

Coursera Capstone Project The Battle of Neighborhoods

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1. Introduction

In Toronto there are many places where you can go to a bar and enjoy but if you are Italian you would probably be looking for a glimpse of your country, fresh and delicious Italian pizza. Then what would a good place to move in?

My client is looking for a good neighborhood to move in Toronto where he can feel comfortable and enjoy his neighborhood. In this case, a place where he can enjoy good bars and also find Italian restaurants and shops is very important.

2. Data

This project will rely on public data from Foursquare located in [Restaurants of Toronto](#) and [Bars of Toronto](#)

To explore and target recommended locations across different venues according to the presence of similar facilities, we will access data through FourSquare API interface and arrange them as a dataframe for visualization.

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs
0	Fabbrica Rustic Italian	Italian Restaurant	66 Wellington St W	CA	Toronto	Canada	NaN	2826	[66 Wellington St W, Toronto ON M5K 1E7, Canada]	[[{"label": "display", "lat": 43.647161, "lng": ...}
1	Frankie's Italian	Italian Restaurant	892 Queen Street West	CA	Toronto	Canada	NaN	1086	[892 Queen Street West, Toronto ON M4M 1J3, Canada]	[[{"label": "display", "lat": 43.660411, "lng": ...}
2	Scaddabush Italian Kitchen & Bar	Italian Restaurant	382 Yonge Street, Unit #7	CA	Toronto	Canada	Gerrard	3018	[382 Yonge Street, Unit #7 (Gerrard), Toronto ...]	[[{"label": "display", "lat": 43.6589202920287, "lng": ...}
3	Punto Gelato, Simply Italian	Ice Cream Shop	146 Cumberland St	CA	Toronto	Canada	btwn Avenue Rd & Bay St	4230	[146 Cumberland St (btwn Avenue Rd & Bay St), ...]	[[{"label": "display", "lat": 43.6699545284303, "lng": ...}
4	Vicino Italian Kitchen	Italian Restaurant	146 Sumach St	CA	Toronto	Canada	St David St	1390	[146 Sumach St (St David St.), Toronto ON M5A ...]	[[{"label": "display", "lat": 43.659291, "lng": ...}
5	Commisso Bros. & Racco Italian Bakery	Italian Restaurant	8 Kincort Street	CA	Toronto	Canada	Castlefield and Kincort	11072	[8 Kincort Street (Castlefield and Kincort), T...]	[[{"label": "display", "lat": 43.6976211082148, "lng": ...}
6	italian vegetarian magic	Italian Restaurant	7 Yorkville Ave	CA	Toronto	Canada	NaN	4070	[7 Yorkville Ave., Toronto ON, Canada]	[[{"label": "display", "lat": 43.6738009770607, "lng": ...}
7	Italian Consulate Toronto	Embassy / Consulate	136 Beverley St	CA	Toronto	Canada	Dundas Street	3806	[136 Beverley St (Dundas Street), Toronto ON, ...]	[[{"label": "display", "lat": 43.6540269421978, "lng": ...}
8	Gelato Simply Italian	Ice Cream Shop	2076 Yonge St	CA	Toronto	Canada	NaN	6982	[2076 Yonge St, Toronto ON, Canada]	[[{"label": "display", "lat": 43.7020804467324, "lng": ...}
9	Italian Chamber Of Commerce	Conference Room	NaN	CA	NaN	Canada	NaN	5032	[Canada]	[[{"label": "display", "lat": 43.6561580296158, "lng": ...}
10	The Italian Cultural Institute	Art Gallery	496 Huron St	CA	Toronto	Canada	NaN	4844	[496 Huron St, Toronto ON, Canada]	[[{"label": "display", "lat": 43.6684324521470, "lng": ...}
11	Italian Canadian Savings & Credit Union	Bank	1168 Dundas Street West	CA	Toronto	Canada	NaN	6029	[1168 Dundas Street West, Toronto ON M6J 1x4, ...]	[[{"label": "display", "lat": 43.649369, "lng": ...}
12	Italian Walk Of Fame	Historic Site	NaN	CA	Toronto	Canada	NaN	5557	[Toronto ON, Canada]	[[{"label": "display", "lat": 43.655182, "lng": ...}
13	Classic italian style pizza food truck	Food Truck	CNE Midway	CA	Toronto	Canada	NaN	2749	[CNE Midway, Toronto ON, Canada]	[[{"label": "display", "lat": 43.652144, "lng": ...}
14	Florentina's Italian Restaurant	Italian Restaurant	NaN	CA	Toronto	Canada	NaN	2922	[Toronto ON, Canada]	[[{"label": "display", "lat": 43.6765619955446, "lng": ...}
15	Elm Street Italian Deli	Italian Restaurant	15 Elm Street	CA	Toronto	Canada	NaN	2949	[15 Elm Street, Toronto ON M5G 1G7, Canada]	[[{"label": "display", "lat": 43.65769, "lng": ...}
16	Mustachio Italian	Italian Restaurant	595 Bay St	CA	Toronto	Canada	Dundas St	2968	[595 Bay St (Dundas St), Toronto ON M5G ...]	[[{"label": "display", "lat": 43.65816, "lng": ...}

Figure 1: data used in the machine learning algorithm.

Data will be used in the following way: by knowing the locations of already existing restaurants /bars. It is possible to apply many techniques of unsupervised learning technique, but the kernel density estimation (KDE) will be used to looking for the area of influence of the current restaurants/bars.

3. Methodology

A density estimation was used to measure the proximity of the restaurants and bars, Folium was used to print and visualize the map. Most data were picked using Foursquare API, the positions of bars and restaurants are in Figure 2, the blue circles are the restaurants and yellows are the bars. Data used to test the kernel was generated manually using some coordinates from Toronto. It is possible to see the generated test data in Figure 3.

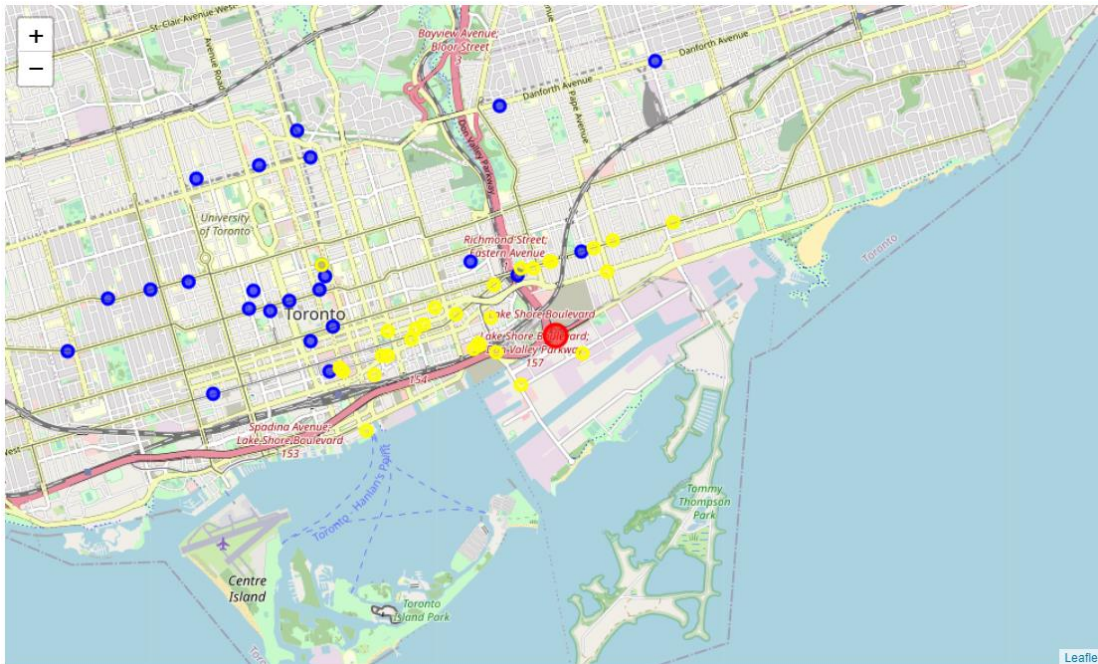


Figure 2: Distribution of bars and restaurants in Toronto.

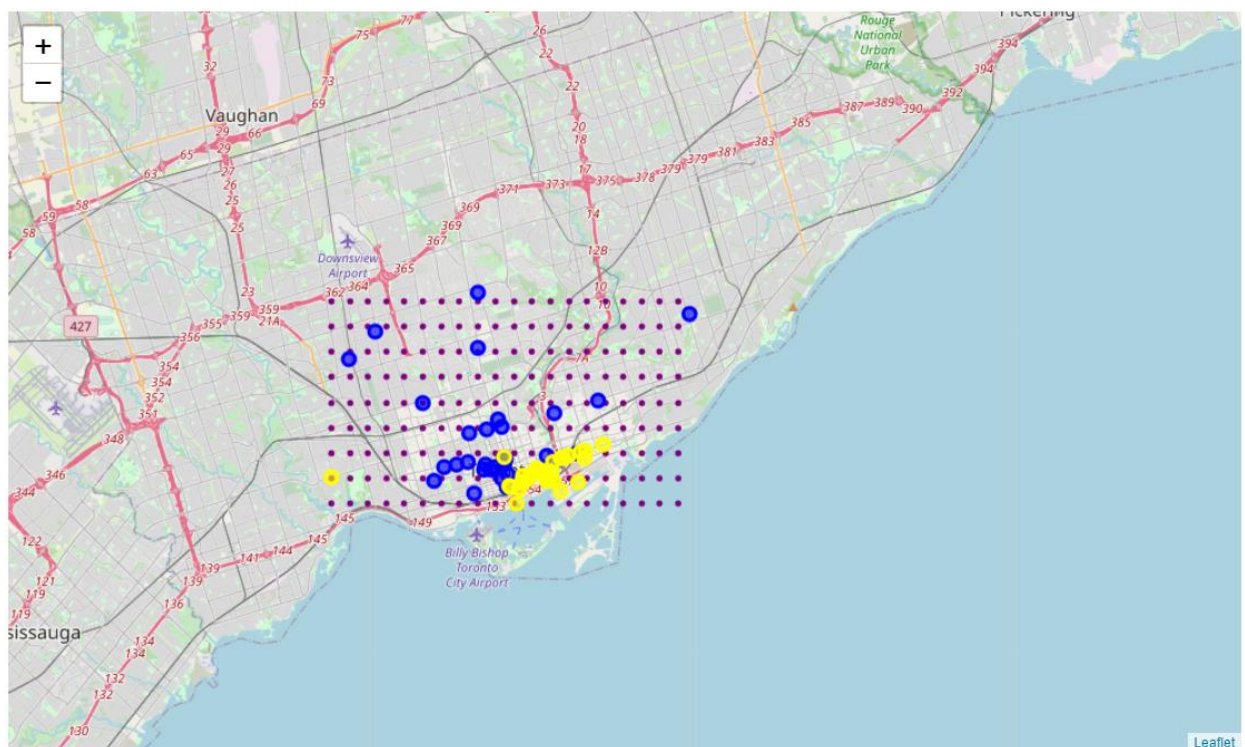


Figure 3: Data generated to test the kernel density estimation.

After the test was done, it is possible to look in Figure 4 where are the region with most bars and restaurateurial. Where the circle is small, most restaurateurial and bars are present in the region.

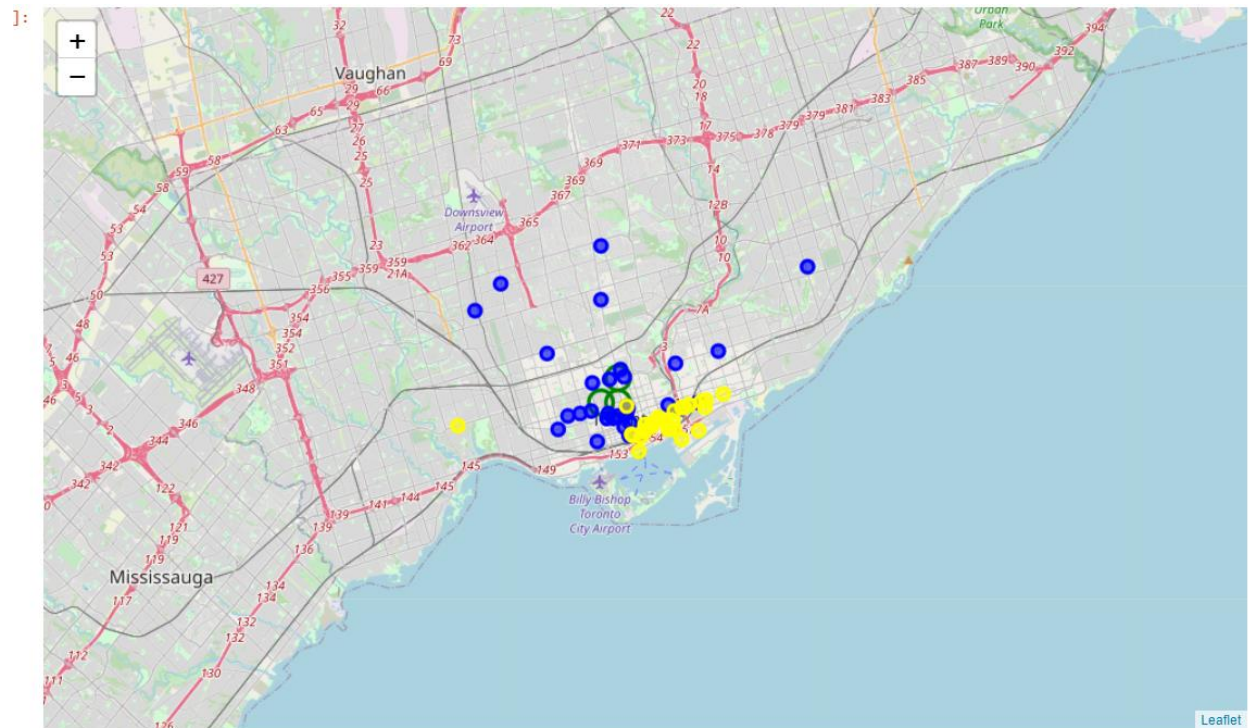


Figure 4: Evaluation of the density distribution kernel.

4. Results

Looking the Figure 5, you can take some assumption. If you want to go near the Toronto you will find a few bars and restaurants, because in this region are many places.

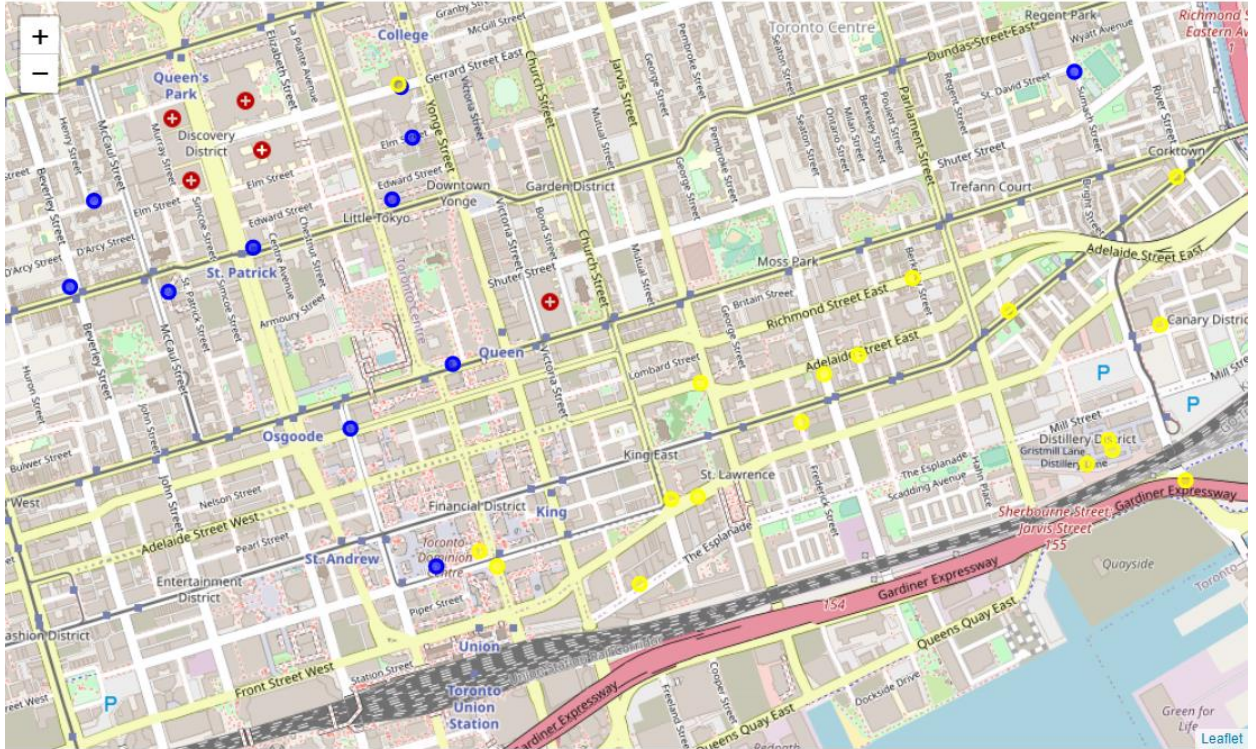


Figure 5: Good spots to drink a coffee/beer.

5. Discussion

Tip data are not used in this example so it only predicts number of opportunities , it will not know how good is the restaurant or bar. To improve the data maybe we need more data to make better prediction.

6. Conclusions

If you don't have any idea to move in or live in Toronto as Italian you will find some tips in this prediction.