# IBM Data Science Professional Certificate

Capstone Project: The Battle of Neighborhoods

Analysing neighborhoods in Brooklyn

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Tashkent 2019

# 1. Problem Statement

People of all kinds from around the world flock to New York City, with some of these them aspiring to make this remarkable place a home of their own. Many of them, provided the more reasonable accommodation prices, choose to settle in Brooklyn.

With the open data provided on Foursquare API coupled with data science techniques, one can derive useful information about different venues in diverse localities of Brooklyn while considering other factors of his choice. This would help the potential client to make an informed decision about buying or renting a suitable property.

### Target audience

Potential clients looking to settle in Brooklyn and lacking the local knowledge of neighborhoods to find the best spot near a specific place of their interests or tastes – be it an Italian restaurant, a sushi bar, or a pub.

### Stakeholders

1. Home Buyers/Renters
2. Home Sellers/Owners
3. Real estate agents

## 2. Data used

- **Data item**
  Foursquare location data

  **Type of data**
  JSON

  **Duration**
  N/A

  **Description of the data**
  Location coordinates obtained by Foursquare API calls.

  To determine the frequency of various amenities as per the client's requirement, Foursquare location data is used.

  **Source:**
  https://foursquare.com/

- **Data item**
  2014 New York City Neighborhood Names

  **Type of data**
  JSON

  **Duration**
  2014

  **Description of the data**
  New York City neighborhoods spatial data.

  To map and cluster the neighborhood data.

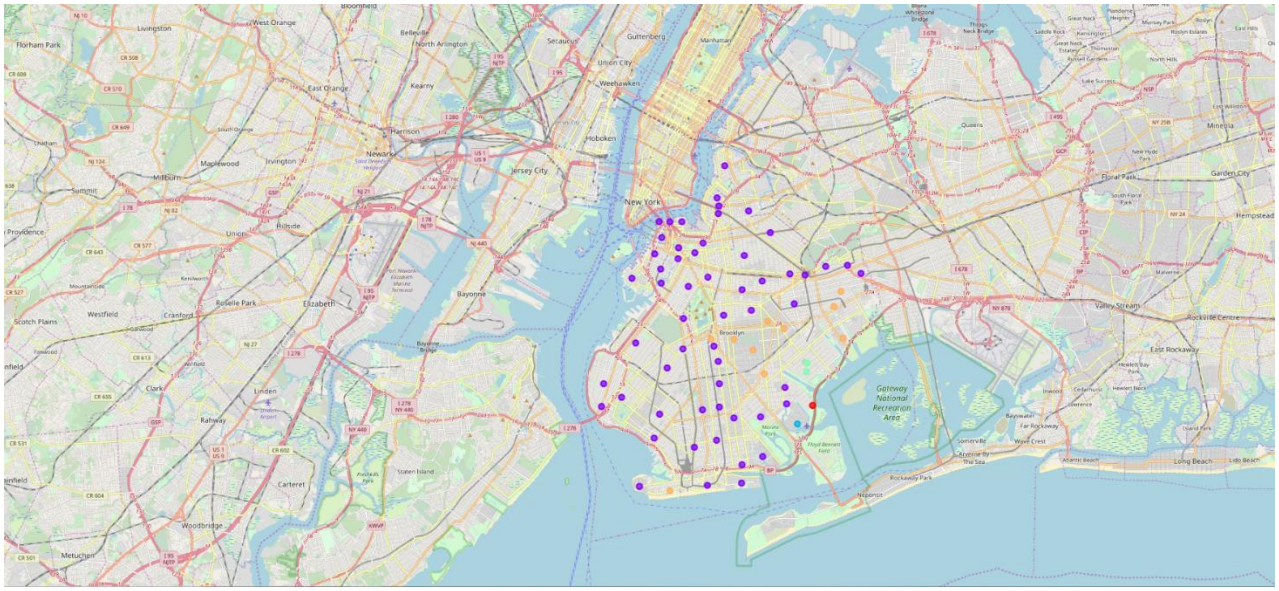
  **Source:**
  https://geo.nyu.edu/catalog/nyu_2451_34572

# 3. Methodology

1. Downloading the dependencies
2. Downloading dataset
3. Data cleansing – transforming data into pandas dataframe
4. Using geopy library to get the latitude and longitude vales of New York City
5. Creating the map of New York City with neighborhoods superimposed on top
6. Creating map of Brooklyn using latitude and longitude values
7. Adding markers to map
8. Creating API request
9. Make GET request
10. Return relevant information on each venue
11. Checking out how many venues there are for each neighborhood
12. Checking out how many categories can be curated from all the returned venues
13. Analysing each neighborhood
14. Each neighborhood with the top 10 common venues
15. Clustering neighborhoods
16. Visualising the clusters
17. Examining clusters

# 4. Results

Analysis of the data returned 77 neighborhoods in Brooklyn, clustered them, and categorized top 10 most common venues in each neighborhood.




This is the head of the resulted data.

| | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | Brooklyn | Bay Ridge | 40.625801 | -74.030621 | 1 | Spa | Italian Restaurant | Pizza Place | Greek Restaurant | American Restaurant | Bar | Bagel Shop | Grocery Store | Sushi Restaurant | Thai Restaurant |
| 1 | Brooklyn | Bensonhurst | 40.611009 | -73.995180 | 1 | Chinese Restaurant | Pizza Place | Sushi Restaurant | Ice Cream Shop | Donut Shop | Smoke Shop | Pet Store | Cosmetics Shop | Grocery Store | Noodle House |
| 2 | Brooklyn | Sunset Park | 40.645103 | -74.010316 | 1 | Bakery | Mexican Restaurant | Pizza Place | Latin American Restaurant | Bank | Gym | Mobile Phone Shop | Pharmacy | Donut Shop | Record Shop |
| 3 | Brooklyn | Greenpoint | 40.730201 | -73.954241 | 1 | Bar | Pizza Place | Coffee Shop | Cocktail Bar | Café | Bakery | Furniture / Home Store | French Restaurant | Mexican Restaurant | Record Shop |
| 4 | Brooklyn | Gravesend | 40.595260 | -73.973471 | 1 | Italian Restaurant | Pizza Place | Bakery | Bus Station | Lounge | Diner | Gourmet Shop | Martial Arts Dojo | Gym | Chinese Restaurant |

Link to the notebook to see the full data:

https://github.com/Fordaemdur/Coursera_Capstone/blob/master/Analysing%20neighborhoods%20in%20Brooklyn.ipynb

## 5. Conclusion

Results provided in the given analysis will help anyone seeking to relocate to Brooklyn find the neighborhood that suits them, as well as help the home/apartment sellers and real estate agents market their products and find the best suit for their client depending on their preferences.