analysis, we found that there are 171 Chinese restaurants in New York. The specific code and process can be seen in the notebook. From the following two charts, we can find some interesting phenomena. From a borough perspective, as we can see below, although Manhattan has the least number of neighborhoods (Neighborhoods per Borough: NYC), it has many Chinese restaurants.

Brooklyn has the most Chinese restaurants, followed by Queens. From the “Chinese Restaurants per Neighborhood” chart, it can be seen that Chinatown has the most Chinese restaurants, and Chinatown is located in Manhattan.

Relationship between Borough and Chinese restaurants

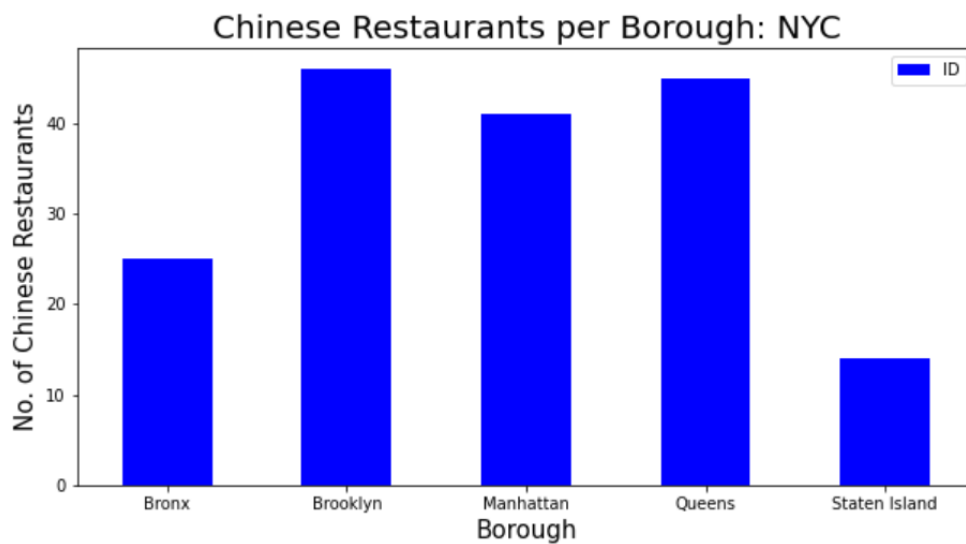


Figure 3. Chinese Restaurants per Borough

Relationship between Neighborhoods and Chinese restaurants

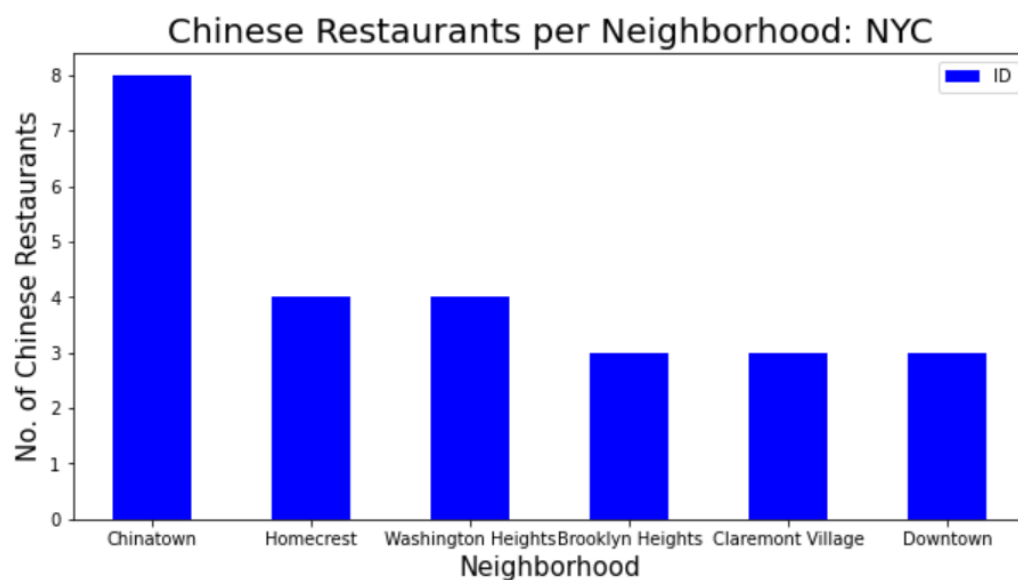


Figure 4. Analyze Chinese Restaurants per Neighborhood

	Borough	Neighborhood	ID	Name
53	Manhattan	Chinatown	4db3374590a0843f295fb69b	Spicy Village
54	Manhattan	Chinatown	4a96bf8ff964a520ce2620e3	Wah Fung Number 1 Fast Food 華豐快餐店
55	Manhattan	Chinatown	5894c9a15e56b417cf79e553	Xi'an Famous Foods
56	Manhattan	Chinatown	59d828f0916bc1155fde2c04	Hwa Yuan
57	Manhattan	Chinatown	3fd66200f964a520b1ea1ee3	Great N.Y. Noodletown
58	Manhattan	Chinatown	5c965dad5455b2002c058659	Yi Ji Shi Mo Noodle Corp
59	Manhattan	Chinatown	4afff2b4f964a520583a22e3	Sun Hing Lung Ho Fun Tofu
60	Manhattan	Chinatown	5ff9e5215b3abd71536c9b46	Hay Hay Roasted 蒜燒臘

Figure 5. Chinese Restaurants in Chinatown

Therefore, Chinatown in Manhattan has the most Chinese restaurants, with a total of 8 restaurants. Now we get the ‘Likes’ of each restaurant through the code. We will conduct follow-up analysis after obtaining the ‘Likes’.

Top 10 neighborhoods with the highest average likes of Chinese restaurants.

We analyzed the top 10 neighborhoods with the highest average preference of Chinese restaurants (the results are shown in the figure below). From the chart, we can see that the average restaurant preferences vary greatly. The maximum value is 363 and the minimum value is only 10. In order to facilitate subsequent analysis, we use Average Likes=30.0 as the cut-off point to select the most suitable location for Chinese restaurants.

	Neighborhood	Average Likes
28	North Side	363.000000
31	Park Slope	75.000000
9	Clinton Hill	46.000000
36	South Side	41.000000
39	Windsor Terrace	33.500000
14	Downtown	33.333333
22	Gowanus	30.000000
4	Boerum Hill	28.000000
5	Brooklyn Heights	24.666667
34	Pelham Parkway	10.000000

Figure 6. Top 10 neighborhoods with the highest average likes of Chinese restaurants

Now, we have analyzed the top 10 neighborhoods with the highest average preference of Chinese restaurants. Then we need to analyze average likes of Chinese Restaurants for each Borough. Through analysis, we have concluded that Chinese restaurants in Brooklyn are the most popular on average. Then, we will consider all the neighborhoods with average likes greater or equal 30.0 to visualize on a map.

Result and discussion

All the project analysis depends on the accuracy of Four Square data. More comprehensive analysis and future work need to incorporate data from other external databases. Through our various analyses above, we can draw conclusions. Among the Chinese restaurants in New York, Chinese restaurants in Manhattan and Brooklyn are highly liked on average. At the same time, we got 171 Chinese Restaurants across New York City. From a borough perspective, as we see below, although Manhattan has the least number of neighborhoods(Neighborhoods per Borough: NYC), it has a lot of Chinese restaurants. Brooklyn has the most Chinese restaurants, followed by Queens. From the “Chinese Restaurants per Neighborhood” chart, we can see that Chinatown has the most Chinese restaurants, and Chinatown is located in Manhattan.

Conclusion

Based on the above information, I would like to say that Manhattan and Brooklyn are the best places to eat Chinese food in New York. To get the most benefit, I will open a Chinese restaurant in Brooklyn. Brooklyn has multiple neighborhoods, and the average customer “likes” rate exceeds 30. At the same time, the concentration of Chinese restaurants is less than that of Manhattan's Chinatown. Therefore, opening a Chinese restaurant in Brooklyn is less competitive than opening a Chinese restaurant in Chinatown. It is also very important that real estate prices in Brooklyn are much cheaper than in Manhattan, so the rent and cost of opening a restaurant will be lower than in

Chinatown in Manhattan. This is consistent with our daily cognition. Brooklyn is the most populous borough on the western end of Long Island. The culture, society and race of this area are very diverse. I believe that if I open the Chinese restaurant here, I will get a very good return on investment. In summary, my Chinese restaurant will be opened in Brooklyn.