

Animal Product Substitutes in Toronto

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The Business Problem

- The goal is to address where a manufacturer of animal product substitutes should consider marketing or distributing their products in the city of Toronto.

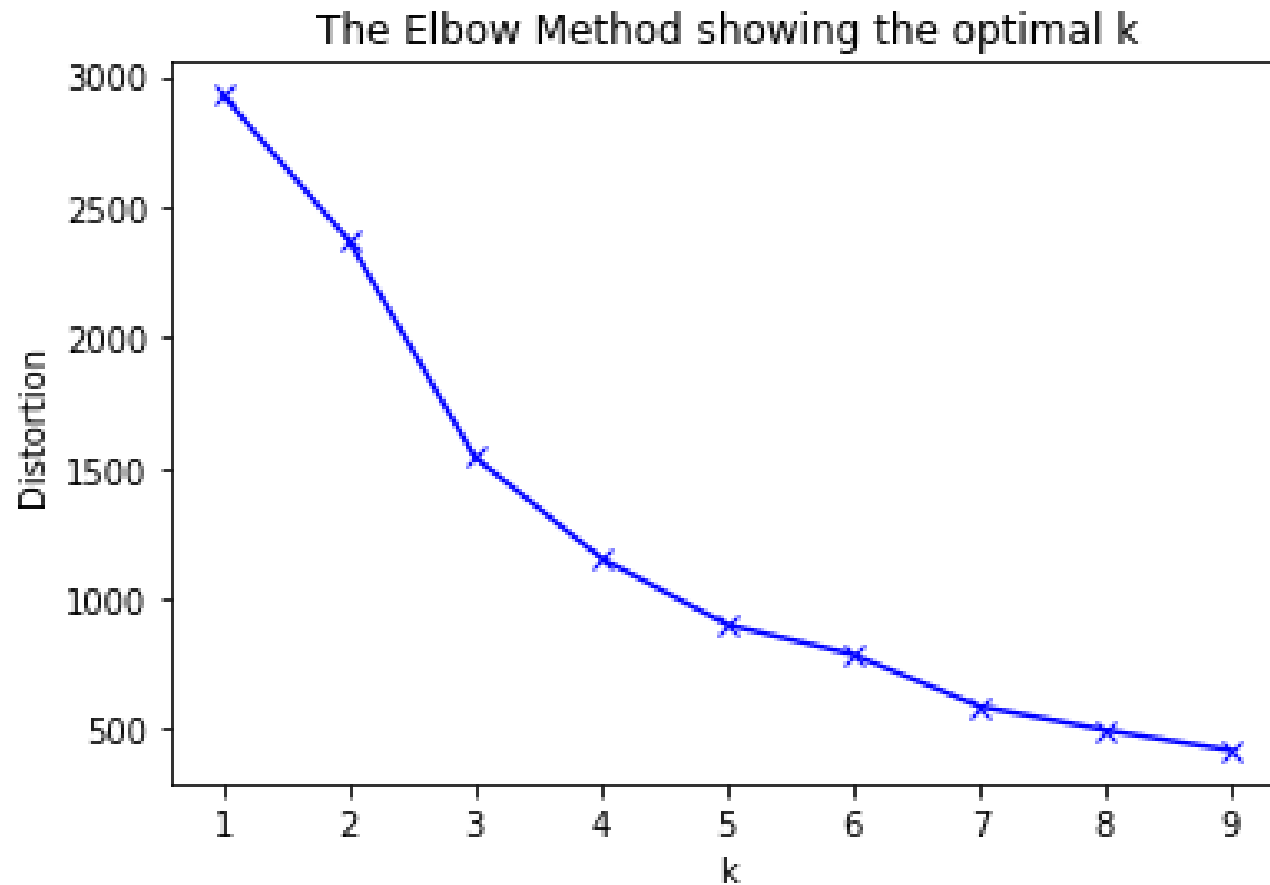
Data Acquisition

- The data used was acquired through the foursquare API and the Open Data Toronto project.
- For each neighborhood fractions of: males, females, people of high income (top five deciles), people on public assistance, people employed, people of European descent, people of Asian descent, Canadian Citizens, and people aged fifteen to thirty-four. Were used in addition to the number of relevant venues and population density.
- The fractional values were made using scripts that added together relevant values and divided them element-wise.
- The columns are assumed to be largely independent of each other.
- The venues were assigned neighborhoods by shortest distance.

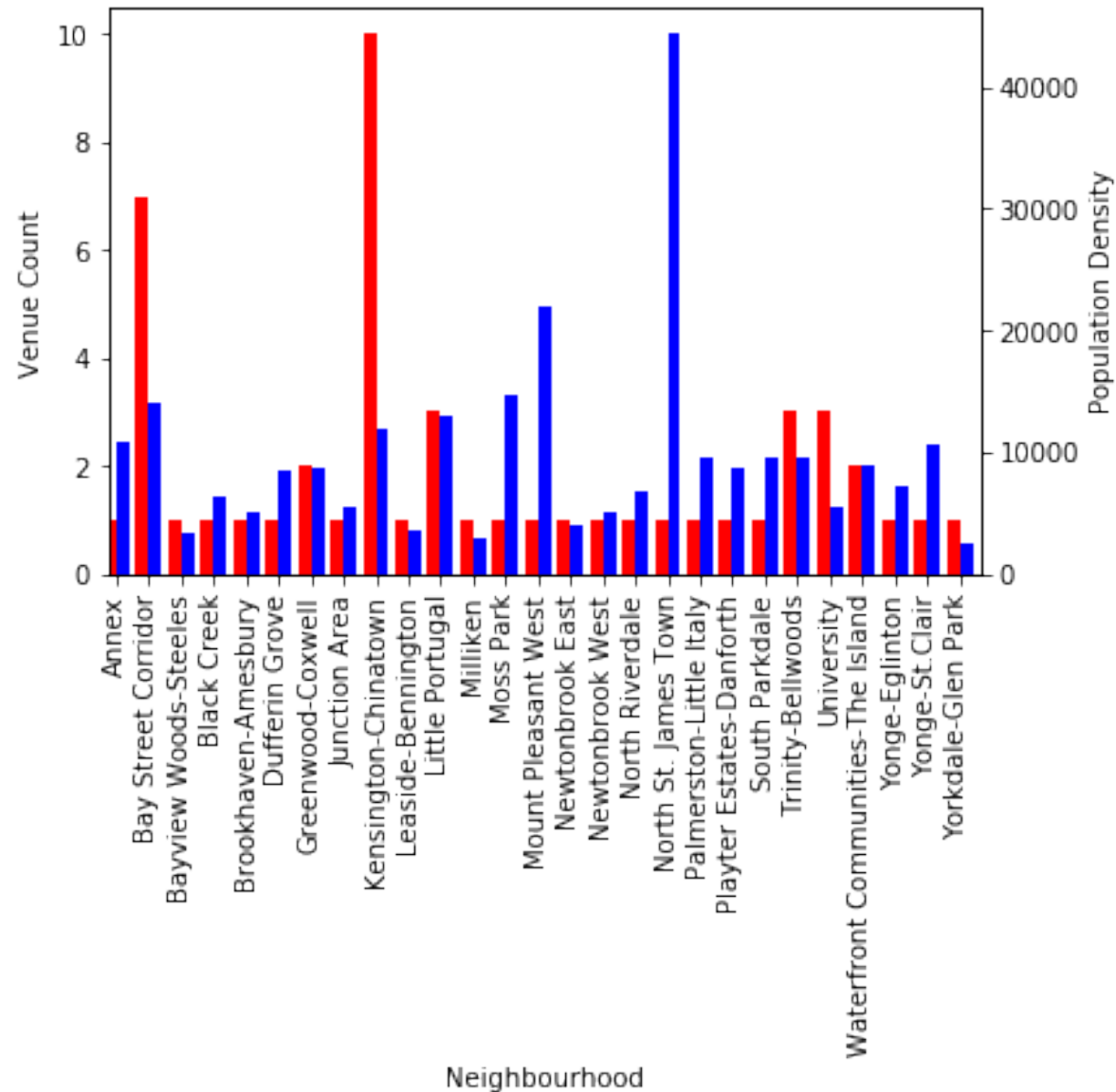
Results: Brief Overview

- The results showed that clusters with high densities of vegan and vegetarian restaurants had higher fractions of young people living there.
- There seems to be a minimum population density for there to be a high density of these venues.
- There is does not seem to be an immediate correlation between high income and the amount of venues.
- Areas with high density of venues tend to be at least somewhat racially diverse.
- The optimal k value for clustering was five.

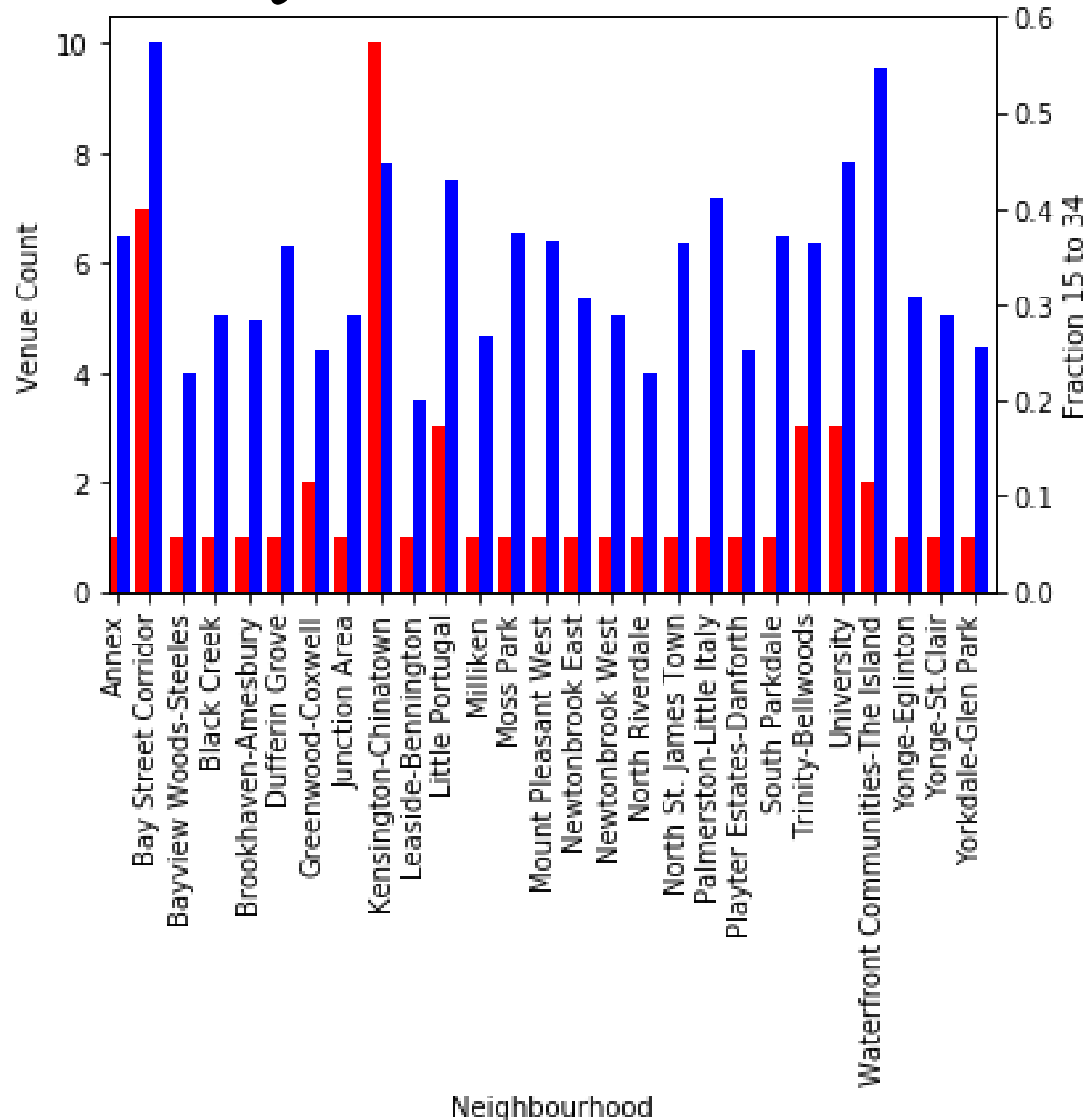
The Elbow Method to Find the Best K



The Population Density per km (Blue) and the Density of Desired Venues (Red)



The Fraction of Young People (Blue) and the Density of Desired Venues (Red)



Results: Continued.

- The only thing reliably similar about the clusters with high densities of vegan and vegetarian restaurants was that they skewed towards having a younger populace.
- The high population density possibly suggests that the patrons of these venues may not come from the same neighborhood.
- These neighborhoods seem to be racially diverse.

Conclusions

- It seems that any of the neighborhoods with a high density of vegan and vegetarian restaurants might be a good place to market or distribute a substitute for an animal product.
- This is at best a preliminary analysis and further study must be done to look at other factors relating to restaurant patronage between neighborhoods.
- K-means is suitable for gaining some quick insight in this case but is not a suitable means for more precise future study.