# EXPLORATION AND MAPPING OF THE MANHATTAN COFFEE SHOPS

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# Business Problem

- Aspiring business owners have a big decision to make: WHERE?

- Location for setting up a business may impact:
  - Revenue
  - Initial costs
  - Operational costs
  - Customer traffic
  - Advertising

# New York Coffee Shops

- There are approximately **3,389 coffee shops** in New York
- How to decide where to build another?

- Using Foursquare venue data and data involving Manhattan neighborhoods, location can be ranked in a variety of parameters to help locate the "perfect" neighborhood.

# Data Details

- Latitude, longitude latitude and longitude of New York City Neighborhoods – **Wikipedia**

- List of venues with neighborhood and category data – **Foursquare**

- Population by neighborhood from 2012 census - **WorldAtlas** data

-  Real Estate transaction data from 2019-2020 – **Property Shark**

https://www.worldatlas.com/articles/manhattan-neighborhoods-by-population.html

https://www.propertyshark.com/Real-Estate-Reports/nyc-neighborhood-sales/#:~:text=Only%209%20NYC%20neighborhoods%20recorded,and%20Neponsit's%20medians%20exceeded%20%20%241%2C000%2C000

# Part 1: Frequency of Coffee Shops

```
----Battery Park City----
              venue    freq
0              Park    0.10
1       Coffee Shop    0.06
2             Hotel    0.06
3    Clothing Store    0.05
4               Gym    0.04


----Carnegie Hill----
              venue    freq
0       Coffee Shop    0.07
1              Café    0.06
2         Wine Shop    0.04
3               Gym    0.03
4          Bookstore  0.03
```
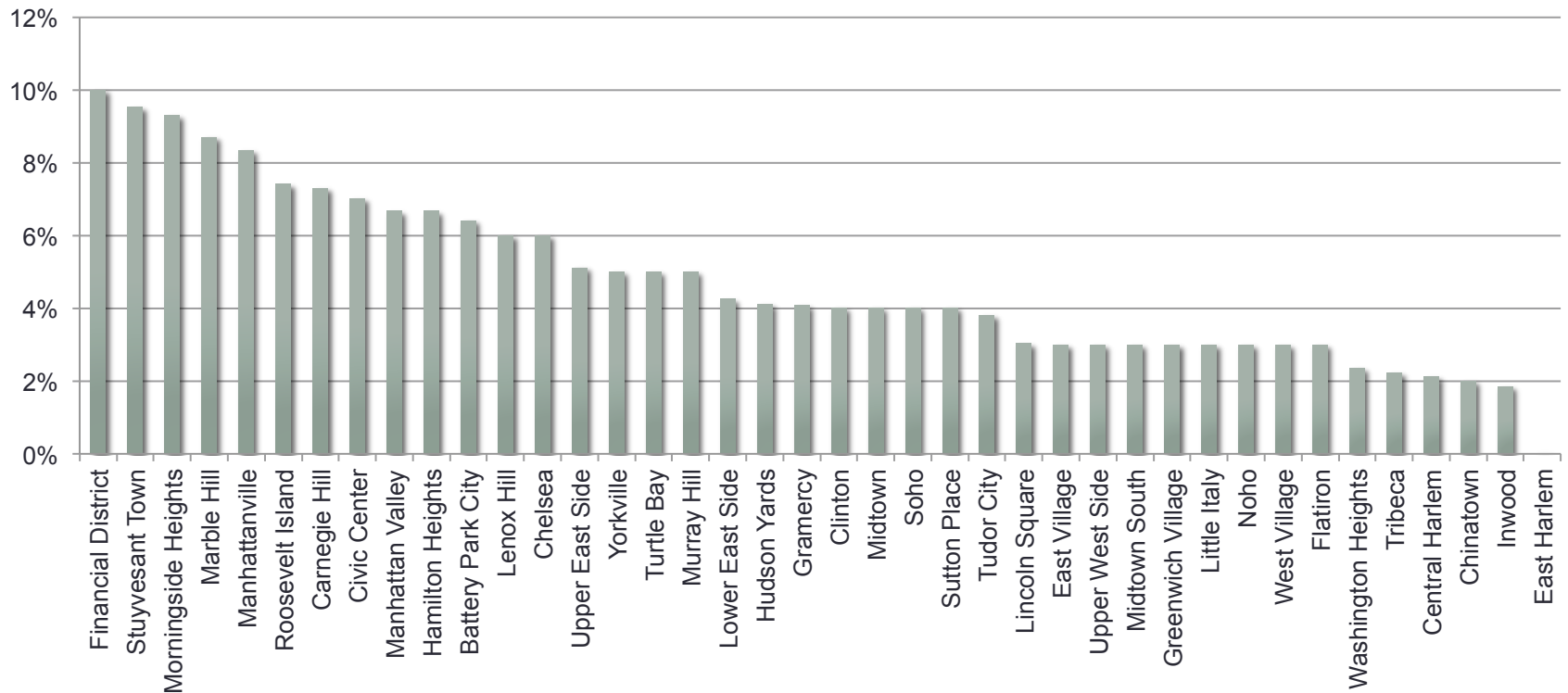
| | Neighborhood | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue |
|---|---|---|---|---|---|
| 0 | Battery Park City | Park | Coffee Shop | Hotel | Clothing Store |
| 1 | Carnegie Hill | Coffee Shop | Café | Wine Shop | Gym |
| 2 | Central Harlem | African Restaurant | Seafood Restaurant | Gym / Fitness Center | American Restaurant |
| 3 | Chelsea | Coffee Shop | Art Gallery | Bakery | American Restaurant |
| 4 | Chinatown | Chinese Restaurant | Bakery | Cocktail Bar | American Restaurant |

Output from venue category frequency analysis along with the first few rows from the common venues data-frame.
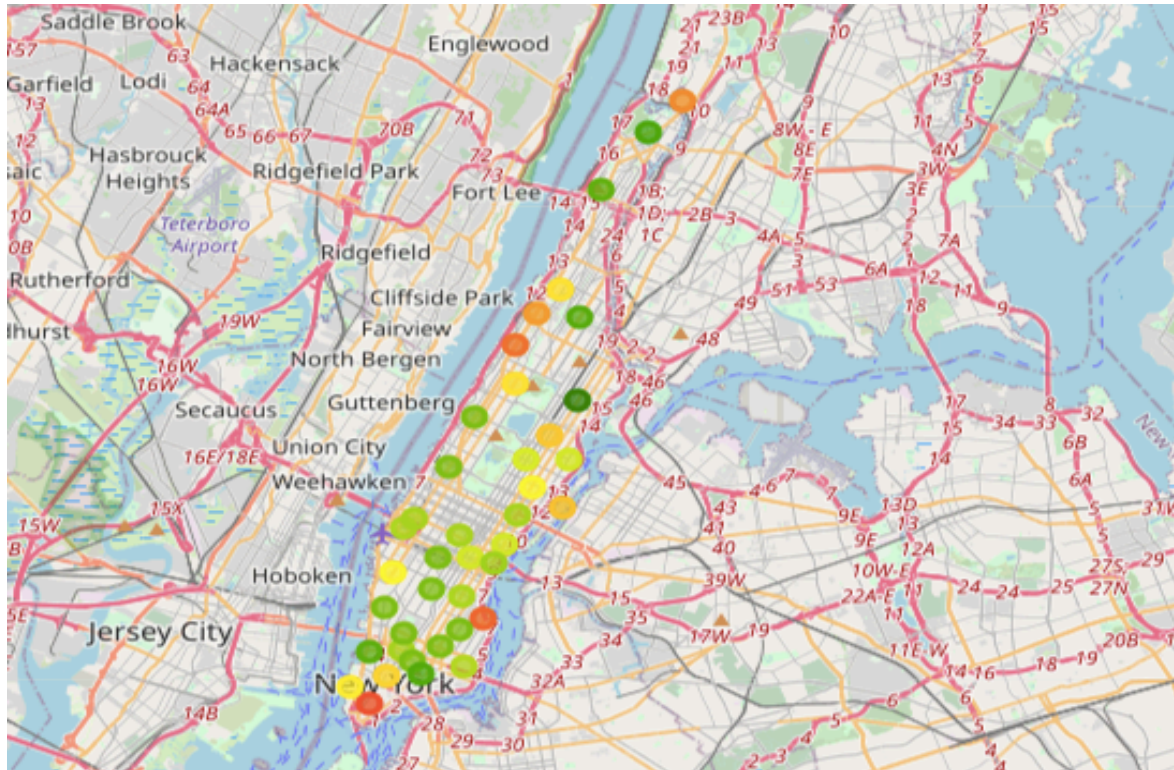
# Part 1: Frequency of Coffee Shops

**Frequency of Coffee Shops as Venues**



Graph showing the frequency of coffee shops as venues in Foursquare data per neighborhood in Manhattan. The Financial District showed highest frequency, and East Harlem showed the lowest.

# Part 1: Frequency of Coffee Shops



**Green = low frequency of coffee shops**

**Red = high frequency of coffee shops**

Image of the map of Manhattan, the markers showing each neighborhood color-coded based on frequency of coffee shops as venues in Foursquare data.
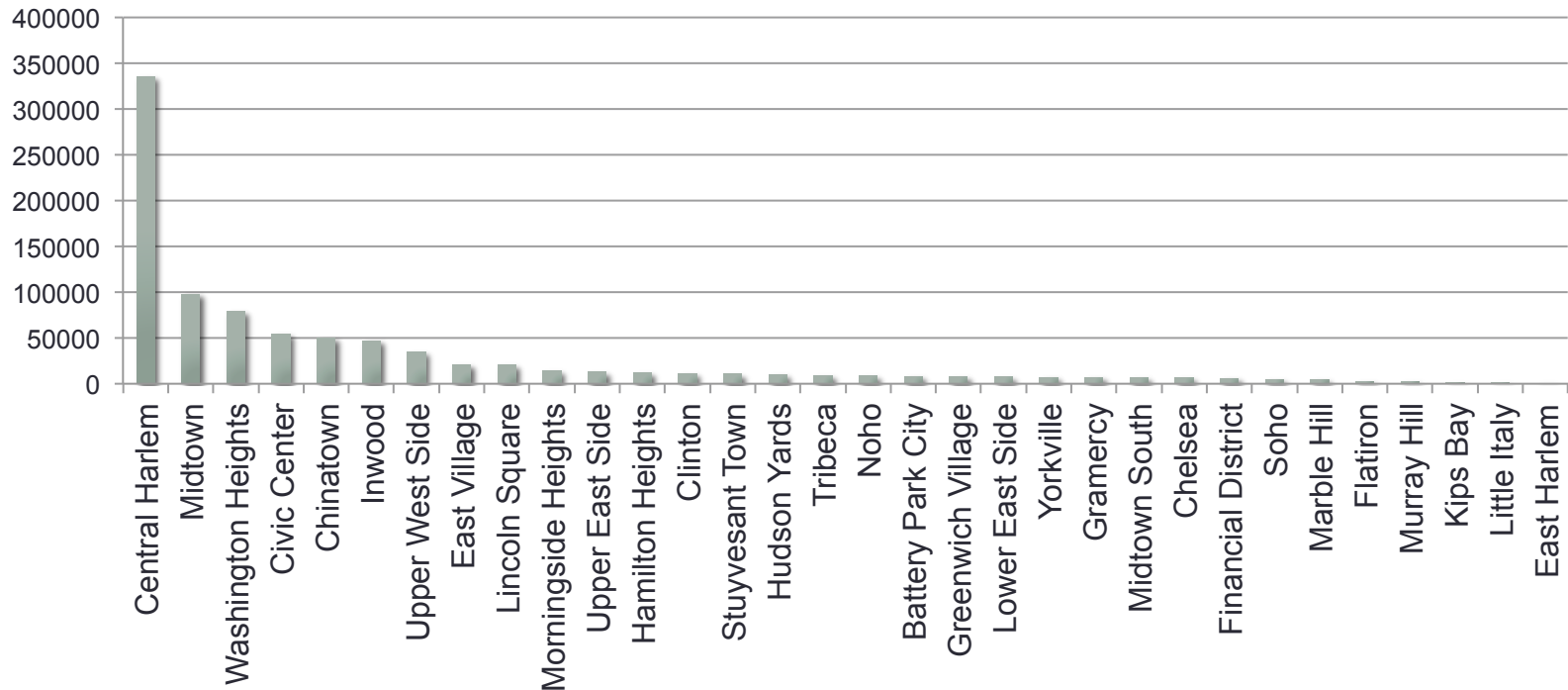
# Part 2: People per Coffee Shop

| | Neighborhood | Coffee Shop | Population | Population per shop |
|---|---|---|---|---|
| 1 | Central Harlem | 1.0 | 335109.0 | 335109.000000 |
| 21 | Midtown | 4.0 | 391371.0 | 97842.750000 |
| 31 | Washington Heights | 2.0 | 158318.0 | 79159.000000 |
| 4 | Civic Center | 7.0 | 382654.0 | 54664.857143 |
| 3 | Chinatown | 2.0 | 100000.0 | 50000.000000 |
| 15 | Inwood | 1.0 | 46746.0 | 46746.000000 |
| 30 | Upper West Side | 6.0 | 209084.0 | 34847.333333 |
| 7 | East Village | 3.0 | 62832.0 | 20944.000000 |

Top rows of the data-frame to incorporate population data, with number of coffee shops, population, and ratio of population per shop. Central Harlem has the highest ratio, followed by Midtown.
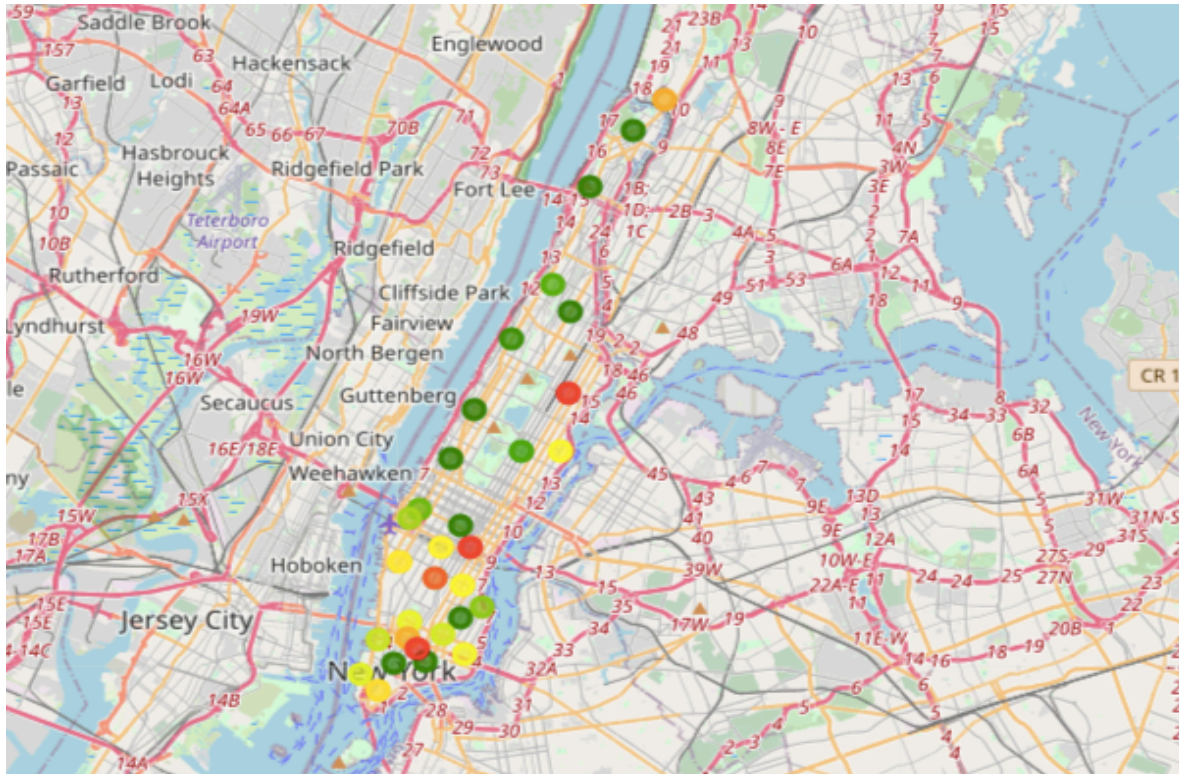
# Part 2: People per Coffee Shop

**Population per shop**



Graph showing the ratio of population to coffee shops in each neighborhood in Manhattan, using 2012 census data. Central Harlem and Midtown had the highest population per coffee shop.

# Part 2: People per Coffee Shop



**Green = many people per coffee shop**

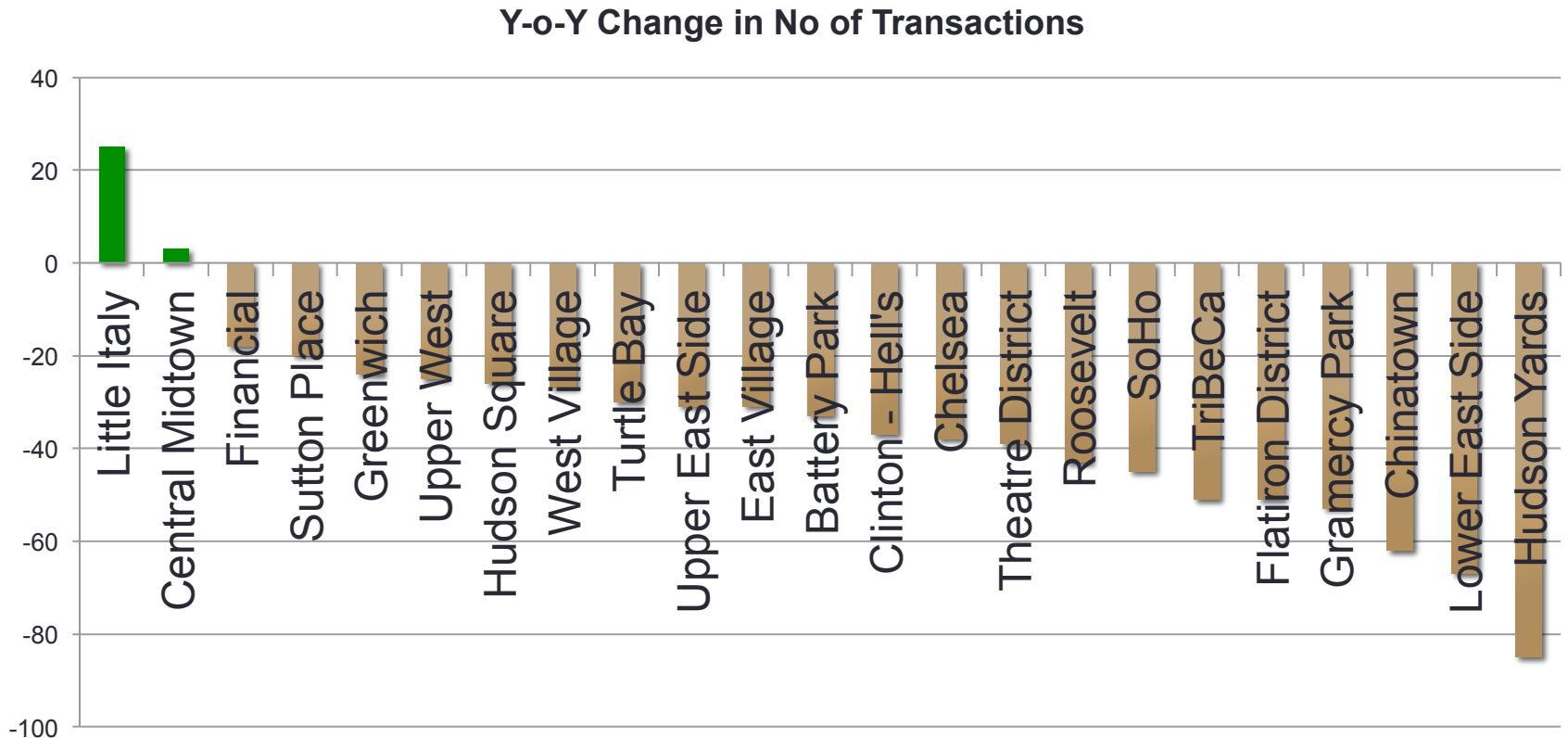**Red = few people per coffee shop**

Image of the map of Manhattan, the markers showing each neighborhood color-coded based on number of people living in the neighborhood per coffee shop as found in 2012 census data.

# Part 3: Neighborhood Growth

| | Rank | Borough | Neighborhood | Median Sale Price 2020 | Y-o-Y Change in Median Sale Price | No of Transactions 2020 | Y-o-Y Change in No of Transactions |
|---|---|---|---|---|---|---|---|
| 2 | 3 | Manhattan | Little Italy | $2,750,000.0 | 4% | 35 | 25 |
| 6 | 7 | Manhattan | Central Midtown | $1,790,000.0 | 44% | 225 | 3 |
| 23 | 24 | Manhattan | Financial District | $1,100,000.0 | 10% | 212 | -18 |
| 36 | 34 | Manhattan | Sutton Place | $900,000.0 | -16% | 160 | -20 |
| 20 | 21 | Manhattan | Greenwich Village | $1,136,000.0 | -19% | 368 | -24 |
| 12 | 13 | Manhattan | Upper West Side | $1,303,000.0 | 18% | 1429 | -25 |
| 4 | 5 | Manhattan | Hudson Square | $2,100,000.0 | -15% | 78 | -26 |

Top rows of the data-frame to incorporate real estate transaction data. The final column, "Y-o-Y Change in No of Transactions" was used in this analysis. The only two neighborhoods with positive growth are Little Italy & Central Midtown.

# Part 3: Neighborhood Growth

**Y-o-Y Change in No of Transactions**



Graph showing real estate transaction growth per neighborhood in Manhattan, using Property Shark data from 2019 to 2020. Little Italy and Central Midtown are the only neighborhoods experiencing growth in 2020, compared to 2019

# Discussion

- Highest growth in 2020:
  - Little Italy
  - Central Midtown
  - Financial District
- Lowest frequency of coffee shops:
  - Chinatown
  - Inwood
  - East Harlem
- Most people per coffee shop:
  - Central Harlem
  - Midtown
  - Washington Heights

# Conclusion and Future Work

- Overall:
  - Neighborhoods in Manhattan were analyzed 3 ways to determine which would be best location for a new coffee shop
  - While no clear winner was indicated, Midtown and the Financial district are 2 likely successful options
- Future:
  - Incorporate foot traffic data
  - Perform further analysis to optimize all parameters