Capstone Project Report
The Battle of Neighborhoods – Week 1

1. Introduction

In this work we use data science techniques and data fetched from Foursquare to study a specific business problem. The project was performed in the context of the Capstone Project - The Battle of Neighborhoods of IBM Data Science series.

1.1. Business problem and background

GONE is a successful grab-and-go restaurant that is established in Regent Park, Toronto. Recently, an opportunity to establish a franchise in Manhattan, New York appeared through their network of friends and USA collaborators. Knowing that neighborhood dynamics are one of the most important success factors of its venue in Canada, they are looking to understand the dynamics of the neighborhoods of New York to help making the decision.

2. Data Description

For our research we will use the neighborhoods location data provided in the course and fetch additional data regarding venues from Foursquare API. For each neighborhood we collected the data of 100 venues within a radius of 500 meters from the given location. In principle, this data and in particular each venue category will be able to characterize each neighborhood in terms of lifestyle and dynamics.

2.1. Data for Toronto

Regarding the data for Toronto we scrap the wikipedia for data of postal codes in the zone of Toronto and restrict to the Boroughs containing "Toronto", resulting in a dataset containing 39 neighborhoods. We then use the location data provided in the course materials to associate latitude and longitude coordinates. Through this location data we use Foursquare venues search API to collect the data for 100 venues within a radius of 500 meters of the given location of a neighborhood, resulting in a total of 1619 venues falling in 235 unique categories. Our final dataset is a frequency table of each unique venue category for each one of the 39 neighborhoods.
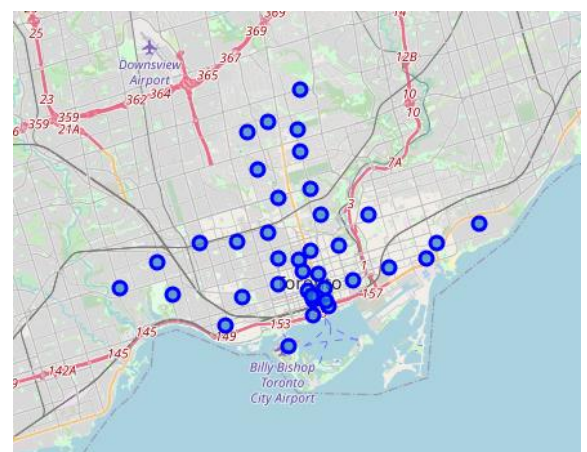

Figure 1 Map of the neighborhoods of Toronto.

Table 1 First five lines of a table containing the neighborhoods and the top10 most common venues in each of them.

	Neighborhood	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	Berczy Park	Coffee Shop	Cocktail Bar	Beer Bar	Farmers Market	Pharmacy	Cheese Shop	Bakery	Restaurant	Seafood Restaurant	Butcher
1	Brockton, Parkdale Village, Exhibition Place	Café	Coffee Shop	Breakfast Spot	Grocery Store	Bakery	Bar	Italian Restaurant	Restaurant	Climbing Gym	Burrito Place
2	Business reply mail Processing Centre, South C...	Light Rail Station	Yoga Studio	Auto Workshop	Gym / Fitness Center	Garden Center	Garden	Fast Food Restaurant	Farmers Market	Comic Shop	Pizza Place
3	CN Tower, King and Spadina, Railway Lands, Har...	Airport Service	Airport Terminal	Airport Lounge	Harbor / Marina	Sculpture Garden	Plane	Rental Car Location	Boat or Ferry	Bar	Airport Gate
4	Central Bay Street	Coffee Shop	Italian Restaurant	Sandwich Place	Café	Burger Joint	Salad Place	Bubble Tea Shop	Thai Restaurant	Ramen Restaurant	Portuguese Restaurant

2.2. Data for Manhattan

Regarding the data for Manhattan we used the New York data from the course materials and restrict to the Boroughs containing "Manhattan", resulting in a dataset containing 40 neighborhoods. We then use the location data fetched from geopy to associate latitude and longitude coordinates. Through this location data we use Foursquare venues search API to collect the data for 100 venues within a radius of 500 meters of the given location of a neighborhood, resulting in a total of 3217 venues falling in 331 unique categories. Our final dataset is a frequency table of each unique venue category for each one of the 40 neighborhoods.
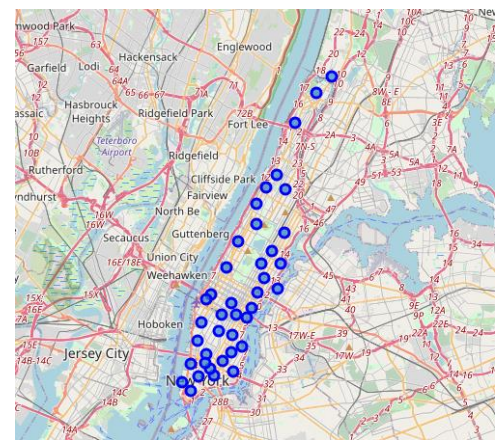

Figure 2 Map of the neighborhoods in Manhattan.

Table 2 First five lines of a table containing the neighborhoods and the top10 most common venues in each of them.

	Neighborhood	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	Battery Park City	Coffee Shop	Hotel	Park	Clothing Store	Memorial Site	Gym	Shopping Mall	Plaza	Playground	Food Court
1	Carnegie Hill	Coffee Shop	Pizza Place	Café	Yoga Studio	Gym / Fitness Center	Bookstore	Gym	Bar	Wine Shop	Grocery Store
2	Central Harlem	French Restaurant	Chinese Restaurant	Gym / Fitness Center	Public Art	Bar	Seafood Restaurant	American Restaurant	African Restaurant	Cafeteria	Grocery Store
3	Chelsea	Coffee Shop	Bakery	Art Gallery	Ice Cream Shop	French Restaurant	Café	Italian Restaurant	Wine Shop	American Restaurant	Cycle Studio
4	Chinatown	Chinese Restaurant	Bakery	Cocktail Bar	American Restaurant	Spa	Optical Shop	Vietnamese Restaurant	Shanghai Restaurant	Supermarket	Salon / Barbershop