

IBM APPLIED DATA SCIENCE CAPSTONE

Relocating to a Neighbourhood in Toronto

Introduction

Relocating to Toronto

- Toronto is the most populous city, the financial, Educational and technological hub of Canada
- Both my Friend and I are relocating to Toronto later this year, and will be staying in Toronto for 2 years
- We both really love Japanese food so I would like to stay in a neighbourhood which has some Japanese restaurants, among other things
- We have also heard that Toronto has very high real estate rental price, but I do not want to spend much money on rental

Business Problem Description

- We want to choose a place which has lower rentals, as I am in Toronto for 2 years only
- As we savour Japanese food, we want to be in a neighbourhood with some Japanese restaurants

Problem description	Solution
➤ Choosing neighbourhood with low average real estate rental (Our budget is about \$1500)	➤ Identify neighbourhood where average real estate rental is low (around \$1500)
➤ Choose neighbourhood with some Japanese restaurants	➤ Identify neighbourhood with Japanese's restaurant as a common venue

Target Audience

Target Audience

- Anybody planning to relocate to Toronto for a short duration, do not want to miss tasty Japanese food and want to save cost on rental expenses
- This analysis can be generalised for anybody/ any family planning to relocate to Toronto and wants good variety of restaurants around them

Data Sources

Data Sets Extracted	Data Sources
➤ List of borough and neighbourhoods in Toronto scraped along with postal codes (web scraped)	➤ Wikipedia page titled 'List of Postal Codes of Canada: M'
➤ List of venues such as cafes, restaurants for each neighbourhoods obtained (through explore API)	➤ Foursquare.com
➤ Average monthly real estate rental in Toronto neighbourhoods (in \$) based on postal codes (precleaned .csv file)	➤ Kaggle dataset

Data Pre-processing

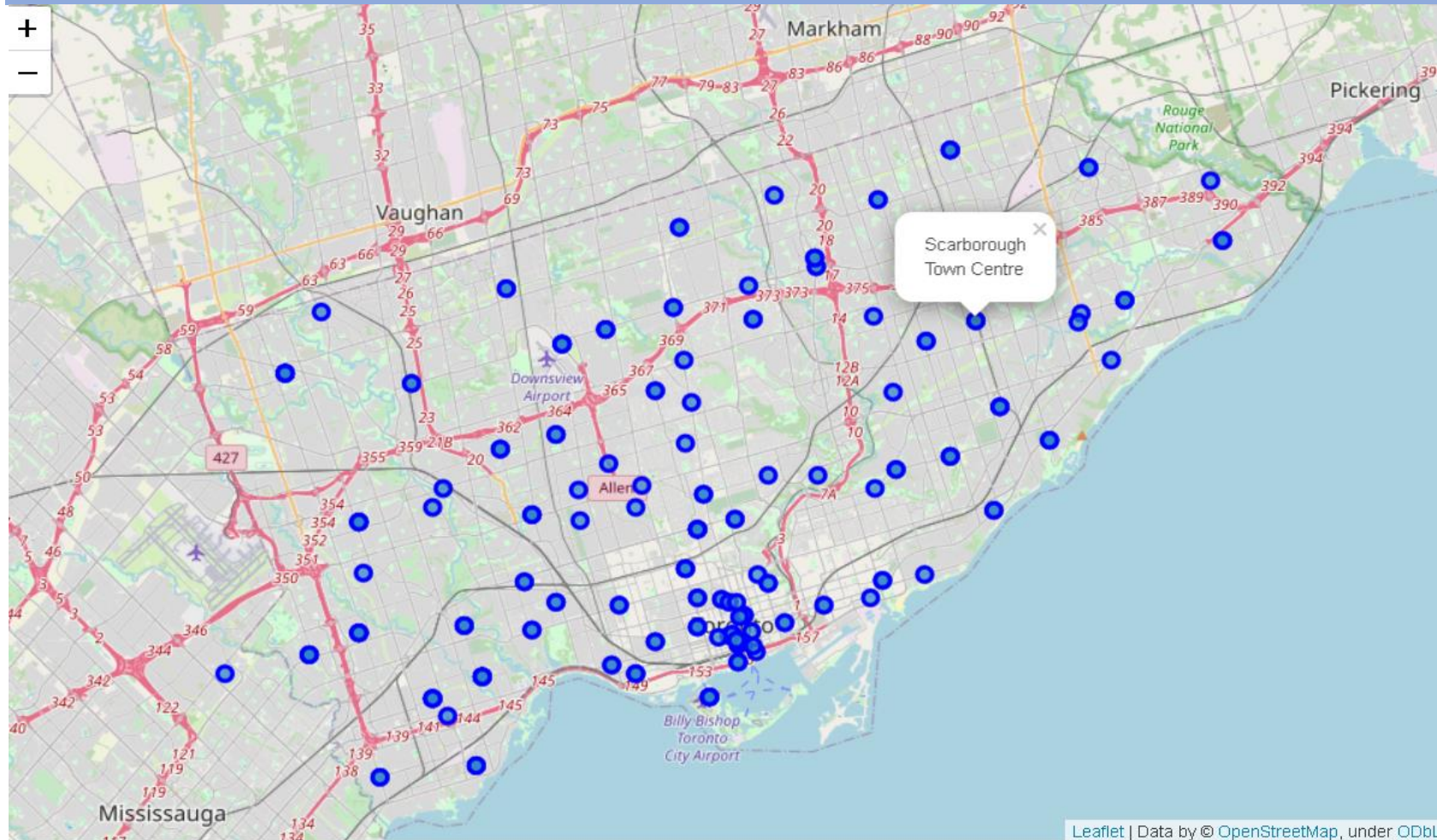
Data Set	Pre-processing & Data Exploration Steps
<ul style="list-style-type: none">➤ List of borough and neighbourhoods in Toronto scraped along with postal codes (web scraped)➤ List of venues such as cafes, restaurants for each neighbourhoods obtained (through explore API)➤ Average real estate rental in Toronto neighbourhoods based on postal codes (precleaned .csv file)	<ul style="list-style-type: none">➤ Dropping unassigned postal codes➤ Split the neighbourhoods which were grouped together for particular postal code into separate rows➤ Extract venues, venue category➤ Encoding venues for ease for further analysis➤ Dropping unnecessary columns➤ Finding mean rental based on postal codes

Exploratory Analysis

Exploratory Analysis	Outcome
➤ Geolocate all Toronto neighborhoods using Geopy	➤ Geolocated 209 Neighbourhood of Toronto (see slide 8 for neighbourhood map of Toronto)
➤ Append list of venues and venue category to each geolocated neighborhood	➤ 5184 venues and venue categories identified across each neighbourhood
➤ Encode the data for further analysis	(see slide 11 for venue category results)
➤ Explore the venue categories	➤ Number and spread of Japanese restaurants across Toronto
➤ Identify 5 most common venue category for each neighborhood	➤ List of all 209 neighborhoods top 5 venue categories (see slide 12 for snapshot of top 5 venues)
➤ Compute average rental for each neighborhood	➤ Average rental for each neighborhood (see slide 9 for data exploration results)

Exploratory Analysis Results

Identified Geo-located Neighborhoods

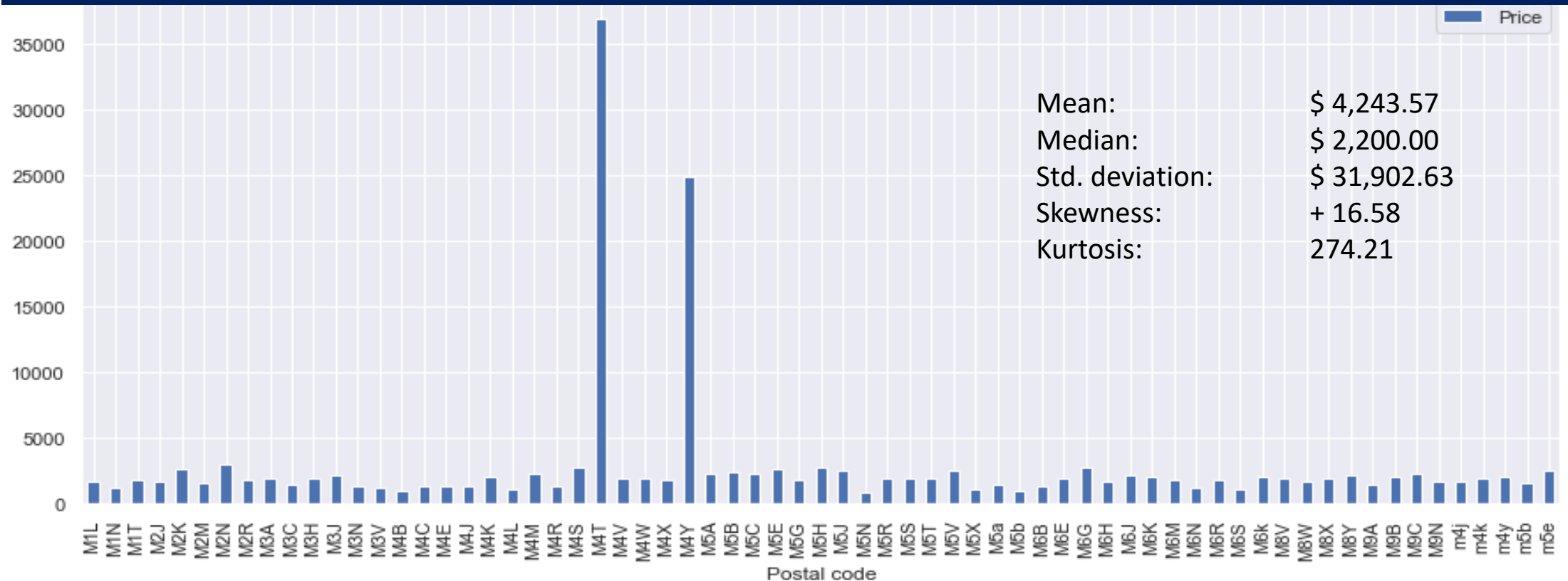


209 neighbourhoods across Toronto, geolocated based in locational coordinates (latitude and longitude)

Exploratory Analysis Results

Average Real Estate Rental (postal code wise)

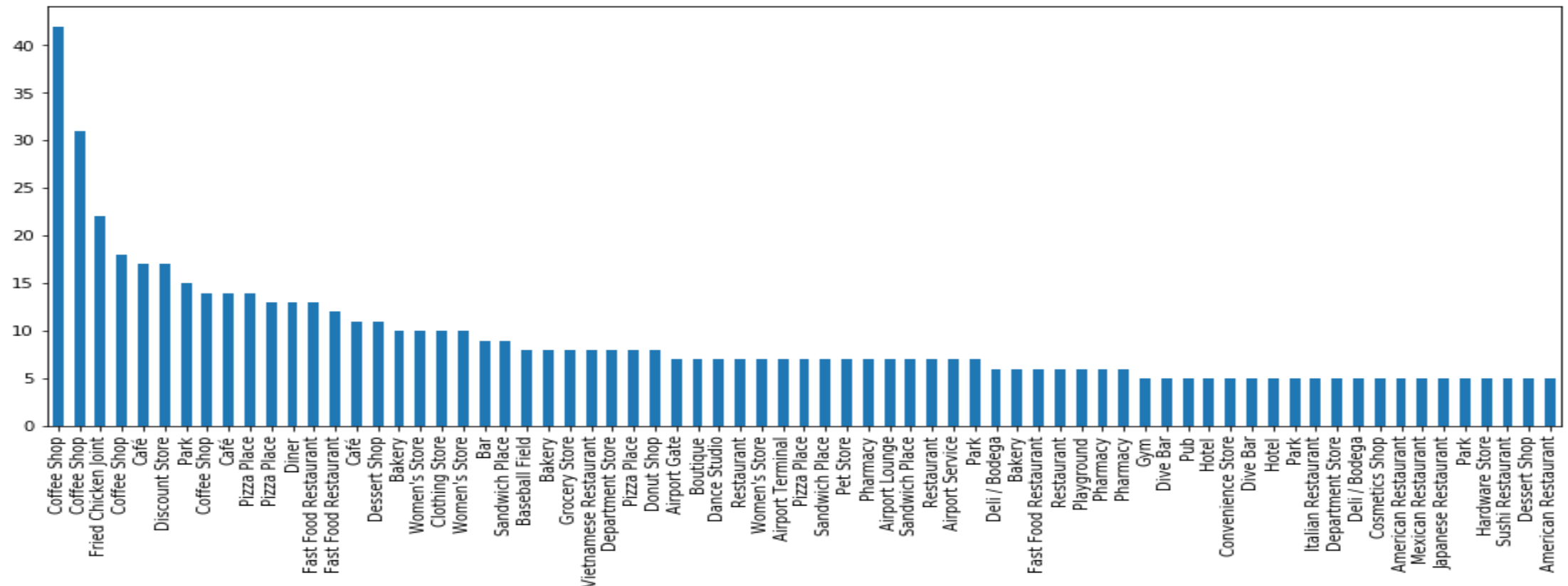
Certain neighbourhoods have very high real estate rentals and is increasing the mean rental



Exploratory Analysis Results

Frequency/ number of Venue Categories across the Neighborhoods

Japanese Restaurants are not very common among venue categories



Exploratory Analysis Results

5 most Common Venues for each Neighborhood – a snapshot

Postal code	Borough	Neighborhood	Latitude	Longitude	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	Avg. Rental (\$)
M3A	North York	Parkwoods	43.758800	-79.320197	Coffee Shop	Chinese Restaurant	Bank	Discount Store	Gas Station	2000.00
M5A	Downtown Toronto	Regent Park	43.654260	-79.360636	Coffee Shop	Park	Pub	Bakery	Theater	2364.66
M5A		Harbourfront	43.654260	-79.360636	Coffee Shop	Park	Pub	Bakery	Theater	2364.66
M9A	Etobicoke	Islington Avenue	43.622575	-79.514215	Restaurant	Coffee Shop	BBQ Joint	Movie Theater	Bar	1475.00
M4B	East York	Parkview Hill	43.706397	-79.309937	Pizza Place	Athletics & Sports	Fast Food Restaurant	Pharmacy	Gym / Fitness Center	1000.00

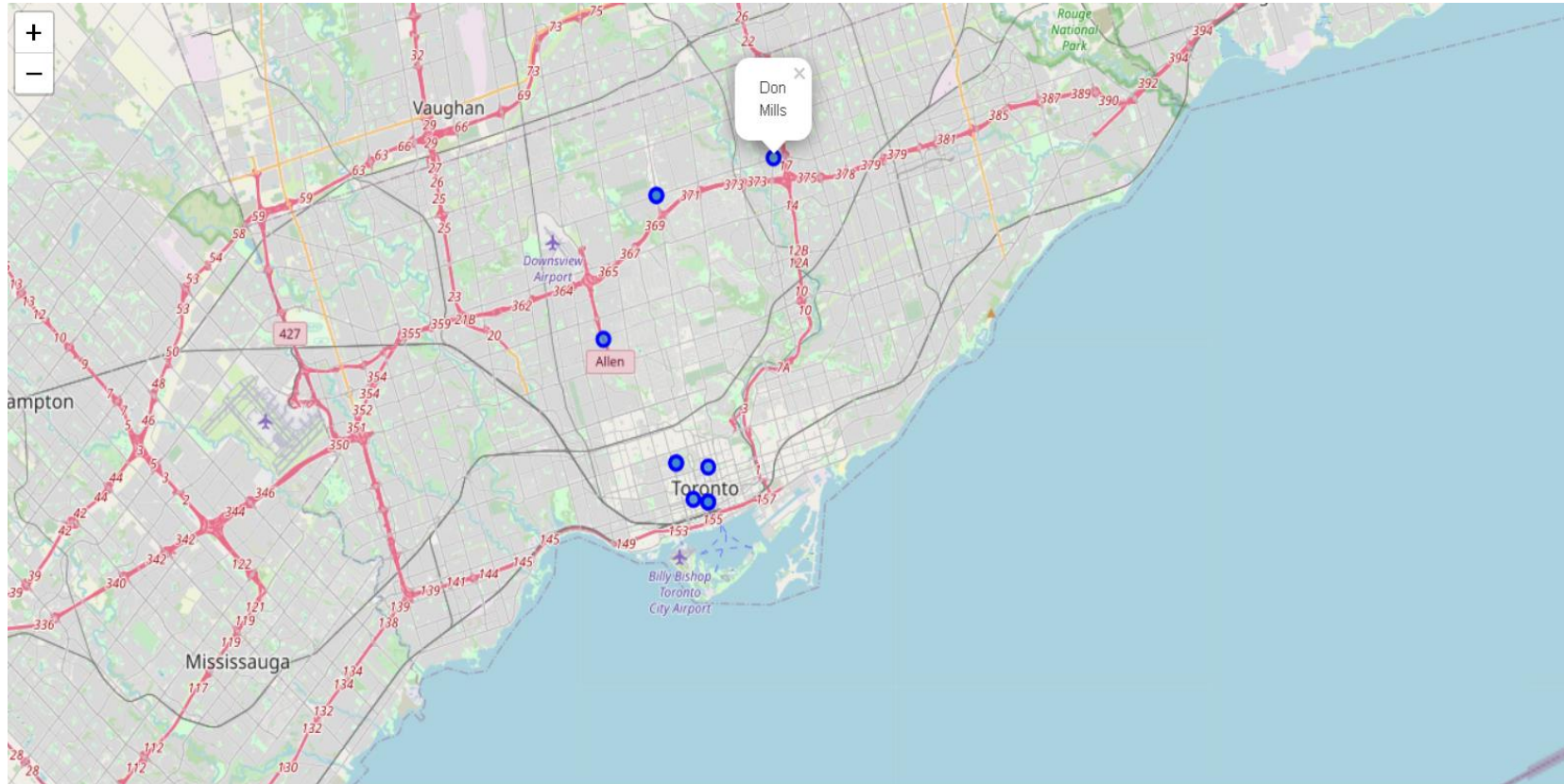
Final Results

Results – List of neighborhoods where Japanese Restaurant as common venue

Postal code	Borough	Neighborhood	Latitude	Longitude	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	Price
M5X	Downtown Toronto	First Canadian Place	43.648429	-79.382280	Coffee Shop	Café	Hotel	Japanese Restaurant	Restaurant	1100.00
M5X	Downtown Toronto	Underground city	43.648429	-79.382280	Coffee Shop	Café	Hotel	Japanese Restaurant	Restaurant	1100.00
M6B	North York	Glencairn	43.708712	-79.440685	Japanese Restaurant	Pub	Tennis Court	Playground	Grocery Store	1300.00
M3C	North York	Don Mills	43.775347	-79.345944	Clothing Store	Coffee Shop	Japanese Restaurant	Fast Food Restaurant	Tea Room	1516.66
M2J	North York	Fairview	43.778517	-79.346556	Clothing Store	Coffee Shop	Fast Food Restaurant	Japanese Restaurant	Cosmetics Shop	1763.50
M2J	North York	Henry Farm	43.778517	-79.346556	Clothing Store	Coffee Shop	Fast Food Restaurant	Japanese Restaurant	Cosmetics Shop	1763.50
M2J	North York	Oriole	43.778517	-79.346556	Clothing Store	Coffee Shop	Fast Food Restaurant	Japanese Restaurant	Cosmetics Shop	1763.50
M5G	Downtown Toronto	Central Bay Street	43.661425	-79.386067	Coffee Shop	Sandwich Place	Gastropub	Sushi Restaurant	Japanese Restaurant	1813.46
M2R	North York	Willowdale	43.761510	-79.410923	Coffee Shop	Japanese Restaurant	Grocery Store	Pharmacy	Fried Chicken Joint	1867.00
M2N	North York	Willowdale	43.761510	-79.410923	Coffee Shop	Japanese Restaurant	Grocery Store	Pharmacy	Fried Chicken Joint	3000.00
M4Y	Downtown Toronto	Church and Wellesley	43.661195	-79.382114	Coffee Shop	Japanese Restaurant	Diner	Burger Joint	Sandwich Place	24853.16

Final Results

Results – Map of neighborhoods with Japanese Restaurants as common venue



Don Mills
neighborhood in
North York borough
fits both the criteria:

- Japanese
Restaurants as
top 3 most
common venue
- Average rental
price of \$
1516.66

Final Results

Steps and Final Results Summary

Data Analysis Steps	Results
<ul style="list-style-type: none">➤ List of neighborhoods which contains Japanese restaurant	<ul style="list-style-type: none">➤ 11 Neighbourhood of Toronto where Japanese Restaurants featured in top 5 venue category*
<ul style="list-style-type: none">➤ Sort each neighborhood based on average rental price	<ul style="list-style-type: none">➤ Don Mills neighborhood in North York borough fits both the criteria<ul style="list-style-type: none">➤ Japanese Restaurants as top 3 most common venue➤ Average rental price of \$ 1516.66

So, Don Mills is the ideal location to relocate.

Thank You