

Chinese Restaurant in Chinatown, Chicago

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Introduction

It is hard to find a good restaurant without reviewing scores, especially when students are doing reviews for their final exams in the public library. This analysis is to find the best Chinese restaurant in Chinatown, Chicago for students studying in Chinatown Public Library.

Data to be used

The analysis will be using the address of public library to locate the area in which more Chinese restaurants are located. Next, it will use foursquare to find Chinese restaurants in certain range nearby the library and relevant information such as distance and rating.

Finally, the result will show a few options and display the rating in dataframe with suggested restaurant.

Methodology

To set up the appropriate tools used in the analysis, it is important to install libraries such as numpy, pandas, matplotlib and geopy etc. After installing the necessary libraries, information will be requested from Foursquare, specifying the number of searches to be used in the analysis. Afterwards, the latitude and longitude of Chinatown Public Library in Chicago will be requested in order to set up the center point for the search.

Next, after retrieving data of keyword “Chinese restaurant” by radius of 300 meters, the result will be loaded into json file and after normalizing values, the data will be transformed into dataframe. It is essential to clean up unnecessary data such as postcode in the data before further analysis is conducted.

```
[58]: {'meta': {'code': 200, 'requestId': '5e8e9d21d03993001bb09a10'},
      'response': {'venues': [{'id': '57476c6acd182ac356bcc850',
                             'name': 'Chef Bao Chinese Restaurant',
                             'location': {'address': '2230 S Wentworth Ave',
                                           'lat': 41.85195375570797,
                                           'lng': -87.63222098350525,
                                           'labeledLatLngs': [{'label': 'display',
                                                                'lat': 41.85195375570797,
                                                                'lng': -87.63222098350525}],
                                           'distance': 209,
                                           'postalCode': '60616',
                                           'cc': 'US',
                                           'city': 'Chicago',
                                           'state': 'IL',
                                           'country': 'United States',
                                           'formattedAddress': ['2230 S Wentworth Ave',
                                                                'Chicago, IL 60616',
                                                                'United States']},
                             'categories': [{'id': '4bf58dd8d48988d145941735',
                                              'name': 'Chinese Restaurant',
                                              'pluralName': 'Chinese Restaurants',
                                              'shortName': 'Chinese',
                                              'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/asian_',
                                                       'suffix': '.png'},
                                              'primary': True},
                                              {'id': '4bd62e20637ba59325d8f770',
                                              'name': 'Great Wall Restaurant',
                                              'location': {'address': '2127 S China Pl',
                                                            'lat': 41.854095623018154,
                                                            'lng': -87.633142035872,
                                                            'labeledLatLngs': [{'label': 'display',
                                                                                       'lat': 41.854095623018154,
                                                                                       'lng': -87.633142035872}]}]}]}
```

Figure 1. Part of json file

[73]:		id	name	categories	referralId	hasPerk	location.address	location.lat	location.lng
0	57476c6acd102ac356bcc850	Chef Bao Chinese Restaurant	4bf58dd8d48988d145941735	Chinese Restaurant	1586404723	False	2230 S Wentworth Ave	41.851954	-87.632221
1	4bd62e20637ba59325d8f770	Great Wall Restaurant	4bf58dd8d48988d145941735	Chinese Restaurant	1586404723	False	2127 S China Pl	41.854096	-87.633142
2	4b6a36b2f964a52070cd2be3	Mayflower	4bf58dd8d48988d145941735	Chinese Restaurant	1586404723	False	2225 S Wentworth Ave	41.852175	-87.632221
3	4a7ca70df964a5201aed1fe3	Ken Kee Restaurant	4bf58dd8d48988d145941735	Chinese Restaurant	1586404723	False	2129 S China Pl	41.854014	-87.633142
4	4f74aae3e4b0f112e194fdc9	Chinese American Veteran's	4bf58dd8d48988d130941735	Chinese Restaurant	1586404723	False	NaN	41.852700	-87.632221

Figure 2. Result of searching by keyword “Chinese restaurant”

After data cleaning, a map will be displayed to show the restaurants and visualize their distance from the library. Moreover, a histogram is formed to show the number of restaurants within walking distance by categorizing distance into 6 groups.

		name	categories	address	lat	lng	distance	id
11		Cantonesia Restaurant	Chinese Restaurant	204 W Cermak Rd	41.853154	-87.632107	75	4b5f55aaf964a520a7b429e3
1		Great Wall Restaurant	Chinese Restaurant	2127 S China Pl	41.854096	-87.633142	86	4bd62e20637ba59325d8f770
3		Ken Kee Restaurant	Chinese Restaurant	2129 S China Pl	41.854014	-87.633196	87	4a7ca70df964a5201aed1fe3
7		My Place Chinese Cuisine	Chinese Restaurant	2022 S Wentworth Ave	41.854626	-87.632556	93	50bba610e4b09c65432edb2e
20		Little lamb restaurant	Chinese Restaurant	NaN	41.852948	-87.631846	102	54a590b6498e51ca1d812128
19		Moon Palace Restaurant	Chinese Restaurant	216 W Cermak Rd	41.852915	-87.632311	103	4b3e5aaf964a520cc9b25e3
24		Emerald City	Chinese Restaurant	218 W Cermak Rd	41.852947	-87.632691	108	4c34f488a0ced13a040e196e
18		Three Happiness	Chinese Restaurant	209 W Cermak Rd	41.852815	-87.632326	114	4b5b5141f964a5201cf428e3
31		Yan Bang Cai	Chinese Restaurant	228 W Cermak Rd	41.852888	-87.633018	126	51f3ef808bbdec0dcf323d80
28		Tientsin Restaurant	Chinese Restaurant	2002 S Wentworth Ave	41.855029	-87.631981	133	59bec36d135b3922e9bf86b0
17		New Chinatown Restaurant	Chinese Restaurant	207 W Cermak Rd	41.852615	-87.632368	136	4c6c7b6099b9236a8ed1e2c9
5		Hing Kee Restaurant	Chinese Restaurant	2140 S Archer Ave	41.853990	-87.633826	138	4debcc19b0f8a2937f7f81955
8		Triple Crown Restaurant	Chinese Restaurant	2217 S Wentworth Ave	41.852484	-87.631875	152	4b24af7ef964a520706924e3

Figure 3. Result sort by distance after filtering the correct categories

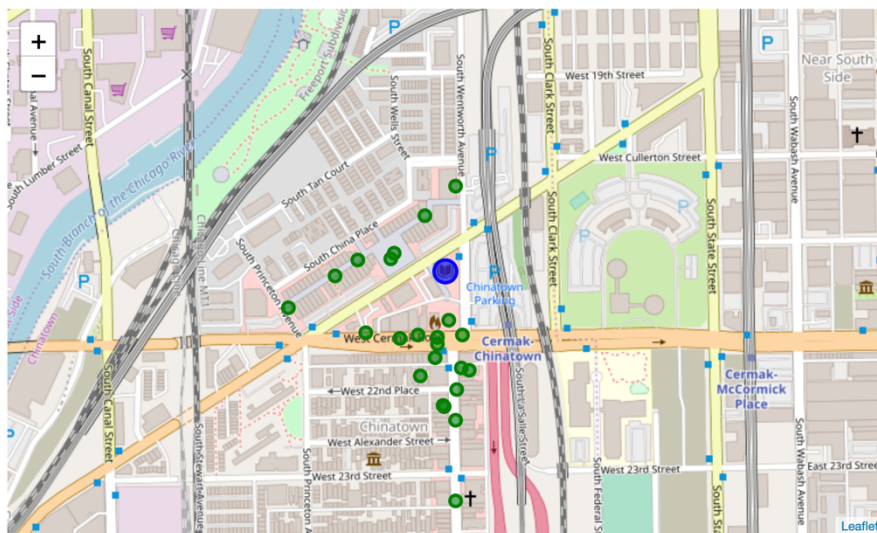


Figure 4. Map showing relevant geographic location of selected restaurants

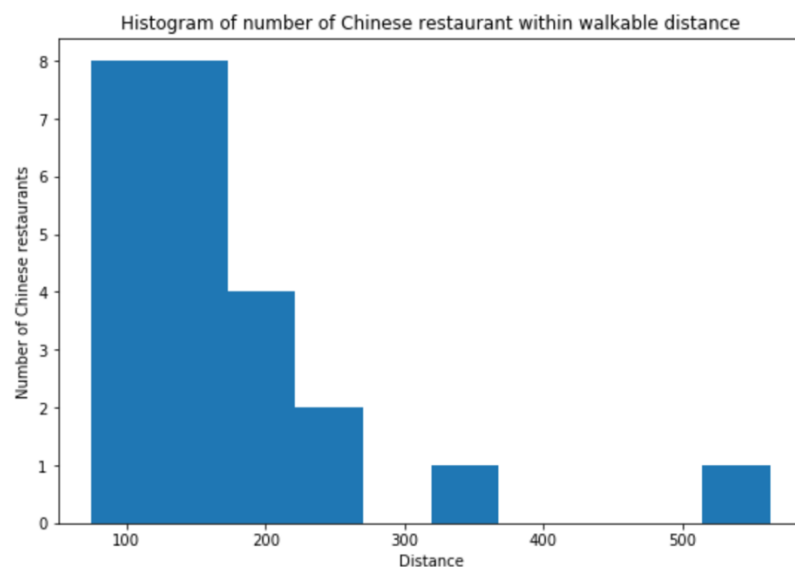


Figure 5. Histogram of number of selected Chinese restaurants

Since the suggestion should be based on the most common concern – distance, a new index including top 7 restaurants nearest restaurants will be generated. Afterwards, rating for each restaurant is added into the dataframe and is also displayed in a histogram for quick reference.

Result

After plotting in the distance and ratings of the nearest 7 restaurants around the Chinatown Public Library in scatter plot, it is revealed that there is no direct relationship between distance and the rating. Therefore, a short question-and-answer program is constructed so that students can easily sort the nearest restaurant by either distance or ratings.



Figure 6. Scatter plot of restaurant's distance from Library against ratings

```
Are you in mood of Chinese food? YES/NO  YES
Good, let's start
By what method? Distance/Rating Distance
Good, here you go the suggested resaurants by distance
distance
name
Three Happiness          114.0
Emerald City             108.0
Moon Palace Restaurant   103.0
My Place Chinese Cuisine  93.0
Ken Kee Restaurant       87.0
Great Wall Restaurant    86.0
Cantonesia Restaurant    75.0
```

Figure 7. Question and reply program to call out the restaurants by distance or rating

Discussion

The observation of nil direct relationship between ratings and distance from center point is not surprising. However, in some other scenario, such as comparing restaurants in same categories with the relevant distance from office or central business area may have more direct relationship. Further analysis can include different types of search center point such as

library, school, office building, residential areas to come up with a broader coverage of samples.

On the other hand, categories of restaurants can be discussed as well. For example, fine dining restaurants in rural areas may have much longer distance from the city center but still gain high rating due to its uniqueness. Furthermore, age group is a possible variable. For instance, adults age over 30 are more likely to have a car and people within this age group may be more willing to travel long distance compared with students age under 18.

Conclusion

The above analysis tries to figure out the relationship between distance and ratings for the Chinese restaurants around Chinatown Public Library, Chicago. Moreover, a simple call function is created for users to search for the best restaurants quickly by distance and the ratings. However, more variables may be included in the analysis such as location of search center, age group of users and the types of restaurants.