

Capstone Project-The Battle of Neighbourhoods (Part-2)

FINAL REPORT



Introduction

Problem Statement:

Finding the most suitable neighbourhood in Toronto, Canada to start a new Thai Restaurant venture. The most ideal location to open up this new restaurant will be found out with the help of all the Machine Learning and Data Science concepts learnt in the course so far. These concepts include segmentation , clustering etc. To be able to achieve our solution to the problem statement, we need to find the following information and observe the solutions obtained from them to be able to solve the ultimate problem statement:

- Areas with Thai restaurants in Toronto
- Neighbourhoods around Toronto that lack Thai restaurant

Target Audience:

The solution to this problem statement will help any entrepreneur looking to open up a Thai based restaurant.

Background

Being a Thai food connoisseur, my idea is to spread the vibrant and rich taste of their cuisine across Toronto. With this idea, people would be introduced to this new flavour that they may or may not have tasted before, and most likely will open in a neighbourhood that has a lack of Thai based restaurants. This will definitely be a positive addition to the neighbourhood as now the people who are Thai food lovers like me will definitely be able to enjoy a Thai meal and for those people who have never tasted Thai cuisine before, this will be new cuisine for them to try and taste the rich Thai culture through their food.

Methodology

We begin by obtaining the list of neighbourhoods in Toronto, Canada as we did in the past weeks. From the Wikipedia page, we use web scraping that allows us to pull tabular data from the page into a data frame as required by us.

The link used is:

https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

Here after, we will require the coordinates, that is, the latitude and longitude values of these neighbourhoods. We can do this either by using the geocoder package or using the csv file from IBM and use this to match the coordinates with the neighbourhoods of Toronto. These coordinates can be verified from by visualization of the map of Toronto using the Folium package.

	Postcode	Borough	Neighbourhood
0	M1B	Scarborough	Rouge, Malvern
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union
2	M1E	Scarborough	Guildwood, Morningside, West Hill
3	M1G	Scarborough	Woburn
4	M1H	Scarborough	Cedarbrae

Now the postcodes of these neighbourhoods are matched to the respective coordinates.

	PostalCode	Borough	Neighbourhood	Latitude	Longitude
0	M1B	Scarborough	Rouge, Malvern	43.806686	-79.194353
1	M1C	Scarborough	Highland Creek, Rouge Hill, Port Union	43.784535	-79.160497
2	M1E	Scarborough	Guildwood, Morningside, West Hill	43.763573	-79.188711
3	M1G	Scarborough	Woburn	43.770992	-79.216917
4	M1H	Scarborough	Cedarbrae	43.773136	-79.239476

Next we will find out the number of neighbourhoods

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Borough
Central Toronto      9
Downtown Toronto    19
East Toronto         5
West Toronto         6

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Hereafter, we will find the Thai restaurants in Toronto,

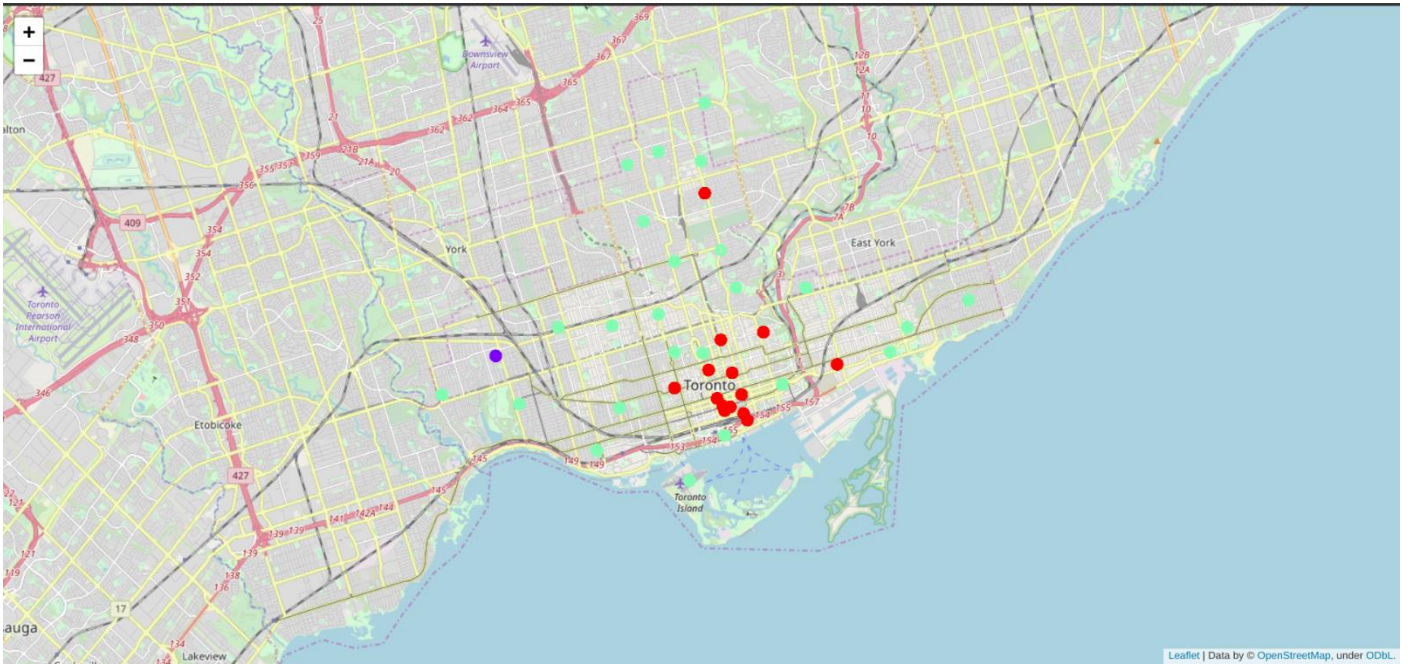
	Neighborhoods	Thai Restaurant
0	Adelaide, King, Richmond	0.030000
1	Berczy Park	0.017857
2	Brockton, Exhibition Place, Parkdale Village	0.000000
3	Business Reply Mail Processing Centre 969 Eastern	0.000000
4	CN Tower, Bathurst Quay, Island airport, Harbo...	0.000000

Now using the Foursquare API, we will be able to obtain the names, coordinates, categories of the venues. Using this we find out the unique categories from the venues.

The last step is to perform the neighbourhood clustering.

	Neighborhood	Thai Restaurant	Cluster Labels	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Adelaide, King, Richmond	0.03	0	43.650571	-79.384568	Four Seasons Centre for the Performing Arts	43.650592	-79.385806	Concert Hall
0	Adelaide, King, Richmond	0.03	0	43.650571	-79.384568	The Keg Steakhouse + Bar	43.649937	-79.384196	Steakhouse
0	Adelaide, King, Richmond	0.03	0	43.650571	-79.384568	Nathan Phillips Square	43.652270	-79.383516	Plaza
0	Adelaide, King, Richmond	0.03	0	43.650571	-79.384568	Rosalinda	43.650252	-79.385156	Vegetarian / Vegan Restaurant
0	Adelaide, King, Richmond	0.03	0	43.650571	-79.384568	Shangri-La Toronto	43.649129	-79.386557	Hotel

Result:



Purple cluster: Shows neighbourhoods with no Thai restaurants.

Red cluster: Shows neighbourhoods with little or no Thai restaurants.

Green cluster: Shows neighbourhoods with high number of Thai restaurants.

Observations:

Since the Green clusters already have a number Thai restaurants open, it would be better to open up Thai restaurants in and around the purple or the red clusters where the number of Thai restaurants are little to none (like North Toronto West and Parkdale).

Conclusions:

After all the analysis performed, the information regarding the best location to set up a Thai Restaurant so as to have more people come in and make maximum profit has been found. Areas with little to no Thai based restaurants were found in this analysis which is a great place to start up our venture.