**Finding the best location for a new Mediterranean restaurant in the city of Toronto**

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**December 7, 2020**

**Problem Introduction:**

Toronto is the largest city in Canada with a population of 2,731,571. Not only is Toronto the biggest city in Canada it is also one of the most multicultural. Looking at a demographic breakdown, the city has many different cultures scattered around, with 51.5% of the population being visible minority and this visible minority is also having a large variety of different cultures. One large demographic in the city is Mediterranean. Mediterranean cuisine encompasses the cuisine of countries located on the Mediterranean Sea. This includes countries like Italy, Greece, Syria, Morocco and Spain. These countries have large affiliated population within the city of Toronto. The aim of this analysis is to look at all neighbourhoods of Toronto and find the best location to open a new Mediterranean restaurant. We will take into consideration the proximity to other similar restaurants as well as where the restaurant would thrive near demographics that would enjoy Mediterranean cuisine.

**Interests:**

Interested parties in this type of exploratory analysis would be entrepreneurs who may be looking to exploit the market by using data to obtain an advantage over the competition by finding the best location for a restaurant.

**Data:**

This section we will look at the sources that will be used as well as why they were chosen.

1. The first source will be a list of all the Toronto postal codes and the neighbourhoods that accompany them. This will allow an easy way to identify neighbourhoods when analyzing the demographic data and will help when creating maps.

(<https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M>)

1. This next source will allow us to look at the demographic breakdown in Toronto to see where the Mediterranean population resides and help make connections between demographics and the potential locations to open a new restaurant.

(<https://en.wikipedia.org/wiki/Demographics_of_Toronto>)

1. Next to gather data on restaurants relative to neighbourhoods we will be using the four square api

(<https://foursquare.com/>)

1. For mapping we will need latitude and longitude which we will obtain from a csv file with all the information synced to the Toronto neighbourhoods.

(<https://cocl.us/Geospatial_data>)

1. Lastly for a more detailed breakdown of city demographics in a neighbourhood by neighbourhood basis with a dataset containing the population numbers of Mediterranean people as well as average household income numbers.

(<http://map.toronto.ca/wellbeing/#eyJ0b3Itd2lkZ2V0LWNsYXNzYnJlYWsiOsSAcGVyY2VudE9wYWNpdHnElzcwfSwiY3VzxIJtYcSTYcSXxIBuZWlnaGJvdXJob29kc8S2fcSrxIHEg8SFxIfEicSLdGFixYXEmCLEo3RpdmVUxZBJZMSXxYnEhMWPYi1pbmRpY2HEgnLFhcWIYWdzTWFwxLYiesWCbcSXMTDErHjEly04ODM2NDQ1LjAzNzk4OTTErMSnOjU0MjE0OTIuMcaNxow1NcWIxaTFpsWoxarFksSAxZjFq2lvbsSXMsSsc8WkZ2xlxbTErnLEk8SfVGltZcWcxKjErMWWxrrGpCI3xbTGoMWnxanEg8Wcc0HFpVfEucS7dMWSW8SAxIfFnjczIsSsd8eOaHTFucSsxJPGpnNlUG%2FEjnLEpcaQZmFsx6LEq8eTxZ06IsW6MceYIseaxLrHnMeeIsegxJvHosekx6bHqMSXx6rHrGXHriLHlMexMTMwx7XHt8ePx7rHvMWrx6PHpcSzyIE6yIPHrSzHr8WeMTI4yI3Hm8edOjHHn2XHociTyIDEpsiCx6vImcibyIk1yIzHmcihyJDIpse9yKjIlciqyJfIrMiFXcWHxYjGv2XHosenyYHFhsSsxrTGtnRJxaXHhsWqTcWDxrLHscaubsawxrLFhw%3D%3D>)

**Data Cleaning & Processing:**

The first step was scraping the Wikipedia page with all the Toronto neighbourhood data, including names of the neighbourhoods and their postal codes. Once this was in a data frame the table had certain neighbourhoods with an unassigned value. The steps taken to clean this were to remove any entry where there were more than two values missing. Next was to take the data from the csv file and mere it with the data frame to make one single table that has all the geographic data needed for the analysis4.

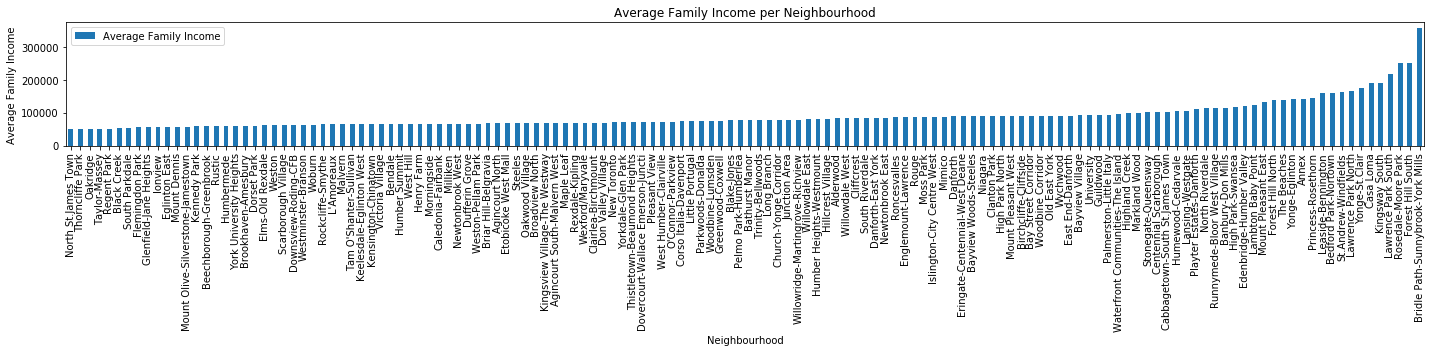
The next table contained all the demographic data collected from an official City of Toronto website5.Since this website agglomerated the official census data there was an issue since Mediterranean is not an official denomination. To work around this, I took the data for: ‘Europe’, ‘Arab’ and ‘West Asia/Middle East’. The data was the added together in another column that was considered Mediterranean. This is not a perfect encapsulation of a Mediterranean population but was the best available.

Since we are looking for an ideal location for a restaurant next the four square api was used to access the Mediterranean restaurants currently in Toronto. When parsing through there were not a significant number of Mediterranean restaurants therefore, I broadened the criteria since Mediterranean is somewhat of a blanket term. The new criteria included Mediterranean, Greek and Italian restaurants since these were the most significant Mediterranean cuisines that could be considered competition to a new restaurant. Later on all three tables were joined together as one final table with all data.

**Methodology**

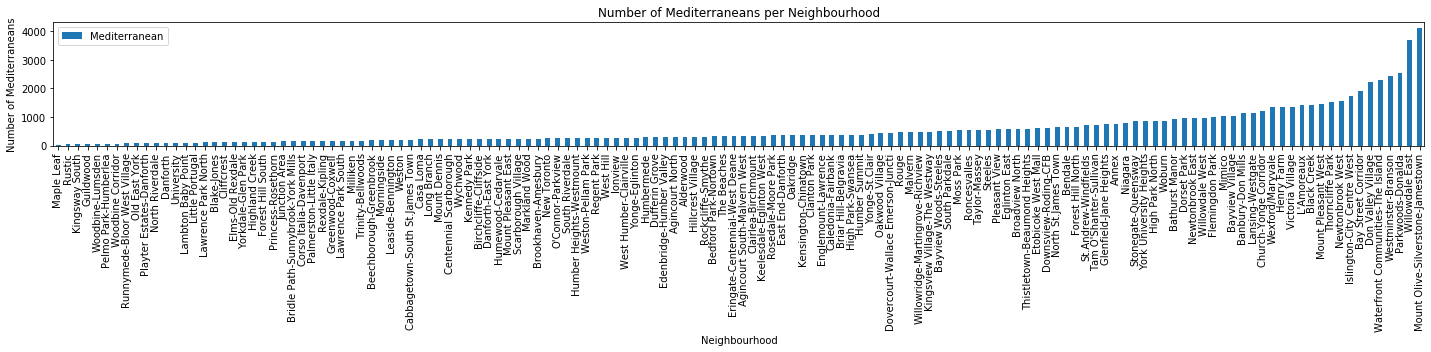
Since this analysis is looking at the best location for a new Mediterranean restaurant, it is key to know the demographic breakdown of the area the restaurant is to be opened in. Key factors to opening a new restaurant would be the demographics fondness to the type of cuisine served, which also ties in the type of cuisine and dominant demographic of the area. Another potential factor would be the average income, this may have an affect on family’s likelihood to eat out or order take away. Additionally, the amount of immediate competition from the surrounding area which would most likely be the largest factor when looking at a location. All three of these factors may be key therefore should be explored further.

Distribution of Family Income



Mediterranean’s per Neighbourhood

I would expect that there will be a higher frequency of Mediterranean restaurants where the population of Mediterranean is higher



Frequency of Mediterranean Restaurants

Using the mean number of Mediterranean restaurants taken by using four square api, we can see the distribution of the Mediterranean restaurants across the city of Toronto. The reason for gathering this data is because knowing the frequency of Mediterranean restaurants will give a rough estimate of what the competition for customers would be like in the respective neighbourhoods.

Chart

Description automatically generated

The next step is to cluster the data to see which neighbourhoods are characteristically similar. This will provide the owners of a restaurant a grouping of neighbourhoods which can help choose which area is best for a restaurant considering the many factors. The first step to do this is to create a plot where we can determine the ideal number of clusters for the data at hand.

Squared error for number of clusters

Chart, line chart

Description automatically generated

Using this chart it looks like the ideal number of clusters would be 4.

**Results**

The four clusters were situated around the city like in this map.

Map

Description automatically generated

Each of the four clusters had different characteristics that would make them better potential markets for a new Mediterranean restaurant.

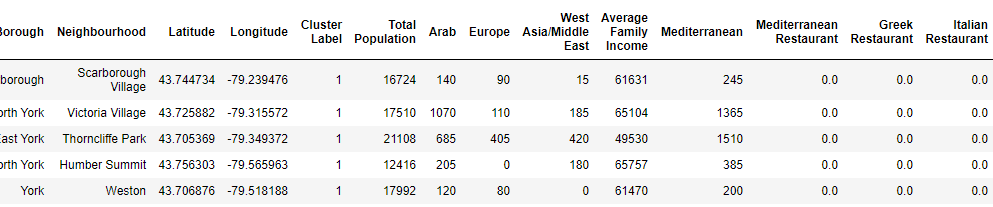
Cluster 1

Graphical user interface, text, application

Description automatically generated

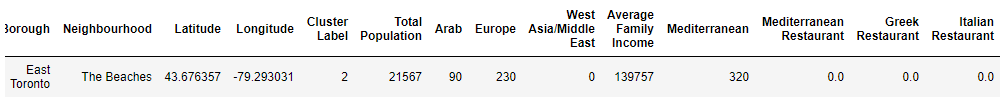
The first cluster has higher income and a higher population of Mediterranean people as well as some competition from other similar restaurants.

Cluster 2



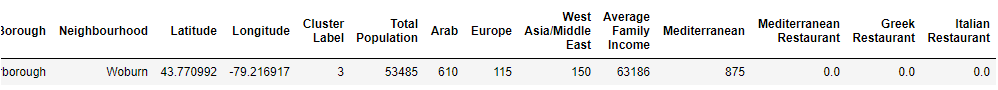
The second cluster has middle tier income and a quite high Mediterranean population but not much competition when it comes to the Mediterranean restaurant market.

Cluster 3



Cluster three contains the highest income out of all the clusters, but also has one of the lowest Mediterranean populations and no Mediterranean restaurants.

Cluster 4



This last cluster has middle tier income and a Mediterranean population that is not too small but little to no Mediterranean restaurants.

**Discussion**

Some observations from the data were that the number of Mediterranean’s within the population did not necessarily equal a large number of those restaurants. This was the opposite to what I had thought to be true. For prospective owners of a Mediterranean restaurant there would be many good locations to open up a new restaurant, which is reflected in the data. The best possible location remains to be completely clear it would depend on what new owners would consider the key aspects for success of the restaurant. For example cluster 3 has a high average income which one may assume could lead residents to be more likely to spend money to dine out or order take away, but with a relatively low population of Mediterranean people you would have to look at the likelihood of that population to try a new restaurant with food different to their own culture. These are just some of the many different factors to consider. That being said, looking at the data the most promising cluster to open a restaurant in would be cluster 2. This cluster has the highest Mediterranean population in the study but with a negligible number of Mediterranean restaurants which presents a unique opportunity for a new restaurant to capitalize on the lack of competition. Additionally, the cluster has middle tier average income which means they are still likely to consider eating out and take away. Within cluster two the two best options would be Victoria Village or Thorncliffe Park since they both have the highest population numbers for Mediterranean people.

**Conclusion**

In this study I analyzed Toronto geographic and demographic data to determine the best spots to potentially open a Mediterranean cuisine restaurant. Looking at average household Income, Population numbers and other similar restaurants I determine 4 cluster where opening a restaurant would be a viable option. Using the data, the recommendation was that cluster 2 was the most viable with the neighbourhoods of Victoria Village or Thorncliffe Park being the best two within that cluster.

**Next Steps**

The next steps would be to go more in depth to find the best spot within the chosen cluster of neighbourhoods. The residents of the area could be surveyed to see the likelihood of ordering take out or dining out to see if it is worth opening. Additionally it may make sense to see if residents would be likely to still order or go to a restaurant even if it is out of neighbourhood because there may not be rental space for a new restaurant or Startup cost may be too high in the area.