The Battle of the Neighborhoods - Week 1

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Kindly note that this section contains only the Business Problem and Data (as "Source of Data" used in this report)

1. Introduction

1.1 Background

The city of Calgary is one of the largest municipalities Canada located in the province of Alberta. The city had a population of 1,285,711 in 2019, making it Alberta's largest city and Canada's third-largest municipality.

Calgary's economy includes activity in the energy, financial services, film and television, transportation and logistics, technology, manufacturing, aerospace, health and wellness, retail, and tourism sectors.

The Calgary Metropolitan Area (CMA) is home to Canada's second-highest number of corporate head offices among the country's 800 largest corporations.

With a thriving population and rich economy like this, there is no doubt a restaurant might be a good business venture in the city of Calgary.

1.2 Business Problem

Finding the right location to open a new restaurant can be quite challenging because the investor has to be confident that the proposed restaurant isn't located in a neighborhood already congested with restaurants were completion may be stiff. Also, the restaurant investor needs to be sure there's a market demand for its proposed cuisine/meals.

In this Capstone project, we will be focussing on using location analytics and machine learning algorithms such as clustering to provide answer these business questions.

1.3 Interest/Target Audience

The outcome of this project benefits an investor who is looking to setup a new restaurant business or expand an existing restaurant value chain.

2 Source of Data

For this analysis, I will be using the "List of neighbourhoods in Calgary" data scraped from Wikipedia (https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Calgary).

From the scraped data, there are total 257 neighbourhoods are in Calgary. The data will be trimmed down to two features ("Name" and "Sector") to remove irrelevant data for this analysis.

There are total 257 neighbourhoods are in Calgary. We will find latitude and longitude of each neighbourhood and cluster them according the restaurants present in each neighbourhood fetched from foursquare location data. Then we will make decision examining each cluster of neighbourhoods.

Sample records from Wikipedia.

	Name[9]	Quadrant	Sector[10]	Ward[11]	Type[10]	2012 PopulationRank	Population(2012)[9]	Population(2011)[9]	% change	Dwellings(2012)[9]	Area(km2)[10]	Populationdensity
0	Abbeydale	NE/SE	Northeast	10	Residential	82	5917.0	5700.0	3.8	2023.0	1.7	3480.6
1	Acadia	SE	South	9	Residential	27	10705.0	10615.0	0.8	5053.0	3.9	2744.9
2	Albert Park/Radisson Heights	SE	East	10	Residential	75	6234.0	6217.0	0.3	2709.0	2.5	2493.6
3	Altadore	SW	Centre	11	Residential	39	9116.0	8907.0	2.3	4486.0	2.9	3143.4
4	Alyth/Bonnybrook	SE	Centre	9	Industrial	208	16.0	17.0	−5.9	14.0	3.8	4.2

The dataframe will be enriched by writing a function to append "Calgary" to each neighborhood to enhance the chances of looking-up the coordinates of each neighborhood.

```
calgary_df.head()
```

	Neighborhood	Location
1	Acadia	South, Calgary
2	Albert Park/Radisson Heights	East, Calgary
3	Altadore	Centre, Calgary
4	Alyth/Bonnybrook	Centre, Calgary
5	Applewood Park	East, Calgary

Further enrichment of the dataframe will be performed to include the coordinates (latitude and longitude) for each neighbourhood using the geopy library.

```
[14]: calgary_df.head()
```

[14]:

	Neighborhood	Location	Latitude	Longitude
1	Acadia	South, Calgary	50.968655	-114.055587
2	Albert Park/Radisson Heights	East, Calgary	51.044845	-113.990195
3	Altadore	Centre, Calgary	51.015104	-114.100756
4	Alyth/Bonnybrook	Centre, Calgary	51.016669	-114.024294
5	Applewood Park	East, Calgary	51.044658	-113.928931

The Calgary demographic data will then be used as an input to the foursquare location data to fetch top 100 restaurants nearby to each neighbourhood within 4000 meters radius.

```
[47]: calgary_restaurants_unique[calgary_restaurants_unique['Venue Category'].str.contains('Restaurant')].head()
```

[47]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
1	Abbeydale	51.058836	-113.929413	A&W Canada	51.068291	-113.933571	Fast Food Restaurant
3	Abbeydale	51.058836	-113.929413	Song Huong Vietnamese Restaurant	51.038606	-113.942208	Vietnamese Restaurant
6	Abbeydale	51.058836	-113.929413	McDonald's	51.075787	-113.958094	Fast Food Restaurant
9	Abbeydale	51.058836	-113.929413	KFC	51.064316	-113.957155	Fast Food Restaurant
10	Abbeydale	51.058836	-113.929413	Barrio Fiesta	51.052695	-113.935544	Filipino Restaurant