Exploring the venues to create an effective travel itinerary

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Introduction

- Travel plans are an integral component of any successful trip.

- Modern itinerary-making tools, from websites to mobile apps, allow travelers to build colorful trip timelines and share their travel plans with loved ones.

- But the ability to engineer an effective, seamless itinerary requires more than just bells and whistles.

- Well-laid travel plans are an integral component of any successful trip.

Problem

Tom is a data scientist work & live in Manhattan for almost 5 years. Tom likes to explore & visit new places.

For the upcoming Christmas holidays he & his friend would like to explore "Brooklyn" borough in New York city.

Tom & his friends have never been to Brooklyn before so they are not sure about the venues, venue names, venue category etc.

Brooklyn is completely new to Tom & his friends. They are facing difficulty in planning their trip.

They need our help to:

- Explore the neighborhoods of Brooklyn
- Provide them the list of neighborhood which are having the most & least venues.

Data acquisition & approach

For this project we need the following data:

- New York City data that contains list Boroughs, Neighborhoods along with their latitude and longitude

- Data source : https://cocl.us/new_york_dataset.

- Description: This data set contains the required information. And we will use this data set to explore various neighborhoods of New York city.

- Data source: Foursquare API.

- Description: By using this API we will get all the venues in each neighborhood.

Data acquisition & approach

- Collect the New York city data from https://cocl.us/new_york_dataset

- Filter out the data only for Brooklyn borough.

- Using Foursquare API we will explore the venues for each neighborhood.

- Analyze each neighborhood by most common venues.

- Cluster neighborhoods.

- Visualize the resulting cluster.

3. Data Transformation & Analysis for each neighborhood

- Download the data set from https://cocl.us/new_york_dataset

- Transform the data into a pandas data

- Visualizing the Brooklyn neighborhood
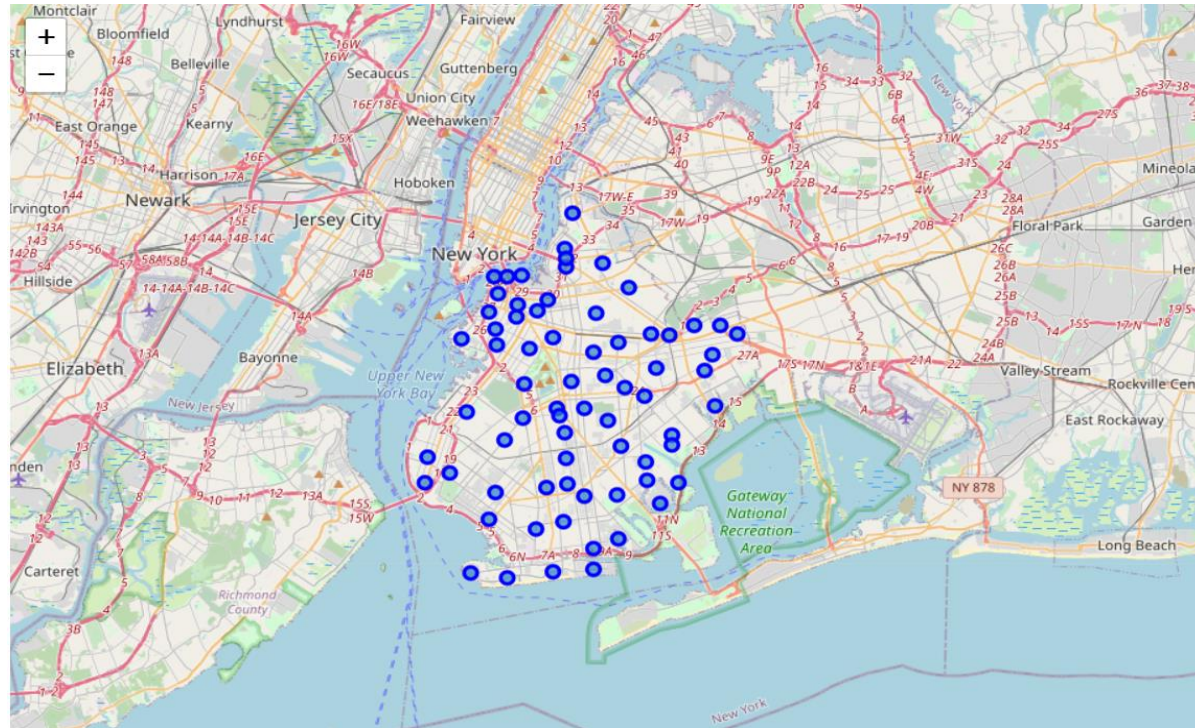
3. Data Transformation & Analysis for each neighborhood

- Exploring neighborhoods using Foursquare API

- Analyzing each neighborhood

- Convert the resulting dataset into pandas data frame & display the top 10 venues

Exploring using Foursquare API

Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Bath Beach	50	50	50	50	50	50
Bay Ridge	87	87	87	87	87	87
Bedford Stuyvesant	28	28	28	28	28	28
Bensonhurst	36	36	36	36	36	36
Bergen Beach	7	7	7	7	7	7
Boerum Hill	93	93	93	93	93	93
Borough Park	16	16	16	16	16	16
Brighton Beach	44	44	44	44	44	44
Broadway Junction	17	17	17	17	17	17
Brooklyn Heights	100	100	100	100	100	100
Brownsville	15	15	15	15	15	15
Bushwick	75	75	75	75	75	75
Canarsie	7	7	7	7	7	7
Carroll Gardens	100	100	100	100	100	100
City Line	43	43	43	43	43	43

Top 10 venues

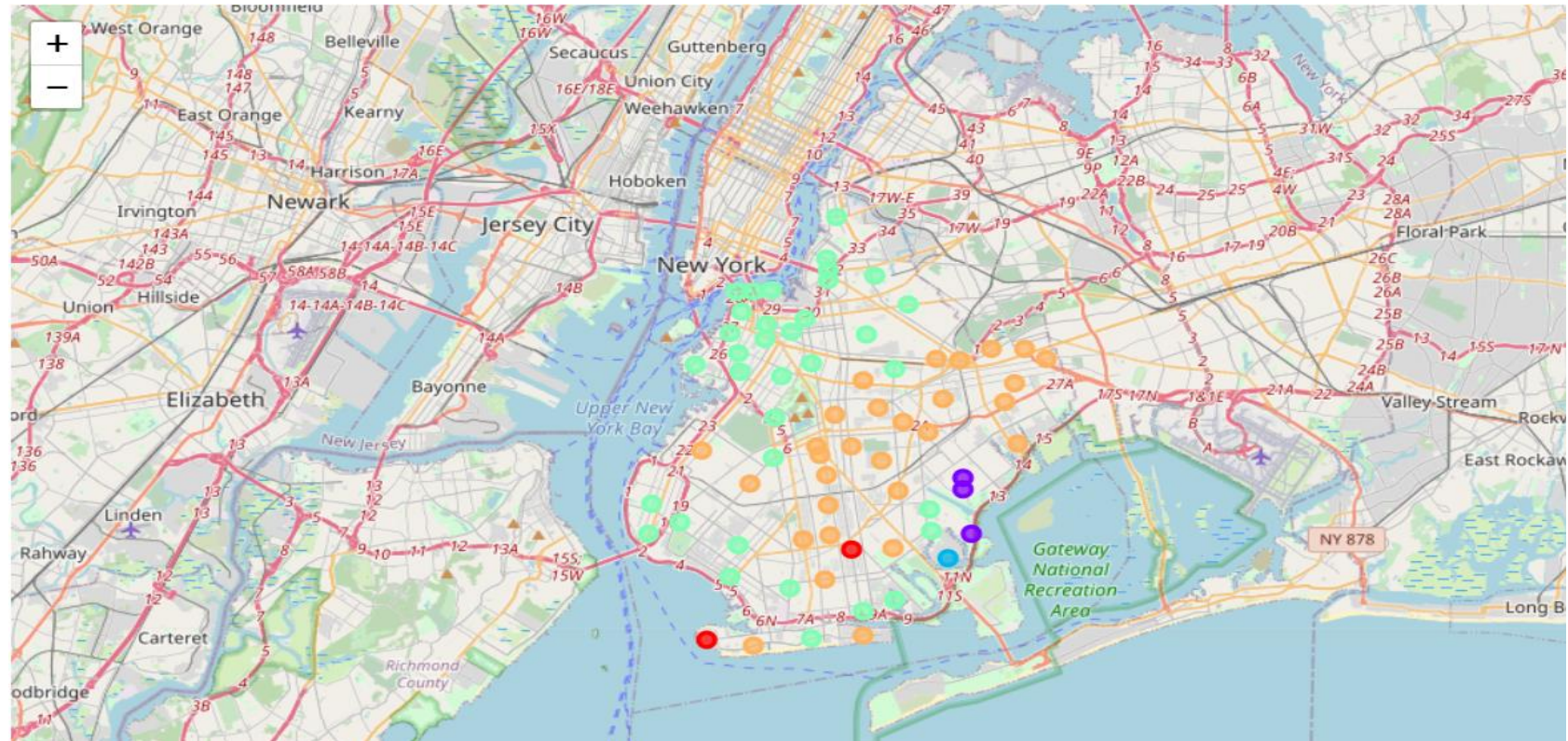|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Bath Beach	Chinese Restaurant	Pharmacy	Gas Station	Bubble Tea Shop	Pizza Place	Italian Restaurant	Halal Restaurant	Fast Food Restaurant	Cantonese Restaurant	Russian Restaurant
1	Bay Ridge	Spa	Italian Restaurant	Pizza Place	Greek Restaurant	Grocery Store	Bar	American Restaurant	Pharmacy	Sandwich Place	Hookah Bar
2	Bedford Stuyvesant	Coffee Shop	Café	Pizza Place	Bar	Discount Store	Gourmet Shop	Bagel Shop	Juice Bar	Basketball Court	New American Restaurant
3	Bensonhurst	Pizza Place	Ice Cream Shop	Italian Restaurant	Sushi Restaurant	Donut Shop	Chinese Restaurant	Grocery Store	Dessert Shop	Spa	Liquor Store
4	Bergen Beach	Harbor / Marina	Donut Shop	Baseball Field	Playground	Park	Athletics & Sports	Field	Falafel Restaurant	Farm	Farmers Market

4. Clustering neighborhoods

- Run the K-means to cluster the neighborhoods into 5 clusters.
- Visualize the clusters on a map as shown below
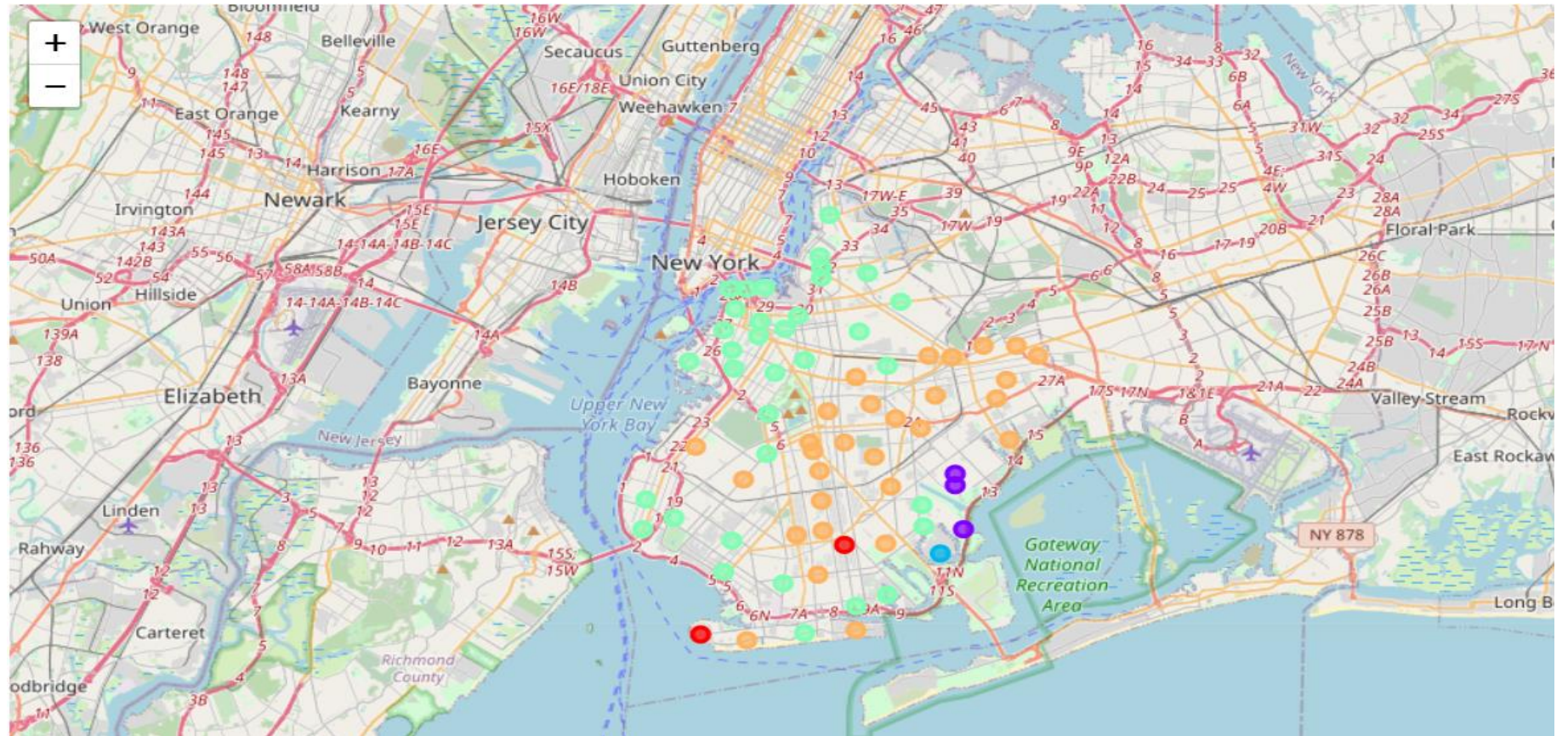
Legend : Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 | Cluster 5

5. Result

■ As per the below 5 cluster map we recommend the neighborhoods which falls under the **'Cluster 4'** & **'Cluster 5'** to Tom & his friends to explore as it has the most venues & categories

Legend : Cluster 1 | Cluster 2 | Cluster 3 | Cluster 4 | Cluster 5

5. Discussion & Conclusion

▶ The following is the list of clusters of neighborhood which are having most & least neighborhoods

Most Neighborhood Cluster 4 (Neighborhood Count = 35)

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 Bay Ridge	Spa	Italian Restaurant	Pizza Place	Greek Restaurant	Gym / Fitness Center	Bar	American Restaurant	Playground	Thai Restaurant
1 Bensonhurst	Flower Shop	Bakery	Dessert Shop	Ice Cream Shop	Italian Restaurant	Sushi Restaurant	Donut Shop	Smoke Shop	Butcher
3 Greenpoint	Bar	Pizza Place	Cocktail Bar	Coffee Shop	Yoga Studio	Mexican Restaurant	Sushi Restaurant	Grocery Store	Café
4 Gravesend	Italian Restaurant	Pizza Place	Lounge	Bus Station	Bakery	Pharmacy	Donut Shop	Eastern European Restaurant	Chinese Restaurant
5 Brighton Beach	Beach	Russian Restaurant	Restaurant	Eastern European Restaurant	Gourmet Shop	Sushi Restaurant	Bank	Mobile Phone Shop	Convenience Store
6 Sheepshead Bay	Dessert Shop	Turkish Restaurant	Sandwich Place	Chinese Restaurant	Park	Outlet Store	Restaurant	Russian Restaurant	Grocery Store
11 Kensington	Thai Restaurant	Grocery Store	Ice Cream Shop	Pizza Place	Restaurant	Outdoors & Recreation	Donut Shop	Gas Station	Spa
12 Windsor Terrace	Café	Diner	Park	Grocery Store	Bagel Shop	Middle Eastern Restaurant	Salad Place	Bookstore	Chinese Restaurant
13 Prospect Heights	Bar	Mexican Restaurant	Café	Thai Restaurant	Cocktail Bar	Gourmet Shop	Wine Shop	Bakery	American Restaurant
15 Williamsburg	Coffee Shop	Bar	Bagel Shop	Yoga Studio	Food Truck	Taco Place	Latin American Restaurant	Steakhouse	Liquor Store
16 Bushwick	Bar	Deli / Bodega	Coffee Shop	Mexican Restaurant	Bakery	Pizza Place	Discount Store	Thrift / Vintage Store	Vegetarian / Vegan Restaurant
17 Bedford Stuyvesant	Bar	Pizza Place	Café	Coffee Shop	Gift Shop	Gourmet Shop	New American Restaurant	Fruit & Vegetable Store	Boutique
18 Brooklyn Heights	Deli / Bodega	Yoga Studio	Park	Pizza Place	Italian Restaurant	Gym	Bakery	Cosmetics Shop	Bar
19 Cobble Hill	Pizza Place	Bar	Playground	Coffee Shop	Cocktail Bar	Ice Cream Shop	Italian Restaurant	Deli / Bodega	Yoga Studio
20 Carroll Gardens	Italian Restaurant	Coffee Shop	Pizza Place	Bakery	Cocktail Bar	Bar	Wine Shop	Spa	Bank
21 Red Hook	Seafood Restaurant	Bar	Park	Art Gallery	Flower Shop	Pizza Place	Bagel Shop	Farm	New American Restaurant
22 Gowanus	Furniture / Home Store	Italian Restaurant	Bar	Coffee Shop	Art Gallery	Hardware Store	Wine Shop	Pizza Place	Deli / Bodega
23 Fort Greene	Italian Restaurant	Wine Shop	Flower Shop	Opera House	Theater	French Restaurant	Coffee Shop	Cocktail Bar	Grocery Store
24 Park Slope	Coffee Shop	Burger Joint	Italian Restaurant	Bagel Shop	Bookstore	Pet Store	Pizza Place	Pub	Vietnamese Restaurant
33 Bath Beach	Pharmacy	Pizza Place	Chinese Restaurant	Gas Station	Fast Food Restaurant	Sushi Restaurant	Italian Restaurant	Bubble Tea Shop	Asian Restaurant
35 Dyker Heights	Grocery Store	Dance Studio	Golf Course	Burger Joint	Park	Food	Bagel Shop	Fast Food Restaurant	Falafel Restaurant
36 Gerritsen Beach	Ice Cream Shop	Pizza Place	Bar	Department Store	Boat or Ferry	Gas Station	Seafood Restaurant	Bagel Shop	Restaurant
38 Clinton Hill	Italian Restaurant	Pizza Place	Thai Restaurant	Wine Shop	Chinese Restaurant	Mexican Restaurant	Indian Restaurant	Japanese Restaurant	Restaurant
40 Downtown	Burger Joint	Coffee Shop	Sandwich Place	Pizza Place	Chinese Restaurant	Bar	Juice Bar	Bank	Bakery
41 Boerum Hill	Coffee Shop	Bar	Dance Studio	Furniture / Home Store	Arts & Crafts Store	French Restaurant	Bakery	Sandwich Place	Spa
48 Georgetown	Bank	Pharmacy	American Restaurant	Donut Shop	Bagel Shop	Cosmetics Shop	Coffee Shop	Burger Joint	Mexican Restaurant
49 East Williamsburg	Bar	Deli / Bodega	Cocktail Bar	Bakery	Coffee Shop	Mexican Restaurant	Music Venue	Concert Hall	Café
50 North Side	Coffee Shop	Pizza Place	Yoga Studio	American Restaurant	Wine Bar	Bar	Jewelry Store	Vegetarian / Vegan Restaurant	Bakery
51 South Side	Coffee Shop	Bar	American Restaurant	Pizza Place	Yoga Studio	Breakfast Spot	Wine Bar	Mexican Restaurant	South American Restaurant
53 Fort Hamilton	Deli / Bodega	Italian Restaurant	Pharmacy	Sandwich Place	Chinese Restaurant	Steakhouse	Pizza Place	Bagel Shop	Cocktail Bar
60 Mill Basin	Pizza Place	Japanese Restaurant	Cosmetics Shop	Bank	Bagel Shop	Chinese Restaurant	Ice Cream Shop	American Restaurant	Liquor Store
61 Fulton Ferry	Park	Scenic Lookout	American Restaurant	Coffee Shop	Bridge	Roof Deck	Bakery	Pizza Place	Boat or Ferry
62 Vinegar Hill	Food Truck	Coffee Shop	Café	Art Gallery	Spa	Park	Bookstore	Scenic Lookout	Bike Rental / Bike Share
63 Weeksville	Chinese Restaurant	Discount Store	Fried Chicken Joint	Donut Shop	Liquor Store	Gas Station	Grocery Store	Park	Cocktail Bar
65 Dumbo	Coffee Shop	Park	Scenic Lookout	Bakery	Art Gallery	Italian Restaurant	Boxing Gym	Pizza Place	Gym

Least Neighborhood Cluster 3 (Neighborhood Count = 1)

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
30 Mill Island	Pool	Women's Store	Filipino Restaurant	Factory	Falafel Restaurant	Farm	Farmers Market	Fast Food Restaurant	Field	Fish & Chips Shop