OPENING OF A NEW VEGAN RESTAURANT IN TORONTO

Applied Data Science Capstone by IBM/Coursera

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1. INTRODUCTION

1.INTRODUCTION

Background

Toronto is the capital city of the Canadian province of Ontario. It is the most populous city in Canada and is an international center of business, finance, arts, and culture.

The annual sales generated by the restaurant industry in Ontario are $33 Billion and there are 9,1 Million visits to restaurants every day.

Canada's is home to approximately 850,000 vegans and there are nearly 2.3 million vegetarians. Ontario is the second region in Canada with the highest percentage of It's estimated that the number of Canadians going meatless or eating less meat could exceed 10 million by 2025.

People, especially in cosmopolitan cities like Toronto, are more open to trying and exploring vegetarian or vegan restaurants even if they do not follow a strictly vegan or vegetarian diet.

1.INTRODUCTION

Business Problem

Location is one of the most important decision to make when you want to open a new restaurant, specially for a niche business like a vegan restaurant.

Several factors affects the success of a new restaurant which are directly related to the location:
- Visibility and accessibility
- Demographics
- Competition

The objective of this project to determine which might be the 'best' neighborhood in Toronto to open a vegan restaurant.

1.INTRODUCTION

Stockholders

This study would be extremely useful for entrepreneurs that want to open a vegan restaurant in the city of Toronto.

2. DATA DESCRIPTION

2.DATA DESCRIPTION

The data used is a list of all boroughs and neighborhoods in Toronto, geographical coordinates and venues information.

The factors considered for our final decision are the number of existing Vegan restaurants , number of existing Yoga Studio and the most common venues of each neighborhood.
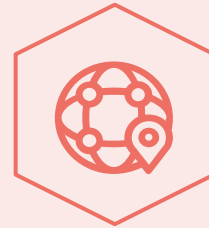
Data sources and acquisition

Wikipedia

Postal Code, Borough, and Neighborhoods. We use Beautiful Soup Library.

Geospatial Data

Geographical coordinates of all neighborhoods and venues.

Foursquare API

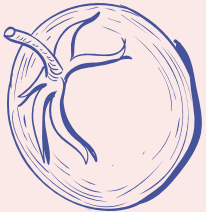Location-related data. Category venues in each neighborhood.

3. METHODOLOGY

3.METHODOLOGY

**Data
cleaning**
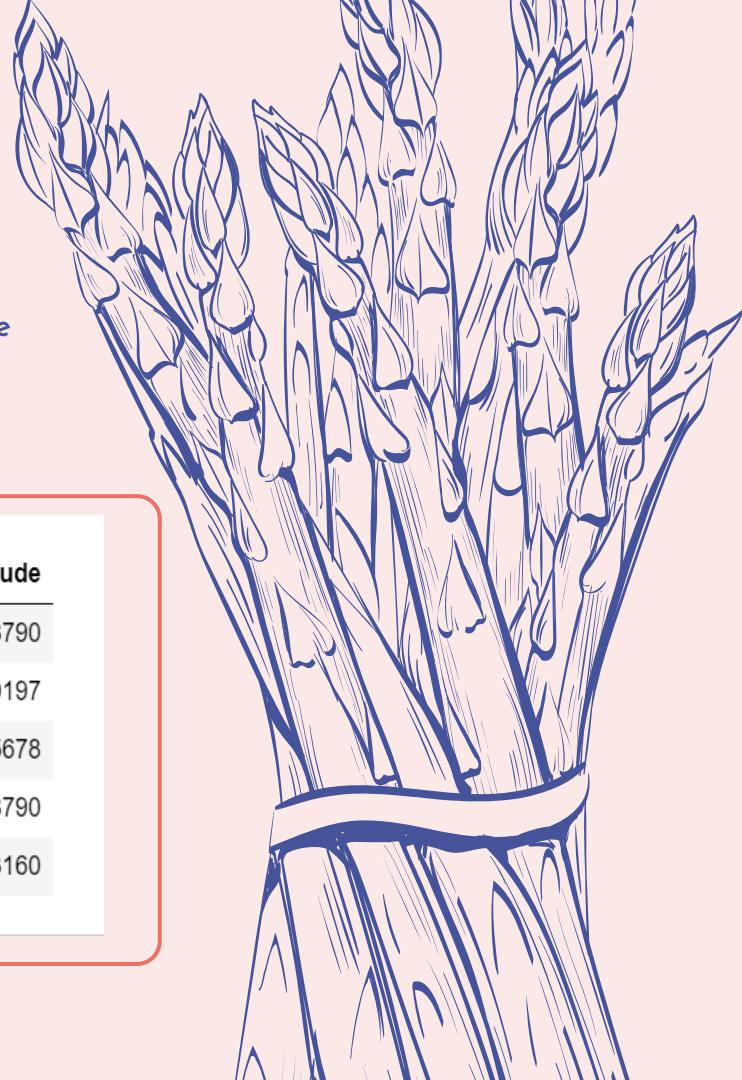
**Data
exploration**

**Data
analysis**

3.METHODOLOGY

1.Data Cleaning

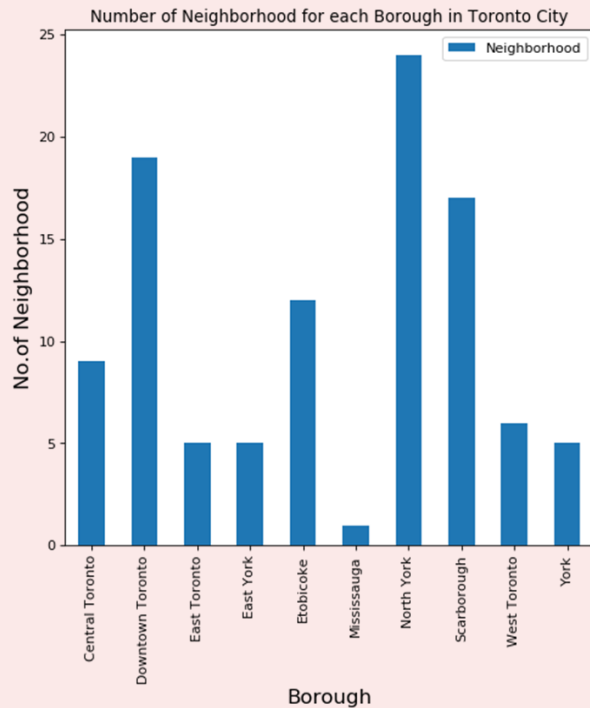After all the data was collected, we need to process it until a suitable data frame is obtained for the analysis

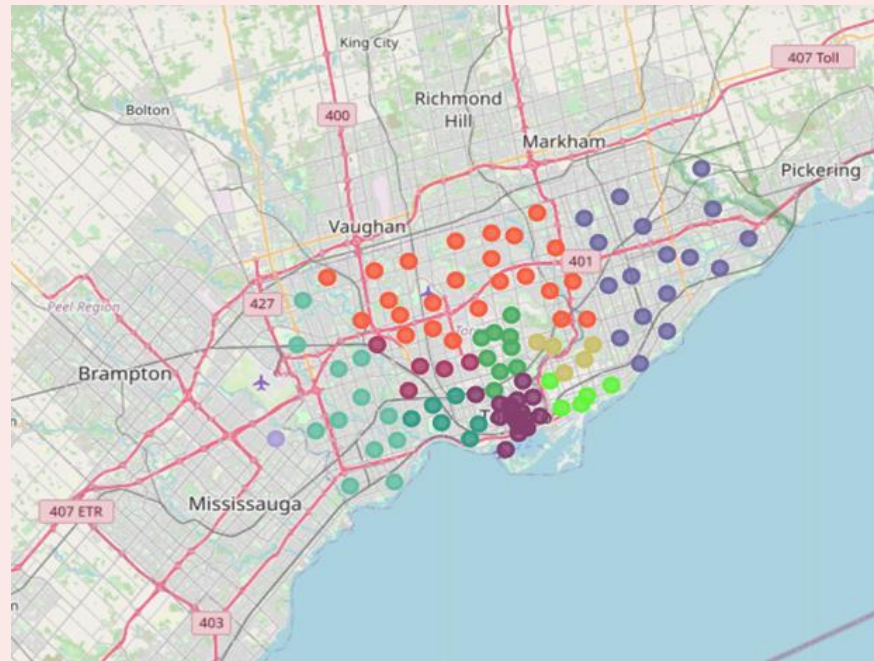|	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M4N	Central Toronto	Lawrence Park	43.728020	-79.388790
1	M4P	Central Toronto	Davisville North	43.712751	-79.390197
2	M4R	Central Toronto	North Toronto West, Lawrence Park	43.715383	-79.405678
3	M4S	Central Toronto	Davisville	43.704324	-79.388790
4	M4T	Central Toronto	Moore Park, Summerhill East	43.689574	-79.383160

2.Data Exploration

Comparison of the number of neighborhoods in each borough by creating a bar chart.

Map of Toronto with neighborhoods superimposed on top and color-coded depending in what borough they are in (Folium Library)

3.METHODOLOGY

2.Data Exploration

Using Foursquare API we get a list of all the Venues in Toronto and start exploring each neighborhood attending to this venue information. Name, coordinates and type will be retrieved for each venue

We create a data frame with the most common 10 top venues for each Neighborhood.

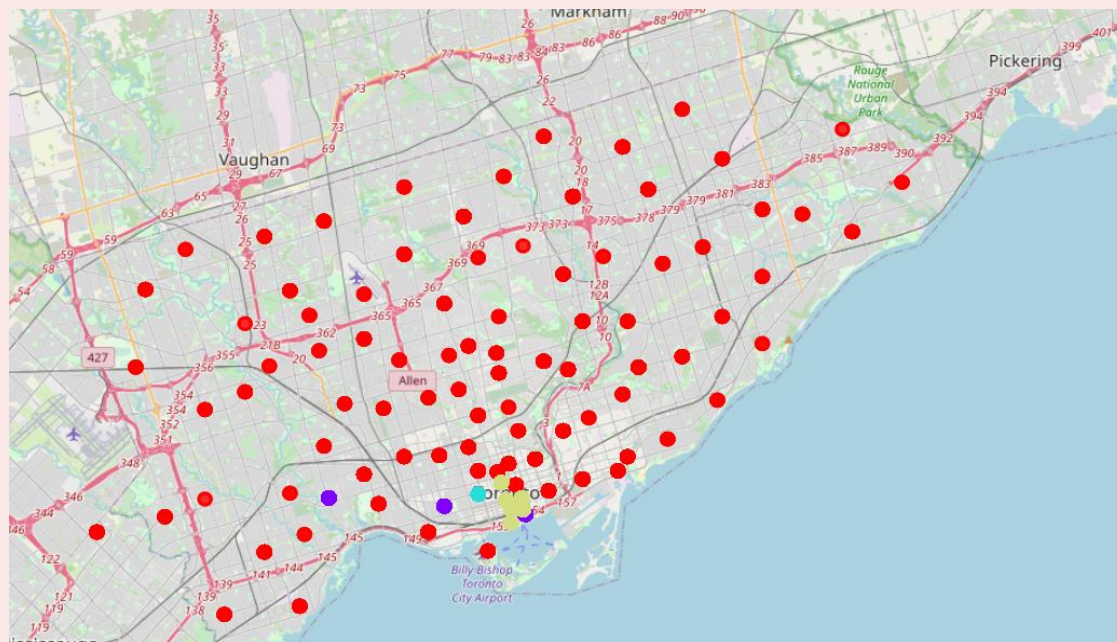|	Neighborhoods	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Agincourt	Lounge	Skating Rink	Latin American Restaurant	Clothing Store	Breakfast Spot	Falafel Restaurant	Event Space	Ethiopian Restaurant	Escape Room	Discount Store
1	Alderwood, Long Branch	Pizza Place	Pharmacy	Gym	Sandwich Place	Coffee Shop	Pub	Dog Run	Dim Sum Restaurant	Diner	Discount Store
2	Bathurst Manor, Wilson Heights, Downsview North	Bank	Coffee Shop	Fried Chicken Joint	Chinese Restaurant	Bridal Shop	Sandwich Place	Diner	Restaurant	Middle Eastern Restaurant	Supermarket
3	Bayview Village	Japanese Restaurant	Café	Chinese Restaurant	Bank	Distribution Center	Dog Run	Doner Restaurant	Donut Shop	Drugstore	Yoga Studio
4	Bedford Park, Lawrence Manor East	Sandwich Place	Italian Restaurant	Coffee Shop	Greek Restaurant	Thai Restaurant	Locksmith	Liquor Store	Comfort Food Restaurant	Juice Bar	Butcher

2.Data Exploration

Using K-Means Technique we cluster the neighborhoods based on similar averages of vegan/vegetarian restaurant. Elbow Point Technique reveals 4 as the best K value.

We can easily visualize clusters and neighborhoods in the map below created with Folium
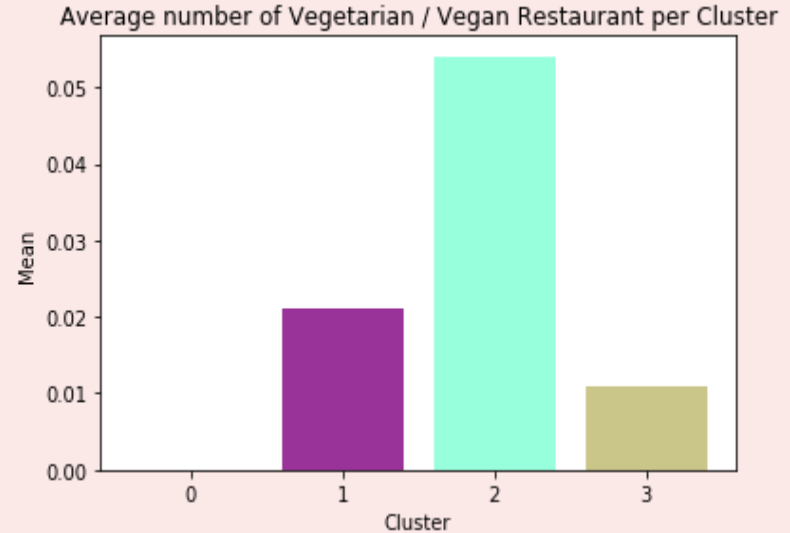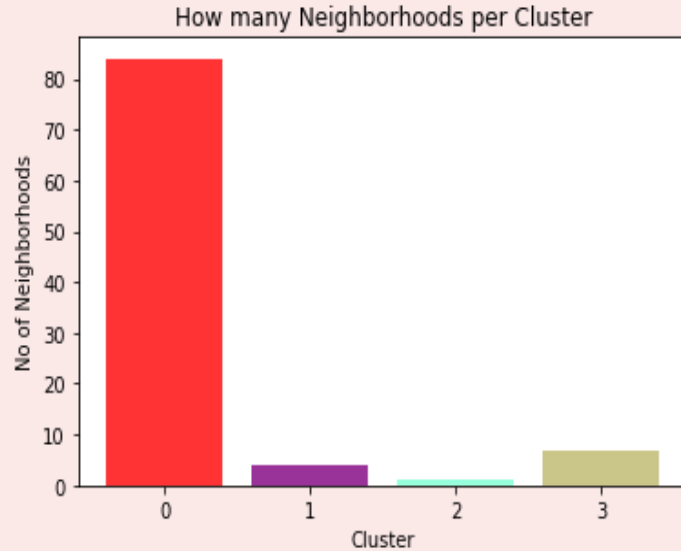
- Cluster 0 – Red
- Cluster 1 – Purple
- Cluster 2 – Turquoise
- Cluster 3– Green Khaki

3. Data Analysis

Cluster 0, being the one with the highest number of neighborhoods, has the lowest average of Vegan/Vegetarian Restaurants (0,00).

Cluster 2 has the highest average (0,54054) but the lowest number of neighborhoods (1).

3.Data Analysis

Cluster 0

84 Neighborhoods
225 Unique Venues Categories
0 Vegan Restaurant
9 Yoga Studio

Cluster 2

1 Neighborhoods
49 Unique Venues Categories
4 Vegan Restaurant
0 Yoga Studio

Cluster 1

4 Neighborhoods
97 Unique Venues Categories
5 Vegan Restaurant
2 Yoga Studio

Cluster 3

7 Neighborhoods
145 Unique Venues Categories
7 Vegan Restaurant
2 Yoga Studio

4. RESULTS AND DISSCUSION

4.RESULT AND DISCUSSION

Our recommendation is to open a Vegan Restaurant in one of this 4 Neighborhoods inside Downtown Toronto and belonging to Cluster 0:

- Church and Wellesley
- Regent Park/Harbourfront
- University of Toronto/Harbord
- Queen´s Park Ontario/Provincial Government

There is no Vegan/ Vegetarian Restaurant (no direct competitors) and there are Yoga Studios (clients closely related to our business)

But is any of these 4 neighborhoods more suitable for a Vegan/Vegetarian Restaurant?

After analyzing the 10 most common venues in each one we conclude that Church and Wellesley or Queen´s Park Ontario/Provincial Government are the best neighborhoods for opening a Vegan/Vegetarian Restaurant.

In both neighborhoods there is a Yoga Studio as one of the most common venues. Others are almost all restaurants or cafes which tells us that there are many people looking for place to eat or drink

4.RESULT AND DISCUSSION

Church and Wellesley

Queen´s Park Ontario, Provincial Government

3. CONCLUSIONS

5.CONCLUSIONS

We fetched data from several data sources, processed and visualized it. We used Foursquare API to explore venues and K-means cluster algorithm.

We considered competition and venues with similar clients as key variables to make a final recommendation.

A final recommendation on optimal Vegan/Vegetarian location in Toronto have been given to the stakeholders.

Stockholders are also encouraged to take into consideration additional factors such as accessibility or locals rent opportunities to made their final location decision.

THANKS

**Do you you need
further info?**

A complete and detailed report
and all code used for this project are
stored in a GitHub account and can
be consulted from there.