

THE BATTLE OF NEIGHBORHOODS

BY: MOFE JEMIDE

Business Problem

- Toronto is one of the most populous cities in Canada. Toronto's demographics show that it is large and ethnically diverse. With its diverse culture comes diverse food items. There are a wide variety of restaurants in Toronto, each belonging to categories such as Chinese, Indian, French, Jamaican, Portuguese etc.
- In this project we would go through a series of steps to determine whether or not it is a good idea to setup an Italian restaurant in Toronto and if what areas/neighborhoods would be the most profitable for the restaurant.

Data Acquisition

- For this project, I would be scraping a list of Canada postal codes from the following website: (https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M). This will provide me with the postal code, borough & the name of all the neighborhoods present in Toronto.
- Afterwards, I would leverage the following website: (https://cocl.us/Geospatial_data) csv file to get all the geographical coordinates of the neighborhoods. This includes a list of **Boroughs, Neighborhoods, postal codes, latitudes and longitudes**.
- I would need to get information about various venues in Toronto using Foursquare's explore API (<https://developer.foursquare.com/docs>).

```
In [25]: toronto_part = toronto_grouped(['Neighborhood', 'Italian Restaurant'])  
toronto_part.sort_values(by=['Italian Restaurant'], ascending=False)
```

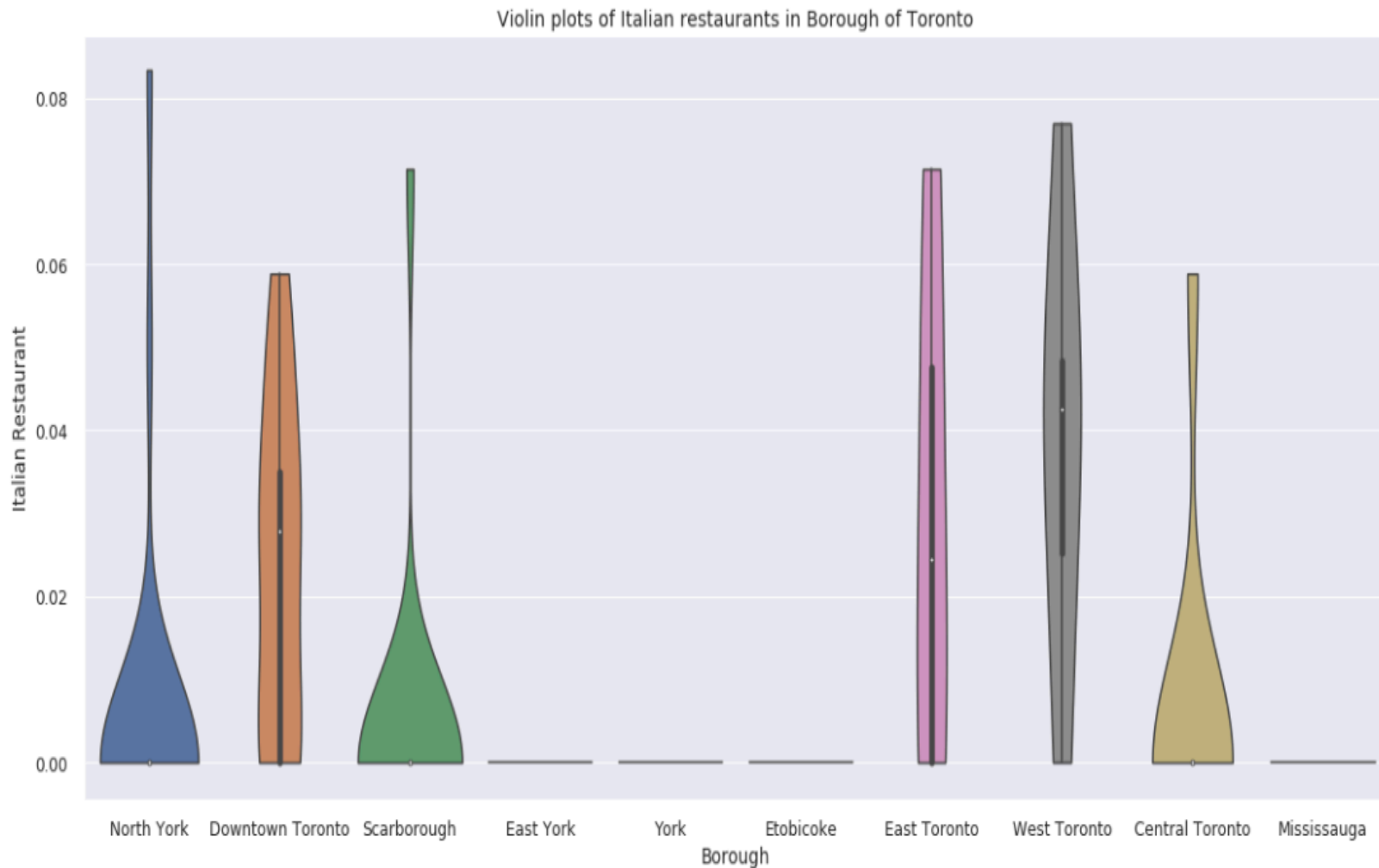
Out[25]:

	Neighborhood	Italian Restaurant
7	Bedford Park, Lawrence Manor East	0.086957
70	Parkdale, Roncesvalles	0.076923
85	The Danforth West, Riverdale	0.071429
24	Clarks Corners, Sullivan, Tam O'Shanter	0.066667

Relationship between neighborhoods and Italian restaurants

These are the neighborhoods with the highest Italian Restaurant presence.

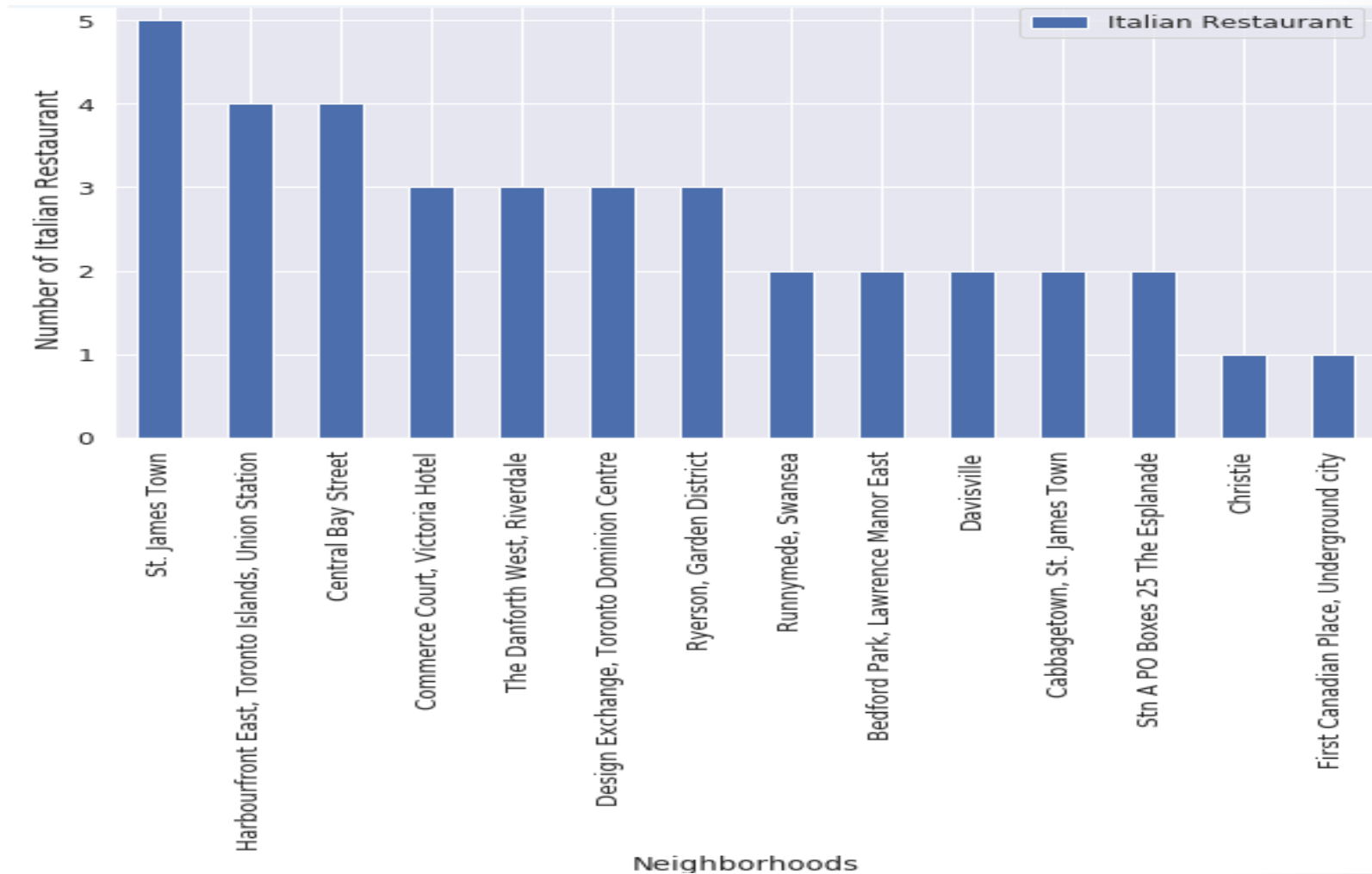
North York, Downtown Toronto, Scarborough, East Toronto, West Toronto and Central Toronto are densely populated with Italian restaurants.

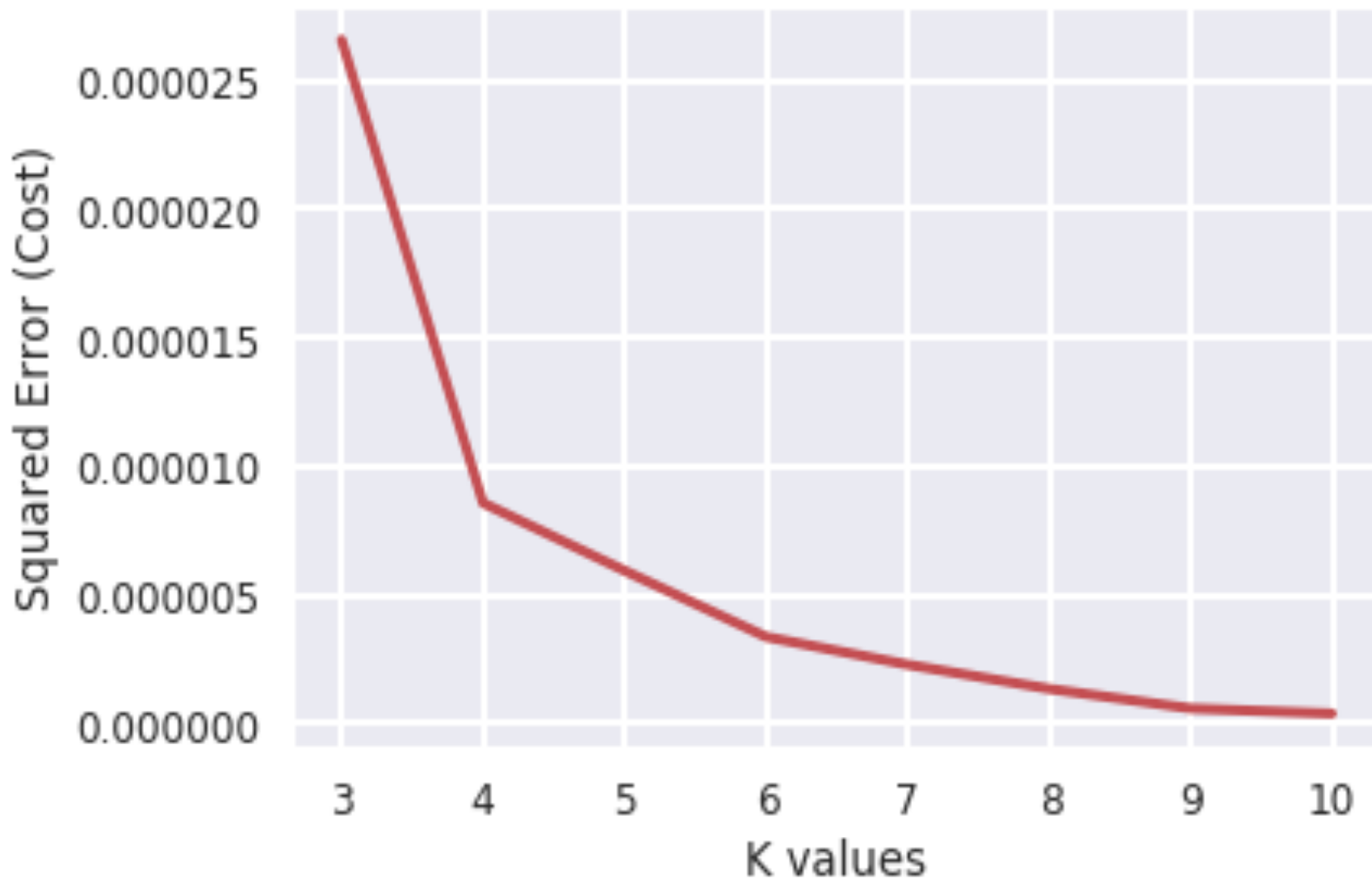


Continued...

- Downtown Toronto has potential Italian Restaurant market seeing as it has a high number of Italian restaurants but not as much as boroughs like North York, West Toronto, and Scarborough etc. where the Italian restaurant market is saturated with too much competition for a new restaurant.
- For people who have a taste for Italian Cuisine wants a wide variety of Italian Cuisine North York would be the ideal location. North York's neighborhoods are the most densely populated with Italian restaurants.
- East York, York, Etobicoke and Mississauga lack Italian restaurants.

The neighborhood with the highest number of Italian restaurants is St. James Town, having 5 Italian restaurants and the neighborhood with the lowest number of Italian restaurants are Christie, First Canadian Place and Underground City, having just 1.



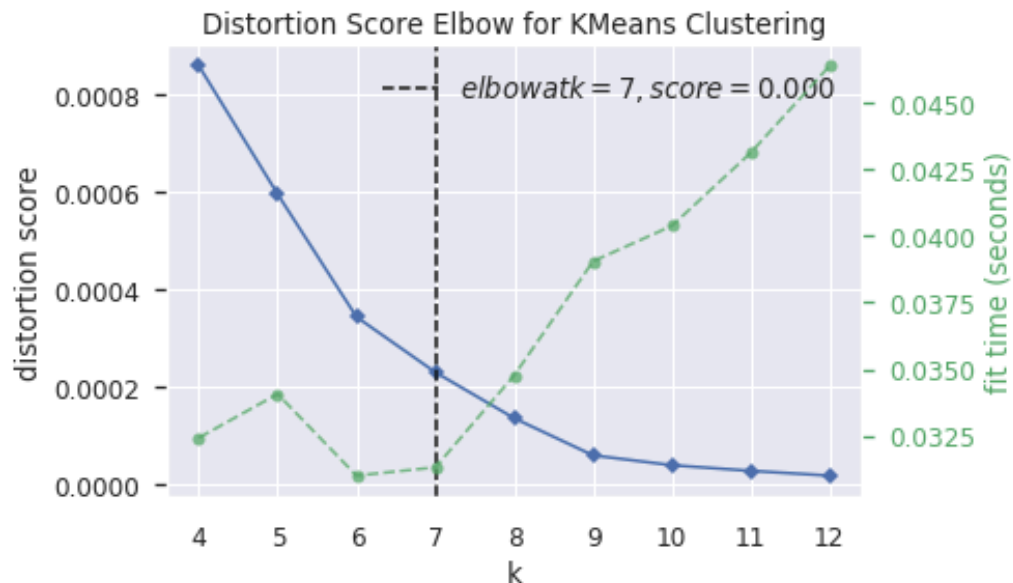


Predictive Modeling

The K-means algorithm was used for the clustering of the Toronto Neighborhoods.


```
# Instantiate the clustering model and visualizer
model = KMeans()
visualizer = KElbowVisualizer(model, k=(4,13))

visualizer.fit(toronto_part_clustering)      # Fit the data to the visualizer
visualizer.show()                          # Finalize and render the figure
```



Predictive Modeling- Elbow method

Finding the best value of K using the distortion score elbow. The best k was 7.

Conclusion & Future Direction

- Built useful model to determine the best area/neighborhood to open an Italian restaurant.
- The accuracy of the model has room for improvement.
- Capture more details that can influence the choice of an area to open a restaurant such as:
 - Population demographics
 - Cost of rent in the area.