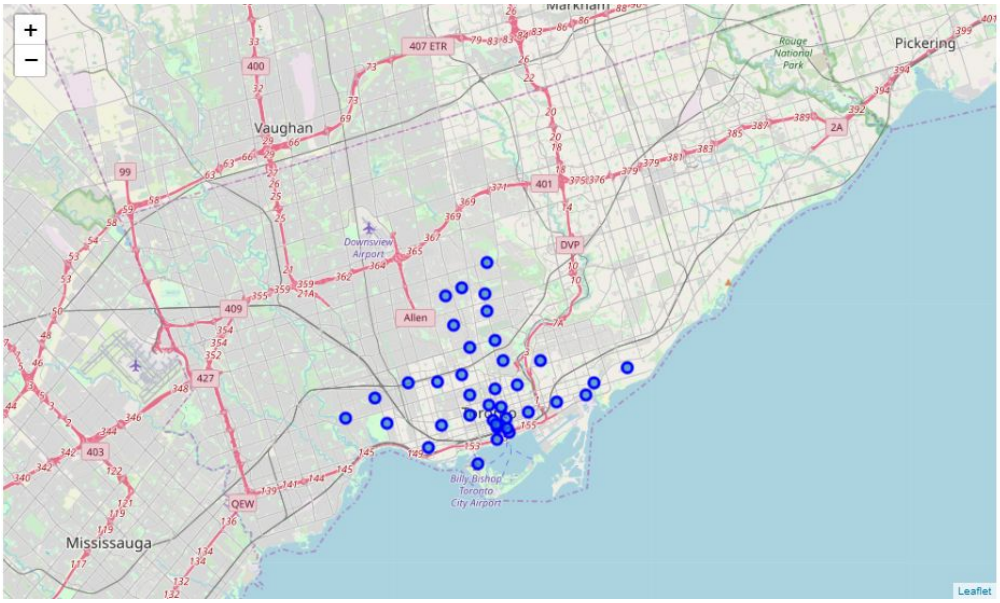
Capstone Report

Trending places in TORONTO



Introduction

Mergers come into play in the world of business for two very different reasons. The first is when you've decided it makes sense to join forces with another company to reap the rewards that come from your combined strengths. A smart business merger can help you enter a new market, reach more customers, freeze out a competitor or fill a gap in your company's abilities. Mergers can get you on the fast track to become more competitive. With a complementary partner, your business can acquire products, distribution channels, technical knowledge, infrastructure or cash to propel you to a new level of success. The flexibility and power boost they provide can be a key strategic tool for today's entrepreneurs. And the best part is that they can go wherever your ideas take them(source:https://www.entrepreneur.com/encyclopedia/mergers).

In this scenario a company who wants to expands its business into a new city, wants to do analysis of famous and trending places in Toronto, where people usually prefer to go over others. The company wants to narrow down some trending places in Toronto so that they can open their new center or merge with a existing player in that particular area.

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1. Business Problem

A famous restaurant chain, headquartered in London, had slowly expanded their arms to various untouched cities in Europe, and with time they have grown up quite significantly, instead of opening new restaurant, the companies believe in collaboration.

They had already collaborated with major local players in approximately 34 cities in western Europe, and the company is making high revenue out of it. One peculiar thing about the company is that they not only invest in other restaurant or eating joints, they also collaborate with cafes, regional snack centre and other places where people go for an experience.

The company wants to expand its boundary and this time they have their eye on Toronto. The company is looking forward for major experience and food players in famous and trending areas.

NOTE: The company wants to shortlist certain trending areas in Toronto

For the Purpose of analysis we will be dividing the whole Toronto into 5 main regions called North ,West, South, East and Central Toronto.

Based on the data and visual analysis we will selecting the place or area from the above mentioned areas for the company to target major food players in Toronto

2. Data

We will be using foursquare data for this report generation, we will shortlisting certain trending places in Toronto where people usually go for the purpose of entertainment and food.

The main focus here is to select the most trending area in the Toronto. and not the exact Restaurants and Entertainment centers.

	Places	Latitude	Longitude
0	East Toronto	43.740571	-79.315266
1	West Toronto	43.665612	-79.471215
2	North Toronto	43.706400	-79.404222
3	South Toronto	43.677616	-79.377684
4	Central Toronto	43.657921	-79.421661

We had divided the whole Toronto into 5 main regions called North ,West, South, East and Central Toronto. We will be selecting one out of the five areas

We will be narrowing down our list of Trending places in Toronto based on user experiences and number of average number of people visit that area and many others.

We will be using data from Foursquare.com as well various other website, also we will be loading some CSV containing data which might be helpful for our analysis.

3. Libraries Used:

1. Numpy, to handle data
2. Pandas, for analysis
3. Json for taking care of Json files
4. Geocoders for handling latitudes and longitudes.
5. Matplotlib for plotting graphs and visuals
6. Sklearn for clustering
7. Folium for generating map Visuals

4. Analysis:

First we load all of the required libraries(mentioned above) for the analysis.

Then we load the CSV files containing the latitudes and longitudes of the four zones of Toronto namely North ,West, South, East and Central Toronto as we want to classify our trending venues based on their location in the following zones.

	Places	Latitude	Longitude
0	East Toronto	43.740571	-79.315266
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We create a map of Toronto using latitudes and longitudes values.

The geographical coordinate of Toronto are 43.653963, -79.387207.

We called the Foursquare API and define the credentials for further obtaining Json files for our analysis.

We explore the different venue using the Foursquares credentials and converting the obtained Json file in to the pandas dataframe for our further analysis.

```
East Toronto
West Toronto
North Toronto
South Toronto
Central Toronto
```

	Places	Places Latitude	Places Longitude	Venue	Venue id	Venue Latitude	Venue Longitude	Venue Category
0	East Toronto	43.740571	-79.315266	Georgy Porgy's	4b2ffd70f964a52003f424e3	43.741668	-79.314625	American Restaurant
1	East Toronto	43.740571	-79.315266	Baskin Robbins	4de5655118389f0558613366	43.742158	-79.314141	Ice Cream Shop
2	East Toronto	43.740571	-79.315266	Damas Grillhouse & Juice Bar	4d0bf09d3bc0b60c7e5bd174	43.741839	-79.309296	Mediterranean Restaurant
3	East Toronto	43.740571	-79.315266	Shooters Snooker & Sports Club	4ddb3971922e1b86cddae4e9	43.742637	-79.313052	Pool Hall
4	East Toronto	43.740571	-79.315266	GoodLife Fitness North York Victoria Terrace	4b049809f964a520725522e3	43.742234	-79.313351	Gym

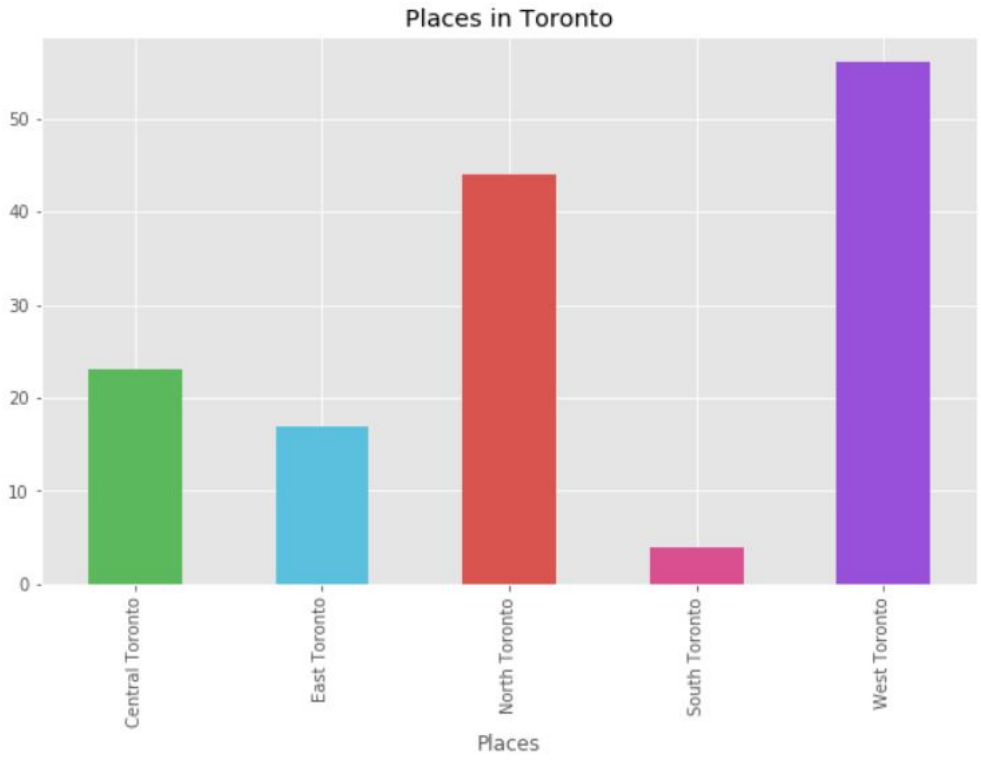
Then we group the places accordingly to the different venues counts on the data frame.

The output is as follows:

```
Out[65]: Places
         Central Toronto    23
         East Toronto       17
         North Toronto      44
         South Toronto       4
         West Toronto       56
         Name: Venue Category, dtype: int64
```

We load the data in python and also use Foursquare API to generate a series of results which includes the trending area in Toronto.

Then we plot an histogram to visualise different places based on the number of different counts of venue.



We also calculate average of different venues in each of the five location.

	Places	American Restaurant	Antique Shop	Arts & Crafts Store	Asian Restaurant	Baby Store	Bakery	Bar	Baseball Field	Beer Store	Bookstore	Boutique	Breakfast Spot	Buffet	Building
0	Central Toronto	0.000000	0.000000	0.000000	0.000000	0.000000	0.043478	0.086957	0.000000	0.000000	0.043478	0.000000	0.086957	0.000000	0.00
1	East Toronto	0.058824	0.000000	0.000000	0.000000	0.058824	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00
2	North Toronto	0.000000	0.000000	0.022727	0.022727	0.000000	0.022727	0.000000	0.022727	0.000000	0.045455	0.000000	0.022727	0.022727	0.00
3	South Toronto	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.25
4	West Toronto	0.000000	0.035714	0.035714	0.000000	0.000000	0.035714	0.071429	0.000000	0.017857	0.017857	0.017857	0.017857	0.000000	0.00

Then we select top 10 venues in each of the five zones, the python output is as follows:

Based on the users rating and average number people visiting that area, we had shortlisted several places in the Toronto.

```
----Central Toronto----
                  venue  freq
0                   Bar  0.09
1          Dessert Shop  0.09
2         Breakfast Spot  0.09
3    Italian Restaurant  0.04
4             Pet Store  0.04
5    Salon / Barbershop  0.04
6               Gay Bar  0.04
7    Falafel Restaurant  0.04
8  Portuguese Restaurant  0.04
9            Sports Bar  0.04


----East Toronto----
                      venue  fre
0       American Restaurant  0.0
1        Chinese Restaurant  0.0
2  Mediterranean Restaurant  0.0
3              Intersection  0.0
4         Indian Restaurant  0.0
5            Ice Cream Shop  0.0
6              Home Service  0.0
7                       Gym  0.0
8                 Pool Hall  0.0
9       Fried Chicken Joint  0.0
```

Based on these values ce combines the result of all the zones and categories it into most common venues in all the zones and put it into a dataframe and the output is as follows:

Out[78]:

	Places	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Central Toronto	Dessert Shop	Breakfast Spot	Bar	Pet Store	Candy Store	Salon / Barbershop	Falafel Restaurant	Portuguese Restaurant	Bookstore	Sports Bar
1	East Toronto	Intersection	Sandwich Place	Baby Store	Chinese Restaurant	Coffee Shop	Deli / Bodega	Discount Store	Fried Chicken Joint	Gym	Home Service
2	North Toronto	Coffee Shop	Fast Food Restaurant	Japanese Restaurant	Gym	Bookstore	Pizza Place	Caribbean Restaurant	Burger Joint	Pub	Poutine Place
3	South Toronto	Park	Trail	Building	Yoga Studio	Fried Chicken Joint	Diner	Discount Store	Electronics Store	Falafel Restaurant	Fast Food Restaurant
4	West Toronto	Bar	Coffee Shop	Italian Restaurant	Café	Thai Restaurant	Nail Salon	Bakery	Grocery Store	Antique Shop	Arts & Crafts Store

5. Result

Based on the analysis the result is as follows:

A. North Toronto should be the place where the company should target to acquire new partner in food industry as it has 4 out 10 food centres in the most common venue table.

NORTH TORONTO

In [88]:
```
Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 2, Toronto_merged.columns[[1] + list(range(5, Toronto_merged.shape[1]))]]
```

Out[88]:

	Latitude	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
1	43.665612	Coffee Shop	Italian Restaurant	Café	Thai Restaurant	Nail Salon	Bakery	Grocery Store	Antique Shop	Arts & Crafts Store

Also all 4 of them fall under top 4 most common venue in North Toronto.

B. Apart from North Toronto the Company can also Look forward in West Toronto

WEST TORONTO

In [90]:
```
Toronto_merged.loc[Toronto_merged['Cluster Labels'] == 4, Toronto_merged.columns[[1] + list(range(5, Toronto_merged.shape[1]))]]
```

Out[90]:

	Latitude	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
2	43.7064	Fast Food Restaurant	Japanese Restaurant	Gym	Bookstore	Pizza Place	Caribbean Restaurant	Burger Joint	Pub	Poutine Place

As west Toronto has 5 food centres out of its 10 most common venues list.

6. CONCLUSION

Based on the exploratory and visual data analysis we conclude that the company can look forward into North and West Toronto to expands its business in Toronto.

The company can easily find and will be benefited the most if they eye potential partners and collaborators in the North and the West zones of Toronto.