



Where Should We Build Brooklyn's Next Donut Shop?

Data Science Certificate Capstone Project

THE PROBLEM

A national doughnut chain wants to expand their business by opening a new doughnut shop in Brooklyn, NY, but which neighborhood should they choose?

They would like a shop in a great location to draw a large customer base with large incomes.



BROOKLYN, NY



Number of Neighborhoods: 70

Population: 2.6 million

Median Income: \$56,015

Number of Commercial Bakeries Selling Doughnuts: 59

Population per Doughnut Shop: 44,663

Average Revenue per Doughnut Shop: \$2.3 million

THE DATA

2014 New York City Neighborhood Names Points File

This geospatial data was used to locate Brooklyn and all of its neighborhoods for mapping purposes.

Foursquare API

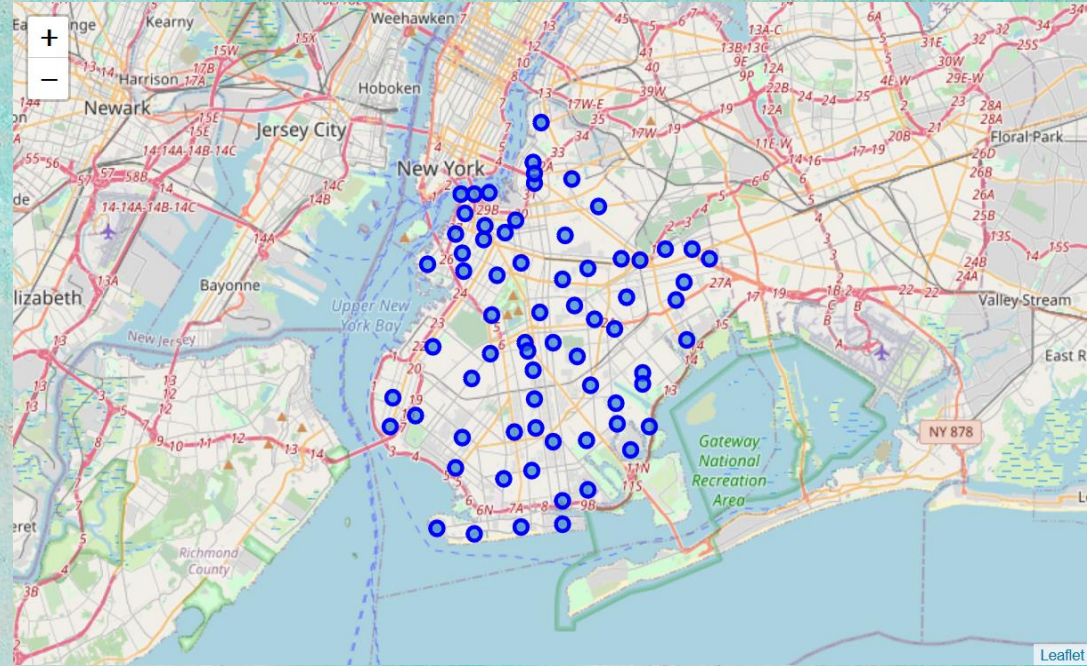
This data was used to determine the most common venue in each neighborhood. The most common venues were used to determine which neighborhoods do not have doughnut shops, which will guide the national doughnut chain to the neighborhood ripest for development.

US Census Demographic & Business Data

Provided background information on Brooklyn and its neighborhoods to help select the right location.

METHODOLOGY

Brooklyn's 70 neighborhoods were mapped using Folium and the NY geospatial data.



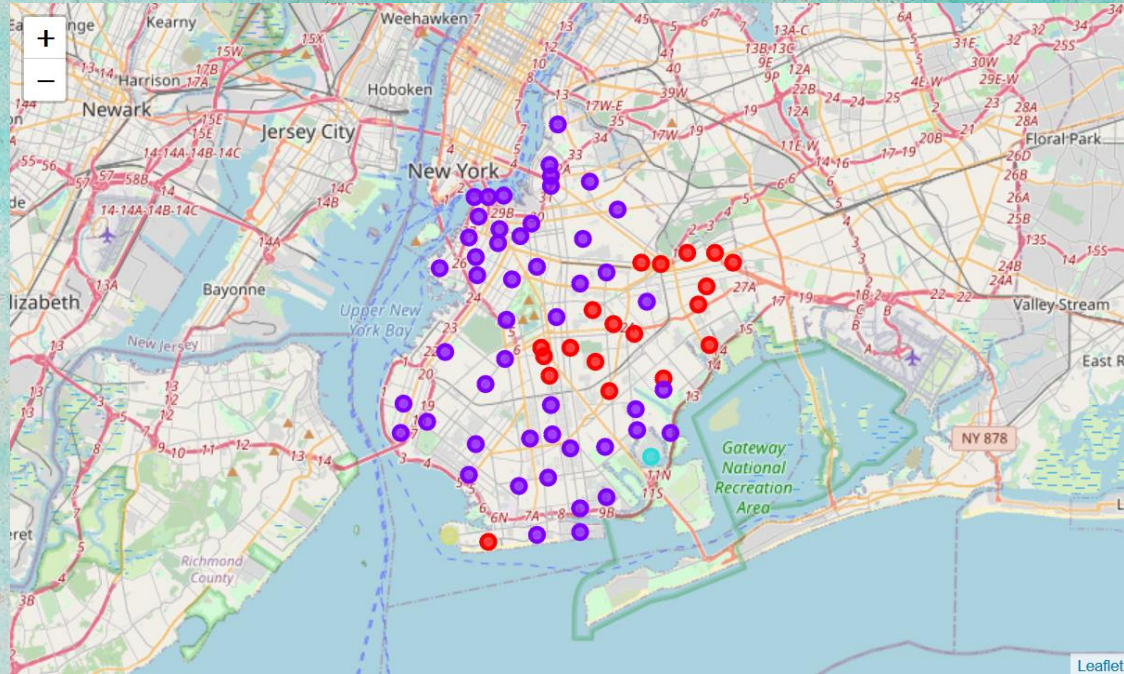
METHODOLOGY (cont.)

Using Foursquare, the top 10 most common venues were determined for each neighborhood.

	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	Fast Food Restaurant	Bubble Tea Shop	Gas Station	Sushi Restaurant	Italian Restaurant	Cantonese Restaurant	Park	Liquor Store
1	Bay Ridge	Spa	Italian Restaurant	Pizza Place	Greek Restaurant	American Restaurant	Bar	Pharmacy	Ice Cream Shop	Playground	Mediterranean Restaurant
2	Bedford Stuyvesant	Bar	Coffee Shop	Café	Pizza Place	Boutique	New American Restaurant	Gift Shop	Gourmet Shop	Juice Bar	Cocktail Bar
3	Bensonhurst	Ice Cream Shop	Donut Shop	Chinese Restaurant	Grocery Store	Sushi Restaurant	Italian Restaurant	Flower Shop	Furniture / Home Store	Liquor Store	Spa
4	Bergen Beach	Harbor / Marina	Donut Shop	Baseball Field	Playground	Athletics & Sports	Women's Store	Factory	Falafel Restaurant	Farm	Farmers Market

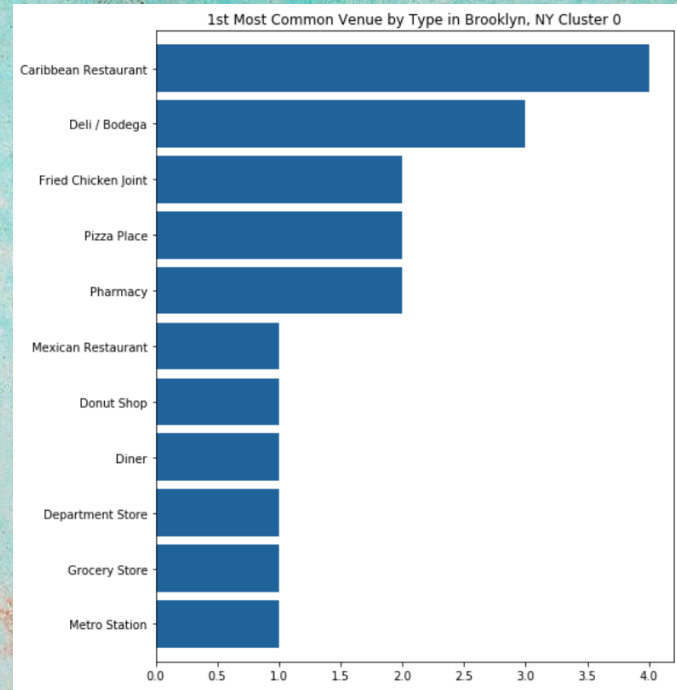
METHODOLOGY (cont.)

The neighborhoods were clustered using the k-means algorithm to group similar neighborhoods together. Four clusters were produced.



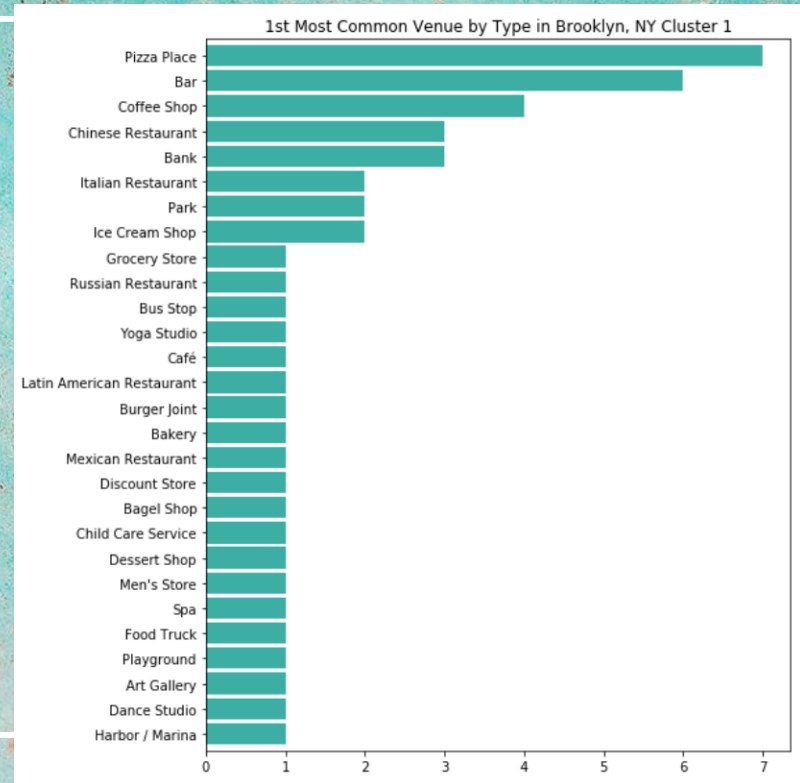
RESULTS

Cluster 0 has 19 neighborhoods. This set of first most common venues are varied, where Caribbean restaurants are most common in four of the neighborhoods. A doughnut shop is the first most common venue for just one neighborhood.



RESULTS (cont.)

Cluster 1 has an even more diverse set of first common venues than Cluster 0. It's important to note that doughnut shops were not first most common for any of the neighborhoods, which may be good news for the national doughnut chain looking for the perfect location.



RESULTS (cont.)

- Clusters 2 and 3 each only had one neighborhood.
- To find areas where a new doughnut shop would be welcomed, the data was then subset to include only those neighborhoods **without** a doughnut shop.
- The neighborhoods were then sorted by the number of venues and ranked. The top 20 neighborhoods were considered the short list of possible locations for the new doughnut shop.

DISCUSSION

- A national doughnut chain would like to open in a neighborhood with an active set of venues that already attracts customers.
- The top four neighborhoods with the most venues were Brooklyn Heights, Carroll Gardens, South Side, and North Side. Each have at least 100 venues and are located in Cluster 1.
- Demographic data was used to select the right neighborhood:

Neighborhood	Population	Median Income	Bachelor Degree or Higher
Brooklyn Heights	62,823	\$124,996	74.1%
Carroll Gardens	37,845	\$100,213	62.9%
South Side	88,349	\$36,404	27.2%
North Side	102,624	\$71,225	49.6%

RECOMMENDATIONS

The newest location of the doughnut shop chain is **Brooklyn Heights!**

- The data science tools used showed that it has many venues in the area that already attract customers. It has no other doughnut shops in the neighborhood, so there is no direct competition to the national chain.
- From the mapping results, it is seen that Brooklyn Heights is conveniently located directly across from Manhattan and clustered among several other neighborhoods, potentially bringing in additional customers that are only a short subway or ferry ride away.
- The demographics show that this is a wealthy neighborhood, with a median income of \$124,996 and large with a population of 62,823.