

The Battle of the Neighborhoods - Report

1. Introduction & Business Problem :

The City of New York, is the most populous city in the United States. It is diverse and is the financial capital of USA. It is multicultural. It provides lot of business opportunities and business friendly environment. It is a global hub of business and commerce. The city is a major center for banking and finance, retailing, world trade, transportation, tourism, real estate, new media, traditional media, advertising, legal services, accountancy, insurance, theater, fashion, and the arts in the United States. As it is highly developed city so cost of doing business is also one of the highest. Thus, any new business venture or expansion needs to be analyzed carefully. The insights derived from analysis will give good understanding of the business environment which help in strategically targeting the market. This will help in reduction of risk. And the Return on Investment will be reasonable.

Business Problem

The City of New York is famous for its excellent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history. Cafe Houses have become so popular in the United States now it seems that there is one on every corner, not only in major cities but also in smaller cities. Starting a cafe house can be a great business opportunity, but you need to distinguish yourself from others to enjoy long-term success.

If you plan a cafe house that can demand higher prices for its coffee focus on neighborhoods and outlets that already attract a more sophisticated client. If you plan a economically cost effective and cheap cafe house point to the masses looking for affordable high-traffic locations with large shopping centers and other local points of interest. So it is evident that to survive in such competitive market it is very important to strategically plan. Various factors need to be studied in order to decide on the Location.

My Client wants to open her business in Manhattan area, so I will only focus on that borough during my analysis. The objective is to locate and recommend to the management which neighborhood of New York city will be best choice to start a high end cafe house. The Management also expects to understand the rationale of the recommendations made. This would interest anyone who wants to start cafe house in New York city.

2. Data

Data 1: Neighborhood has a total of 5 boroughs and 306 neighborhoods. In order to segment 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 latitude and longitude coordinates of each neighborhood. This dataset exists for free on the web. Link to the dataset is: https://geo.nyu.edu/catalog/nyu_2451_34572

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

Data2: New York city geographical coordinates data will be utilized as input for the Foursquare API, that will be leveraged to provision venues information for each neighborhood .We will use the Foursquare API to explore neighborhoods in New York City..

In addition, Cafe category Id 4bf58dd8d48988d16d941735 is used for retrieving data from Foursquare API.

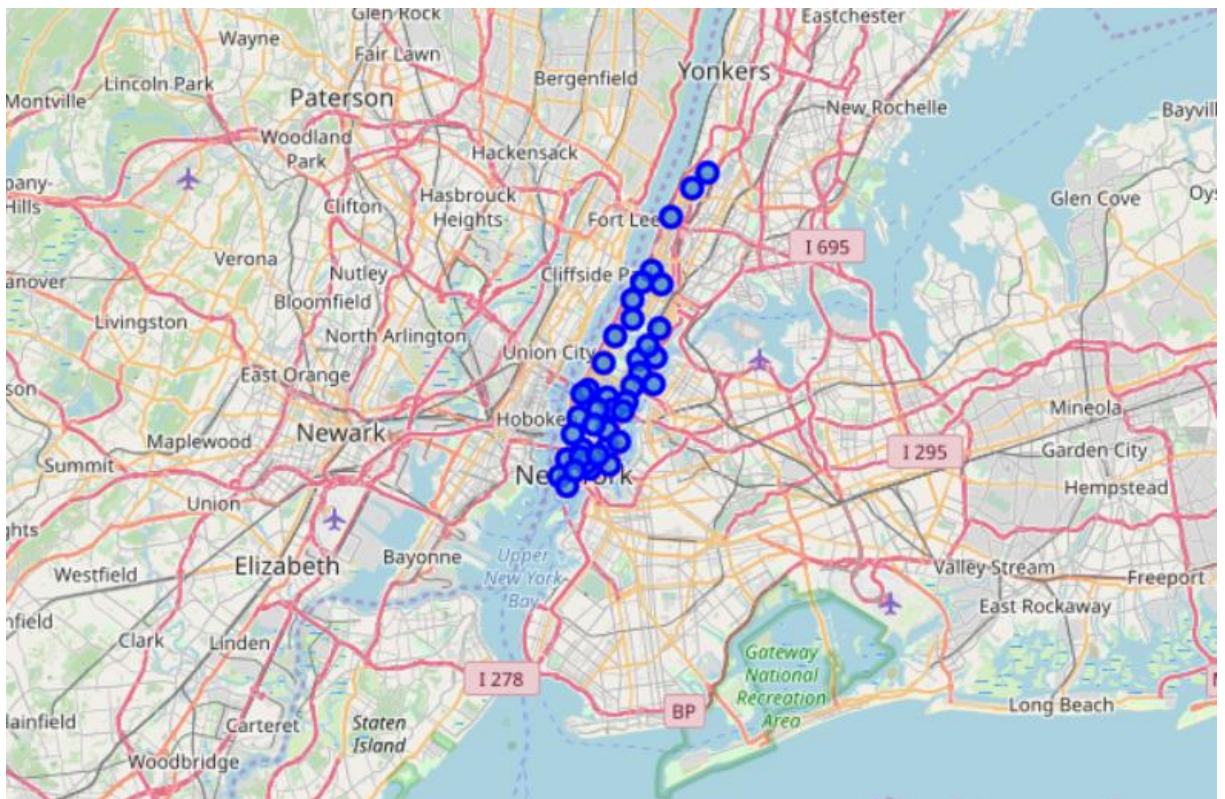
3. Methodology

In this project, I will use the basic methodology as taught in Week 3 lab.

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
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Above, I have done convert addresses into their equivalent latitude and longitude values. Then we will use the Foursquare API to explore neighborhoods in Manhattan, New York. After that, explore function to get cafe categories in each neighborhood.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	Gold Mine Cafe	40.878916	-73.904698	Café
1	Marble Hill	40.876551	-73.91066	Sugarboy Bakery Cafe	40.877948	-73.902860	Bakery
2	Marble Hill	40.876551	-73.91066	Amores Cafe & Salad Juice Bar	40.869485	-73.916754	Café
3	Marble Hill	40.876551	-73.91066	JH Café	40.868210	-73.902124	Café
4	Marble Hill	40.876551	-73.91066	Moss Café: Farm-To-Table Restaurant and Coffee...	40.885269	-73.910103	Café

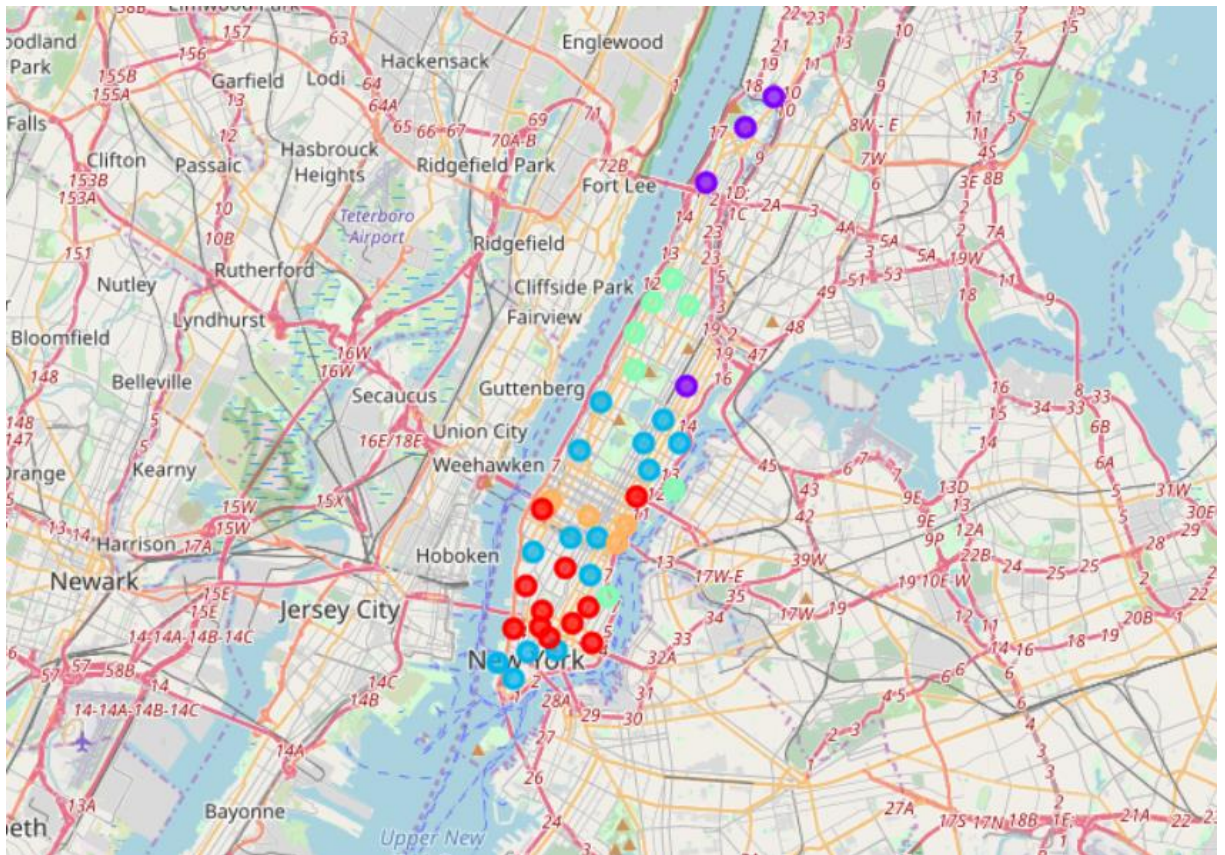


Cafes in Manhattan

	Neighborhood	Afghan Restaurant	American Restaurant	Australian Restaurant	Austrian Restaurant	Bagel Shop	Bakery	Bar	Beer Garden	Bookstore	Breakfast Spot	Bubble Tea Shop	Cafeteria	Café	Cocktail Bar	Coffee Shop	College Cafeteria	Convenience Store	Cooking School	Cuban Restaurant	Ci
0	Marble Hill	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1	Marble Hill	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Marble Hill	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
3	Marble Hill	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
4	Marble Hill	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

Then use this feature to group the neighborhoods into clusters K-means clustering algorithm will be use to complete this task. And also, the Folium library to visualize the neighborhoods in Manhattan and its emerging clusters.

	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
0	Battery Park City	Café	Coffee Shop	Bakery	Sandwich Place	Deli / Bodega	Bubble Tea Shop	Restaurant	Juice Bar	Italian Restaurant	Pizza Place
1	Carnegie Hill	Café	Coffee Shop	Bakery	French Restaurant	Bagel Shop	Salad Place	Gym / Fitness Center	Donut Shop	Pharmacy	Cocktail Bar
2	Central Harlem	Café	Coffee Shop	Ethiopian Restaurant	American Restaurant	Dessert Shop	Bar	Cafeteria	Donut Shop	Deli / Bodega	Diner
3	Chelsea	Café	Coffee Shop	Bakery	Sandwich Place	Diner	Cooking School	New American Restaurant	Japanese Restaurant	Italian Restaurant	Dessert Shop
4	Chinatown	Café	Coffee Shop	Bakery	French Restaurant	Internet Cafe	Dessert Shop	Cupcake Shop	Bookstore	Furniture / Home Store	Swiss Restaurant



4. Results

K-mean Cluster Using K-mean to clustering data area with less number of sushi bars

Cluster 0

	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
18	Greenwich Village	Café	Coffee Shop	Bakery	French Restaurant	Italian Restaurant	Cupcake Shop	Cocktail Bar	Mediterranean Restaurant	Cafeteria	Furniture / Home Store
19	East Village	Café	Coffee Shop	Bakery	French Restaurant	Sandwich Place	Bookstore	Tea Room	Australian Restaurant	Sushi Restaurant	Korean Restaurant
20	Lower East Side	Café	Coffee Shop	Bakery	Bookstore	Tea Room	American Restaurant	Pet Service	Latin American Restaurant	Italian Restaurant	Vegetarian / Vegan Restaurant
21	Tribeca	Café	Coffee Shop	Bakery	French Restaurant	Dessert Shop	Cupcake Shop	Bubble Tea Shop	Italian Restaurant	Cocktail Bar	Mediterranean Restaurant
22	Little Italy	Café	Coffee Shop	Bakery	French Restaurant	Australian Restaurant	Gaming Cafe	Cupcake Shop	Cafeteria	Bookstore	Furniture / Home Store
23	Soho	Café	Coffee Shop	Bakery	French Restaurant	Cupcake Shop	Australian Restaurant	Italian Restaurant	Cocktail Bar	Mediterranean Restaurant	Cafeteria
24	West Village	Café	Coffee Shop	Bakery	Diner	American Restaurant	Dessert Shop	Cupcake Shop	Mediterranean Restaurant	New American Restaurant	Cafeteria
31	Noho	Café	Coffee Shop	Bakery	Australian Restaurant	French Restaurant	Gaming Cafe	Cupcake Shop	Internet Cafe	Hotel Bar	Bookstore
34	Sutton Place	Café	Coffee Shop	Bakery	Sandwich Place	Tea Room	Dessert Shop	French Restaurant	Juice Bar	Bar	Scandinavian Restaurant
38	Flatiron	Café	Coffee Shop	Bakery	Sandwich Place	American Restaurant	Australian Restaurant	Food Court	Hotel Bar	Italian Restaurant	Japanese Restaurant
39	Hudson Yards	Café	Coffee Shop	Bakery	Sandwich Place	Diner	American Restaurant	Food Court	Donut Shop	Japanese Restaurant	Cupcake Shop

Cluster 1

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	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
0	Marble Hill	Café	Bakery	Wine Shop	Donut Shop	Cuban Restaurant	Cupcake Shop	Deli / Bodega	Dessert Shop	Diner	Ethiopian Restaurant
2	Washington Heights	Café	Pet Café	Sandwich Place	Wine Shop	Dessert Shop	Cooking School	Cuban Restaurant	Cupcake Shop	Deli / Bodega	Diner
3	Inwood	Café	Coffee Shop	Seafood Restaurant	Diner	Cooking School	Cuban Restaurant	Cupcake Shop	Deli / Bodega	Dessert Shop	Donut Shop
7	East Harlem	Café	Coffee Shop	Bakery	American Restaurant	Mexican Restaurant	Bagel Shop	Sandwich Place	Diner	Cupcake Shop	Deli / Bodega

Cluster 2

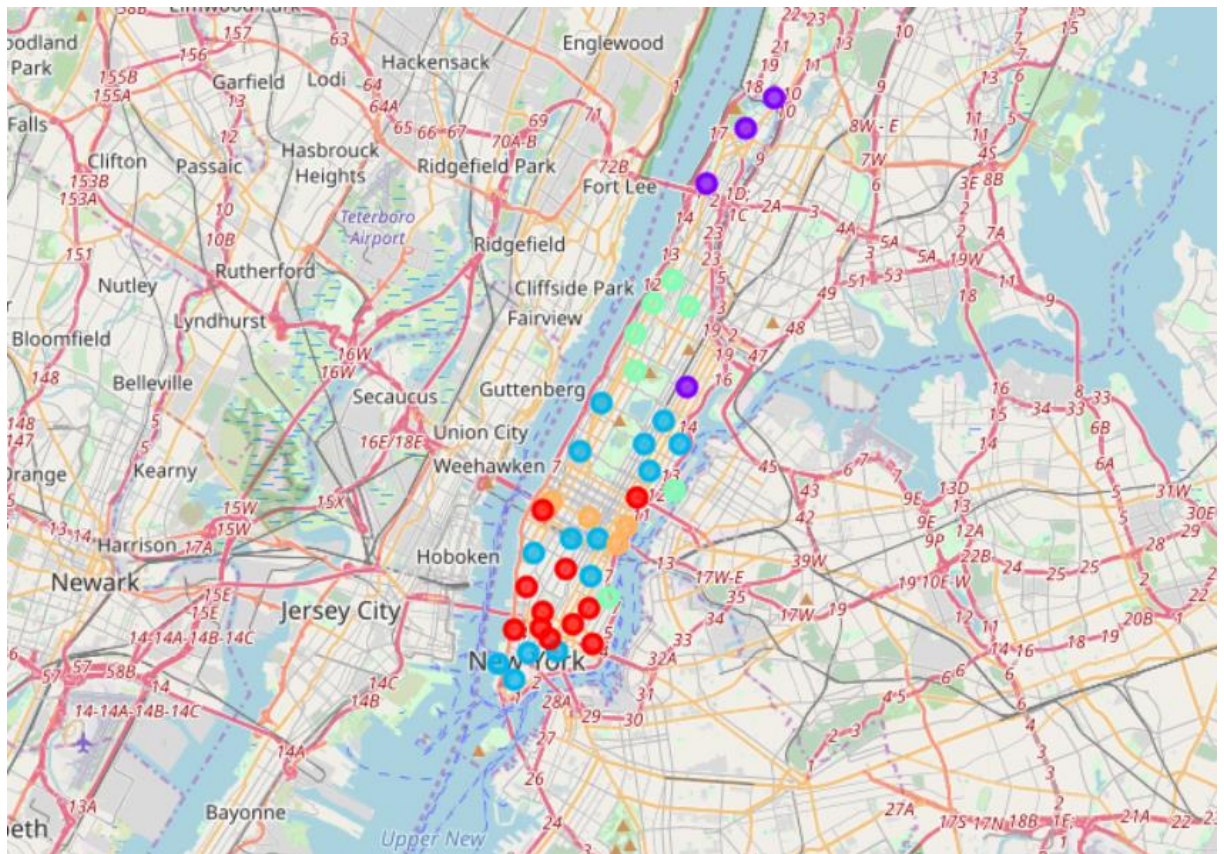
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1	Chinatown	Café	Coffee Shop	Bakery	French Restaurant	Internet Cafe	Dessert Shop	Cupcake Shop	Bookstore	Furniture / Home Store	Swiss Restaurant
8	Upper East Side	Café	Coffee Shop	Bakery	French Restaurant	Vegetarian / Vegan Restaurant	Salad Place	Dessert Shop	Pharmacy	Italian Restaurant	Donut Shop
9	Yorkville	Café	Coffee Shop	Bakery	French Restaurant	Vegetarian / Vegan Restaurant	Bagel Shop	Pharmacy	Gym / Fitness Center	Salad Place	Deli / Bodega
10	Lenox Hill	Café	Coffee Shop	Bakery	Vegetarian / Vegan Restaurant	Dessert Shop	Deli / Bodega	Donut Shop	Italian Restaurant	Diner	New American Restaurant
12	Upper West Side	Café	Bakery	Coffee Shop	Diner	Convenience Store	Kosher Restaurant	Juice Bar	Italian Restaurant	Restaurant	Food Stand
13	Lincoln Square	Café	Bakery	Coffee Shop	Sandwich Place	Diner	Wine Shop	New American Restaurant	American Restaurant	Cuban Restaurant	Dessert Shop
16	Murray Hill	Café	Coffee Shop	Bakery	Sandwich Place	American Restaurant	Food Court	Deli / Bodega	Bar	Diner	Bookstore
17	Chelsea	Café	Coffee Shop	Bakery	Sandwich Place	Diner	Cooking School	New American Restaurant	Japanese Restaurant	Italian Restaurant	Dessert Shop
27	Gramercy	Café	Coffee Shop	Bakery	Sandwich Place	Italian Restaurant	Hotel Bar	Sushi Restaurant	Australian Restaurant	Flower Shop	Food & Drink Shop
28	Battery Park City	Café	Coffee Shop	Bakery	Sandwich Place	Deli / Bodega	Bubble Tea Shop	Restaurant	Juice Bar	Italian Restaurant	Pizza Place
29	Financial District	Café	Coffee Shop	Sandwich Place	Deli / Bodega	Bakery	Italian Restaurant	Bubble Tea Shop	Pizza Place	Juice Bar	Dessert Shop
30	Carnegie Hill	Café	Coffee Shop	Bakery	French Restaurant	Bagel Shop	Salad Place	Gym / Fitness Center	Donut Shop	Pharmacy	Cocktail Bar
33	Midtown West	Café	Coffee Shop	Bakery	French Restaurant	Sandwich Place	Salad Place	Cooking School	Donut Shop	Pharmacy	Furniture / Home Store

Cluster 3

	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
4	Hamilton Heights	Café	Coffee Shop	American Restaurant	Cafeteria	Ethiopian Restaurant	Wine Shop	Diner	Cupcake Shop	Deli / Bodega	Dessert Shop
5	Manhattanville	Café	Coffee Shop	College Cafeteria	American Restaurant	Bar	Donut Shop	Cupcake Shop	Deli / Bodega	Dessert Shop	Diner
6	Central Harlem	Café	Coffee Shop	Ethiopian Restaurant	American Restaurant	Dessert Shop	Bar	Cafeteria	Donut Shop	Deli / Bodega	Diner
11	Roosevelt Island	Café	Coffee Shop	Bakery	Vegetarian / Vegan Restaurant	French Restaurant	Diner	Donut Shop	Flower Shop	Ethiopian Restaurant	Convenience Store
25	Manhattan Valley	Café	Convenience Store	Dessert Shop	French Restaurant	Coffee Shop	Kosher Restaurant	Deli / Bodega	Food Truck	Bakery	Donut Shop
26	Morningside Heights	Café	Coffee Shop	Dessert Shop	College Cafeteria	Bar	Deli / Bodega	French Restaurant	Bakery	Cupcake Shop	Food Truck
37	Stuyvesant Town	Café	Coffee Shop	Bakery	Beer Garden	Korean Restaurant	Jazz Club	Breakfast Spot	Diner	Russian Restaurant	Sandwich Place

Cluster 4

	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
14	Clinton	Café	Coffee Shop	Bakery	Sandwich Place	Donut Shop	Food Court	Japanese Restaurant	Diner	Wine Bar	American Restaurant
15	Midtown	Café	Coffee Shop	Bakery	Sandwich Place	Donut Shop	Diner	Bookstore	Food Court	Deli / Bodega	French Restaurant
35	Turtle Bay	Café	Coffee Shop	Bakery	Sandwich Place	Deli / Bodega	Italian Restaurant	Juice Bar	Bagel Shop	Scandinavian Restaurant	Japanese Restaurant
36	Tudor City	Café	Coffee Shop	Bakery	Sandwich Place	Deli / Bodega	Japanese Restaurant	Donut Shop	Italian Restaurant	Juice Bar	Bagel Shop



Based on above data frame, Clinton, Turtle Bay, Midtown and Tudor City are places where new cafes can be started.

5. Discussion

In this section, I would be discussing the observations I have noted and the recommendation that I can make based on the results.

This analysis is performed on limited data. This may be right or may be wrong. But if good amount of data is available there is scope to come up with better results.

- There is high competition in Washington Heights, Marble Hill and Inwood so it is very risky to open business in these areas.
- Clinton, Turtle Bay, Midtown, Tudor City show potential.
- It can be done more detailed analysis by adding other factors such as transportation, demographics of inhabitants.

Finally, FourSquare proved to be a good source of data but frustrating at times.

Despite having a Developer account I regularly exceeded my hourly limit locking me out for the day.

6. Conclusion

Although all of the goals of this project were met there is definitely room for further improvement and development as noted below. However, the goals of the project were met and, with some more work, could easily be developed into a fully fledged application that could support the opening a business idea in an unknown location.

As per the neighborhood or restaurant type mentioned like café analysis can be checked. A venue with lowest risk and competition can be identified.