Opening a wine bar around Manhattan

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1. Introduction

1.1 Background

In current times the interest rate on bank saving accounts is very low, and the value of shares is volatile because of catastrophic events which may happen e.g. pandemic, economic crisis… Thus, in order to maximize the profit, I want to invest a portion of my savings buying a commercial business.

1.2 Objective

Because my passion is Wine tasting, and I really would like to live in New York, the goal is to find the most suitable neighbourhood in New York to open a successful Wine Bar.

1.3 Criteria

- The Wine Bar will be in a central part of the city to attract more people -> Around Manhattan.
- The Wine Bar will be nearby other restaurants. It will be perfect for a glass of wine after work and before dinner.
- The Wine Bar will be located in a neighbourhood with other similar wine bars. If they are operating it probably means that it is the right area to open a new one.

2. Data acquisition and cleaning

2.1 Data sources

The json file of New York can be downloaded from:

https://cocl.us/new_york_dataset/newyork_data.json

The new York neighborhood has a total of 5 boroughs and 306 neighborhoods. In order to segement the neighborhoods and explore them, we will essentially need a dataset that contains the 5 boroughs and the neighborhoods that exist in each borough as well as the the latitude and longitude coordinates of each neighborhood.

The data about venues are obtained from Foursquare after creating a developer account.

https://developer.foursquare.com/places

3. Results and discussions

3.1 New York map

Using the json file of New York and the Geopy library, we build a map of New York with all the different area marked in blue (Figure 1).

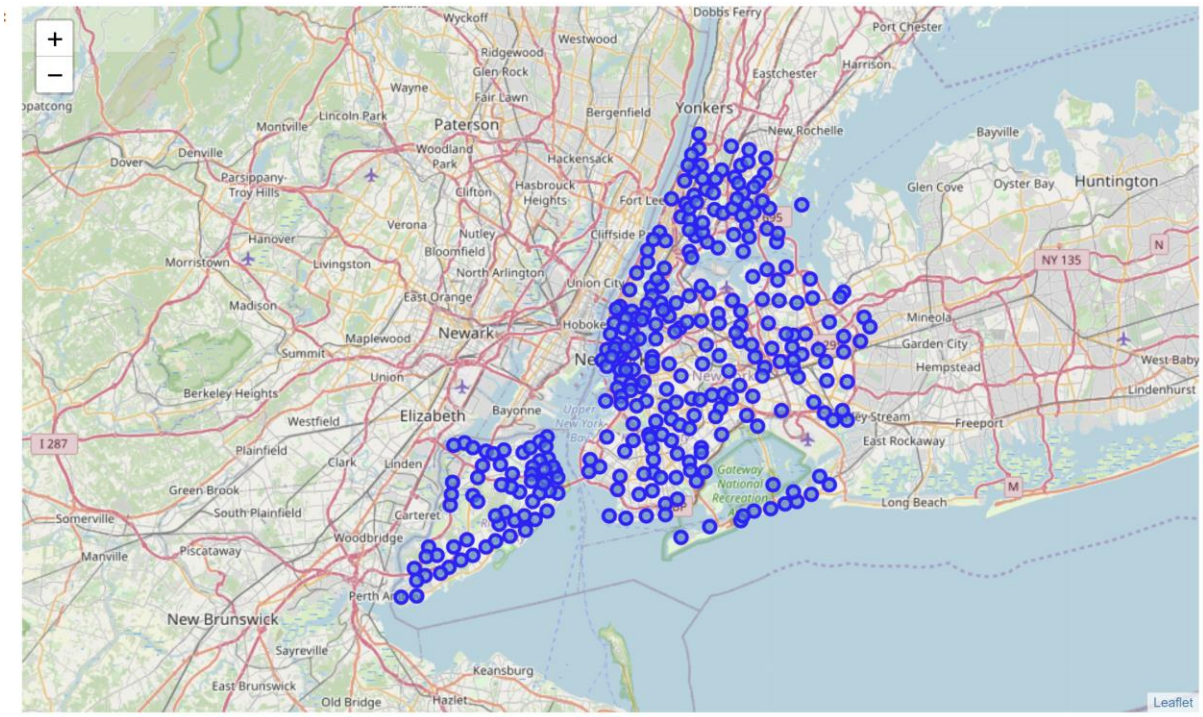
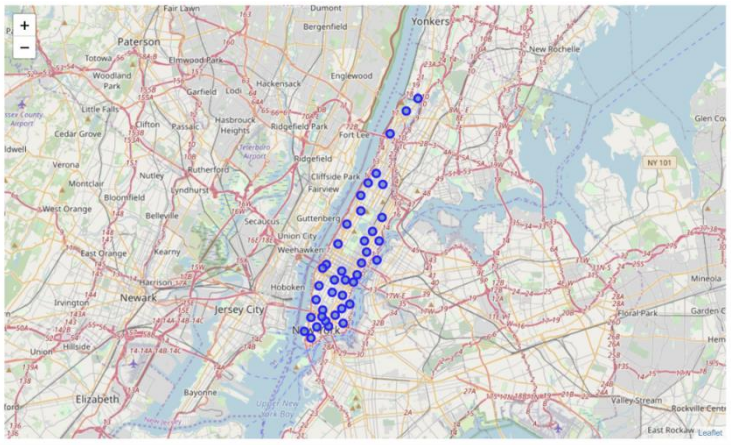


Figure 1. Map of New York with each district marked in blue.

We decide to focus only on the neighboring area of Manhattan for our analysis, which are reported in Figure 2.



Marble Hill	East Village
Chinatown	Lower East Side
Washington Heights	Tribeca
Inwood	Little Italy
Hamilton Heights	Soho
Manhattanville	West Village
Central Harlem	Manhattan Valley
East Harlem	Morningside Heights
Upper East Side	Gramercy
Yorkville	Battery Park City
Lenox Hill	Financial District
Roosevelt Island	Carnegie Hill
Upper West Side	Noho
Lincoln Square	Civic Center
Clinton	Midtown South
Midtown	Sutton Place
Murray Hill	Turtle Bay
Chelsea	Tudor City
Greenwich Village	Stuyvesant Town
	Flatiron
	Hudson Yards

Figure 2. Zoom of the Manhattan area with its neighbourhoods marked in blue and listed on the right hand side.

3.2 Venue information

We collect venues information about the Manhattan neighborhoods using Foursquare.

First we drop several venues that we consider not necessary for our analysis such as categories which do not include keywords like ‘Bar’ or “Restaurant”. For each neighborhoods we define the 5 most visited venues as important information to check the Wine Bar popularity (Figure 3).

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Battery Park City	Italian Restaurant	Mexican Restaurant	American Restaurant	Chinese Restaurant	Wine Bar
1	Carnegie Hill	Italian Restaurant	Japanese Restaurant	French Restaurant	Wine Bar	Sushi Restaurant
2	Central Harlem	African Restaurant	American Restaurant	Chinese Restaurant	Seafood Restaurant	French Restaurant
3	Chelsea	American Restaurant	Italian Restaurant	Seafood Restaurant	Wine Bar	Sushi Restaurant
4	Chinatown	Chinese Restaurant	American Restaurant	Hotpot Restaurant	Vietnamese Restaurant	Asian Restaurant

Figure 3. Dataframe containing the 5 most visited venues for each Manhattan neighborhood.

3.3 Clustering

Then we perform a clustering of the venues based on attributes only relative to Bar and Restaurants. We decide to classify the neighborhoods into 5 clusters, and the results are reported in Figure 4.

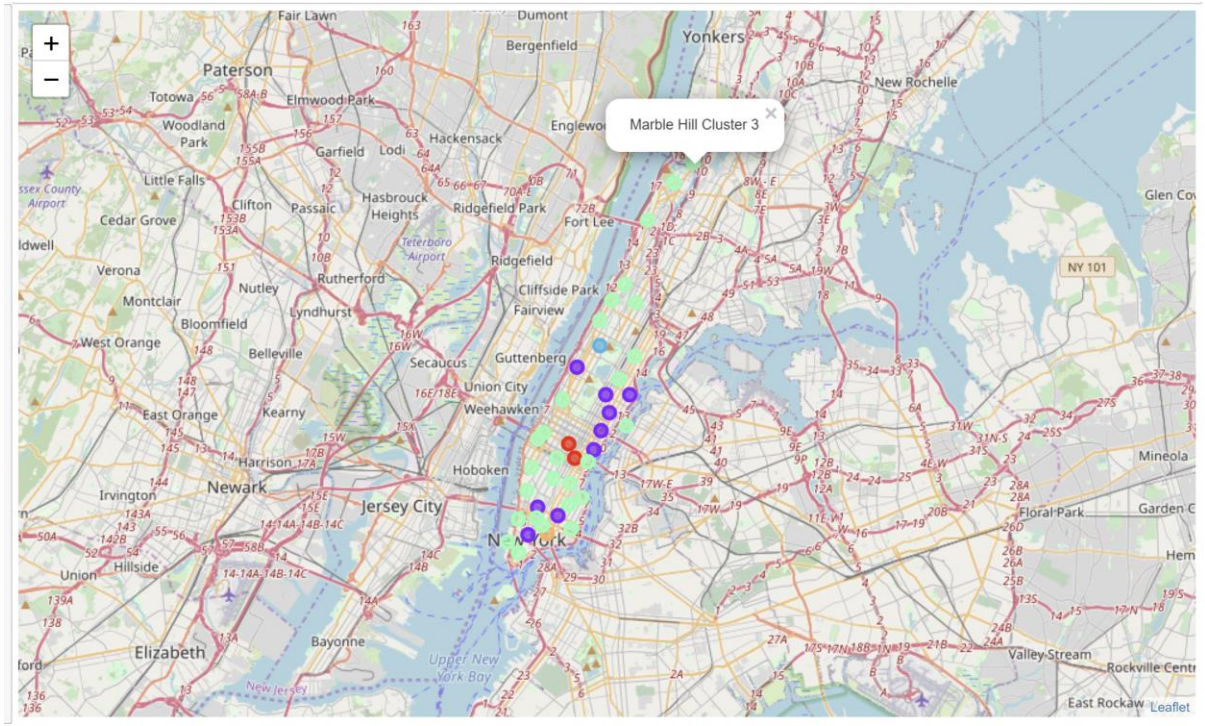


Figure 4. Map of Manhattan neighborhoods divided into 5 clusters based on Bars and Restaurants visit information.

Thus, we can build the dataframe reported in Figure 5, containing information on each neighborhood (name, latitude, longitude), cluster label and the 5 most visited venues.

	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
0	Manhattan	Marble Hill	40.876551	-73.910660	3	Seafood Restaurant	American Restaurant	Wine Bar	French Restaurant	Empanada Restaurant
1	Manhattan	Chinatown	40.715618	-73.994279	4	Chinese Restaurant	American Restaurant	Hotpot Restaurant	Vietnamese Restaurant	Asian Restaurant
2	Manhattan	Washington Heights	40.851903	-73.936900	3	Chinese Restaurant	Spanish Restaurant	Latin American Restaurant	Mexican Restaurant	New American Restaurant
3	Manhattan	Inwood	40.867684	-73.921210	3	Mexican Restaurant	Restaurant	Chinese Restaurant	Wine Bar	American Restaurant
4	Manhattan	Hamilton Heights	40.823604	-73.949688	3	Mexican Restaurant	Sushi Restaurant	Indian Restaurant	Chinese Restaurant	Caribbean Restaurant

Figure 5. Dataframe containing information on each neighborhood (name, latitude, longitude), cluster label and the 5 most visited venues.

3.4 Most visited venues

We can analyse the occurrence of each category of restaurants and bars in the 1st – 5th Most Common Venue , as reported in Figure 6.

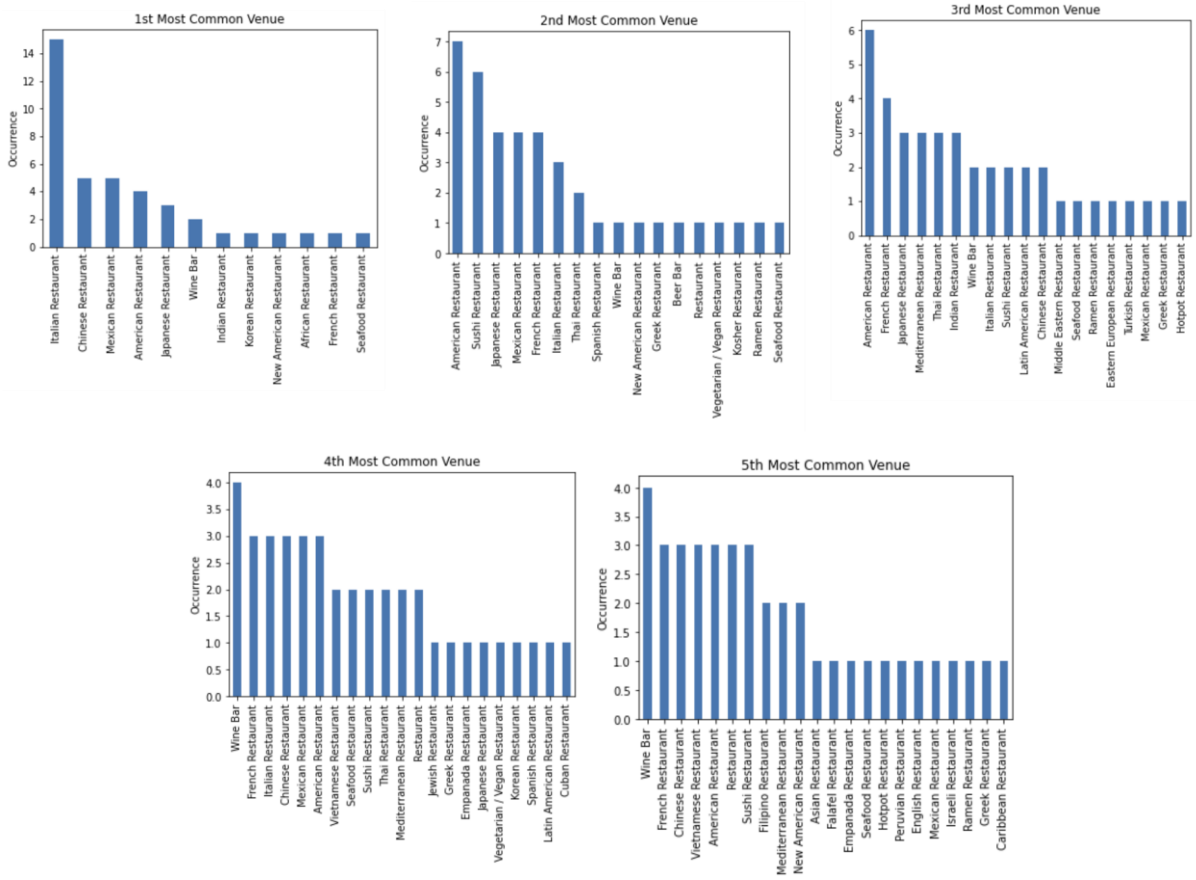


Figure 6. Occurrence of each bar and restaurant category as 1st – 5th Most common Venue.

We can see from Figure 6 top-left panel, that Wine Bar appears twice as 1st Most visited Venue. Then we find the neighborhoods where this happens, they are reported in Figure 7.

	Neighborhood	Cluster Labels
19	East Village	3
37	Stuyvesant Town	3

Figure 7. Name of neighborhood and cluster label of the area around Manhattan with 'Wine Bar' as 1st most visited venue.

As reported in Figure 7, the best neighborhoods to open a successful Wine Bar are East Village and Stuyvesant Town, both belonging to Cluster number 3.

4. Conclusions

The aim of this project is to find the best neighborhood around Manhattan to open a new Wine Bar as investment.

We analysed the neighborhoods of Manhattan and we listed the venues in each area.

We clustered the areas in 5, and we found the best area to open a Wine Bar based on similar features in that area, they are East Village and Stuyvesant Town, both belonging to Cluster number 3.