

A new Italian restaurant in Toronto: where to place it?

IBM Data Science Certificate – Final Report

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Abstract

After the numerical analysis of Toronto neighbourhood, we have identified the areas where the level of competition, for an Italian restaurant, is high and where it is low. We have found the number of total restaurants in Toronto and the most common venues for each neighbourhood. A map with the clustered venues makes it easier to identify the areas of high venues density and the areas with low venues density.

Introduction and business problem definition

Aldo is 35 years old and moved from Milan to Toronto. He has 15 years of experience as Italian chef and now wishes to get started with his restaurant in Toronto. Since he is not familiar with the city, we will try to help him with some data to decide which is the appropriate neighbourhood for his activity.

Among other things, Aldo need to know:

- the level of competition on each neighbourhood
- which are the most dynamic neighbourhoods
- have an idea of Toronto neighbourhoods

Data

Based on our business problem we are interested to identify and evaluate the following parameters:

- number of Italian restaurants on each neighbourhood
- number of hotels on each neighbourhood, as people who move for pleasure or business have high likelihood to be client segment
- ten most common activities for each neighbourhood

Toronto neighbourhoods are defined by latitude and longitude that we upload in our notebook by an external file, it is publicly available for download.

Number and category of venues for each neighbourhood are obtained using Foursquare API.

Methodology

In this project we are focused on identifying the most common venues for each neighbourhood of Toronto, in this way we get some more confidence with a city.

In the second step we filter the data and identify the total number of restaurants present in Toronto, this help us to identify the higher level of competition. Later, we go in more detail and identify the number of restaurants that offer a Mediterranean and European cuisine. We and this step with the identification of Italian restaurants and the identification of hotels in Toronto.

In the final step we use folium to create a map of Toronto city; we also use plugins function to group markers into different clusters, this make easier identification of areas with higher density of venues.

In this project we use different defined function, very useful and necessary to complete the analysis. More details of this functions can be found in the attached notebook.

Analysis

We start analysing the higher level of competition by looking at the total number of restaurants in Toronto. Then we proceed to investigate how many of them offer a Mediterranean and European cuisine. After applying the appropriate pandas filtering, we investigate the total number of Italian restaurants. Furthermore, we investigate the total number of hotels in Toronto.

Among other thing we are interested to know the density of Mediterranean and European restaurants in Toronto, so we store these venues into pandas dataframe. Then we add to this dataframe hotel venues. We use pandas' function to check the total number of venues for each Toronto neighbourhood. We perform filtering in 'Italian Restaurant' to identify the neighbourhood with the higher and lower number of Italian restaurants.

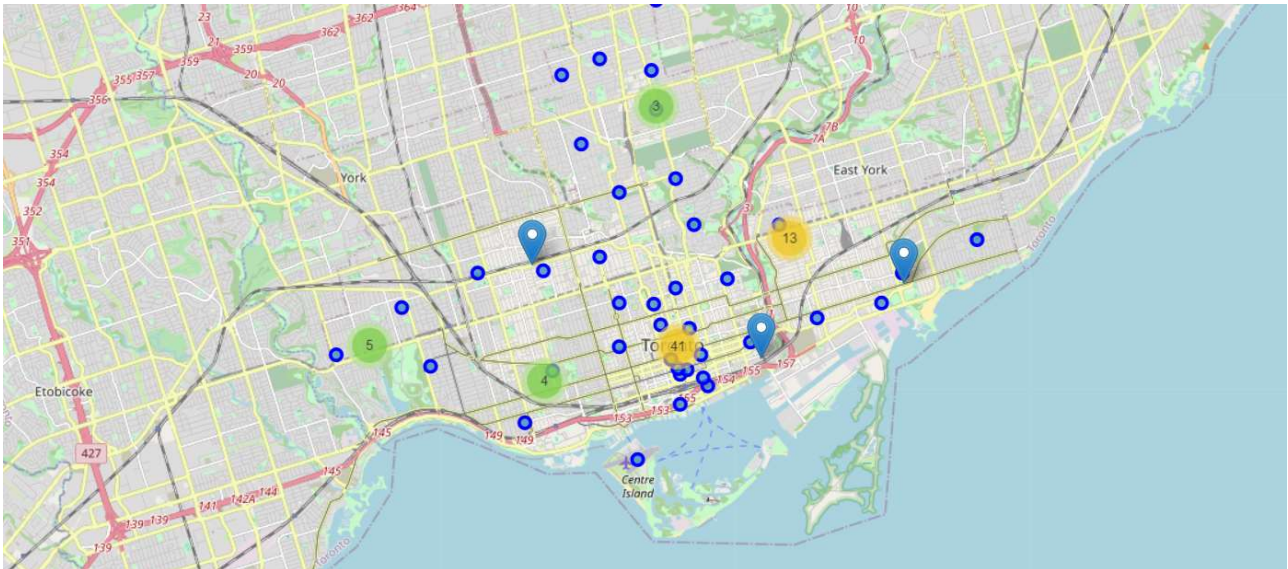
In the second step we use folium to create a map of Toronto and add neighbourhoods to the map using the latitude and longitude coordinates of each neighbourhoods. Later, we proceed by adding venues into the map, for a fast-visual check. As it is hard to read all the venues, we proceed by grouping the markers into different clusters.

In the third and final step we identify the ten most common venues for each neighbourhood. We conclude our analysis by creating clusters of

Results and discussion

At the higher level of competition, we have found that 387 restaurants are present in Toronto. Making a more detail analysis we have seen that 69 of them offer a Mediterranean and European cuisine. The number of Italian restaurants in Toronto is 41. Furthermore, we have found that are 34 hotel presents in Toronto.

The area between University of Toronto – St James Town – Berczy Park has the higher density of venues, there are 41 venues. The second most dense are is located between The Danforth West – Studio District, there are 13 venues. The third most dense area is located between High Park – Runnymede – Parkdale, there are 5 venues.



Looking at the total number of Italian restaurants for each neighbourhood, we note that Central Bay Street is the neighbourhood with the highest number of restaurants, there are four. Toronto Dominion Centre and Commerce Court are very active neighbourhoods, we can see a high number of hotels, six hotels for Toronto Dominion and five hotels for Commerce Court, and there are respectively three Italian restaurants for each of these neighbourhoods.

Danforth West is another interesting neighbourhood. The level of competition is high level, in this neighbourhood Italian Restaurant is the 2nd most common venue. At the same time Danforth West has a high level of Greek restaurants, they are the 1st most common venue of the neighbourhood, in total there are nine Greek restaurants.

	Neighborhood	French Restaurant	Greek Restaurant	Hotel	Hotel Bar	Italian Restaurant	Mediterranean Restaurant
0	Central Bay Street	1	0	1	0	4	0
1	Harbourfront East , Union Station , Toronto Is...	0	0	4	1	3	0
2	Garden District, Ryerson	0	0	2	0	3	0
3	Toronto Dominion Centre , Design Exchange	1	1	6	0	3	0
4	Commerce Court , Victoria Hotel	1	0	5	0	3	0
5	Stn A PO Boxes	1	0	2	0	3	0
6	The Danforth West , Riverdale	0	9	0	0	3	0
7	Runnymede , Swansea	1	0	0	0	2	0
8	St. James Town , Cabbagetown	0	0	0	0	2	0
9	University of Toronto , Harbord	1	0	0	0	2	0

As we can see in the table below there are six neighbourhoods that do not have an Italian restaurant and four of them seems to be active as there are present Hotels or other Mediterranean and European restaurants.

	Neighborhood	French Restaurant	Greek Restaurant	Hotel	Hotel Bar	Italian Restaurant	Mediterranean Restaurant
17	Parkdale , Roncesvalles	0	0	0	0	1	0
18	Queen's Park , Ontario Provincial Government	0	0	0	0	1	0
19	Studio District	0	0	0	0	1	0
20	Christie	0	0	0	0	1	0
21	Berczy Park	1	1	1	0	0	0
22	Richmond , Adelaide , King	0	0	3	0	0	1
23	Regent Park , Harbourfront	1	0	0	0	0	0
24	Davisville North	0	0	1	0	0	0
25	Church and Wellesley	0	0	2	0	0	2
26	Kensington Market , Chinatown , Grange Park	0	0	0	1	0	0

Conclusions

In our opinion neighbourhoods Richmond, Adelaide, King and Davisville North are two dynamic areas and do not have Italian restaurants among the 10 common venues. They can be a good starting point to evaluate the placement of the new restaurant.

Our work is focused in analysis of the data, before the final decision is necessary to make an economic and financial analysis, all aspect that are outside the scope of this report.

Acknowledgement

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