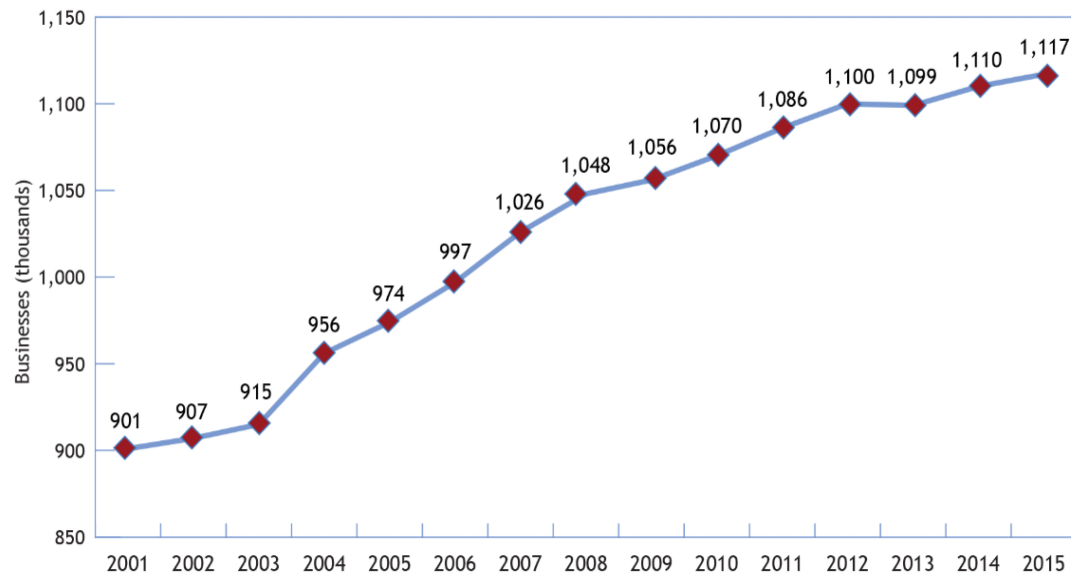# Battle of The Neighborhoods

Background

The number of businesses in Canada is growing every year. As you can see in the chart below, Canada has consistently had a steady increase in number of businesses. With every new business, business owners need to setup a shop or headquarters. And based on the data shown below, this need will only continue to grow. The given project can help such business owners setup their new shops/businesses in the most strategic and beneficial locations.

Figure 1: Number of businesses with at least one employee, Canada, 2001–2015

Source: Statistics Canada, Canadian Centre for Data Development and Economic Research (CDER), National Accounts Longitudinal Microdata File.

Problem Statement

- This project is to give us a glimpse into some of the major neighborhoods of one of the biggest cities in Canada, namely Toronto. The goal of this project is to help someone who wants to open a shop/business in Toronto determine a suitable location to open there business. By leveraging data science and the Foursquare API they can be provided with details about existing and competing businesses and position their new shop/business accordingly.

Business Requirements

▶ Determining the top most popular venues in a given neighbourhood

▶ Categorizing and providing data on particular venues such as Restaurants, Parks etc.

▶ Producing the locations (latitude and longitude), names, ratings, categories, addresses etc. of the produced venues as required

▶ Producing information specific to the category of shop/business that the stakeholder is trying to create

▶ and more

Example Scenario

- For example lets say an aspiring Restaurant owner would like to open a restaurant somewhere in Toronto. This project should help him by providing data regarding similar restaurants in each neighbourhood, their locations (latitude and longitude), and additional details about the restaurant that can be produced by the Foursquare API such as rating, menus, reviews etc.

Stakeholders

- So for this project the stakeholders are business owners looking for locations for their new business/shop. The information generated and produced by this project could also be of interest to various industries.

Data Acquisition

We will be gathering data using data provided by Wikipedia on the city of Toronto stored in csv format as well as leveraging the data provided by Foursquare API. Some of the parameters of data we will be using includes the following

▶ latitude and longitude coordinates of neighbourhoods and venues

▶ top venues in each neighbourhood

▶ category of each venue (Restaurant, Park, Museum etc.)

▶ Venue names

▶ Neighbourhood names

▶ Venue details etc.

Methodology

▶ Adding postal code as a parameter/variable to the data frame

▶ Checking whether the data set is correct by displaying records where postal code is 'M5G' and where postal code is 'M9V'

Out[18]:

	Postal Code	Borough	Neighborhood	Latitude	Longitude
57	M5G	Downtown Toronto	Central Bay Street	43.657952	-79.387383

Out[19]:

	Postal Code	Borough	Neighborhood	Latitude	Longitude
101	M9V	Etobicoke	Albion Gardens, Beaumond Heights, Humbergate, ...	43.739416	-79.588437

Methodology

▶ We then map the neighborhoods in Toronto on a map.
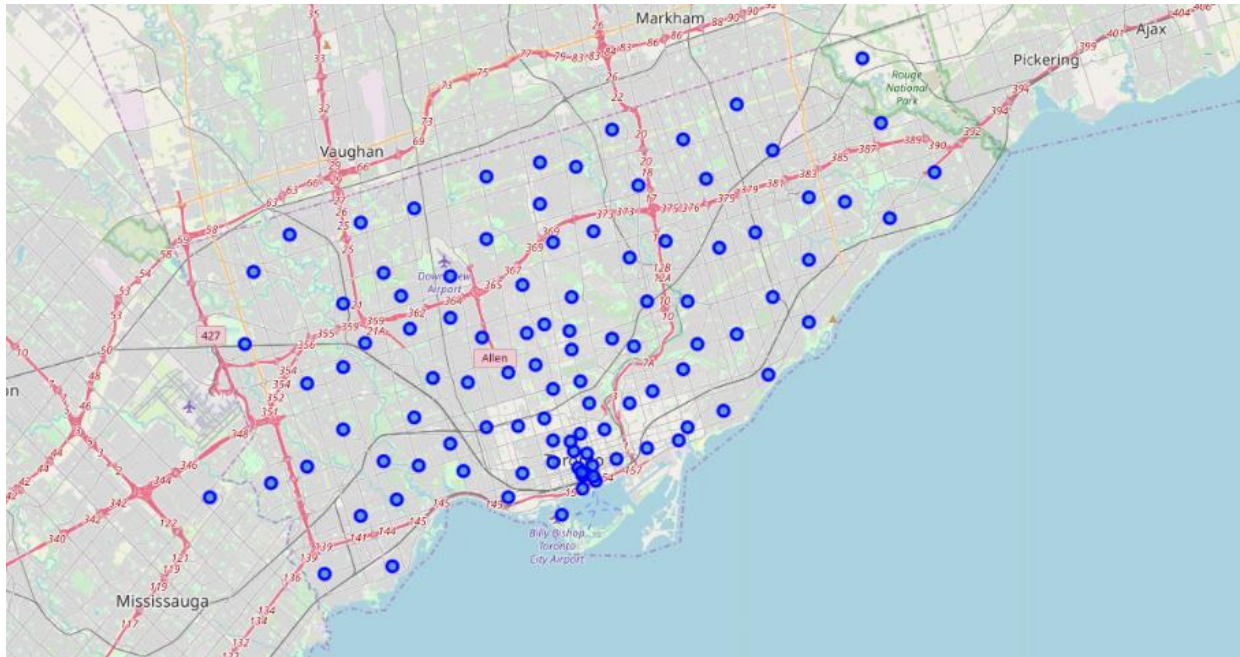
Methodology

▶ Create app on Foursquare developers tools

▶ Leverage data from Foursquare API by making calls with appropriate urls, Client ID and Client secret

▶ Display venue data near a given neighbourhood leveraged from Foursquare including Venue name, Venue locality, Venue distance from neighbourhood, Venue address, Venue category etc.

Methodology

Out[28]:

	name	categories	lat	lng
0	Subway	Sandwich Place	43.742421	-79.589471
1	Shoppers Drug Mart	Pharmacy	43.741685	-79.584487
2	Popeyes Louisiana Kitchen	Fried Chicken Joint	43.741202	-79.584545
3	Sheriff's No Frills	Grocery Store	43.741696	-79.584379
4	The Beer Store	Beer Store	43.741694	-79.584373

In [31]: df2

Out[31]:

Postal Code	Borough	Neighborhood	Latitude	Longitude
M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353
M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497
M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
M1G	Scarborough	Woburn	43.770992	-79.216917
M1H	Scarborough	Cedarbrae	43.773136	-79.239476
M1J	Scarborough	Scarborough Village	43.744734	-79.239476
M1K	Scarborough	East Birchmount Park, Ionview, Kennedy Park	43.727929	-79.262029
M1L	Scarborough	Clairlea, Golden Mile, Oakridge	43.711112	-79.284577
M1M	Scarborough	Cliffcrest, Cliffside, Scarborough Village West	43.716316	-79.239476
M1N	Scarborough	Birch Cliff, Cliffside West	43.692657	-79.264848
M1P	Scarborough	Dorset Park, Scarborough Town Centre, Wexford ...	43.757410	-79.273304
M1R	Scarborough	Maryvale, Wexford	43.750072	-79.295849
M1S	Scarborough	Agincourt	43.794200	-79.262029
M1T	Scarborough	Clarks Corners, Sullivan, Tam O'Shanter	43.781638	-79.304302
M1V	Scarborough	Agincourt North, L'Amoreaux East, Milliken, St...	43.815252	-79.284577
M1W	Scarborough	L'Amoreaux West	43.799525	-79.318389
M1X	Scarborough	Upper Rouge	43.836125	-79.205636

```
(2222, 7)
```

Out[33]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Scarborough	43.806686	-79.194353	Wendy's	43.807448	-79.199056	Fast Food Restaurant
1	Scarborough	43.784535	-79.160497	Royal Canadian Legion	43.782533	-79.163085	Bar
2	Scarborough	43.763573	-79.188711	Swiss Chalet Rotisserie & Grill	43.767697	-79.189914	Pizza Place
3	Scarborough	43.763573	-79.188711	G & G Electronics	43.765309	-79.191537	Electronics Store
4	Scarborough	43.763573	-79.188711	Big Bite Burrito	43.766299	-79.190720	Mexican Restaurant

In [34]:
```python
venues.groupby('Venue Category').count()
```

Out[34]:

Venue Category	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude
Accessories Store	1	1	1	1	1	1
Afghan Restaurant	1	1	1	1	1	1
Airport	2	2	2	2	2	2
Airport Food Court	1	1	1	1	1	1
Airport Gate	1	1	1	1	1	1
Airport Lounge	2	2	2	2	2	2
Airport Service	1	1	1	1	1	1
Airport Terminal	2	2	2	2	2	2
American Restaurant	25	25	25	25	25	25
Antique Shop	2	2	2	2	2	2
Aquarium	5	5	5	5	5	5
Art Gallery	12	12	12	12	12	12
Arts & Crafts Store	5	5	5	5	5	5
Asian Restaurant	17	17	17	17	17	17
Athletics & Sports	5	5	5	5	5	5
Auto Garage	1	1	1	1	1	1
Auto Workshop	1	1	1	1	1	1
BBQ Joint	5	5	5	5	5	5

Observation

- We were able to make significant observations such as the surplus of restaurants and cafes in neighborhoods like Scarborough and West Toronto. We also note that neighborhoods like Central Toronto, Downtown Toronto, East York and North York have stiff competition for coffee shops. Whereas neighbourhoods like Etobicoke and York are good neighborhoods to open a coffee shops.

Conclusion and Future Scope

▶ We have successfully provided all the data required by business owners to allow them to open their new businesses in the most strategic and beneficial areas. We have met all our business requirements. We have provided our stakeholders with the data required in a filtered, structured and easy to understand format.

▶ The future scope of this project includes making it available to business holders so that they can make use of the information it produces. This project has successfully leveraged the modern technologies of data science while making use of one of the worlds leading location data providers (Foursquare) to solve the given problem.