

VEGAN AND VEGETARIAN RESTAURANT EXPANSION IN THE TORONTO AREA REPORT

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Introduction

For this project, we will like to know how many vegan restaurants are in the Toronto area. As we see, being vegan is a trend that is growing a lot in popular culture, but most vegan people cannot find vegan restaurants. Most of the vegan people have to go great distances to find vegan restaurants to satisfy their needs. This could be an excellent opportunity for investors to invest in neighborhoods where there is a lack of vegan restaurants.

Business Problem

As explained before, this could be an excellent opportunity for investors that want to differentiate their product with vegan alternatives with a market that is growing a lot in recent years.

First, for investors to put their money in the project, they have to see which neighborhoods Toronto has a lack of vegan restaurants.

The data that we will use is:

- A list of different neighborhoods in Toronto that we will get the data from Wikipedia.
- We will use the coordinates of each neighborhood in which we will obtain from the Geocoder Package to receive the coordinates of the city.
- The data on the location of different vegan restaurants around the city of Toronto, which we will be using the Foursquare API to retrieve the data.

Methodology

As we mentioned before, first, we will use the information from Wikipedia to retrieve the data on the neighborhoods of Toronto.

```
[ ] url = "https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M"
page = requests.get(url)
if page.status_code == 200:
    print('Page download successful')
else:
    print('Page download error. Error code: {}'.format(page.status_code))
```

Page download successful

```
[ ] import lxml
df_html = pd.read_html(url, header=0, na_values = ['Not assigned'])[0]
df_html.head()
```

	Postal code	Borough	Neighborhood
0	M1A	NaN	NaN
1	M2A	NaN	NaN
2	M3A	North York	Parkwoods
3	M4A	North York	Victoria Village
4	M5A	Downtown Toronto	Regent Park / Harbourfront

After finding all the information on the Neighborhoods of Toronto, then we will use the information of the Geocoder Package to receive the coordinates and postcodes of the city. Then we will combine the data found on Wikipedia with the Geocoder Package to have a better understanding of how those neighborhoods and postcodes combine.

```
[ ] url_csv = 'http://cocl.us/Geospatial_data'
df_coordinates = pd.read_csv(url_csv)
df_coordinates.head()
```

	Postal Code	Latitude	Longitude
0	M1B	43.806686	-79.194353
1	M1C	43.784535	-79.160497
2	M1E	43.763573	-79.188711
3	M1G	43.770992	-79.216917
4	M1H	43.773136	-79.239476

```
[ ] df_neighborhood = pd.read_csv('Toronto_Postal_code.csv', index_col=[0])
df_neighborhood.head()
```

	Postal code	Borough	Neighborhood
0	M1B	Scarborough	Malvern / Rouge
1	M1C	Scarborough	Rouge Hill / Port Union / Highland Creek
2	M1E	Scarborough	Guildwood / Morningside / West Hill
3	M1G	Scarborough	Woburn
4	M1H	Scarborough	Cedarbrae

```
[ ] df_coordinates.rename(columns={'Postal Code': 'PostalCodes'}, inplace=True)
df_neighborhood.rename(columns={'Postal code': 'PostalCodes'}, inplace=True)

[ ] df_neighborhood_coordinates = pd.merge(df_neighborhood, df_coordinates, on='PostalCodes')
df_neighborhood_coordinates.head()
```

```
[ ] df_coordinates.rename(columns={'Postal Code': 'PostalCodes'}, inplace=True)
df_neighborhood.rename(columns={'Postal code': 'PostalCodes'}, inplace=True)

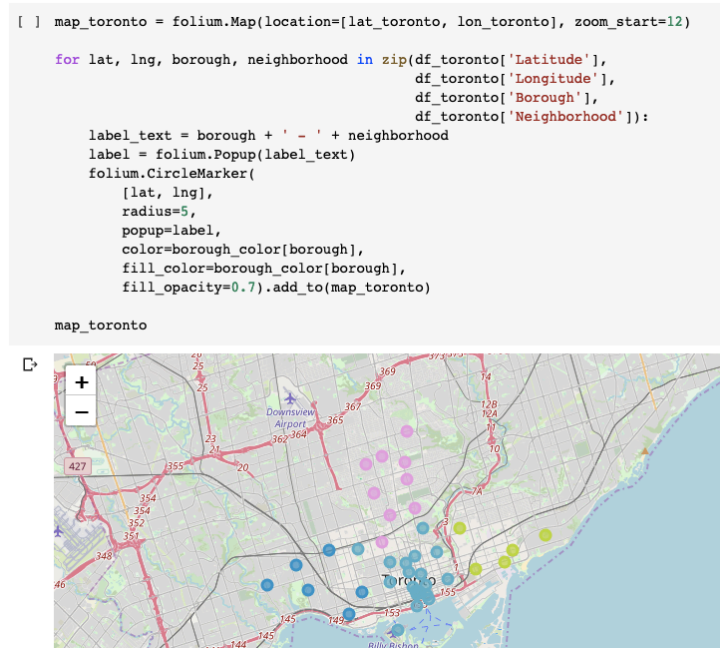
[ ] df_neighborhood_coordinates = pd.merge(df_neighborhood, df_coordinates, on='PostalCodes')
df_neighborhood_coordinates.head()
```

	PostalCodes	Borough	Neighborhood	Latitude	Longitude
0	M1B	Scarborough	Malvern / Rouge	43.806686	-79.194353
1	M1C	Scarborough	Rouge Hill / Port Union / Highland Creek	43.784535	-79.160497
2	M1E	Scarborough	Guildwood / Morningside / West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

```
[ ] df_neighborhood_coordinates[(df_neighborhood_coordinates['PostalCodes']=='M5G')
(df_neighborhood_coordinates['PostalCodes']=='M5E')]
```

	PostalCodes	Borough	Neighborhood	Latitude	Longitude
56	M5E	Downtown Toronto	Berczy Park	43.644771	-79.373306
57	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383

Now that we have all the information, we can see a map of the different clusters of neighborhoods that we want to work with to carry out our research, which is divided into three.



With the information we have, now it is time to look for Vegan/Vegetarian restaurants in the clusters that we found on the results of the map.

For this, we will use Foursquare API to retrieve and detect all the types of venues located in the different clusters, which is more than 235.

Now that we have the above information, we will group all the Vegetarian/Vegan Restaurants into the Neighbourhoods, and we will work with which are the following:

```
[ ] to_vegetarian_vegan = to_grouped["Neighborhoods", "Vegetarian / Vegan Restaurant"]
[ ] to_vegetarian_vegan.head(9)
```

	Neighborhoods	Vegetarian / Vegan Restaurant
0	Berczy Park	0.017857
1	Brockton / Parkdale Village / Exhibition Place	0.000000
2	Business reply mail Processing CentrE	0.000000
3	CN Tower / King and Spadina / Railway Lands / ...	0.000000
4	Central Bay Street	0.012987
5	Christie	0.000000
6	Church and Wellesley	0.000000
7	Commerce Court / Victoria Hotel	0.020000
8	Davisville	0.000000

Results

From our findings, we can see that most of the vegan/vegetarian restaurants in Toronto are located in Cluster 0, with those neighborhoods are the following:

- Harbourfront East
- Runnymede
- Richmond
- Stn A PO Boxes
- St. James Town
- Toronto Dominion Centre
- Berczy Park
- Central Bay Street
- Commerce Court
- First Canadian Place

Having all the information from the findings from the data of the clusters, we can say that investors wanting to invest money in vegan/vegetarian restaurants in Toronto should highly consider investing in the neighborhoods in Cluster 2. Which are the following:

- Kensington Market
- The Annex / North Midtown / Yorkville

	Neighborhood	Vegetarian / Vegan Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
14	Harbourfront East / Union Station / Toronto Is...	0.010000	0	43.640816	-79.381752	Kupfert & Kim	43.641179	-79.378144	Vegetarian / Vegan Restaurant
28	Runnymede / Swansea	0.025641	0	43.651571	-79.484450	Awai	43.650412	-79.478477	Vegetarian / Vegan Restaurant
25	Richmond / Adelaide / King	0.020000	0	43.650571	-79.384568	Rosalinda	43.650252	-79.385156	Vegetarian / Vegan Restaurant
25	Richmond / Adelaide / King	0.020000	0	43.650571	-79.384568	Planta Queen	43.650622	-79.388154	Vegetarian / Vegan Restaurant
31	Stn A PO Boxes	0.010417	0	43.646435	-79.374846	Fresh On Front	43.647815	-79.374453	Vegetarian / Vegan Restaurant
29	St. James Town	0.010000	0	43.651494	-79.375418	Fresh On Front	43.647815	-79.374453	Vegetarian / Vegan Restaurant
37	Toronto Dominion Centre / Design Exchange	0.010000	0	43.647177	-79.381576	Rosalinda	43.650252	-79.385156	Vegetarian / Vegan Restaurant
0	Berczy Park	0.017857	0	43.644771	-79.373306	Fresh On Front	43.647815	-79.374453	Vegetarian / Vegan Restaurant
4	Central Bay Street	0.012987	0	43.657952	-79.387383	Vegetarian Haven	43.656016	-79.392758	Vegetarian / Vegan Restaurant
7	Commerce Court / Victoria Hotel	0.020000	0	43.648198	-79.379817	Fresh On Front	43.647815	-79.374453	Vegetarian / Vegan Restaurant
7	Commerce Court / Victoria Hotel	0.020000	0	43.648198	-79.379817	Rosalinda	43.650252	-79.385156	Vegetarian / Vegan Restaurant
11	First Canadian Place / Underground city	0.010000	0	43.648429	-79.382280	Rosalinda	43.650252	-79.385156	Vegetarian / Vegan Restaurant

	Neighborhood	Vegetarian / Vegan Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
34	The Annex / North Midtown / Yorkville	0.047619	2	43.672710	-79.405678	Live Organic Food Bar	43.675053	-79.406715	Vegetarian / Vegan Restaurant
17	Kensington Market / Chinatown / Grange Park	0.038961	2	43.653206	-79.400049	Buddha's Vegetarian	43.651904	-79.403312	Vegetarian / Vegan Restaurant
17	Kensington Market / Chinatown / Grange Park	0.038961	2	43.653206	-79.400049	Hibiscus	43.655454	-79.402439	Vegetarian / Vegan Restaurant
17	Kensington Market / Chinatown / Grange Park	0.038961	2	43.653206	-79.400049	King's Cafe	43.654270	-79.401897	Vegetarian / Vegan Restaurant

Discussion and Conclusion

In the data, we used there was a significant limitation using Foursquare API. However, nothing we can not work with, but the limitations give a scope of the business the investors can put their money on. In more, in-depth research is for sure that we can have a better understanding of each of the clusters and neighborhoods used in the Postal Codes used on the research paper.

With all the findings on this report, we can conclude that the economic benefits of expanding into the mentioned neighborhoods will create a tremendous economic impact on those neighborhoods now that the trend of becoming vegetarian or vegan is on the rise.

As the results suggest, there is no great variety of vegan restaurants in the Toronto area, mainly because of the price of the plate of each restaurant. However, we can work with it as the economic profit of opening one is undoubtedly a reality