



# BATTLE OF THE NEIGHBORHOOD

M.H. 2020

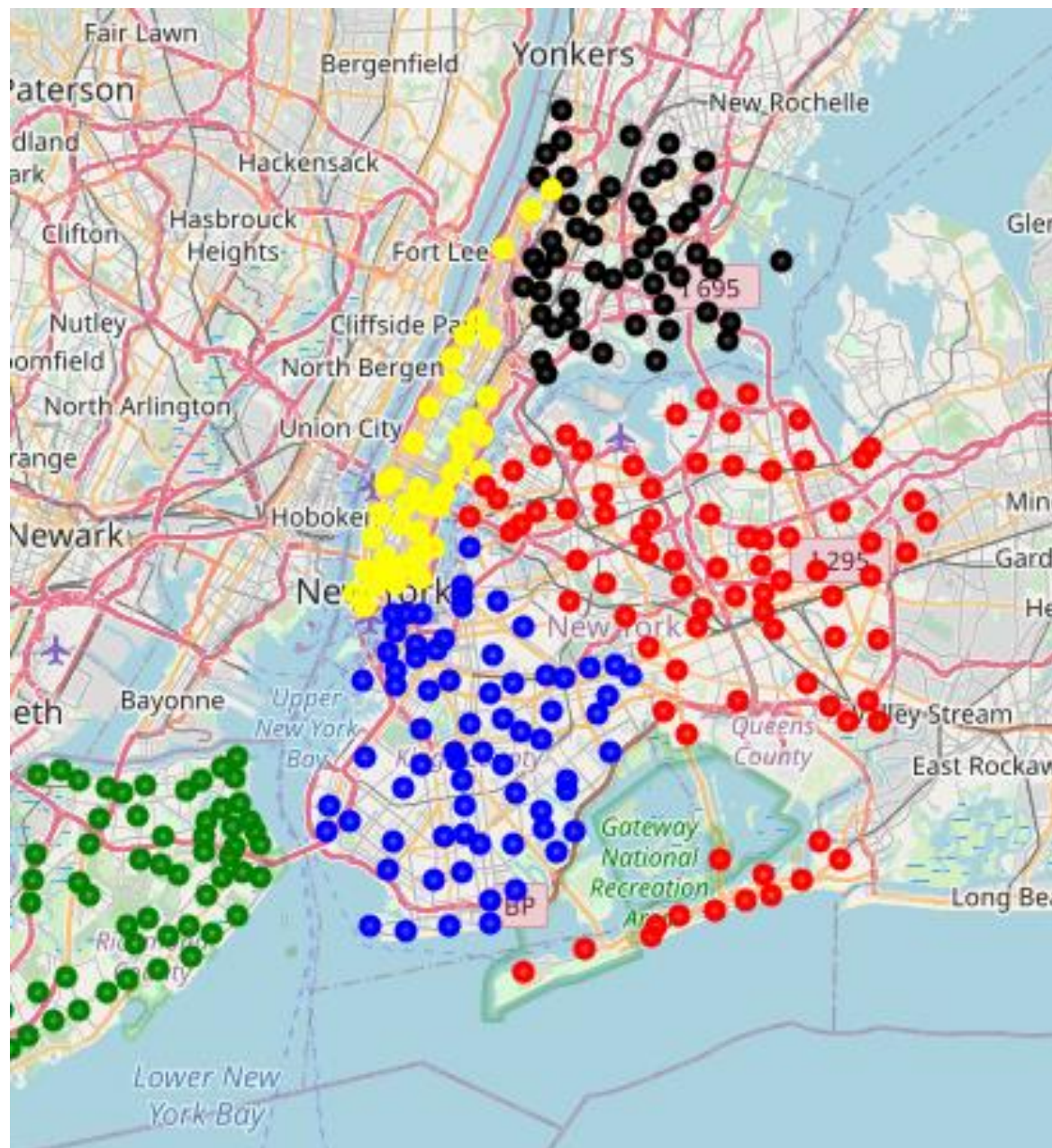


# Motivation

- Advise a CEO on choosing a location for the new company branch
- Both the CEO and most employees are food enthusiasts -> prefer Chinese restaurants
- Find a location for the company within New York that offers many Chinese food venues in the proximity

# Data/Methods

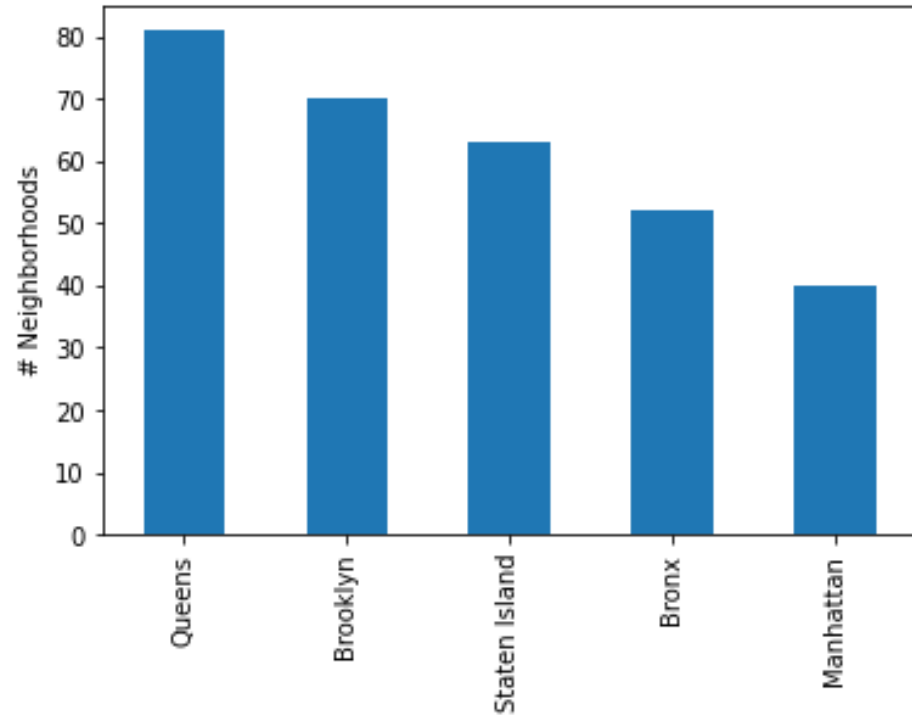
- Spatial information about the boroughs and neighborhoods in New York:
  - ‘2014 New York City Neighborhood Names’ dataset from the NYU Spatial Repository
- Foursquare location data accessed by the Foursquare API using a free account
  - specifically interested in food-venues -> add parameter ‘categoryId’ to the request URL
  - CategoryID for food: 4d4b7105d754a06374d81259
  - URL-mask:  
[https://api.foursquare.com/v2/venues/explore?categoryId={ }&client\\_id={ }&client\\_secret={ }&v={ }&ll={ },{ }&radius={ }&limit={ }](https://api.foursquare.com/v2/venues/explore?categoryId={ }&client_id={ }&client_secret={ }&v={ }&ll={ },{ }&radius={ }&limit={ })
- Use k-means algorithm to cluster neighborhoods in New York by availability of Food-Venue-Types



## #Neighborhoods in New York

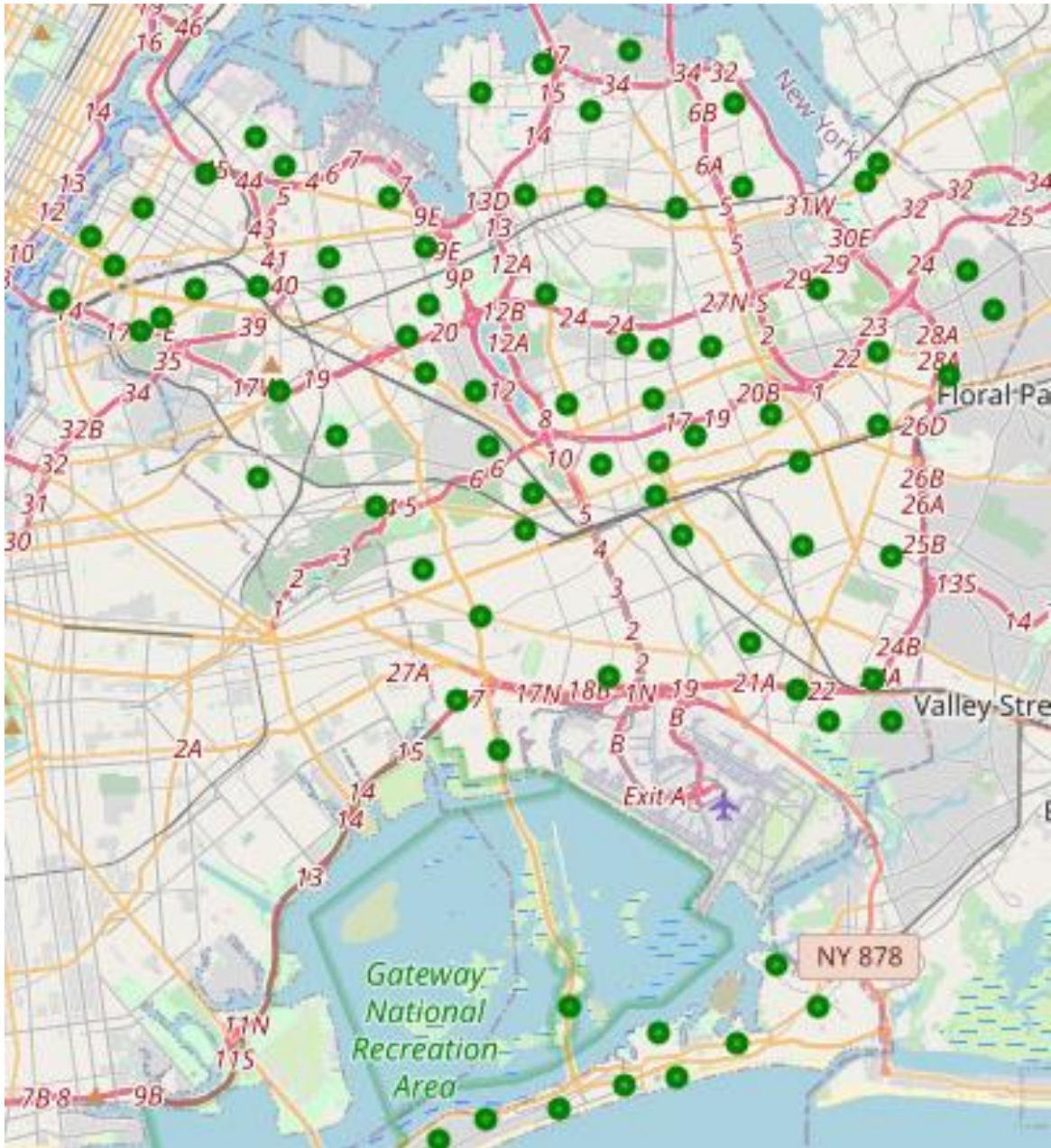
- Use Folium to superimpose the spatial data from NYU Spatial Repository on a map of New York
- Bronx = Black
- Manhattan = Yellow
- Queens = Red
- Brooklyn = Blue
- Staten Island = Green

## #Neighborhoods/Borough



- A list of all boroughs in New York
- Ranked by the number of neighborhoods
- -> Going to focus on Queens for this case study, due to the largest amount of neighborhoods

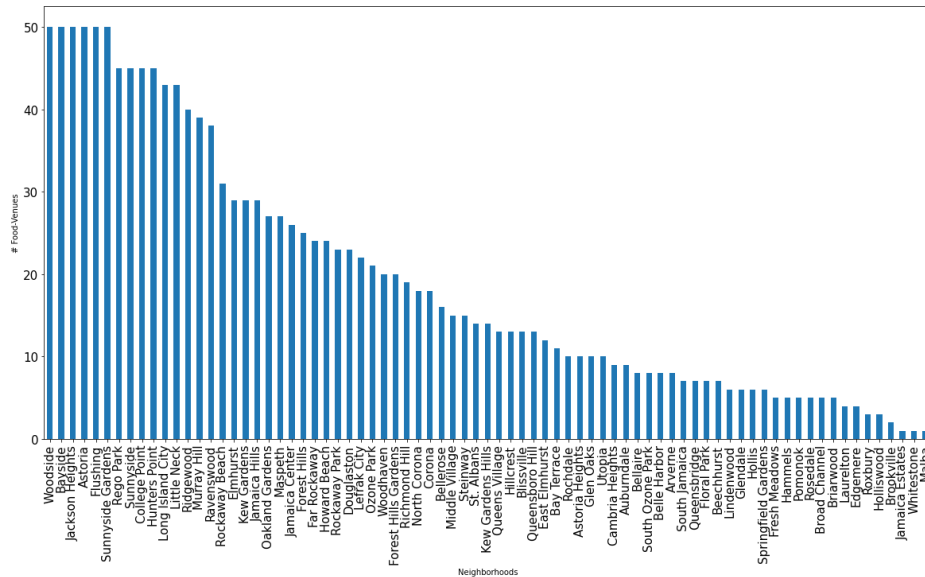




# Overview Queens

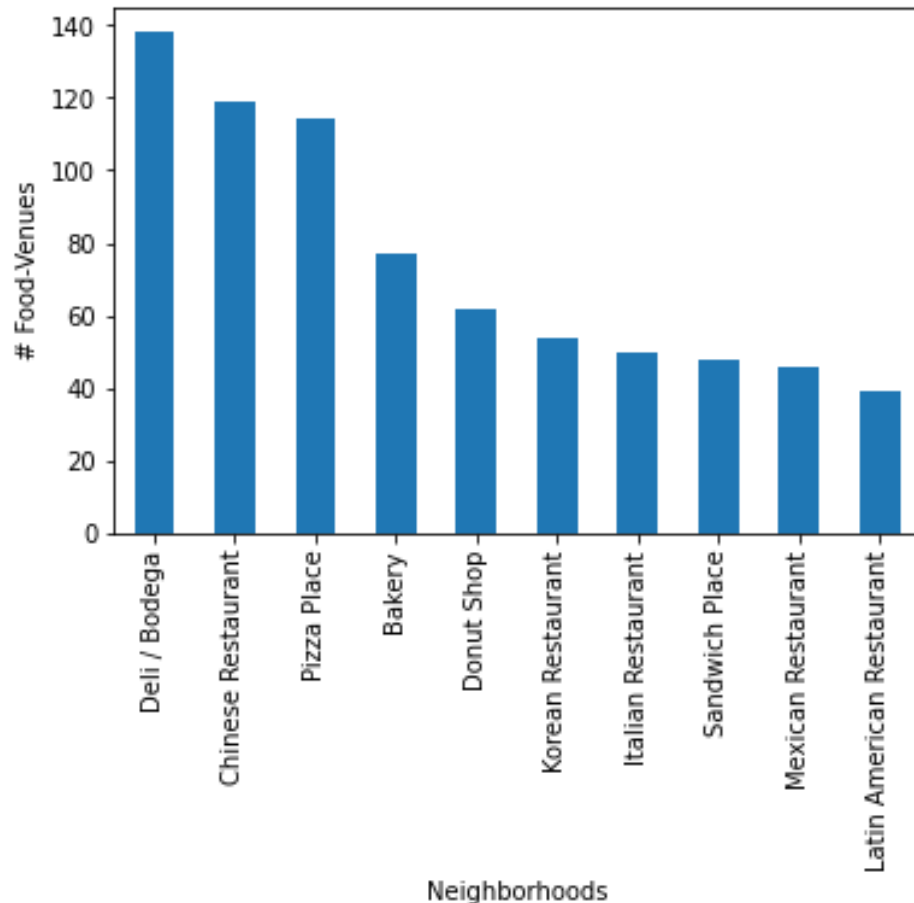
- Detailed overview on the spatial distribution of neighborhoods in Queens
- 80 neighborhoods

# Ranking neighborhoods by #food-venues



- All neighborhoods in Queens are ranked by the number of food-type venues they have to offer
- Due to the usage of a free account for the Foursquare API the number of results was capped at 50
- 6 neighborhoods have 50 or more food-venues
- 3 neighborhoods only offer a single venue
- Most neighborhoods offer 10-30 venues

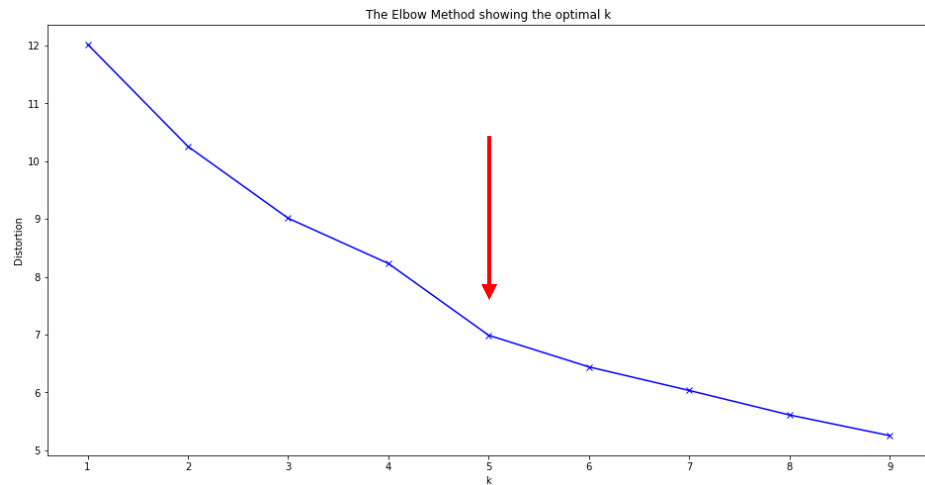
# Most frequent restaurant-type across Queens



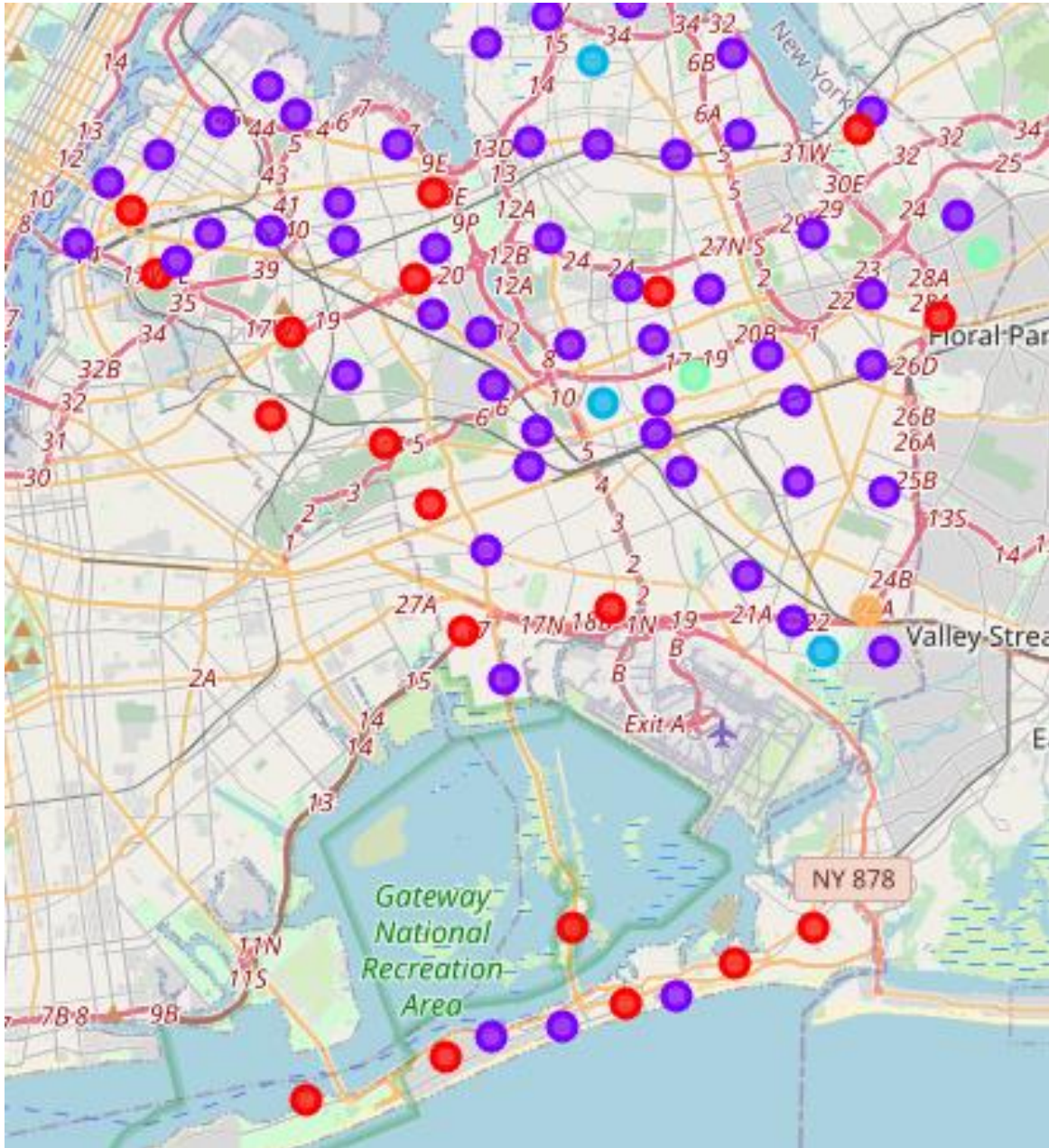
- ~140 Deli/Bodega
  - Bodega – Spanish for 'grocery store'. Offers various items & also food
  - Deli – Originates from the German word 'Delikatesse'. Similar to Bodega, but with a stronger focus on prepared food.
  - Often used interchangeably
- ~120 Chinese Restaurants
  - Good for our client!



# Elbow Method



- Used to determine the number of clusters for the k-mean clustering algorithm
- We will use 5 clusters for this analysis



# Clustered neighborhoods in Queens

- 5 clusters in total
- **Cluster 1:**
  - 19 NBHD / Focus: Deli / Bakery / Pizza
- **Cluster 2:**
  - 52 NBHD / Focus: Chinese Rest. / Pizza / Deli
- **Cluster 3:**
  - 3 NBHD / Focus: Vietnamese Rest. / Dumpling Rest.
- **Cluster 4:**
  - 2 NBHD / Focus: Indian Rest.
- **Cluster 5:**
  - 1 NBHD / Focus: Caribbean Rest.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
67	Forest Hills	Asian Restaurant	Food Truck	Deli / Bodega	Thai Restaurant
19	Middle Village	Chinese Restaurant	Bakery	Burrito Place	Japanese Restaurant
68	Kew Gardens	Chinese Restaurant	Deli / Bodega	Bakery	Italian Restaurant
69	Richmond Hill	Chinese Restaurant	Deli / Bodega	Latin American Restaurant	Pizzeria
22	Ravenswood	Chinese Restaurant	Deli / Bodega	Pizza Place	Bakery
60	Beechhurst	Chinese Restaurant	Deli / Bodega	Restaurant	Salad Bar
5	Bellaire	Chinese Restaurant	Halal Restaurant	Italian Restaurant	Breakfast
70	Flushing	Chinese Restaurant	Hotpot Restaurant	Bakery	Szechuan Restaurant
35	Little Neck	Chinese Restaurant	Korean Restaurant	Pizza Place	Deli / Bodega
40	Fresh Meadows	Chinese Restaurant	Pizza Place	Fast Food Restaurant	Vegetarian Restaurant
24	Queensboro Hill	Chinese Restaurant	Shanghai Restaurant	Pizza Place	Hotpot Restaurant
10	Utopia	Deli / Bodega	Afghan Restaurant	Bakery	Donut Shop
1	Lefrak City	Deli / Bodega	Bakery	Donut Shop	
15	Blissville	Deli / Bodega	Bakery	Donut Shop	Thai Restaurant
55	Ridgewood	Deli / Bodega	Bakery	Pizza Place	Italian Restaurant
28	Woodhaven	Deli / Bodega	Chinese Restaurant	Pizza Place	Mexican Restaurant

## Example from Cluster 2

- First 16 (out of 52) entries for cluster 2
- The most common venues for the respective neighborhoods are shown



# Summary

- The CEO seeks to place the company branch in a neighborhood with many Chinese restaurants
- The second most frequent food-venue-type in Queens (New York) is ,Chinese Restaurant'
- After using k-means clustering:
  - Neighborhoods in cluster 2 have a high occurrence of Chinese restaurants
  - This cluster contains 52 neighborhoods (largest cluster)
- Further analysis could take into account more variables (e.g. Property Cost, Rent Prices, Other Venues etc.)