The Battle of Neighborhoods

Open a Chinese Restaurant in San Francisco

The Golden Gate Bridge

Introduction

San Francisco, officially the City and County of San Francisco, is a cultural, commercial, and financial center in Northern California. San Francisco is the 16th most populous city in the United States, and the fourth most populous in California. Also, San Francisco is famous for its diverse race and ethnicity as many Chinese immigrants chose to live here from long time ago. As a result, many Asian restaurants have been opened in the city and locals and tourists love this so much.

The purpose of this project is to help people who tend to open their own Chinese restaurant in the city. This project will take factors including restaurant density, rating and tips to provide stragety information in terms of location option to the clients.
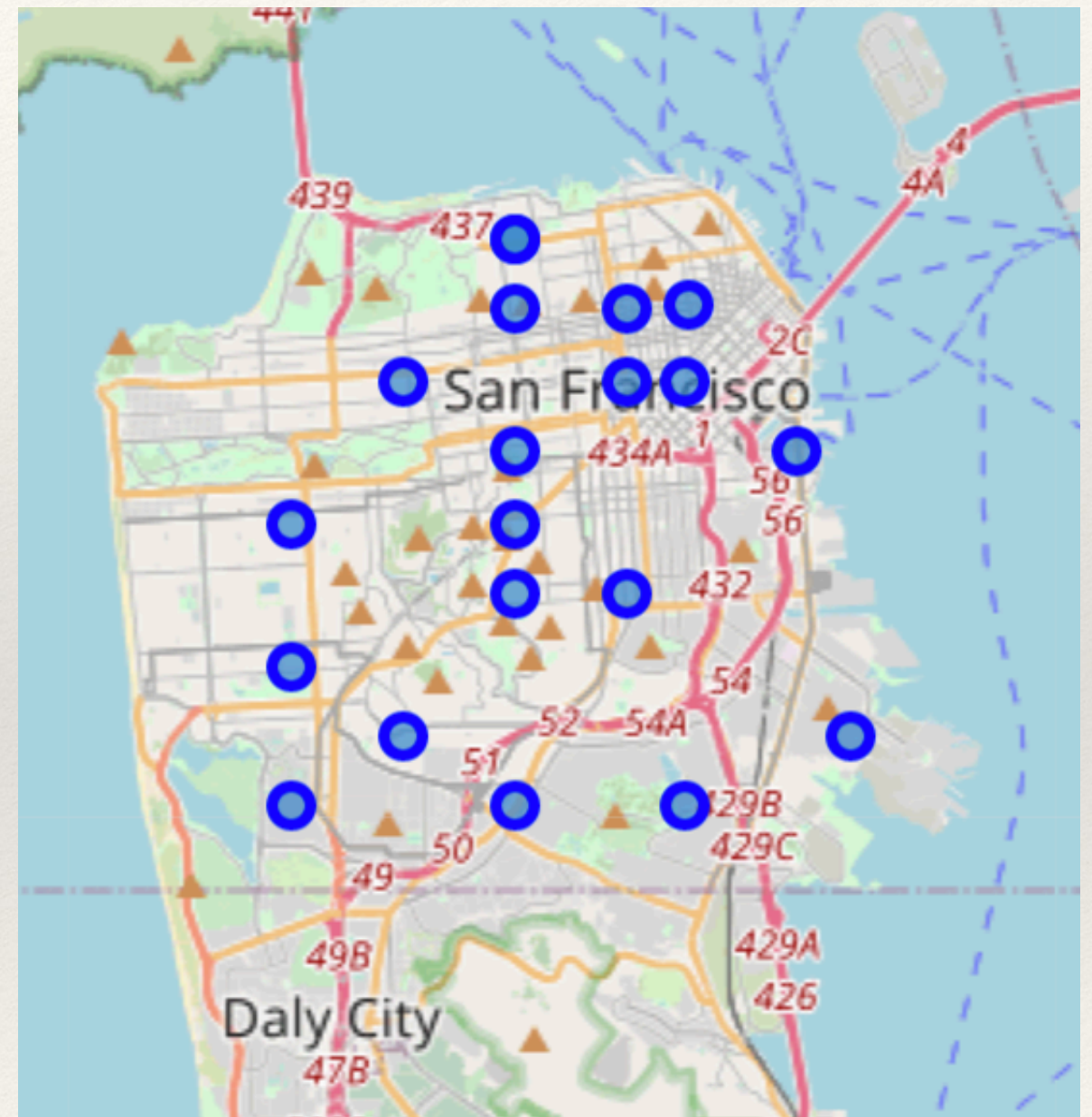
Data

- ❖ San Francisco Neighborhood zip code and geographic data:

  - ❖ We generate the list of neighborhoods candidate around the Chinatown in the city. We use the information on this website: http://www.healthysf.org/bdi/outcomes/zipmap.html

  - ❖ Longitude and latitude information: In order to get the longitude and latitude data information, we will use uszip module to search the information with zipcode

- ❖ Neighborhood Venue information from Foursquare API:

  - ❖ Chinese Restaurants:

    - ❖ Location information

    - ❖ Rating

  - ❖ All Venue Categories

Methodology

❖ We use the Foursquare to get Chinese Restaurant Venue information including information and Rating, getting the average rating in each neighborhood to balance good reputation and strong competition.

❖ In order to attract more customers by having a diverse neighborhood with many other entertainment places, we then cluster the neighborhood by different venue categories using KNN cluster method.

Results

	Zipcode	Neighborhood	Latitude	Longitude
1	94102	Hayes Valley/Tenderloin/North of Market	37.780	-122.420
2	94103	South of Market	37.780	-122.410
3	94107	Potrero Hill	37.770	-122.390
4	94108	Chinatown	37.791	-122.409
5	94109	Polk/Russian Hill (Nob Hill)	37.790	-122.420
6	94110	Inner Mission/Bernal Heights	37.750	-122.420
7	94112	Ingelside-Excelsior/Crocker-Amazon	37.720	-122.440
8	94114	Castro/Noe Valley	37.760	-122.440
9	94115	Western Addition/Japantown	37.790	-122.440
10	94116	Parkside/Forest Hill	37.740	-122.480
11	94117	Haight-Ashbury	37.770	-122.440
12	94118	Inner Richmond	37.780	-122.460
13	94121	Outer Richmond	37.800	-122.700
14	94122	Sunset	37.760	-122.480
15	94123	Marina	37.800	-122.440
16	94124	Bayview-Hunters Point	37.730	-122.380
17	94127	St. Francis Wood/Miraloma/West Portal	37.730	-122.460
18	94131	Twin Peaks-Glen Park	37.750	-122.440
19	94132	Lake Merced	37.720	-122.480
20	94133	North Beach/Chinatown	37.800	-122.440
21	94134	Visitacion Valley/Sunnydale	37.720	-122.410

San Francisco Neighborhoods Map

Chinese Restaurant Venue information

eighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue_id	Venue	Venue Category	Venue Latitude&Longitude	Venue address	Venue Distance
uth of Market	37.780	-122.41	5a616f53d69ed07940d7c279	Sizzling Pot King	[(Szechuan Restaurant, 52af3b773cf9994f4e043c03)]	(37.77711002625363, -122.4125721848816)	{'address': '139 8th St', 'lat': 37.7771100262...	393
Chinatown	37.791	-122.41	5c5f6c27ff0306002c2ff96b	Dim Sum Corner	[(Dim Sum Restaurant, 4bf58dd8d48988d1f5931735)]	(37.792627, -122.406181)	{'address': '601 Grant Ave', 'crossStreet': 'C...	307
Chinatown	37.791	-122.41	4e7680ef1838f9188a51413f	Szechuan Cuisine Uncle Cafe	[(Szechuan Restaurant, 52af3b773cf9994f4e043c03)]	(37.79419177842302, -122.40683096020591)	{'address': '65 Waverly Pl', 'lat': 37.7941917...	403
Chinatown	37.791	-122.41	4b36c6fcf964a520333c25e3	Oriental Pearl	[(Dim Sum Restaurant, 4bf58dd8d48988d1f5931735)]	(37.79435323360806, -122.40595180711202)	{'address': '760 Clay St', 'lat': 37.794353233...	459
Chinatown	37.791	-122.41	4eb9ce33722edc0eaef08d3e	Yummy Dim Sum	[(Dim Sum Restaurant, 4bf58dd8d48988d1f5931735)]	(37.794362, -122.40771399999998)	{'address': '930 Stockton St', 'lat': 37.79436...	390
Chinatown	37.791	-122.41	4e4ce09dbd413c4cc66ce392	Chinese Seafood Dim Sum	[(Dim Sum Restaurant, 4bf58dd8d48988d1f5931735)]	(37.793717, -122.405992)	{'address': '708 Grant Ave', 'lat': 37.793717,...	401
Chinatown	37.791	-122.41	4ac9186af964a52095be20e3	Blossom Bakery	[(Dim Sum Restaurant, 4bf58dd8d48988d1f5931735)]	(37.79452314205239, -122.40680407220638)	{'address': '133 Waverly Pl', 'crossStreet': '...	437

We use the longitude and latitude information for each neighborhood to request the general information of all the Chinese Restaurant in each neighborhood

	Venue_id	Rating
0	5a616f53d69ed07940d7c279	6.2
1	5c5f6c27ff0306002c2ff96b	6.9
2	4e7680ef1838f9188a51413f	6.7
3	4b36c6fcf964a520333c25e3	6.4
4	4eb9ce33722edc0eaef08d3e	6.5
5	4e4ce09dbd413c4cc66ce392	NaN
6	4ac9186af964a52095be20e3	NaN
7	5aff2c8b18d43b00396daf2f	NaN
8	54347c1e498e72e113993c01	6.3
9	52db40d011d268b3e4037631	NaN
10	4648c04df964a520a8461fe3	6.2

	Neighborhood	Rating
2	Ingelside-Excelsior/Crocker-Amazon	8.40
0	Castro/Noe Valley	8.10
1	Chinatown	6.56
5	Polk/Russian Hill (Nob Hill)	6.20
6	South of Market	6.20
3	Inner Richmond	NaN
4	Parkside/Forest Hill	NaN
7	Sunset	NaN

We then use the Venue id of each restaurant to request rating information

We merged these rating information back to the
restaurant data frame and then group by neighborhood to get the average rating for Chinese restaurants in each neighborhoods
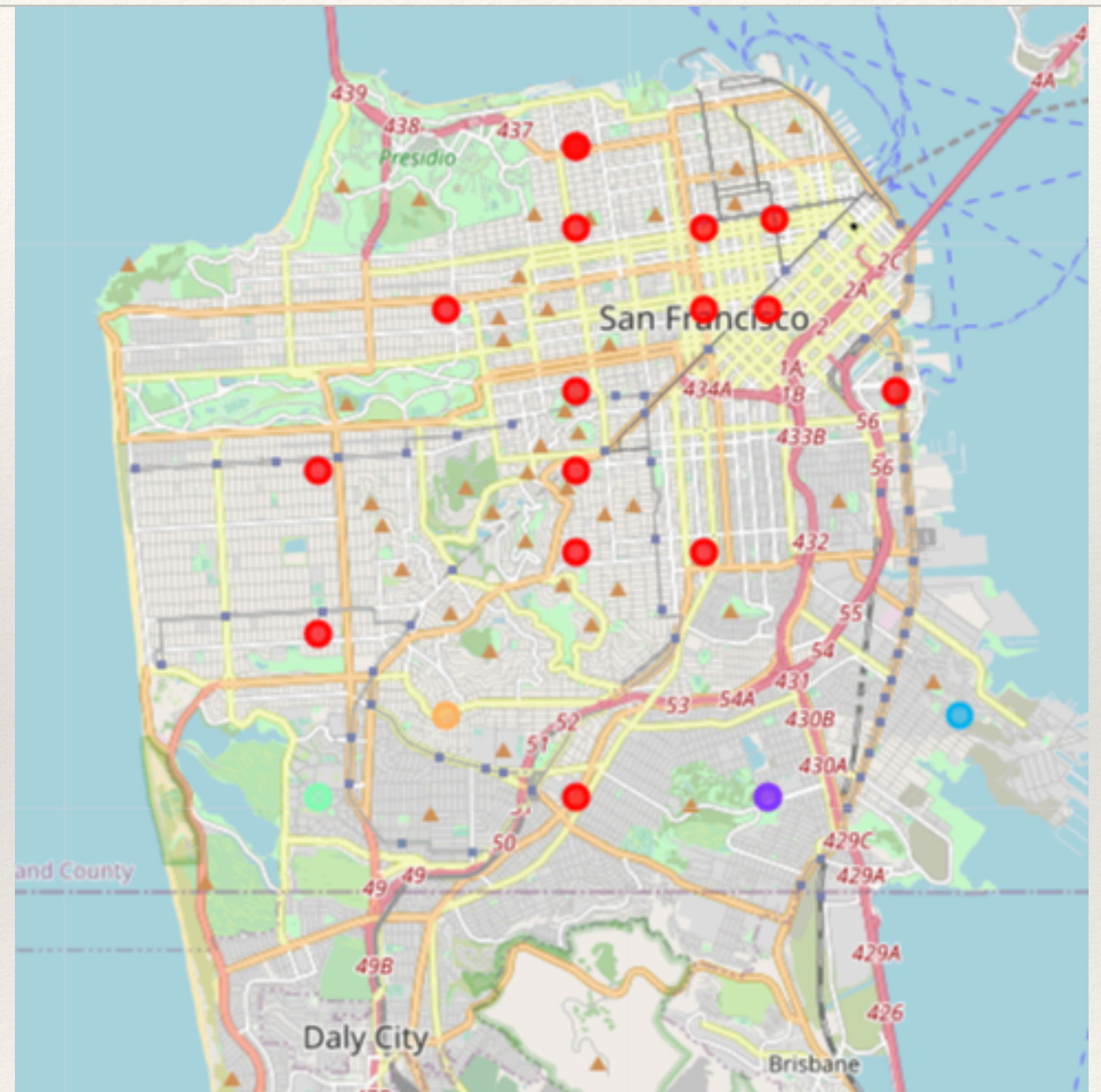
Note:
The null value is that the restaurant is not been rated yet.

The descending order of average rating shows that Ingelside-Excelsior/Crocker-Amazon area has the top ratings. And Chinatown only ranks the third.

Clustering Neighborhoods

	Neighborhood	1st Most Common Venue
0	Hayes Valley/Tenderloin/North of Market	Venue Category_Vietnamese Restaurant
1	South of Market	Venue Category_Coffee Shop
2	Potrero Hill	Venue Category_Food Truck
3	Chinatown	Venue Category_Coffee Shop
4	Polk/Russian Hill (Nob Hill)	Venue Category_Massage Studio
5	Inner Mission/Bernal Heights	Venue Category_Mexican Restaurant
6	Ingelside-Excelsior/Crocker-Amazon	Venue Category_Pizza Place
7	Castro/Noe Valley	Venue Category_Park
8	Western Addition/Japantown	Venue Category_Park
9	Parkside/Forest Hill	Venue Category_Chinese Restaurant
10	Haight-Ashbury	Venue Category_Grocery Store
11	Inner Richmond	Venue Category_Sushi Restaurant
12	Sunset	Venue Category_Bubble Tea Shop
13	Marina	Venue Category_Italian Restaurant
14	Bayview-Hunters Point	Venue Category_Motorcycle Shop
15	St. Francis Wood/Miraloma/West Portal	Venue Category_Fountain
16	Twin Peaks-Glen Park	Venue Category_Yoga Studio
17	Lake Merced	Venue Category_Café
18	North Beach/Chinatown	Venue Category_Italian Restaurant
19	Visitacion Valley/Sunnydale	Venue Category_Garden

We first explore the most common venue in each neighborhoods. The result is shown in the table on the left. Then we used KNN Clustering Method to do unsupervised learning among the neighborhoods area, using the data from Foursquare API and make the venue categories into dummy variable.

Conclusion

❖ Based on the common venue categories shown in the previous slide, we can know that Ingelside-Excelsior/Crocker-Amazon area is a common place for pizza restaurant but the 2nd common place is Chinese Restaurants. While Chinatown has a lot of coffee shop. Taking all of these into consideration, Chinatown might still be a good place to start a new Chinese restaurant. As long as the food are in good quality, the new venue should stand out with high rating in this famous Chinese food area.