Best neighborhoods in NYC for a new dentist office

Applied Data Science Capstone Assignment: Capstone Project - The Battle of Neighborhoods

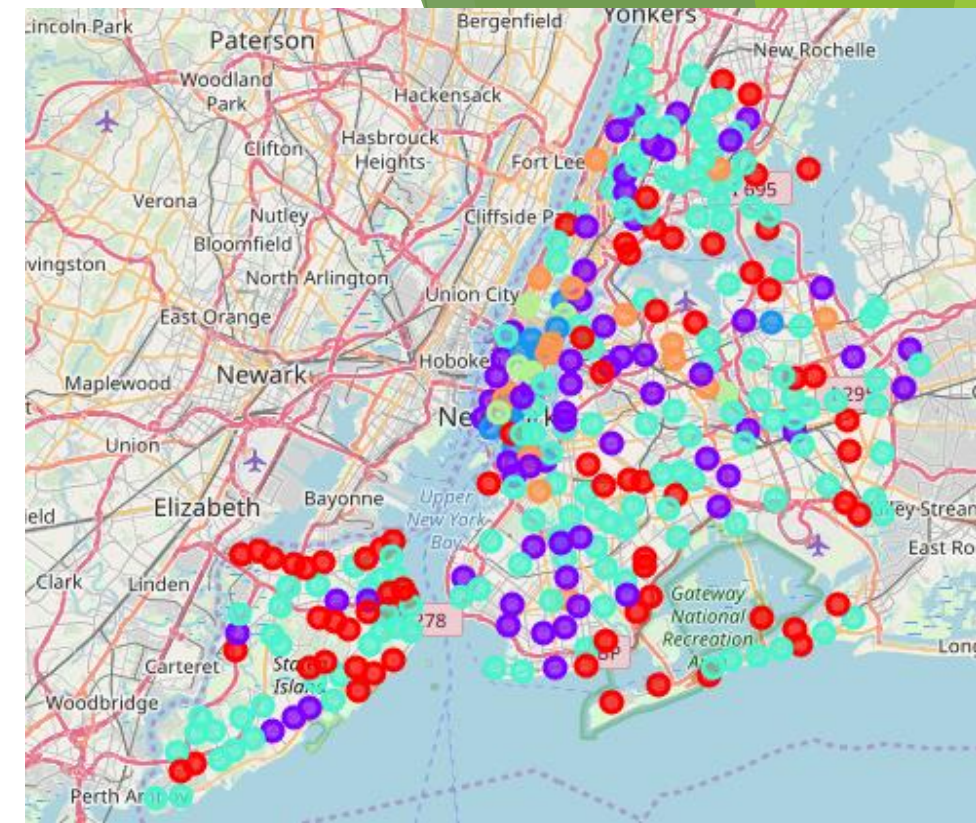# Business problem

- A (hypothetical) client is a dentist who would like to open a new dental office in the New York (NYC) area

- The client has two requirements:

1. The business must be located in an area that presents good business opportunities and allow him to get enough patients

2. Ideally, the location would be (or not far from) a nice place to live for a family, as he would like to live near his work.

Data

- ▶ Primary source for this analysis: Foursquare Places API
    - ▶ Provides data about existing dental offices and neighborhood data like the presence of schools, shopping, parks etc.
- ▶ For other demographic and social data we use government sources:
    - ▶ NYU Furman Center: http://app.coredata.nyc

Analysis

- We used Foursquare's API to get the list of dentists in each neighborhoods

- We used ML algorithm k-means to cluster the neighborhood into 5 clusters, according to the number of dentists.

- All neighborhoods with no dentist office where identified as an additional cluster (cluster label 5).

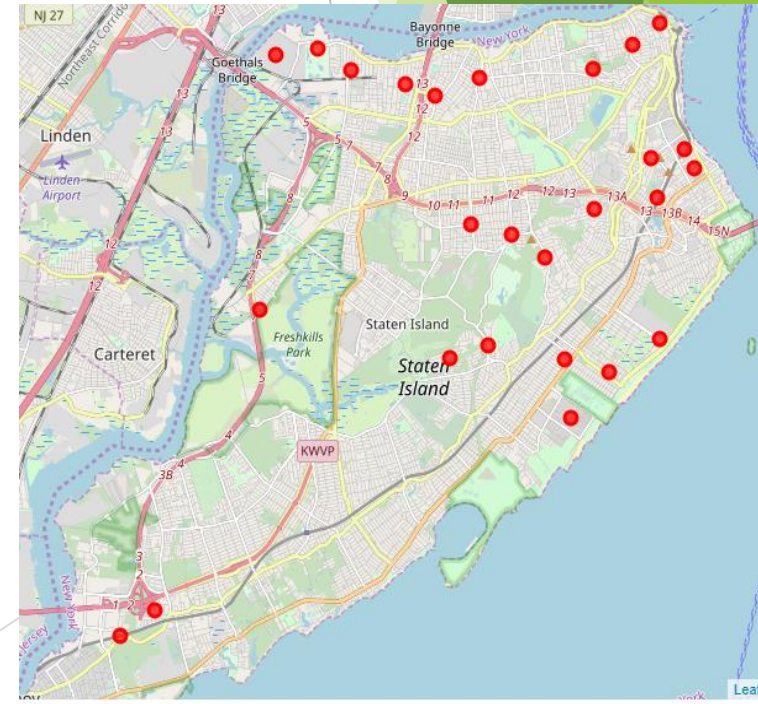- Cluster 2 and 5 represent the best business opportunity, having no or low number of established businesses

Cluster Labels	Dentists							
	count	mean	std	min	25%	50%	75%	max
0	63.0	6.984127	1.853437	5.0	5.00	6.0	8.00	11.0
1	10.0	40.600000	2.412928	38.0	39.25	40.0	40.00	45.0
2	141.0	2.226950	1.110783	1.0	1.00	2.0	3.00	4.0
3	6.0	32.166667	2.316607	29.0	30.50	32.5	33.75	35.0
4	16.0	16.000000	2.804758	12.0	14.00	15.5	17.25	23.0
5	70.0	0.000000	0.000000	0.0	0.00	0.0	0.00	0.0

Analysis

▶ Staten Island offers most neighborhoods in cluster 5 (no established businesses) coupled with high household income, lowest unemployment, crime rate and poverty rate

▶ Based on client's preference for Staten Island borough, we further focused analysis on it.

Borough	median_household_income	pop_density	unemployment	crimerateper1000residents	poverty_rate
Manhattan	86693	73.479122	0.053543	16.458252	0.162231
Bronx	38110	34.985434	0.109212	14.552795	0.280333
Brooklyn	58027	37.941149	0.064241	11.281601	0.198106
Queens	65739	21.684484	0.051791	8.611700	0.121145
Staten Island	80711	8.241244	0.043181	5.970494	0.117867

Results and Conclusions

▶ We identified the neighborhoods in Staten Island cluster 5 with highest number of family-oriented venues, i.e. parks, playground and sport centers

▶ The short list of neighborhoods presenting best business opportunities and environment for family living has been delivered to the client

▶ The client is now able to finalize his choice on the shortlisted neighborhoods, by checking them out and evaluating other aspects (e.g. appealing of the neighbourhood, quality of local schools, housing market, etc)

Neighborhood	Venue	Venue Category
St. George	Lt. Lia Playground	Playground
St. George	Fort Hill	Park
St. George	Maritime Hospital Quarantine Cemetery	Park
St. George	Barrett Triangle	Park
New Brighton	Bocce Courts	Park
New Brighton	Skyline Playground	Playground
New Brighton	Mahoney Park	Park
Rosebank	White playground	Park
Rosebank	DeMatti Park	Park
Todt Hill	St Francis Woodlands	Park
South Beach	Q Ave	Park
Port Richmond	Levy Playground	Playground
Mariner's Harbor	44 Bus Stop.	Playground
Travis	Dr Seuss Park!	Park