Identifying the Best Area in Toronto for a new Pharmacy

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Business Problem

- With a population of 6.3m, Toronto is in need of a growing health infrastructure network to increase its citizens' access to timely and effective healthcare.
- In a less connected world, there is an increase in desire for locally owned, independent pharmacies.
- The most important question is: Where can we place a new pharmacy to best serve the needs of our surrounding population and ultimately increase the healthcare of the city?
- This is important for any pharmacists looking to expand and open their own practice, or investors that are looking to fund a new store-front location

Data

- Data Required and Sources
  - List of neighborhoods in Toronto from Wikipedia
    - https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
  - Toronto population data
    - https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Table.cfm?Lang=Eng&T=1201&S=22&O=A
  - Latitude and Longitude coordinates of neighborhoods
    - Geospatial data provided by Coursera & Geocoder Python package
  - Foursquare API venue data

Methodology

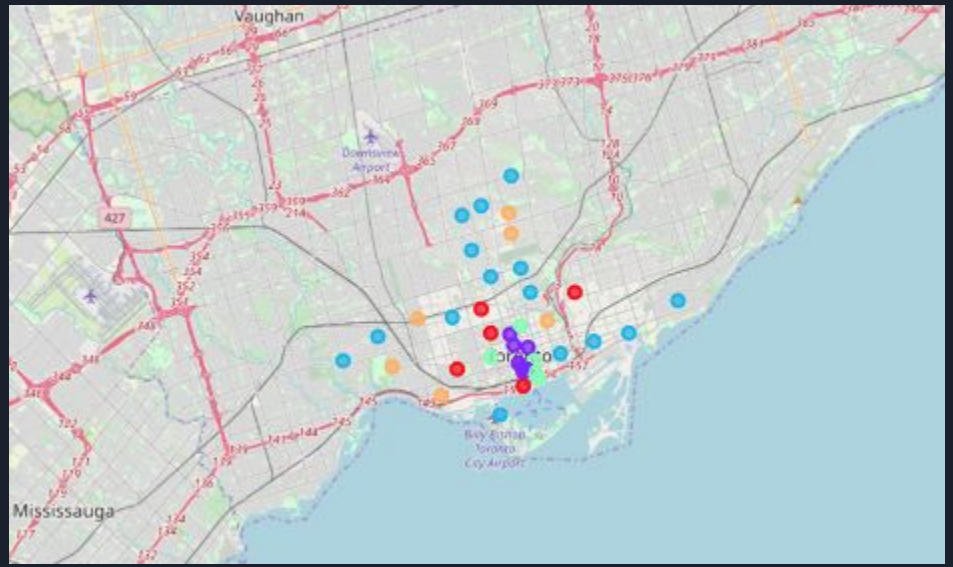
- Data Set-Up
  - Web-Scraping Wikipedia for neighborhoods
  - Merging with latitude and longitude coordinates
  - Using Foursquare API to gain venue details and counts

- Machine Learning
  - Perform clustering of data through K-Means clustering

- Visualization & Analysis
  - Visualizing clusters on a map using Folium
  - Visualize the rates of pharmacies per population

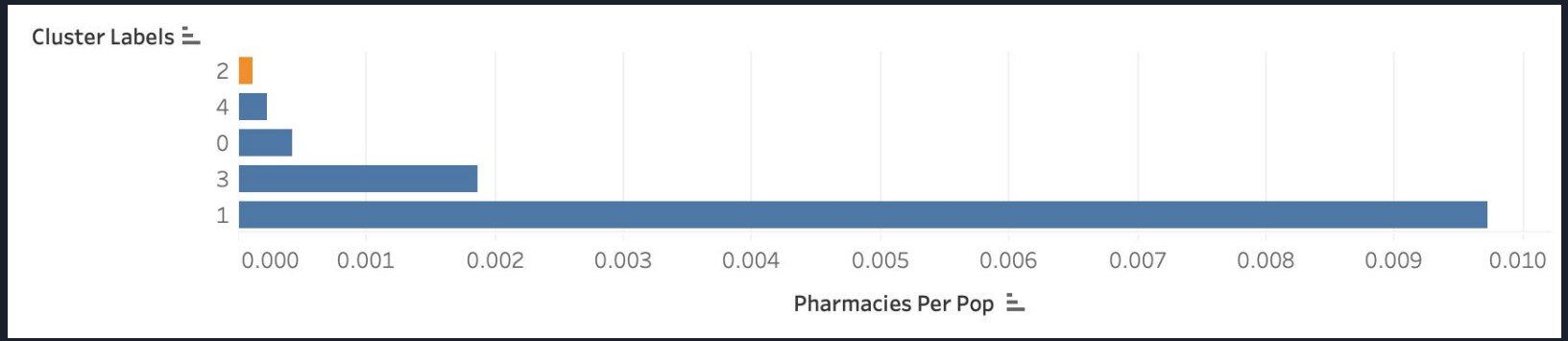
Results

- Categorized the neighborhoods into 5 clusters shown below.



Results

- Found that Cluster 2 had the lowest rate of pharmacies per population, which presents the greatest potential for a new pharmacy to serve its community.



Discussion

- Cluster 2 would be the most effective location for a new pharmacy with Clusters 4 an d 0 close behind.
- This Cluster represents a large area with many neighborhoods that have similar rates of pharmacies per population. Any of these could be utilized as the new location.

Conclusion

- To conclude, we were able to utilize data, analytics, and machine learning to determine that Cluster 2 would be the most effective location for a new pharmacy in Toronto.
- This finding could help with any pharmacists looking to begin their own practice, investors looking to help fund a new store-front, and ultimately the health and access to healthcare for the inhabitants in Greater Toronto.