Capstone Project - Opening a Café in Toronto

Introduction

Dining out or simply going for a coffee are common pastimes in the city of Toronto with cafés, coffee shops or tea rooms being very popular venues. Therefore, it makes financial sense to invest in a new Toronto café.

In order to ensure that the café is as successful as possible, the ideal location for the venue needs to be found. To maximise the number of potential customers the café would ideally be close to the centre of the city, where there is likely to be a lot of foot traffic. However, it should not be too close to areas with a high density of existing cafés, coffee shops or tea rooms as to reduce the amount of direct competition.

The purpose of this report is to describe the data and analysis done to solve this problem. At the end of the report the findings will be presented so that the stakeholders will have confidence that this is a project worth investing in.

Data

To find the ideal location for a new café in Toronto we first need the geospatial data pertaining to the neighbourhoods in the city. Only the central boroughs of Downtown Toronto and Queen's Park are selected. The neighborhoods within these boroughs are identified by scraping the Toronto postcode information from the Wikipedia page:
https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M.
The coordinates of the Toronto neighbourhoods can then be found using the package 'geocoder'.

The Foursquare API is used to find information on all venues in Toronto. Selections can be made so that only information about the cafés, coffee shops or tea rooms in Downtown Toronto and Queen's Park are returned, a selection of the data can be seen in the figure 1 below. Then one can find the areas of low density for these types of venues.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Regent Park, Harbourfront	43.65512	-79.36264	Tandem Coffee	43.653559	-79.361809	Coffee Shop
6	Regent Park, Harbourfront	43.65512	-79.36264	Rooster Coffee	43.651900	-79.365609	Coffee Shop
8	Regent Park, Harbourfront	43.65512	-79.36264	Sumach Espresso	43.658135	-79.359515	Coffee Shop
12	Regent Park, Harbourfront	43.65512	-79.36264	Starbucks	43.651613	-79.364917	Coffee Shop
18	Regent Park, Harbourfront	43.65512	-79.36264	Savoury Grounds	43.656821	-79.358970	Coffee Shop
29	Ontario Provincial Government	43.66253	-79.39188	Coffee Island	43.664271	-79.386972	Coffee Shop
32	Ontario Provincial Government	43.66253	-79.39188	Second Cup	43.659018	-79.394152	Coffee Shop
34	Ontario Provincial Government	43.66253	-79.39188	Aroma Espresso Bar	43.658928	-79.389903	Café
36	Ontario Provincial Government	43.66253	-79.39188	Tim Hortons	43.659415	-79.391221	Coffee Shop
37	Ontario Provincial Government	43.66253	-79.39188	Tim Hortons	43.658906	-79.388696	Coffee Shop
40	Garden District, Ryerson	43.65739	-79.37804	Page One Cafe	43.657772	-79.376073	Café
54	Garden District, Ryerson	43.65739	-79.37804	Tokyo Smoke	43.657020	-79.380445	Coffee Shop
55	Garden District, Ryerson	43.65739	-79.37804	Oakham Café	43.658078	-79.378315	Café
57	Garden District, Ryerson	43.65739	-79.37804	Balzac's Coffee	43.657854	-79.379200	Coffee Shop
59	Garden District, Ryerson	43.65739	-79.37804	The Black Canary Espresso Bar	43.657029	-79.381385	Café

Figure 1: Selection of Toronto Café data.

Methodology

Initial Data Scrape

The Beautiful Soup package in Python is used to extract and format the required postcode data as described in the previous section. The table of postcodes, neighbourhoods and boroughs is then formatted into a Pandas DataFrame. The geocoder API is then used to obtain the coordinates of each of the postcodes.

FourSquare API

Foursquare credentials are required to use the FourSquare API, once obtained, a function is created to find all venues near the to each of the coordinates compiled using geocoder. The name, type and location of each venue is collected into a new DataFrame. A selection is made on the DataFrame to return only the cafés, coffee shops, tea rooms and bubble tea shops:

toronto_cafes=toronto_venues[(toronto_venues['Venue Category']=='Café') | (toronto_venues['Venue Category']=='Coffee Shop') | (toronto_venues['Venue Category']=='Tea Room') | (toronto_venues['Venue Category']=='Bubble Tea Shop')]

Toronto Café Heatmap

The cafés, coffee shops, tea rooms and bubble tea shops are highlighted (blue circles) onto a map of Toronto using Folium. A heatmap is produced showing the highest density regions of these types of venue around Downtown Toronto, see figure 2 below:
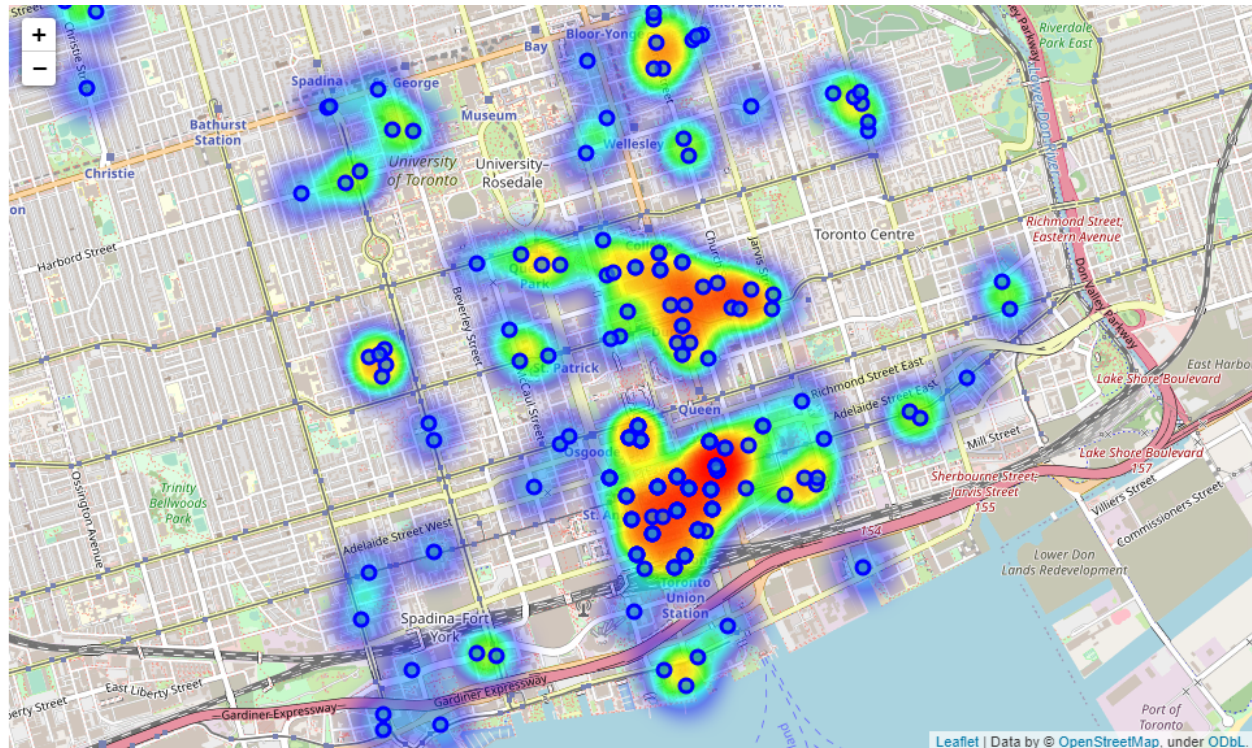

Figure 2: Locations (blue circles) and heatmap of cafés, coffee shops, tea rooms and bubble tea shops around Downtown Toronto.

Finding the Ideal Location

A selection is made on the DataFrame to return everything but the cafés, coffee shops, tea rooms and bubble tea shops:

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toronto_other=toronto_venues[(toronto_venues['Venue Category']!='Café') & (toronto_venues['Venue Category']!='Coffee Shop') & (toronto_venues['Venue Category']!='Tea Room') & (toronto_venues['Venue Category']!='Bubble Tea Shop')]
```

The other types of venue are highlighted (black dots) onto a map of Toronto using Folium. The same heatmap of the highest density regions of cafés, coffee shops, tea rooms and bubble tea shops around Downtown Toronto is added, see figure 3 below.
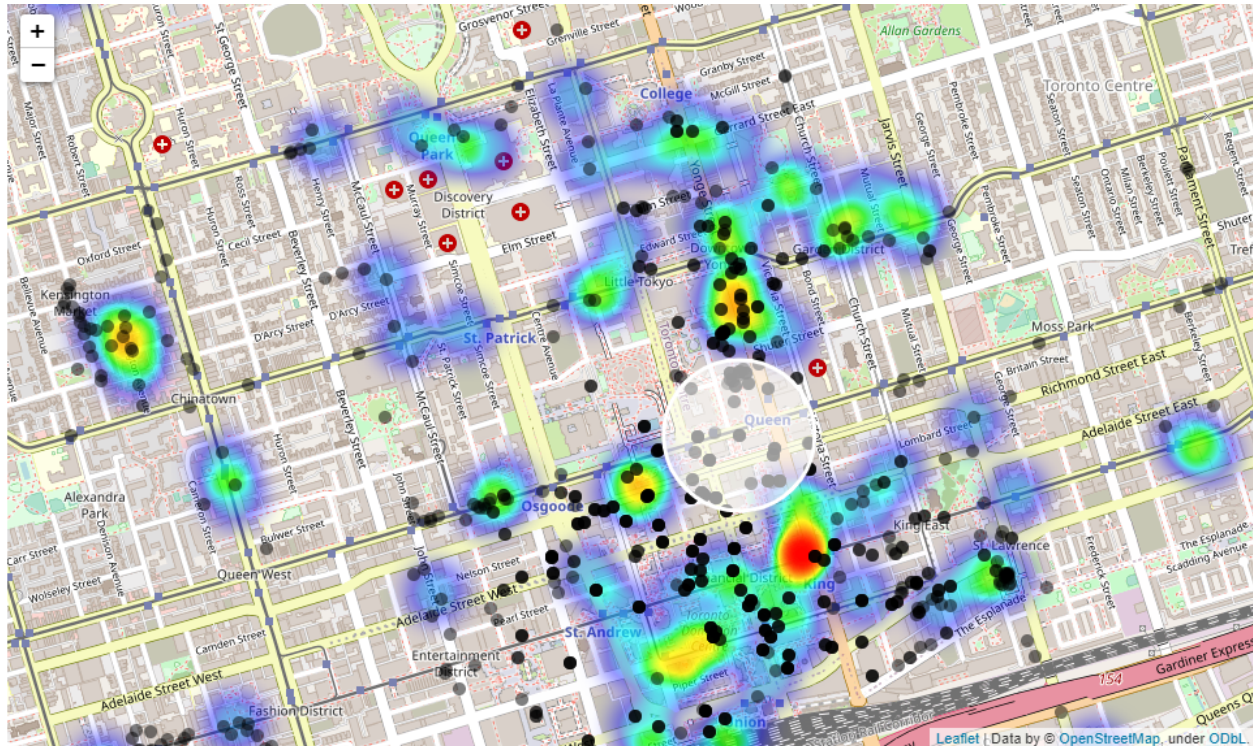
Figure 3: Locations of all other types of venue (black dots) with heatmap of cafés, coffee shops, tea rooms and bubble tea shops around Downtown Toronto. The white circle shows this reports determination of the ideal location for a new café.

Results

In Figure 2, one can see that there are two distinct high density regions of cafés, coffee shops, tea rooms and bubble tea shops around Downtown Toronto. However, there is an L-shaped corridor in between these two sections where there is a void of cafés, coffee shops, tea rooms and bubble tea shops. Figure 3 zooms in on this 'corridor' and adds in the locations of other types of venues. There is a fairly large region in the centre where the heatmap shows there are no afés, coffee shops, tea rooms and bubble tea shops nearby but a large number of other types of venues. From this, it is inferred that there would be a large number of people (potential customers) passing through this area without much direct competition close by. A white circle of radius 200 metres, centred on 43.65 by -79.38 degrees highlights this area. This area is this report's recommendation for the location of the new café.

Discussion

Cafés, coffee shops, tea rooms and bubble tea shops are popular venues in Toronto with 201 found in Downtown Toronto and Queen's Park alone. Therefore, there is much potential in opening a new business in this area. To maximise the number of potential customers it is recommended to open the new café in Downtown Toronto or Queen's Park where there is likely to be a higher traffic of people. The area suggested in the results section is determined to be the ideal location as it is in the heart of Downtown Toronto, there is a high number of other types of venue meaning there is likely to be lots of people, therefore many potential customers, whilst being an are with a low density of cafés, coffee shops, tea rooms and bubble tea shops so there will be limited competition.

Conclusion

The purpose of this report was to find the ideal location for a new café in Toronto. This makes business sense as cafés, coffee shops, tea rooms and bubble tea shops are popular venues in Toronto. To solve this problem data on existing venues in Downtown Toronto were collated using the Geocoder and FourSquare APIs. The ideal location of a circle of radius 200 metres, centred on 43.65 by -79.38 degrees was selected based on the criteria that it is in the heart of Downtown Toronto with a high number of other types of venue with a low density of cafés, coffee shops, tea rooms and bubble tea shops. These criteria were selected to maximise the number of potential customers and limit competition.

This report's goal was to find the ideal location of the new café. Other factors need to be considered before proceeding with this venture such as:
- Property prices
- Property availability
- Price ranges of other cafés in Toronto
- Menu items of successful cafés in Toronto
- Popularity of potential menu items
- Running costs
- Health codes

These recommendations will be provided to stakeholders as evidence that this is a new business worth investing in.