The Battle of

Neighborhood

OPENING A CHINESE RESTAURANT

SHI YUNLONG

Summary

Introduction

The City of Toronto, is the most populous city in the Canada. It is diverse and is the financial capital of Canada. It is multicultural. It provides lot of business opportunities and business friendly environment. It has attracted many different players into the market. It is a global hub of business and commerce. The city is a major center for banking and finance, retailing, world trade, transportation, tourism, real estate, new media, traditional media, advertising, legal services, accountancy, insurance, theater, fashion, and the arts in Canada.

This also means that the market is highly competitive. As it is highly developed city so cost of doing business is also one of the highest. Thus, any new business venture or expansion needs to be analyzed carefully. The insights derived from analysis will give good understanding of the business environment which help in strategically targeting the market. This will help in reduction of risk. And the Return on Investment will be reasonable.

Over the next 50 years, the city is projected to grow at a thrilling rate. In 50 years, the GTA's population will double. The city's diverse population, currently at 2.9 million, will increase to almost 5 million. Nearly 10 per cent of new Torontonians will cram themselves into the core, a sliver that accounts for only three per cent of the city's land mass.

As a result - all things being equal and acknowledging the fact that opening a restaurant business requires deep pockets and lots of hard work, it would seem to be a good choice to open up an Italy restaurant in the core of the city. The question to be answered then is, which neighborhoods in Downtown Toronto would represent the best option.

Objective and Business Problem

My client, a wealthy and successful restauranteur from Italy is eager to expand business operations into Toronto. They want to create an authentic Italy restaurant that will serve and offer the full richness of Italy culture and cuisine to the people of Downtown Toronto.

Since Downtown Toronto is very competitive, my client needs insight from data in

order to decide in which neighborhoods to establish this authentic Italy restaurant.

A restaurant is a business which prepares and serves food and drink to customers in return for money, either paid before the meal, after the meal, or with an open account. Toronto is famous for its excellent cuisine. It's food culture includes an array of international cuisines influenced by the city's immigrant history:

1. Central and Eastern European immigrants, especially Jewish immigrants - bagels, cheesecake, hot dogs, knishes, and delicatessens
2. Italian immigrants - Toronto-style pizza and Italian cuisine
3. Chinese and other Asian restaurants, sandwich joints, trattorias, diners, and coffeehouses are ubiquitous throughout the city
4. mobile food vendors - Some 4,000 licensed by the city
5. Middle Eastern foods such as falafel and kebabs examples of modern Toronto street food
6. It is famous for not just Pizzerias, Cafe's but also for fine dining Michelin starred restaurants. The city is home to "nearly one thousand of the finest and most diverse haute cuisine restaurants in the world", according to Michelin.

Even though well-funded XXX Company Ltd. need to choose the correct location to start its first venture. If this is successful they can replicate the same in other locations. First move is very important, thereby choice of location is very important.

Data

This project will utilize publicly available data from Wikipedia and Foursquare. Specifically, all Toronto neighborhood details along with their postal codes are available here:
https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

The focus of this project will be the Downtown Toronto neighborhoods that will be extracted and analyzed accordingly. The Foursquare API will be utilized to obtain the geographical location data for downtown Toronto, and data will be used to explore the restaurant venues in the neighborhoods.

The restaurants will provide the categories needed for the analysis and these will be used to
determine the viability of the selected locations for the restaurant.

As mentioned above, the data from Wikipedia and Foursquare will be explored and analyzed by considering the restaurant venues in Downtown Toronto. The restaurants from the core of the city will be reviewed in terms of the types or categories of restaurants within a specific radius.

The data will be utilized to come up with a frequency analysis for an Italy restaurant in downtown Toronto, and to come up with the best choices of neighborhoods for my client.

The scraped and cleaned up data, along with geographical coordinates will be merged together and stored in a data frame as follows:

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Harbourfront,Regent Park	43.654260	-79.360636
3	M6A	North York	Lawrence Heights,Lawrence Manor	43.718518	-79.464763
4	M9A	Etobicoke	Islington Avenue	43.667856	-79.532242
5	M1B	Scarborough	Rouge,Malvern	43.806686	-79.194353
6	M3B	North York	Don Mills North	43.745906	-79.352188
7	M4B	East York	Woodbine Gardens,Parkview Hill	43.706397	-79.309937
8	M5B	Downtown Toronto	Ryerson,Garden District	43.657162	-79.378937
9	M6B	North York	Glencairn	43.709577	-79.445073

The above data will be used to come up with frequencies for Italy restaurant in downtown Toronto, and provide options of neighborhoods for my client.

Methodology

Firstly, let us list some important assumptions - all things being equal. Areas where Italy restaurant are the most common venues will be considered good neighborhoods for additional eateries (the location will be deduced based on higher frequencies of Italy establishments in an area). As previously stated and elaborated, only downtown Toronto will be considered for reasons explained in the Introduction. K Means Clustering will be used to divide up and cluster downtown Toronto, and API Foursquare platform will be queried to get the relevant and necessary information.

Steps

Step 1: Neighborhood Identification and Data Cleaning
- Scrape the Wikipedia page for the required data
- Save the cleaned up data in a data frame for further analysis:

	PostalCode	Borough	Neighborhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Harbourfront,Regent Park
3	M6A	North York	Lawrence Heights,Lawrence Manor
4	M9A	Etobicoke	Islington Avenue

Fig 1. Initial data from Wikipedia

Step 2: Get and Merge Location Data
- Take advantage of the already downloaded latitude and longitude data for all postal
  codes and update the location data
- The final data frame, for Downtown Toronto only, is this:

	PostalCode	Borough	Neighborhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Harbourfront,Regent Park	43.654260	-79.360636
3	M6A	North York	Lawrence Heights,Lawrence Manor	43.718518	-79.464763
4	M9A	Etobicoke	Islington Avenue	43.667856	-79.532242
5	M1B	Scarborough	Rouge,Malvern	43.806686	-79.194353
6	M3B	North York	Don Mills North	43.745906	-79.352188
7	M4B	East York	Woodbine Gardens,Parkview Hill	43.706397	-79.309937
8	M5B	Downtown Toronto	Ryerson,Garden District	43.657162	-79.378937
9	M6B	North York	Glencairn	43.709577	-79.445073

Fig 2. Merged data with coordinate

Step 3: Explore the Neighborhoods
- Explore all the neighborhoods in Downtown Toronto, using the coordinate Data
- Using Foursquare API, obtain a list of all the venues available
- Create a map between all the neighborhoods and all possible types of restaurants
- Group the same map by neighborhood

- Display each neighborhood along with the top most common venues

This data will be further used for clustering.

Step 4: Cluster Neighborhoods
- Determine clusters number by elbow method
- With an assumption of clusters number, use K-Cluster algorithm to come up with different clusters
- Map all the defined clusters in the City of Toronto

Step 5: Examine clusters and predict
- Examine each cluster and determine the discriminating venue categories that distinguish each cluster
- Identify the clusters and neighborhoods where Italian restaurants are most common venues

Results

Results are based on the Steps defined in the Methodology section outlined above.

For Steps 1 and 2 the resulting data frames were already displayed above. For Step 3, the map of Downtown Toronto with all the restaurant is below:
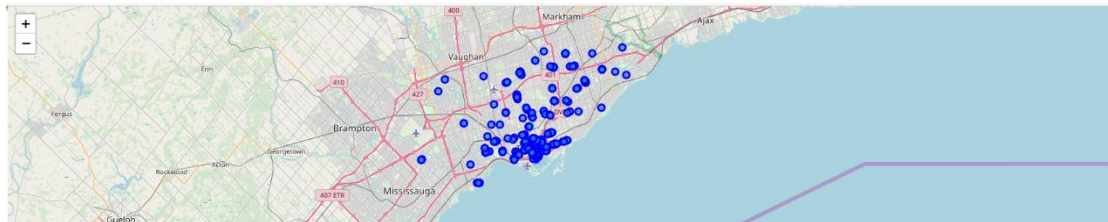

Fig 3 All of restaurant in Toronto City

Then we explore the neighborhoods using the methodology outlined. Based on the mean frequency calculated here are the top most common venues:

```
----Adelaide,King,Richmond----          ----Agincourt----                   ----Little Portugal,Trinity----          ----St. James Town----
              venue  freq                         venue  freq                          venue  freq                              venue  freq
0         Thai Restaurant  0.14        0       Chinese Restaurant  1.0      0           Asian Restaurant  0.15      0          Italian Restaurant  0.20
1     American Restaurant  0.14        1        Afghan Restaurant  0.0      1     Vietnamese Restaurant  0.10      1                 Restaurant  0.20
2        Asian Restaurant  0.10        2        Polish Restaurant  0.0      2         French Restaurant  0.10      2       Japanese Restaurant  0.08
3              Restaurant  0.10        3        Jewish Restaurant  0.0      3    New American Restaurant  0.10      3        Seafood Restaurant  0.08
4        Sushi Restaurant  0.07        4        Korean Restaurant  0.0      4                Restaurant  0.10      4       American Restaurant  0.08
5  Vegetarian / Vegan Restaurant  0.07 5  Latin American Restaurant  0.0    5  Southern / Soul Food Restaurant  0.05  5   New American Restaurant  0.04
6      Seafood Restaurant  0.03        6         Malay Restaurant  0.0      6         Italian Restaurant  0.05      6          French Restaurant  0.04
7  New American Restaurant  0.03       7  Mediterranean Restaurant  0.0     7          Malay Restaurant  0.05      7         German Restaurant  0.04
8        Greek Restaurant  0.03        8       Mexican Restaurant  0.0      8          Greek Restaurant  0.05      8  Middle Eastern Restaurant  0.04
9  Latin American Restaurant  0.03     9  Middle Eastern Restaurant  0.0    9         Korean Restaurant  0.05      9   Comfort Food Restaurant  0.04
```

```
----Stn A PO Boxes 25 The Esplanade----   ----Willowdale South----          ----The Annex,North Midtown,Yorkville----      ----Studio District----
              venue  freq                          venue  freq                          venue  freq                              venue  freq
0              Restaurant  0.18          0       Ramen Restaurant  0.27      0       American Restaurant  0.25      0          Italian Restaurant  0.2
1        Italian Restaurant  0.14        1             Restaurant  0.18      1  Vegetarian / Vegan Restaurant  0.25   1      American Restaurant  0.2
2       Seafood Restaurant  0.14         2    Indonesian Restaurant  0.09    2         Indian Restaurant  0.25      2            Thai Restaurant  0.1
3      Fast Food Restaurant  0.14        3      Fast Food Restaurant  0.09   3         Jewish Restaurant  0.25      3  Latin American Restaurant  0.1
4      Japanese Restaurant  0.09         4        Sushi Restaurant  0.09     4   New American Restaurant  0.00      4          Chinese Restaurant  0.1
5        Indian Restaurant  0.05         5  Middle Eastern Restaurant  0.09  5      Japanese Restaurant  0.00      5   Comfort Food Restaurant  0.1
6        French Restaurant  0.05         6      Japanese Restaurant  0.09    6         Korean Restaurant  0.00      6        Seafood Restaurant  0.1
7  Comfort Food Restaurant  0.05         7    Vietnamese Restaurant  0.09    7  Latin American Restaurant  0.00     7  Middle Eastern Restaurant  0.1
8            Thai Restaurant  0.05       8      Colombian Restaurant  0.00   8          Malay Restaurant  0.00      8   New American Restaurant  0.0
9          Belgian Restaurant  0.05      9     Portuguese Restaurant  0.00   9  Mediterranean Restaurant  0.00      9         Jewish Restaurant  0.0
```

Fig 4 Eight examples for top most common venues

The top venues for each restaurant looks as follows:

	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	Adelaide,King,Richmond	American Restaurant	Thai Restaurant	Asian Restaurant	Restaurant	Sushi Restaurant	Vegetarian / Vegan Restaurant	Indian Restaurant	Colombian Restaurant	Mediterranean Restaurant	Japanese Restaurant
1	Agincourt	Chinese Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
2	Albion Gardens,Beaumond Heights,Humbergate,Jam...	Fast Food Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
3	Bathurst Manor,Downsview North,Wilson Heights	Sushi Restaurant	Fast Food Restaurant	Restaurant	Middle Eastern Restaurant	Vietnamese Restaurant	Doner Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant
4	Bayview Village	Japanese Restaurant	Chinese Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
5	Bedford Park,Lawrence Manor East	Italian Restaurant	Indian Restaurant	Sushi Restaurant	Fast Food Restaurant	Comfort Food Restaurant	Restaurant	Greek Restaurant	American Restaurant	Thai Restaurant	Brazilian Restaurant
6	Berczy Park	Seafood Restaurant	Italian Restaurant	Greek Restaurant	Comfort Food Restaurant	Restaurant	French Restaurant	Indian Restaurant	Belgian Restaurant	Thai Restaurant	Vegetarian / Vegan Restaurant
7	Brockton,Exhibition Place,Parkdale Village	Italian Restaurant	Caribbean Restaurant	Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant
8	Business Reply Mail Processing Centre 969 Eastern	Fast Food Restaurant	Restaurant	Vietnamese Restaurant	Doner Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
9	Cabbagetown,St. James Town	Restaurant	Italian Restaurant	Indian Restaurant	Thai Restaurant	Taiwanese Restaurant	Japanese Restaurant	Caribbean Restaurant	Chinese Restaurant	Fast Food Restaurant	Empanada Restaurant

Fig 5 Top venues for each restaurant

In Step 4 we proceed to Cluster Neighborhoods, and refer to the Elbow Method, we can find the relationship between cluster number and distortion.
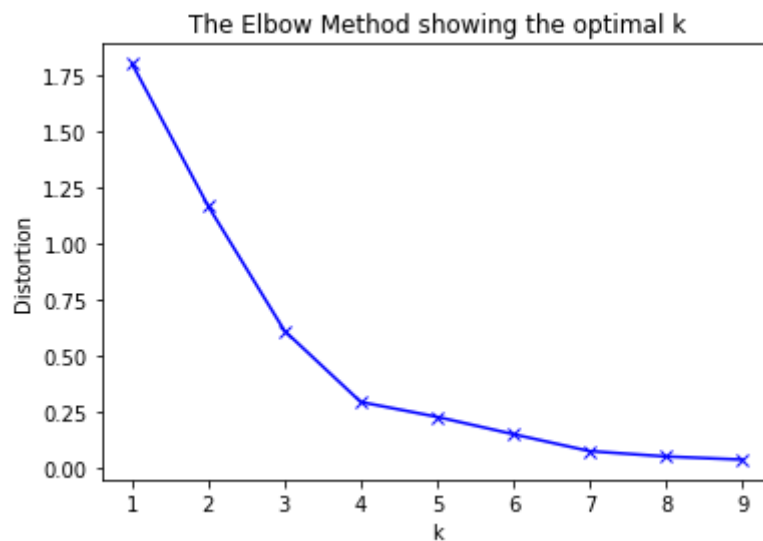

Fig 6 Elbow Method to optimal K

The K is determined for k = 7. Once all the defined clusters are mapped accordingly we have the cluster map:

Fig 7 Cluster map for restaurants

For all of cluster detail data, they are saved in appendix 1.

Discussion

Taking a look at the clusters, and having in mind all of the assumptions, it is clear that Clusters 3 and 5 will be the best areas to open up an Italian restaurant. Italian restaurants appear as the number 1 most common venue in **Bedford Park, Lawrence Manor East** and **Brockton, Exhibition Place, Parkdale Village**. while in **Berczy Park** and **Cabbage town, St James Town** Italian restaurants are the second most common venue! In all of the other clusters/neighborhoods Italian restaurants are not on the radar. so it would not make any sense at all to open a business there, and try to compete with other more popular and well established restaurants. Because Italian restaurants are not even in the top 10 common venues.

As a result, it looks we found specific areas where Italian restaurants are very popular and in demand so it would make sense to take advantage of high demand there and open a restaurant in either cluster 6.

Conclusion

Using the preceding information and results obtained, XXX Company Ltd can choose cluster 6 to open up an Italian restaurant.

All things being equal, the clustering algorithm dissected the data and returned different clusters pinpointing exactly where Italian restaurants are most common venues in Downtown Toronto. Based on the discussion above and results, it is concluded once again that cluster 6 is equally great areas to set up restaurant.

Appendix 1: All cluster data

- **For cluster 1:**

	Borough	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
17	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
38	North York	Chinese Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
72	Central Toronto	Restaurant	Mexican Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant
77	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
89	Scarborough	Fast Food Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant

- **For cluster 2:**

	Borough	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	North York	Portuguese Restaurant	Vietnamese Restaurant	Doner Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
3	North York	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
21	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
28	East York	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
49	North York	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

- **For cluster 3:**

	Borough	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	North York	Caribbean Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
33	North York	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
62	York	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

- **For cluster4:**

	Borough	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
5	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
7	East York	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
20	York	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
43	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
88	Etobicoke	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant
101	Etobicoke	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant

- **For cluster5:**

	Borough	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	North York	Sushi Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
67	Central Toronto	Vietnamese Restaurant	Doner Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant

- **For cluster 6:**

	Borough	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
2	Downtown Toronto	Mexican Restaurant	Greek Restaurant	Italian Restaurant	French Restaurant	Dumpling Restaurant	Gluten-free Restaurant	German Restaurant	Filipino Restaurant	Fast Food Restaurant
8	Downtown Toronto	Ramen Restaurant	Italian Restaurant	Japanese Restaurant	Middle Eastern Restaurant	Vietnamese Restaurant	Vegetarian / Vegan Restaurant	Ethiopian Restaurant	Mexican Restaurant	Chinese Restaurant
12	North York	Italian Restaurant	Japanese Restaurant	Chinese Restaurant	Restaurant	Fast Food Restaurant	Dim Sum Restaurant	Vietnamese Restaurant	Eastern European Restaurant	Gluten-free Restaurant
14	Downtown Toronto	Italian Restaurant	American Restaurant	Japanese Restaurant	Seafood Restaurant	Middle Eastern Restaurant	German Restaurant	New American Restaurant	Comfort Food Restaurant	French Restaurant
19	Downtown Toronto	Italian Restaurant	Greek Restaurant	Comfort Food Restaurant	Restaurant	French Restaurant	Indian Restaurant	Belgian Restaurant	Thai Restaurant	Vegetarian / Vegan Restaurant
22	East York	Restaurant	Mexican Restaurant	Vietnamese Restaurant	Doner Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
23	Downtown Toronto	Japanese Restaurant	Indian Restaurant	Portuguese Restaurant	Falafel Restaurant	Vegetarian / Vegan Restaurant	Korean Restaurant	Mediterranean Restaurant	Middle Eastern Restaurant	French Restaurant
24	Downtown Toronto	Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

25	Scarborough	Thai Restaurant	Caribbean Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
27	North York	Fast Food Restaurant	Restaurant	Middle Eastern Restaurant	Vietnamese Restaurant	Doner Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant
29	Downtown Toronto	Thai Restaurant	Asian Restaurant	Restaurant	Sushi Restaurant	Vegetarian / Vegan Restaurant	Indian Restaurant	Colombian Restaurant	Mediterranean Restaurant	Japanese Restaurant
32	North York	Asian Restaurant	Japanese Restaurant	American Restaurant	Greek Restaurant	Chinese Restaurant	Restaurant	Vietnamese Restaurant	Eastern European Restaurant	Gluten-free Restaurant
35	Downtown Toronto	Italian Restaurant	New American Restaurant	Chinese Restaurant	Japanese Restaurant	Mexican Restaurant	Seafood Restaurant	Indian Restaurant	Sushi Restaurant	Vegetarian / Vegan Restaurant
36	West Toronto	Vietnamese Restaurant	Restaurant	French Restaurant	New American Restaurant	Italian Restaurant	Japanese Restaurant	Korean Restaurant	Malay Restaurant	Cuban Restaurant
40	East Toronto	Italian Restaurant	Indian Restaurant	American Restaurant	Caribbean Restaurant	Restaurant	Eastern European Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant
41	Downtown Toronto	American Restaurant	Italian Restaurant	Japanese Restaurant	Seafood Restaurant	Chinese Restaurant	Fast Food Restaurant	Gluten-free Restaurant	New American Restaurant	Greek Restaurant
42	West Toronto	Caribbean Restaurant	Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant

46	East Toronto	Sushi Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant
47	Downtown Toronto	American Restaurant	Seafood Restaurant	Italian Restaurant	Thai Restaurant	Japanese Restaurant	Vegetarian / Vegan Restaurant	Chinese Restaurant	Gluten-free Restaurant	New American Restaurant
53	East Toronto	Italian Restaurant	Seafood Restaurant	Thai Restaurant	Latin American Restaurant	Middle Eastern Restaurant	Comfort Food Restaurant	Chinese Restaurant	Falafel Restaurant	Empanada Restaurant
54	North York	Indian Restaurant	Sushi Restaurant	Fast Food Restaurant	Comfort Food Restaurant	Restaurant	Greek Restaurant	American Restaurant	Thai Restaurant	Brazilian Restaurant
55	York	Vietnamese Restaurant	Doner Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
58	North York	Restaurant	Vietnamese Restaurant	Middle Eastern Restaurant	Indonesian Restaurant	Sushi Restaurant	Japanese Restaurant	Fast Food Restaurant	German Restaurant	French Restaurant
68	West Toronto	Mexican Restaurant	Italian Restaurant	Cajun / Creole Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant
74	West Toronto	Restaurant	Cuban Restaurant	Eastern European Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant
78	Central Toronto	Italian Restaurant	Indian Restaurant	Greek Restaurant	Japanese Restaurant	Seafood Restaurant	Restaurant	Thai Restaurant	American Restaurant	Filipino Restaurant

79	Downtown Toronto	Japanese Restaurant	Restaurant	Sushi Restaurant	French Restaurant	Chinese Restaurant	Comfort Food Restaurant	Vietnamese Restaurant	Eastern European Restaurant	Gluten-free Restaurant
80	West Toronto	Sushi Restaurant	Restaurant	Vegetarian / Vegan Restaurant	French Restaurant	Latin American Restaurant	Falafel Restaurant	Vietnamese Restaurant	Dumpling Restaurant	German Restaurant
81	Scarborough	Italian Restaurant	Chinese Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant
83	Downtown Toronto	Chinese Restaurant	Vietnamese Restaurant	Mexican Restaurant	Dumpling Restaurant	Comfort Food Restaurant	Hotpot Restaurant	Italian Restaurant	Japanese Restaurant	Filipino Restaurant
85	Central Toronto	American Restaurant	Sushi Restaurant	Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant
87	Etobicoke	Seafood Restaurant	Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant
91	Downtown Toronto	Italian Restaurant	Fast Food Restaurant	Seafood Restaurant	Japanese Restaurant	Indian Restaurant	French Restaurant	Vegetarian / Vegan Restaurant	Comfort Food Restaurant	Molecular Gastronomy Restaurant
95	Downtown Toronto	Italian Restaurant	Indian Restaurant	Thai Restaurant	Taiwanese Restaurant	Japanese Restaurant	Caribbean Restaurant	Chinese Restaurant	Fast Food Restaurant	Empanada Restaurant
96	Downtown Toronto	American Restaurant	Asian Restaurant	Seafood Restaurant	Thai Restaurant	Japanese Restaurant	Gluten-free Restaurant	Vegetarian / Vegan Restaurant	Italian Restaurant	New American Restaurant

	Borough									
98	Downtown Toronto	Japanese Restaurant	Restaurant	American Restaurant	Mediterranean Restaurant	Vietnamese Restaurant	Polish Restaurant	Caribbean Restaurant	Fast Food Restaurant	Italian Restaurant
99	East Toronto	Restaurant	Vietnamese Restaurant	Doner Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Falafel Restaurant

- **For cluster 7:**

	Borough	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
26	North York	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
30	West Toronto	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
50	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Hakka Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
69	Etobicoke	Middle Eastern Restaurant	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
70	Scarborough	Vietnamese Restaurant	Dumpling Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant

75	Mississauga	Mediterranean Restaurant	Middle Eastern Restaurant	Vietnamese Restaurant	Eastern European Restaurant	Greek Restaurant	Gluten-free Restaurant	German Restaurant	French Restaurant	Filipino Restaurant

Appendix 2: Notebook address:

https://eu-gb.dataplatform.cloud.ibm.com/analytics/notebooks/v2/6001292f-737a-49dc-a729-9d70accccb5b/view?access_token=503ed1d88351d4acf776e650eed0e24dd753025f9dc15e817791b3e1e32302cf