

Capstone Project - The Battle of Neighbourhoods (Week 1)

Introduction/Business Problem:

As more Asians move to New York, there is an increased demand for restaurants that sell Asian food, specifically Chinese Restaurant.

If you ever tried to find a Chinese Restaurant around your neighbourhood, you would know that there aren't too many of them yet.

Thus, making this a great opportunity for entrepreneurs (target audience) looking to open a Chinese Restaurant.

In this case we will be looking at where to open a Chinese Restaurant in Manhattan, NY.

Data:

We will be leveraging the already rich Foursquare location data, in combination with New York neighbourhood's

data(<https://ibm.box.com/shared/static/fbpwbovar7lf8p5sgddm06cgipa2rxpe.json> & https://geo.nyu.edu/catalog/nyu_2451_34572) to get the following features; borough, neighbourhood name, latitude and longitude coordinates

, by making an api call (

create the API request URL

```
url =  
'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}'.format(  
  
    CLIENT_ID,  
  
    CLIENT_SECRET,  
  
    VERSION,  
  
    lat,  
  
    lng,  
  
    radius,  
  
    LIMIT)
```

```
# make the GET request
```

`results = requests.get(url).json()[\"response\"][\"groups\"][0][\"items\"]` to the Foursquare database to give us the following features; restaurant name, category, latitude and longitude coordinates.

Methodology:

We will be using the k-means clustering algorithm to group neighbourhoods with similar characteristics (i.e. look at neighbourhoods that already have successful (1st Most Common Venue) Chinese Restaurant and see what features they have, then look for neighbourhoods with the similar features to open a new Chinese Restaurant).

Before we can do all of this we have to load and explore the data by cleaning, defining new variables and transforming the data into a data frame. Also, one hot encoding to get the most common venues in each neighbourhood.

Results:

Manhattan, NY has two neighbourhoods, namely Chinatown and Lower East Side that already have Chinese Restaurant as the 1st Most Common Venue and they both belong to Cluster label 1/Cluster 2.

```
manhattan_merged[manhattan_merged['1st Most Common Venue']=='Chinese Restaurant']
```

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
1	Manhattan	Chinatown	40.715618	-73.994279	1	Chinese Restaurant	Bakery	Cocktail Bar	Bubble Tea Shop	Coffee Shop	Optical Shop	Bar	Spa	American Restaurant	Ice Cream Shop
20	Manhattan	Lower East Side	40.717807	-73.980890	1	Chinese Restaurant	Bakery	Café	Ramen Restaurant	Art Gallery	Coffee Shop	Cocktail Bar	Yoga Studio	Clothing Store	French Restaurant

Discussion:

Even though the number of Asians moving to Manhattan, NY has increased over the years. There are still not enough Chinese restaurants around Manhattan, NY.

Thus, providing a great opportunity for entrepreneurs looking to open Chinese restaurants in neighbourhoods that belong to the same cluster as Chinatown and Lower East Side.

Look at the below neighbourhoods together with other factors such as Chinese population size in that neighbourhood, other restaurants that do not fall under the Chinese restaurant category but serve Chinese food, as potential places to open your restaurant.

Cluster 2

```
manhattan_merged.loc[manhattan_merged['Cluster Labels'] == 1, manhattan_merged.columns[[1] + list(range(5, manhattan_merged.shape[1]))]]
```

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
1	Chinatown	Chinese Restaurant	Bakery	Cocktail Bar	Bubble Tea Shop	Coffee Shop	Optical Shop	Bar	Spa	American Restaurant	Ice Cream Shop
14	Clinton	Theater	Coffee Shop	Italian Restaurant	Gym / Fitness Center	Hotel	Gym	Cocktail Bar	Wine Shop	Thai Restaurant	American Restaurant
15	Midtown	Hotel	Coffee Shop	Theater	Bakery	Clothing Store	Sushi Restaurant	Japanese Restaurant	Cuban Restaurant	Pizza Place	Mediterranean Restaurant
16	Murray Hill	Hotel	Sandwich Place	Pizza Place	Japanese Restaurant	Coffee Shop	Gym / Fitness Center	Mediterranean Restaurant	Deli / Bodega	Bar	Chinese Restaurant
20	Lower East Side	Chinese Restaurant	Bakery	Café	Ramen Restaurant	Art Gallery	Coffee Shop	Cocktail Bar	Yoga Studio	Clothing Store	French Restaurant
22	Little Italy	Spa	Bubble Tea Shop	Mediterranean Restaurant	Italian Restaurant	Ice Cream Shop	Pizza Place	Bakery	Salon / Barbershop	Café	Sandwich Place
26	Morningside Heights	Park	Coffee Shop	American Restaurant	Bookstore	Burger Joint	Sandwich Place	Deli / Bodega	Donut Shop	Seafood Restaurant	Tennis Court
32	Civic Center	Coffee Shop	Hotel	Cocktail Bar	Spa	Park	American Restaurant	Gym / Fitness Center	French Restaurant	Café	Sporting Goods Shop
33	Midtown South	Korean Restaurant	Hotel	Dessert Shop	Burger Joint	Coffee Shop	Japanese Restaurant	Café	American Restaurant	Gym / Fitness Center	Hotel Bar

Conclusion :

Neighbourhoods in Manhattan, NY that are like Chinatown and Lower East Side are the best place to open your Chinese restaurant. So, go open your restaurant in places like Clinton, Murray Hill, Midtown South etc.