

Capstone Project – Battle of the Neighborhoods

Introduction

Under current pandemic, people are staying at home and working at home, they cannot hang out with dear friends or dine in for any special occasions. It is a difficult time not only for them, but also for restaurants. Some of people have become superb chef that they could make various cuisines, treat themselves well at each meal and save money. Others are relying on delivery apps to get food delivery to their house to save them from cooking.

Business Problem

This project will analyze as a delivery food application company, between New York City, US and Toronto, Canada, which city should they start the business first to get more people use the application to order food from various restaurants across the city. This project will get insights on which neighborhood has more diverse restaurants, which means more options for their customers, and higher living standards and quality of life, which means these people are most likely going to have the same standard of food tasting as before and does not mind to pay extra delivery fees during this time. This project will explore the similarities and differences between certain neighborhoods in the two cities, and then determine which neighborhood could generate more values for the business.

Target Audience

Stakeholders from Delivery Love to You LLC.

Data

Data will be captured from Wikipedia pages for location dataset which consists of postal code, name, latitude, and longitude information, diversity of cuisines which shows the cuisine/ restaurant options in one neighborhood, population and density to show the potential number of customers for each neighborhood in New York City, US and Toronto, Canada.

Population and Density:

New York City, US: https://en.wikipedia.org/wiki/New_York_City

Toronto, Canada: https://en.wikipedia.org/wiki/Demographics_of_Toronto_neighbourhoods

Location:

New York City, US: https://en.wikipedia.org/wiki/Neighborhoods_in_New_York_City

Toronto, Canada: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

Diversity of cuisines:

New York City, US: https://en.wikipedia.org/wiki/Cuisine_of_New_York_City

Toronto, Canada: https://en.wikipedia.org/wiki/Cuisine_in_Toronto

This project will also use Foursquare API search feature to collect neighborhood venue data. Python packages and visualizations will also be used to better present the insights to stakeholders.

Methodology

Analytics Approach

New York City has a total of 5 boroughs and 306 neighborhoods, and Toronto has 10 boroughs and 103 neighborhoods. The first part of the project is to analyze the data, and find out the most feasible neighborhood in both cities to build network with restaurants and lunch the application. The second part of the project will compare two cities, and find the similarities and differences, and find the better to start the business.

Exploratory Data Analysis

Population and Density:

Toronto, Canada:

Borough	Total Area (km2)	Total Population	Density (Person / km2)
West Toronto	19	151,860	7,992.63
Downtown Toronto	23.8	162,505	6,827.94
York	13.8	88,340	6,401.45
Central Toronto	13.7	86,560	6,318.25
N/A	110.8	575,640	5,195.31
East Toronto	23.4	118,565	5,066.88
East York	18	80,335	4,463.06
North York	115	370,990	3,226.00
Scarborough	177.2	559,985	3,160.19
Etobicoke	118.59	306,725	2,586.43
City of Toronto	633.29	2,501,505	3,950.02

Even though we don't have data for any economy data for each neighborhood, but West Toronto has relatively larger population and relatively smaller land area, which means higher density. Downtown Toronto is in the second place.

New York City, US:

New York City's five boroughs							
Jurisdiction	Population	Gross Domestic Product		Land area		Density	
Borough	Estimate	billions	per capita (USD)	square (miles)	square(km)	persons / (sq.mi)	persons / (km2)
The Bronx	1,418,207	42.695	30,100	42.1	109.04	33,867	13,006

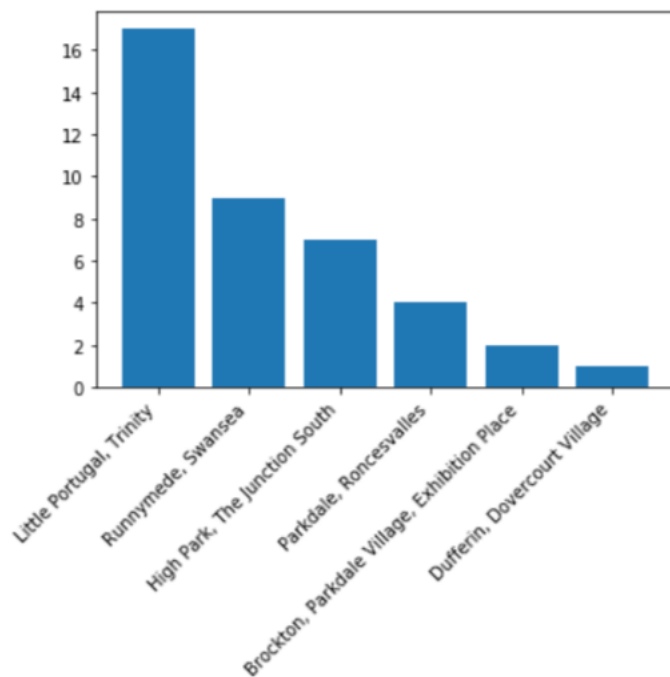
Brooklyn	2,559,903	91.559	35,800	70.82	183.42	36,147	13,957
Manhattan	1,628,706	600.244	368,500	22.83	59.13	71,341	27,544
Queens	2,253,858	93.31	41,400	108.53	281.09	20,767	8,018
Staten Island	476,143	14.514	30,500	58.37	151.18	8,157	3,150
City of New York	8,336,817	842.343	101,000	302.64	783.83	27,547	10,636

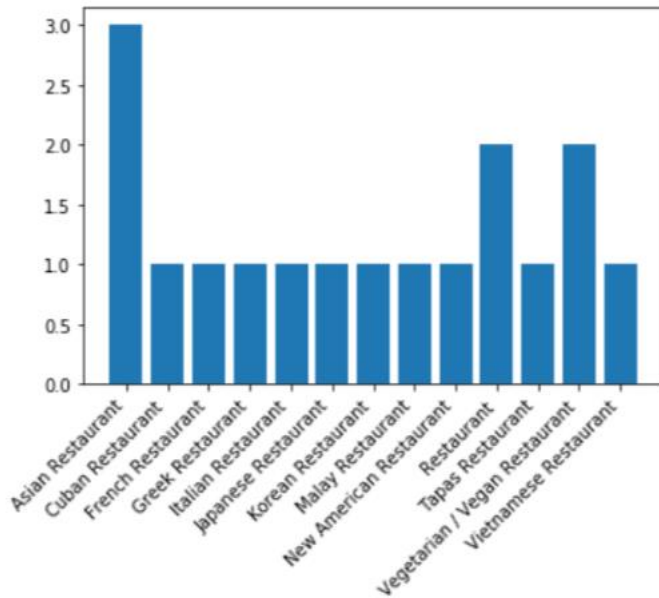
From this chart, Manhattan has the highest density, and much higher gross domestic product. Compare to the highest density borough in Toronto, West Toronto, except Staten Island, all other borough in New York City has higher density. This shows that New York City has much more population than Toronto, which mean much more opportunities for a newly launched companies to start business.

Location and Number of restaurants within one neighborhood:

Toronto, Canada:

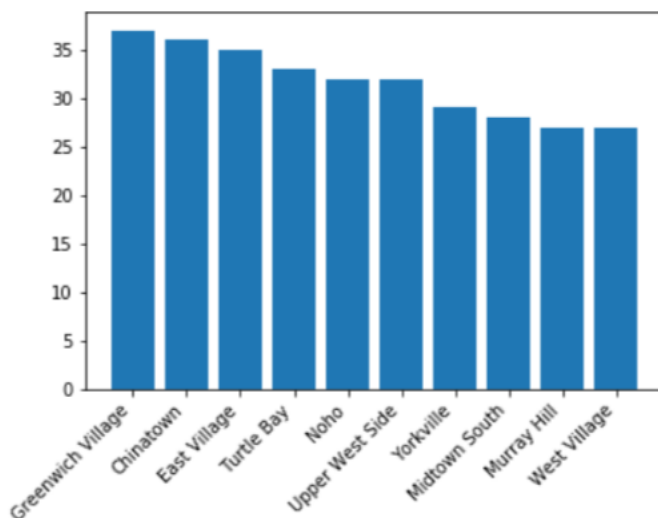
By selecting top 1000 venues within 500 radiuses of neighborhoods in West Toronto, Little Portugal, Trinity has 17 restaurants. Runnymede, Swansea has 9 restaurants, High Park, The Junction South has 7 restaurants, Parkdale, Roncesvalles has 4 restaurants and Brockton, Parkdale Village, Exhibition Place has 2 restaurants. We will then take a closer look at Little Portugal, Trinity, to see which type of cuisine the restaurants are providing. Out of 17 restaurants in Little Portugal, there are three Asian restaurants, two vegan restaurants and two restaurants that do not indicate cuisine in the category. This neighborhood is offering 12 different cuisine for citizens to choose.

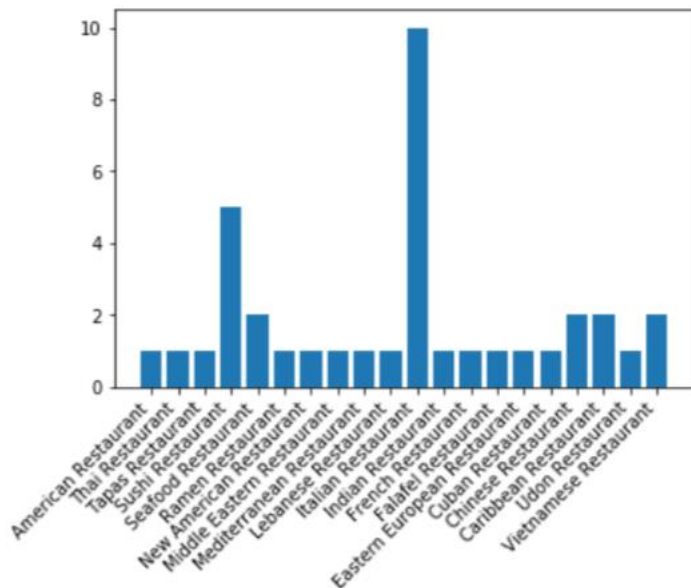




New York City, US:

By selecting top 1000 venues within 500 radiuses in Manhattan, there are 37 restaurants in Greenwich Village, 36 restaurants in Chinatown, 35 restaurants in East Village, 33 restaurants in Turtle Bay and 32 restaurants in Noho and Upper West Side. Unlike Little Portugal in Toronto, Greenwich Village has much more restaurants, and more cuisine choice compare to Little Portugal. Within that neighborhood, Italian cuisine is the most popular one, it has 10 restaurants. There are 5 Japanese / Sushi restaurants, 2 Seafood restaurants, 2 Caribbean restaurants, 2 Vietnamese restaurants, and 2 Chinese restaurants. It has 20 different cuisine restaurants for people to choose.





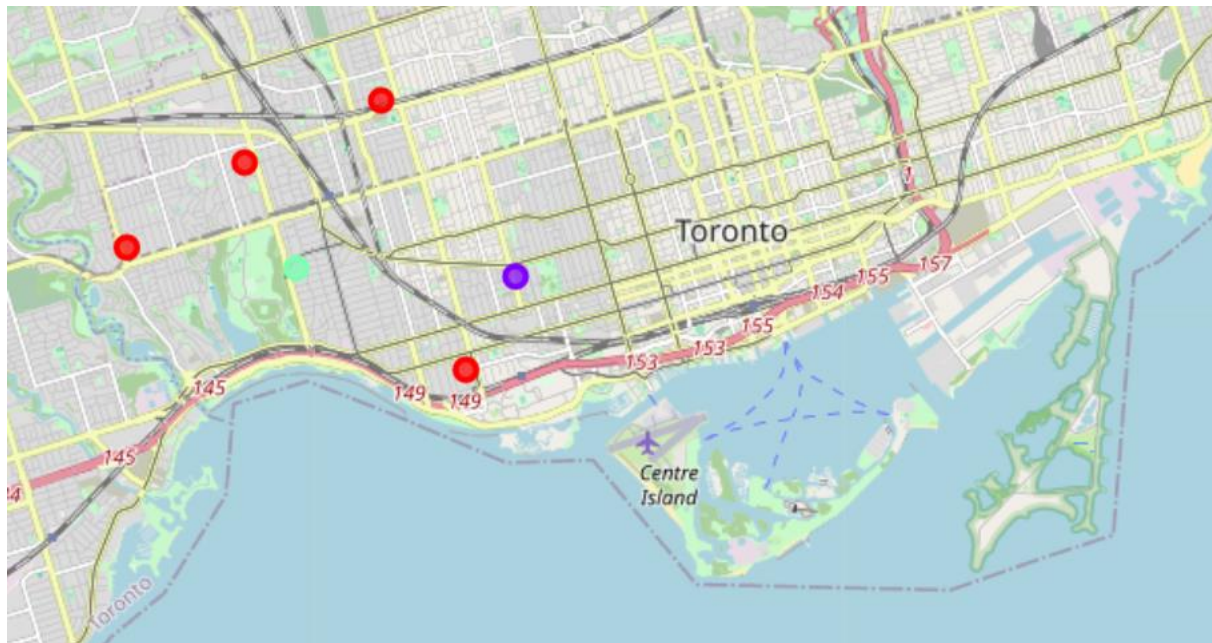
According to our analysis, if the company wants to launch their products in its highest population neighborhood, compare to Toronto, New York City has more diverse restaurants within one neighborhood, and it also has larger number of restaurants within 500 radiuses.

Result:

Toronto has 10 boroughs and 103 neighborhoods. It has 2,501,505 people in the city of Toronto. The borough that has the highest density is West Toronto. We are looking at density because we would like to establish in an area that has more people, this means we will have more opportunities to reach more people in same size of one area. When we take a closer look into this borough, we found out that it only contains 39 restaurants and 22 different cuisines within 6 neighborhoods.

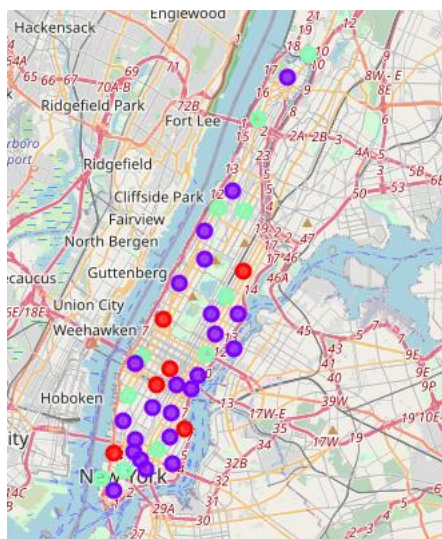
K-means was used to group the neighborhoods in West Toronto into 3 clusters. Cluster_0 has 4 neighborhoods and the most common venues are Bakery, Pharmacy, Café, restaurants, Yoga Studio and Supermarket. Cluster_1 has 1 neighborhood, and the most common venues are Bar, restaurants, and Man's Store. Cluster_2 has 1 neighborhood, and the most common venues are Gift shop, restaurants, bookstore and movie theater.

Seems like Cluster_0 is the residential area, and cluster_1 and cluster_2 is more like a business center.



On the other side, New York City has 5 boroughs and 306 neighborhoods. It has 8,336,817 people in New York City. The borough that has the highest density is Manhattan. We take a closer look into Manhattan, we found out that it has 831 restaurants and 76 different cuisines within 39 neighborhoods.

K-means was used to group the neighborhoods in Manhattan into 3 clusters. Cluster_0 has 6 neighborhoods and the most common venues are Restaurants, plaza, hotel, park, and theater. Cluster_1 has 23 neighborhoods, and the most common venues are different types of restaurants, Park, Bar, Hotel, SPA, and Gym. Cluster_2 has 11 neighborhoods, and the most common venues are Coffee shop, Park, Theater, different types of restaurants and bars.



Discussion:

At beginning, West Toronto was chosen because it has higher density compare to other Toronto boroughs, but when we take a look at the clusters, most of its neighborhoods might be residential neighborhoods, so overall, it does not contain various cuisine and many restaurants choices.

Different from West Toronto, Manhattan is a business and residential mixed borough, it contains high density, but at the same time, it has a lot of different cuisines and many restaurants to choose. By looking at the most common venues in those neighborhoods, you could find out there are not only restaurants but also venues that is for a life style, such as gyms and spa.

Conclusion:

In conclusion, based on the quantity of venues and variety of cuisines, I would recommend to choose Manhattans over West Toronto as a choice for new delivering application to set build up restaurants' relationships, and release the beta version in the neighborhood to attach potential customers.

Manhattans offers way more choice in restaurants and has way more population as potential customers. Even though we know it is a highly competitive location, but it also provides more opportunities.