

FINAL REPORT

Capstone Project - The Battle of Neighborhoods

Introduction:

New York City's demographics show that it is a large and ethnically diverse metropolis. It is the largest city in the United States with a long history of international immigration. New York City was home to nearly 8.5 million people in 2014, accounting for over 40% of the population of New York State and a slightly lower percentage of the New York metropolitan area, home to approximately 23.6 million. Over the last decade the city has been growing faster than the region. The New York region continues to be by far the leading metropolitan gateway for legal immigrants admitted into the United States. New York City has also been a major point of entry for immigrants; the term "melting pot" was coined to describe densely populated immigrant neighborhoods on the Lower East Side. As many as 800 languages are spoken in New York, making it the most linguistically diverse city in the world. English remains the most widely spoken language, although there are areas in the outer boroughs in which up to 25% of people speak English as an alternate language, and/or have limited or no English language fluency. English is least spoken in neighborhoods such as Flushing, Sunset Park, and Corona. With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese, Indian, and French etc.

Problem:

To find the answers to the following questions:

- Q1) List and visualize all major parts of New York City that has great Chinese restaurants.
- Q2) what is best location in New York City for Chinese Cuisine?
- Q3) which areas have potential Chinese Restaurant Market?
- Q4) which all areas lack Chinese Restaurants?

Q5) which is the best place to stay if you prefer Chinese Cuisine?

Data Section:

New York City's demographics show that it is a large and ethnically diverse metropolis. With its diverse culture, comes diverse food items. There are many restaurants in New York City, each belonging to different categories like Chinese, Indian, and French etc.

For this project we need the following data:

1. New York City data that contains list Boroughs, Neighborhoods along with their latitude and longitude.

- Data source: https://cocl.us/new_york_dataset
- Description: This data set contains the required information. And we will use this data set to explore various neighborhoods of New York City

2. Chinese restaurants in each neighborhood of New York City.

- Data source: Foursquare API
- Description: By using this API we will get all the venues in each neighborhood. We can filter these venues to get only Chinese restaurants.

3. GeoSpace data

- Data source: <https://data.cityofnewyork.us/City-Government/Borough-Boundaries/tqmj-j8zm>
- Description: By using this geo space data we will get the New York Borough boundaries that will help us visualize choropleth map.

Methodology:

1. We begin by collecting the New York city data from the following link "https://cocl.us/new_york_dataset"

2. We will find all venues for each neighbourhood using Foursquare API

```
In [6]: new_york_data=get_new_york_data()
```

```
In [7]: new_york_data.head()
```

```
Out[7]:
```

	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

```
In [8]: new_york_data.shape
```

```
Out[8]: (306, 4)
```

The above result shows that there are 306 different Neighborhoods in New York.

3. We will then filter out all venues with Chinese restaurant for further analysis.

```
( 1 / 306 ) Chinese Restaurants in Wakefield, Bronx:3
( 2 / 306 ) Chinese Restaurants in Co-op City, Bronx:3
( 3 / 306 ) Chinese Restaurants in Eastchester, Bronx:1
( 4 / 306 ) Chinese Restaurants in Fieldston, Bronx:0
( 5 / 306 ) Chinese Restaurants in Riverdale, Bronx:0
( 6 / 306 ) Chinese Restaurants in Kingsbridge, Bronx:0
( 7 / 306 ) Chinese Restaurants in Marble Hill, Manhattan:1
( 8 / 306 ) Chinese Restaurants in Woodlawn, Bronx:0
( 9 / 306 ) Chinese Restaurants in Norwood, Bronx:4
(10 / 306 ) Chinese Restaurants in Williamsbridge, Bronx:1
(11 / 306 ) Chinese Restaurants in Baychester, Bronx:4
(12 / 306 ) Chinese Restaurants in Pelham Parkway, Bronx:4
(13 / 306 ) Chinese Restaurants in City Island, Bronx:1
(14 / 306 ) Chinese Restaurants in Bedford Park, Bronx:3
(15 / 306 ) Chinese Restaurants in University Heights, Bronx:0
(16 / 306 ) Chinese Restaurants in Morris Heights, Bronx:2
(17 / 306 ) Chinese Restaurants in Fordham, Bronx:1
(18 / 306 ) Chinese Restaurants in East Tremont, Bronx:1
(19 / 306 ) Chinese Restaurants in West Farms, Bronx:1
```

4. Next using Foursquare API, we will find the Ratings, Tips, and Number of Likes for all the Chinese Restaurants.

```
In [30]: chinese_rest_stats_ny.head()
```

Out[30]:

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Wakefield	0	0	0	0	0
1	Bronx	Wakefield	0	0	0	0	0
2	Bronx	Wakefield	0	0	0	0	0
3	Bronx	Co-op City	0	0	0	0	0
4	Bronx	Co-op City	0	0	0	0	0

5. We will then sort Neighborhoods and Borough the data keeping Ratings as the constraint

	Neighborhood	Average Rating
28	Chelsea	9.2
83	Greenpoint	9.1
54	East Village	9.0
140	North Side	9.0
138	Noho	9.0
133	Murray Hill	8.9
123	Midtown	8.9
124	Midtown South	8.9
195	West Village	8.9
188	Upper West Side	8.8

	Borough	Average Rating
2	Manhattan	8.049020
1	Brooklyn	4.738542
3	Queens	4.701408
4	Staten Island	3.127451
0	Bronx	1.979710

6. Next we will consider all the neighborhoods with average rating greater or equal 9.0 to visualize on map.

	Neighborhood	Average Rating
28	Chelsea	9.2
54	East Village	9.0
83	Greenpoint	9.1
138	Noho	9.0
140	North Side	9.0

7. We will join this dataset to original New York data to get longitude and latitude.

8.

	Borough	Neighborhood	Latitude	Longitude	Average Rating
0	Manhattan	Chelsea	40.744035	-74.003116	9.2
1	Staten Island	Chelsea	40.594726	-74.189560	9.2
2	Manhattan	East Village	40.727847	-73.982226	9.0
3	Brooklyn	Greenpoint	40.730201	-73.954241	9.1
4	Manhattan	Noho	40.723259	-73.988434	9.0
5	Brooklyn	North Side	40.714823	-73.958809	9.0

Result:

So now we can answer the questions asked above in the Questions section:

1. Chelsea (Manhattan), Chelsea (Staten Island), East Village (Manhattan) are some of the best neighborhoods for Chinese cuisine.
2. Manhattan have potential Chinese Restaurant Market.
3. Bronx ranks last in average rating of Indian Restaurants.
4. Manhattan is the best place to stay if you prefer Chinese Cuisine

Conclusion:

There is always room for improvement and hence the above solution I have provided can also be improved for best results depending upon the data we have.