

Applied Data Science Capstone

Assignment: Capstone Project - The Battle of Neighborhoods

Final Report

Jennifer S.

1. Introduction/Business Problem

A Toronto based chef specializing in vegan baked goods has decided to open a vegan donut shop in Downtown Toronto. He has already solicited investors, and created a menu for his new donut shop. He feels his donuts are so handcrafted and unique that he is undeterred by any of the existing donut shops in Downtown Toronto. He has a plan to leverage social media to quickly accelerate his brand awareness.

The client as asked for assistance in locating the ideal location for his new business. He requires the location to be in Downtown Toronto and he requires it to be near several existing vegan or vegetarian restaurants. While he will be focusing heavily on social media to increase brand awareness, he know he needs to rely heavily on foot traffic of vegans in the area to initially get his business started and maintain it over the years.

2. Data

Foursquare Place API was used to acquire the data on existing vegan and vegetarian restaurants in the downtown Toronto area. This was an excellent source for data as the data is contributed by users. The Foursquare developer website offered the category id code to locate the restaurants in the vegan and vegetarian restaurant category. Upon viewing the list of restaurants it was clear that there were a few additional businesses within the list that were not solely vegan, such as an indian restaurant and a thai restaurant. Since it was users who labeled these restaurants as also being in the vegan or vegetarian restaurant group, these restaurants were left in the data, as they are most likely very vegan or vegetarian

friendly and frequented by vegans/vegetarians. The data was cleaned and appropriately labeled, while leaving in additional information about the restaurants for future data exploration and analysis.

The initial dataframe was cluttered with the foursquare business id and odd labels for the latitude and longitude columns.

	id	name	categories	referralId	hasPerk	location.address	location.lat	location.lng
0	59b30028ee71203bd8fbb85d	PLANTA Burger Financial District	['id': '4bf58dd8d48988d1d3941735', 'name': 'V...']	v-1613959040	False	4 Temperance St	43.650934	-79.379299
1	6029bada8ad6c91581dab994	Copper Branch	['id': '4bf58dd8d48988d1d3941735', 'name': 'V...']	v-1613959040	False	470 Front street east	43.653250	-79.355587
2	602730e77fbd223e5aebba07	Ultimate Kitchens Leslieville	['id': '4bf58dd8d48988d1d3941735', 'name': 'V...']	v-1613959040	False	461 Carlaw Ave	43.669162	-79.342223
3	4bb2669314cfd13ac3e214ab	Karly's To-bacon	['id': '4bf58dd8d48988d1d3941735', 'name': 'V...']	v-1613959040	False	NaN	43.684485	-79.316275
4	4f3e3146e4b0a4b0828c96ba	Live Food Bar	['id': '4bf58dd8d48988d1d3941735', 'name': 'V...']	v-1613959040	False	264 Dupont Street	43.645679	-79.376339

This was cleaned by renaming some columns and removing additional unneeded columns.

	name	categories	address	lat	lng
0	PLANTA Burger Financial District	Vegetarian / Vegan Restaurant	4 Temperance St	43.650934	-79.379299
1	Ultimate Kitchens Leslieville	Vegetarian / Vegan Restaurant	461 Carlaw Ave	43.669162	-79.342223
2	Copper Branch	Vegetarian / Vegan Restaurant	470 Front street east	43.653250	-79.355587
3	Little India Restaurant	Indian Restaurant	255 Queen St. W	43.650319	-79.388998
4	Karly's To-bacon	Vegetarian / Vegan Restaurant	NaN	43.684485	-79.316275

3. Methodology

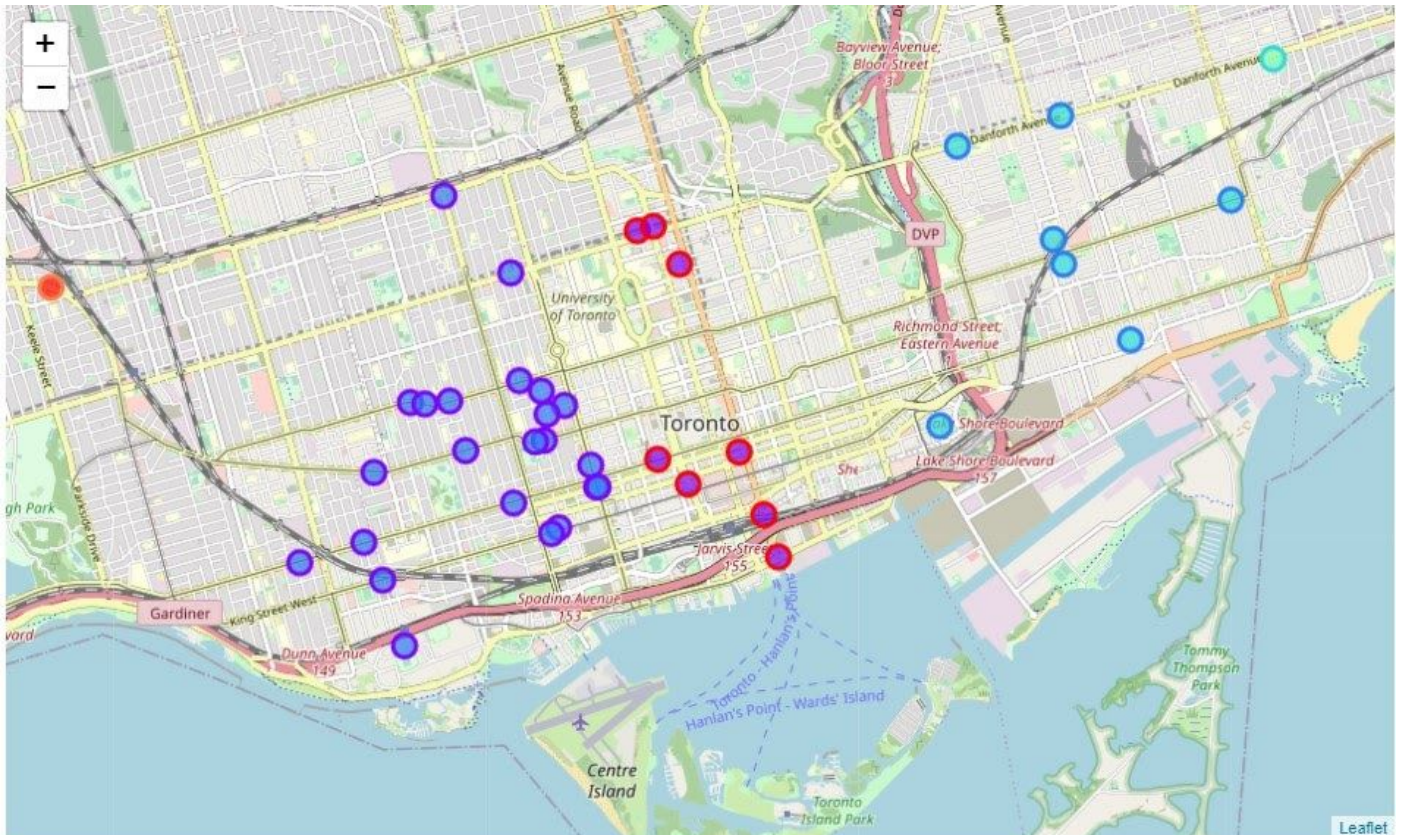
The Foursquare restaurant data included latitude and longitude coordinates for each restaurant. The coordinates were used to create a map of the downtown Toronto area with map markers for each vegan

or vegetarian restaurant. To make the map more visually appealing and to keep with the theme, the map markers were changed to green with leaf icons.

To locate a cluster of vegan and vegetarian restaurants within a small area, the machine learning algorithm k-Means was used to create clusters. Five clusters were created from the 46 restaurants.

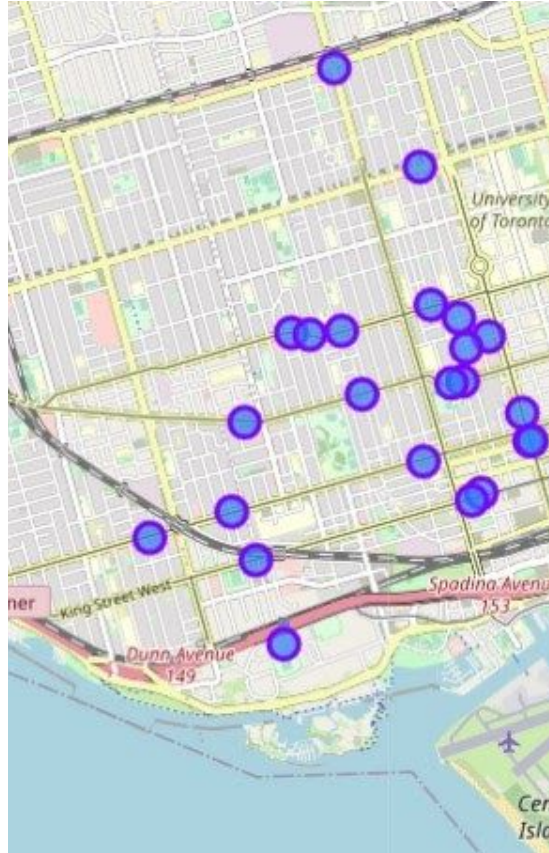
ClusterNum		name	categories	address	lat	Ing
0	1	PLANTA Burger Financial District	Vegetarian / Vegan Restaurant	4 Temperance St	43.650934	-79.379299
1	3	Ultimate Kitchens Leslieville	Vegetarian / Vegan Restaurant	461 Carlaw Ave	43.669162	-79.342223
2	3	Copper Branch	Vegetarian / Vegan Restaurant	470 Front street east	43.653250	-79.355587
3	1	Little India Restaurant	Indian Restaurant	255 Queen St. W	43.650319	-79.388998
4	4	Karly's To-bacon	Vegetarian / Vegan Restaurant	NaN	43.684485	-79.316275
5	1	Live Food Bar	Vegetarian / Vegan Restaurant	264 Dupont Street	43.645679	-79.376339

The clusters were then mapped once again on the Toronto map.



4. Results

Once the restaurants were clustered with k-Means, it was clear that the purple cluster on the map provided the greatest number of vegan and vegetarian restaurants in a small geographical area.



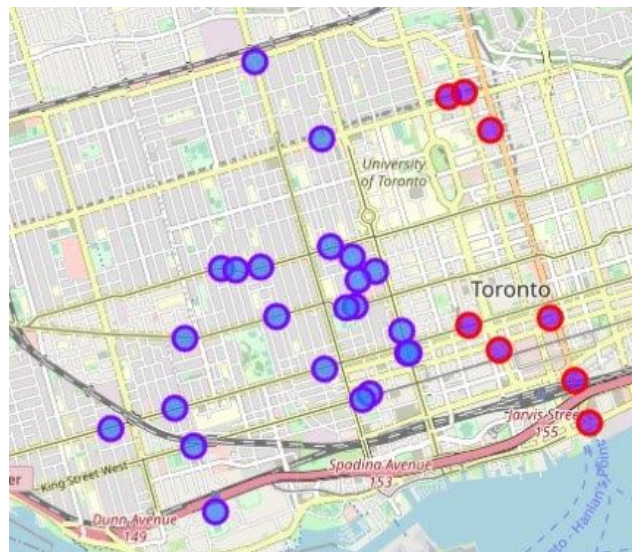
To further explore cluster 2, the information on the individual restaurants within this cluster was pulled and examined.

	ClusterNum	name	categories	address	lat	lng
6	2	Eat Nabati	Egyptian Restaurant	160 Baldwin	43.655014	-79.399830
7	2	Urban Herbivore	Vegetarian / Vegan Restaurant	64 Oxford St	43.656193	-79.402673
8	2	Bar Vegandale	Vegetarian / Vegan Restaurant	1265 Queen St W	43.641587	-79.431202
9	2	Hello 123	Vegetarian / Vegan Restaurant	1122 Queen St W	43.643264	-79.423516
10	2	Lov	Vegetarian / Vegan Restaurant	620 King St W	43.644483	-79.400677
15	2	Bloomers	Vegetarian / Vegan Restaurant	715 Queen St W	43.646690	-79.405918
16	2	La Bartola	Mexican Restaurant	588 College St	43.655380	-79.413546
19	2	Urban Herbivore	Vegetarian / Vegan Restaurant	NaN	43.666245	-79.406320
21	2	Bo De Duyen 菩提緣素食樓	Vegetarian / Vegan Restaurant	186 Spadina Ave.	43.649804	-79.396820
22	2	Cafe 668	Asian Restaurant	885 Dundas West	43.651102	-79.411654
26	2	Wild Child's Kitchen	Vegetarian / Vegan Restaurant	NaN	43.634419	-79.418879
27	2	Veghed	Vegetarian / Vegan Restaurant	1199 Dundas St West	43.649224	-79.422326
28	2	Annapurna Vegetarian Restaurant	Vegetarian / Vegan Restaurant	1085 Bathurst St.	43.672804	-79.414087
30	2	The Hogtown Vegan	Vegetarian / Vegan Restaurant	382 College St	43.657007	-79.405302
33	2	YamChops	Vegetarian / Vegan Restaurant	705 College St.	43.655194	-79.418099

5. Discussion

The selected cluster of vegan and vegetarian restaurants includes a diverse collection of restaurants that is expected to additionally increase the diversity of the foot traffic in the selected area.

While the selected cluster, cluster 2, indicated in purple on the map, contained the largest number of vegan and vegetarian restaurants, it also provided the benefit of proximity to cluster 1. While not the largest cluster generated, cluster 1, indicated with red circles on the map is directly adjacent to cluster 2 and could further serve to select cluster 2 as the location for the future vegan donut shop.



6. Conclusion

This analytics provided of the available Foursquare API data has answered the request of the stakeholders. The stakeholders, the owner of the prospective vegan donut shop, should look for a store location within cluster 2, benefiting from the existing foot traffic of vegan and vegetarian restaurant patrons while possibly also benefiting from proximity of the patrons of the restaurants in cluster 2.