

BUSINESS TRIP DOWNTOWN TORONTO



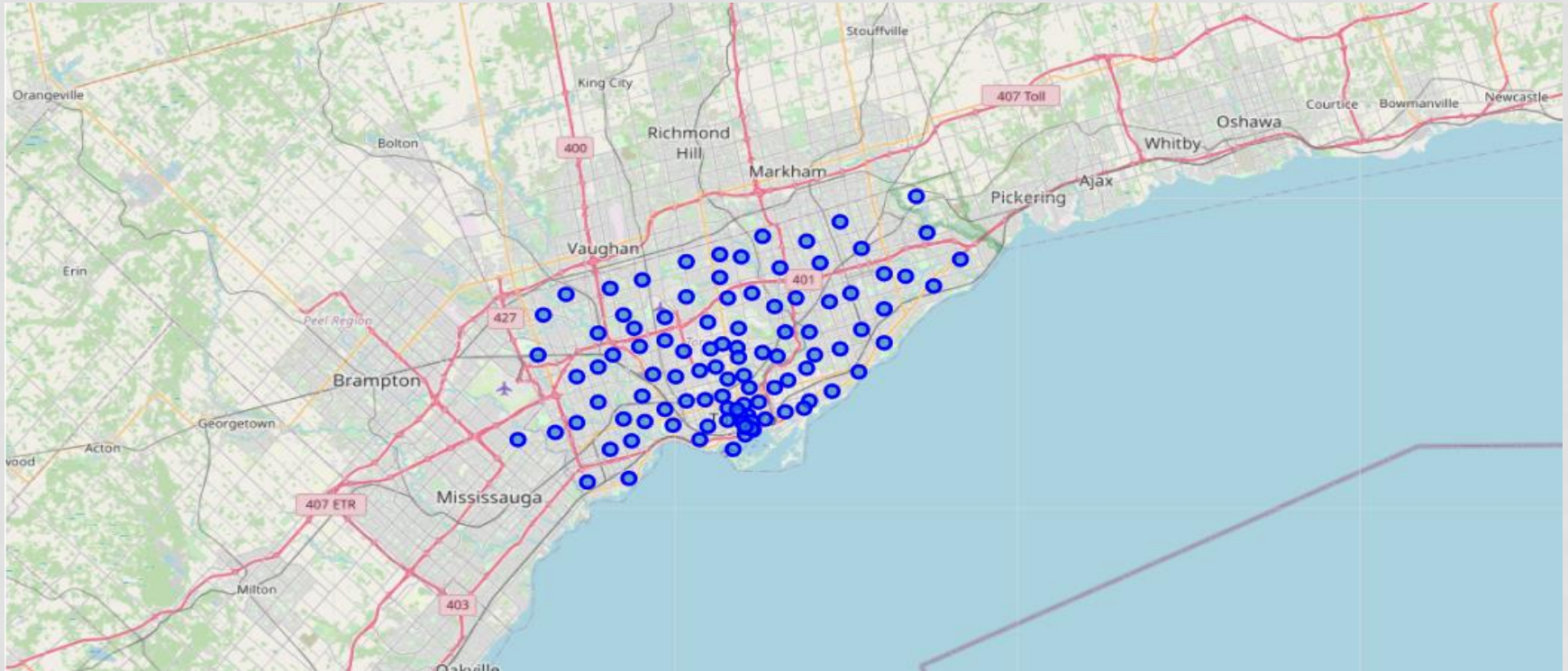
A PROFITABLE JOURNEY MAKES BUSINESS SENSE

- To travel wisely is to embark on the informative and factual road
- A good business journey is to plan ahead
 - **To minimise the following:**
- MONEY MISMANAGEMENT
- TRAVEL TIME MISMANAGEMENT
- DEVIATION OF BUSSINES PERSPECTIVES
- BAD RAPPORT WITH STAKEHOLDERS

DATA REQUISITES AND CLEANING

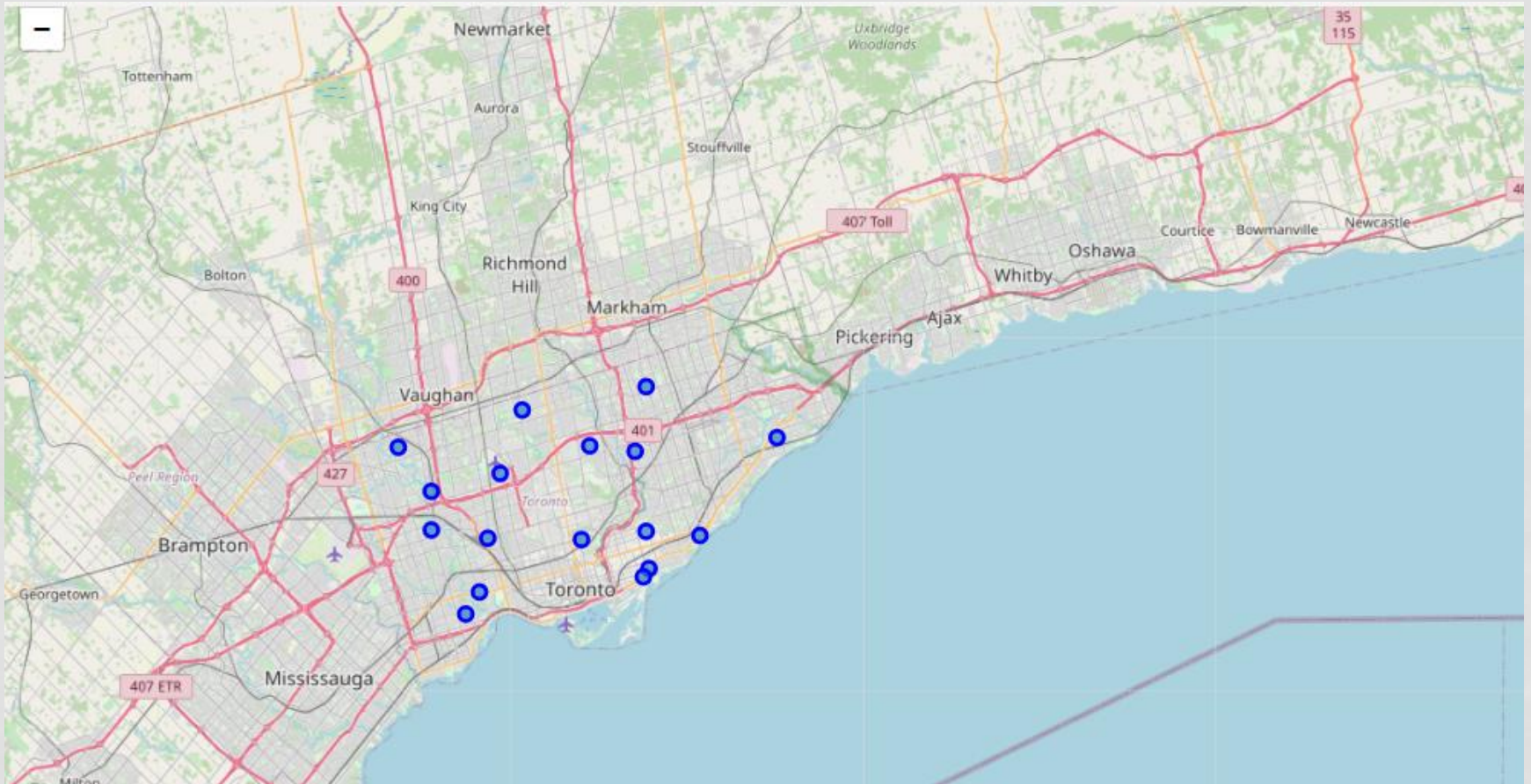
- Canadas postal codes data scrapped from the web
- Via wikipedia
'https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M' (providing us with 103 rows and 3 features of raw data)
- In addition a CSV file was outsourced due to changes in tariffs using the google API. CSV file was read into data frame to acquire coordinates that match the derived postal codes.
- In total 103 rows and 5 features of cleaned data.

VISUALISING OUR CLEAN DATA



A Map of Toronto with all the blue dots depicting its neighbourhoods

AS PER CLIENT - VISUALS WERE NARROWED SPECIFICALLY TO DOWNTOWN TORONTO



TO PROVIDE OUR CLIENT WITH A SUBTLE TASTE OF WHAT DOWN TOWN TORONTO POSSESSES WE FURTHER EXPLORED ONE OF ITS NEIGHBOURHOODS IN DEPTH - REGENT PARK, HARBOURFRONT

- Foursquare was utilised to derive venue details.
- Results from the Json file were expertly cleaned to once again equip the data into pandas dataframe.

	name	categories	lat	lng
0	RBC Royal Bank	Bank	43.766790	-79.191151
1	G & G Electronics	Electronics Store	43.765309	-79.191537
2	Sail Sushi	Restaurant	43.765951	-79.191275
3	Big Bite Burrito	Mexican Restaurant	43.766299	-79.190720
4	Enterprise Rent-A-Car	Rental Car Location	43.764076	-79.193406

9 venues were returned by fourSquare

EXPLORATORY ANALYSIS

- As you can imagine our client is now eager to unveil more of what Toronto has to offer , with that being we will now explore all neighbourhoods in Downtown Toronto. So next we will create a function that to repeat the same process to all the neighbourhoods in Downtown Toronto.
- Resulting data frame : 134 rows and 7 features (see next slide)

71 UNIQUE CATEGORIES RETURNED

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport	16	16	16	16	16	16
Central Bay Street	4	4	4	4	4	4
Christie	3	3	3	3	3	3
Church and Wellesley	8	8	8	8	8	8
Commerce Court, Victoria Hotel	2	2	2	2	2	2
First Canadian Place, Underground city	1	1	1	1	1	1
Garden District, Ryerson	5	5	5	5	5	5
Harbourfront East, Union Station, Toronto Islands	8	8	8	8	8	8
Kensington Market, Chinatown, Grange Park	34	34	34	34	34	34
Regent Park, Harbourfront	9	9	9	9	9	9
Richmond, Adelaide, King	3	3	3	3	3	3
Rosedale	2	2	2	2	2	2
St. James Town	16	16	16	16	16	16
St. James Town, Cabbagetown	2	2	2	2	2	2
Toronto Dominion Centre, Design Exchange	17	17	17	17	17	17
University of Toronto, Harbord	4	4	4	4	4	4

MORE EXPLORATORY WORK

- During our ongoing findings and constant communication with our client it was concluded that as much as our focal point was to discover the vastness of the two city it would also be of great importance to also examine other surrounding and most frequent venues to assist our client further as to what other aspects attract people. (To accomplish this we group rows by neighbourhood and by taking the mean of the frequency of occurrence of each category.)
- To give our client an intuitive analysis in a concise manner we then display the top 10 venues for each neighbourhood.

TOP 10 VENUES IN EACH NEIGHBOURHOOD

16 neighbourhoods were generated but for this presentation only the below will only be visualised

	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	CN Tower, King and Spadina, Railway Lands, Har...	Garden	Farmers Market	Park	Pizza Place	Burrito Place	Brewery	Light Rail Station	Gym / Fitness Center	Skate Park	Restaurant
1	Central Bay Street	Coffee Shop	Pharmacy	Pizza Place	Supermarket	Falafel Restaurant	Dance Studio	Diner	Discount Store	Donut Shop	Electronics Store
2	Christie	Park	Food & Drink Shop	Fast Food Restaurant	Farm	Dance Studio	Diner	Discount Store	Donut Shop	Electronics Store	Falafel Restaurant
3	Church and Wellesley	Coffee Shop	Middle Eastern Restaurant	Chinese Restaurant	Pizza Place	Playground	Discount Store	Sandwich Place	Intersection	Farm	Falafel Restaurant
4	Commerce Court, Victoria Hotel	Tennis Court	Park	Yoga Studio	Farm	Dance Studio	Diner	Discount Store	Donut Shop	Electronics Store	Falafel Restaurant

ALGORITHM

- For this project we chose the K-means CLUSTERING machine learning algorithm based on its accuracy and simplicity. (With that being said we will Run K-means to cluster the neighbourhoods into 5 clusters.)
- We created a new data frame that includes the cluster as well as the top 10 venues for each neighbourhood.

EXAMINE THE CLUSTER

- Now we can examine each cluster and determine the discriminating venue categories that distinguish each cluster.

CLUSTER LABEL 0

	Borough	Clustering Labels	Cluster Labels	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
14	Downtown Toronto	0	0	Pizza Place	Gym	Yoga Studio	Electronics Store	Convenience Store	Dance Studio	Diner	Discount Store	Donut Shop	Falafel Restaurant

CLUSTER LABEL 1

	Borough	Clustering Labels	Cluster Labels	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
1	Downtown Toronto	1	1	Donut Shop	Electronics Store	Medical Center	Rental Car Location	Restaurant	Intersection	Mexican Restaurant	Bank	Falafel Restaurant	Farmers Market
2	Downtown Toronto	1	1	Skating Rink	Café	General Entertainment	College Stadium	Food & Drink Shop	Fish & Chips Shop	Fast Food Restaurant	Farmers Market	Falafel Restaurant	Comic Shop
3	Downtown Toronto	1	1	Fast Food Restaurant	Sandwich Place	Coffee Shop	Chinese Restaurant	Bank	Supermarket	Pharmacy	Pizza Place	Breakfast Spot	Donut Shop
4	Downtown Toronto	1	1	Pharmacy	Discount Store	Pizza Place	Butcher	Supermarket	Coffee Shop	Comic Shop	Convenience Store	Dance Studio	Diner
5	Downtown Toronto	1	1	Food & Drink Shop	Hotel	Fast Food Restaurant	Park	Yoga Studio	Donut Shop	Convenience Store	Dance Studio	Diner	Discount Store
6	Downtown Toronto	1	1	Skating Rink	Beer Store	Dance Studio	Park	Athletics & Sports	French Restaurant	Food & Drink Shop	Fish & Chips Shop	Fast Food Restaurant	Garden
7	Downtown Toronto	1	1	Fast Food Restaurant	Movie Theater	Sandwich Place	Italian Restaurant	Food & Drink Shop	Park	Burrito Place	Pizza Place	Brewery	Pub
8	Downtown Toronto	1	1	Skating Rink	Convenience Store	Fast Food Restaurant	Sandwich Place	Electronics Store	Dance Studio	Diner	Discount Store	Donut Shop	Yoga Studio
9	Downtown Toronto	1	1	Coffee Shop	Italian Restaurant	Sushi Restaurant	Grocery Store	Café	Pizza Place	Pub	French Restaurant	Indie Movie Theater	Health Food Store
10	Downtown Toronto	1	1	Light Rail Station	Garden	Skate Park	Park	Pizza Place	Burrito Place	Brewery	Restaurant	Comic Shop	Gym / Fitness Center
11	Downtown Toronto	1	1	Pizza Place	Chinese Restaurant	Intersection	Playground	Sandwich Place	Middle Eastern Restaurant	Discount Store	Coffee Shop	Electronics Store	Donut Shop

CLUSTER LABEL 2

	Borough	Clustering Labels	Cluster Labels	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
6	Downtown Toronto	2	2	Airport	Park	Garden	French Restaurant	Food & Drink Shop	Fish & Chips Shop	Fast Food Restaurant	Farmers Market	General Entertainment	Electronics Store

CLUSTER LABEL 3

	Borough	Clustering Labels	Cluster Labels	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
9	Downtown Toronto	3	3	Tennis Court	Restaurant	Yoga Studio	Electronics Store	Convenience Store	Dance Studio	Diner	Discount Store	Donut Shop	Falafel Restaurant

CLUSTER LABEL 4

	Borough	Clustering Labels	Cluster Labels	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
13	Downtown Toronto	4	4	Baseball Field	Yoga Studio	Farmers Market	Dance Studio	Diner	Discount Store	Donut Shop	Electronics Store	Falafel Restaurant	Fast Food Restaurant
15	Downtown Toronto	4	4	Baseball Field	Yoga Studio	Farmers Market	Dance Studio	Diner	Discount Store	Donut Shop	Electronics Store	Falafel Restaurant	Fast Food Restaurant

CLIENT BUSINESS TRIP CONCLUSION

- Final decision on the optimal location within the Downtown Toronto region based on a comprehensive and mostly volume based characteristic of neighbourhood's venues and direct business needs encapsulated with a great tourist experience. It was decided that **Cluster 5 emanating from our algorithm proved to provide more variety than all other clusters, and the following locations were chosen to be her priority upon landing in the city of Toronto -*Kensington Market, Chinatown, Grange Park {these locations were chosen predominately due to its high volume of venues and variety in restaurants.** With these results we are determined that our client and her associated stakeholders will be able to make further informed and acute business models upon her return to South Africa.