

An aerial photograph of Calgary, Alberta, Canada. The image shows the city's skyline with numerous skyscrapers, including the distinctive Calgary Tower. In the foreground, the Bow River flows through the city, bordered by lush green Central Park. A large, semi-transparent circular graphic is overlaid on the right side of the image, containing the title text.

The Battle of Neighborhoods

City of Calgary

Introduction

- Calgary is the third-largest municipality in Canada.
- Many Calgarians lived in the city's suburbs, central districts such as 17 Avenue, Kensington, Inglewood and the Mission District, which have become more popular and the density in those areas has increased.
- There were more than 5900 restaurants operating in Calgary according to the records from Alberta Health Services. That's up from 5500 in 2015. Compare with the rest of Canada, Albertans spend the second most on dining out.



Problem Description

- A restaurant, or an eatery, is a business that serves food and drinks to customers.
- With the increased competition from food delivery services like SkipTheDishes and UberEats, a lot of restaurant owners were forced to think outside the box.
- According to the 2016 Census, 60% of Calgary's population was European origin, 36% of the population belonged to a visible minority group. It's food culture includes international cuisines influenced by the immigrants.





Problem Description

- Community Population
- Demographics
- Who are the competitors in the location?
- Are there any Farmers Markets, Wholesale Markets ect nearby so the ingredients can be purchased in low cost?



Target Audience

- The objective is to locate and recommend to the management which neighborhood of Calgary will be best choice to start a restaurant. The Management also expects to understand the rationale of the recommendations made.
- The success criteria of the project will be a good recommendation of borough/Neighborhood choice to any company who would like to do investment to Calgary, based on Lack of such restaurants in that location and nearest suppliers of ingredients.

Data Section

	Name	Type	Population
0	Abbeydale	Residential	5,917
1	Acadia	Residential	10,705
2	Albert Park/Radisson Heights	Residential	6,234
3	Altadore	Residential	9,116
4	Alyth/Bonnybrook	Industrial	16

- Data1.
- list of neighborhoods in Calgary
 - The dataset is on the free wikipedia.
- https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Calgary

	TRADENAME	ADDRESS	LICENCETYPES	COMDISTNM	JOBSTATUSDESC	JOBCREATED	longitude	latitude	location	Count
0	FESTIVAL MARKET AT EAU CLAIRE	139 BARCLAY PR SW	MARKET	EAU CLAIRE	RENEWAL LICENSED	1995/07/11	-114.069507	51.052453	(51.052453240987, -114.06950715568)	1
1	CHINOOK CENTRE	#B 6455 MACLEOD TR SW	MARKET	MEADOWLARK PARK	RENEWAL LICENSED	2000/06/13	-114.073836	50.997976	(50.9979758797472, -114.0738360896)	1
2	KENSINGTON ARTISAN MARKET	#101 225 10 ST NW	MARKET	HILLHURST	LICENSED	2019/01/23	-114.086241	51.053591	(51.0535912689486, -114.086241242606)	1
3	BROOKFIELD PLACE (CALGARY) GP	225 6 AV SW	MARKET	DOWNTOWN COMMERCIAL CORE	RENEWAL LICENSED	2017/05/16	-114.066183	51.047071	(51.0470708957163, -114.066182739294)	1
4	BANKERS COURT	850 2 ST SW	MARKET	DOWNTOWN COMMERCIAL CORE	RENEWAL LICENSED	2013/10/16	-114.067340	51.044991	(51.0449905772837, -114.067340276426)	1

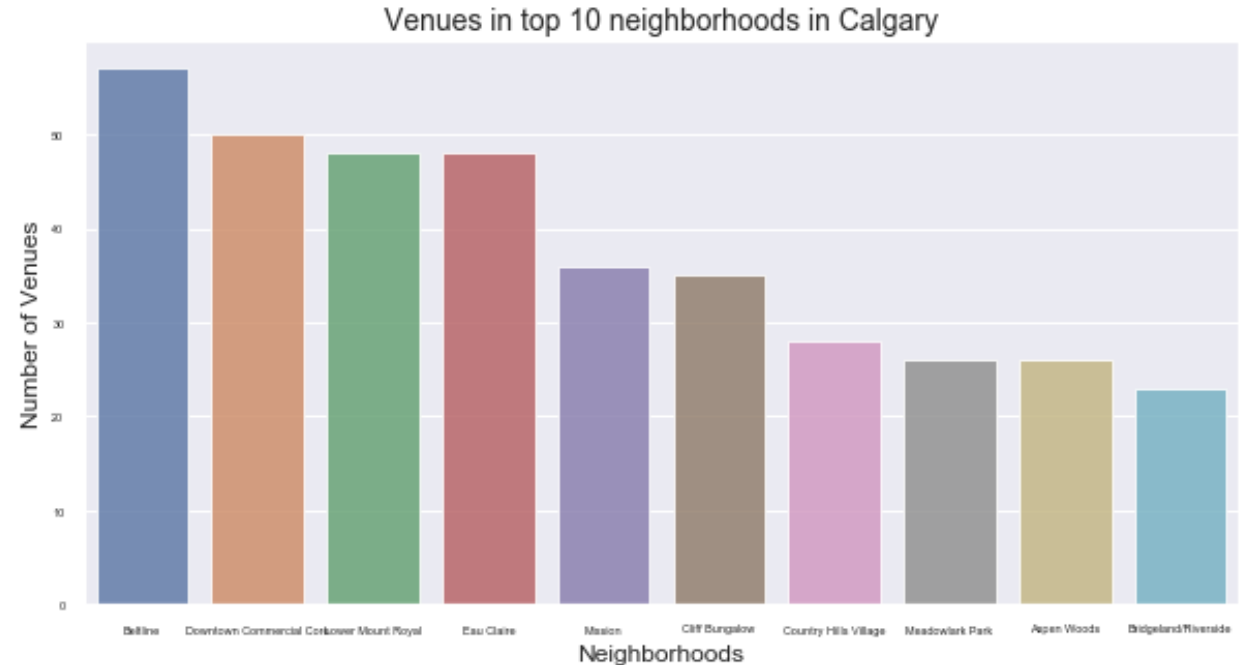
- Data2.list of business license database filtered as Market
- Link is: <https://data.calgary.ca/Business-and-Economic-Activity/Calgary-Business-Licences/vdjc-pybd/data>

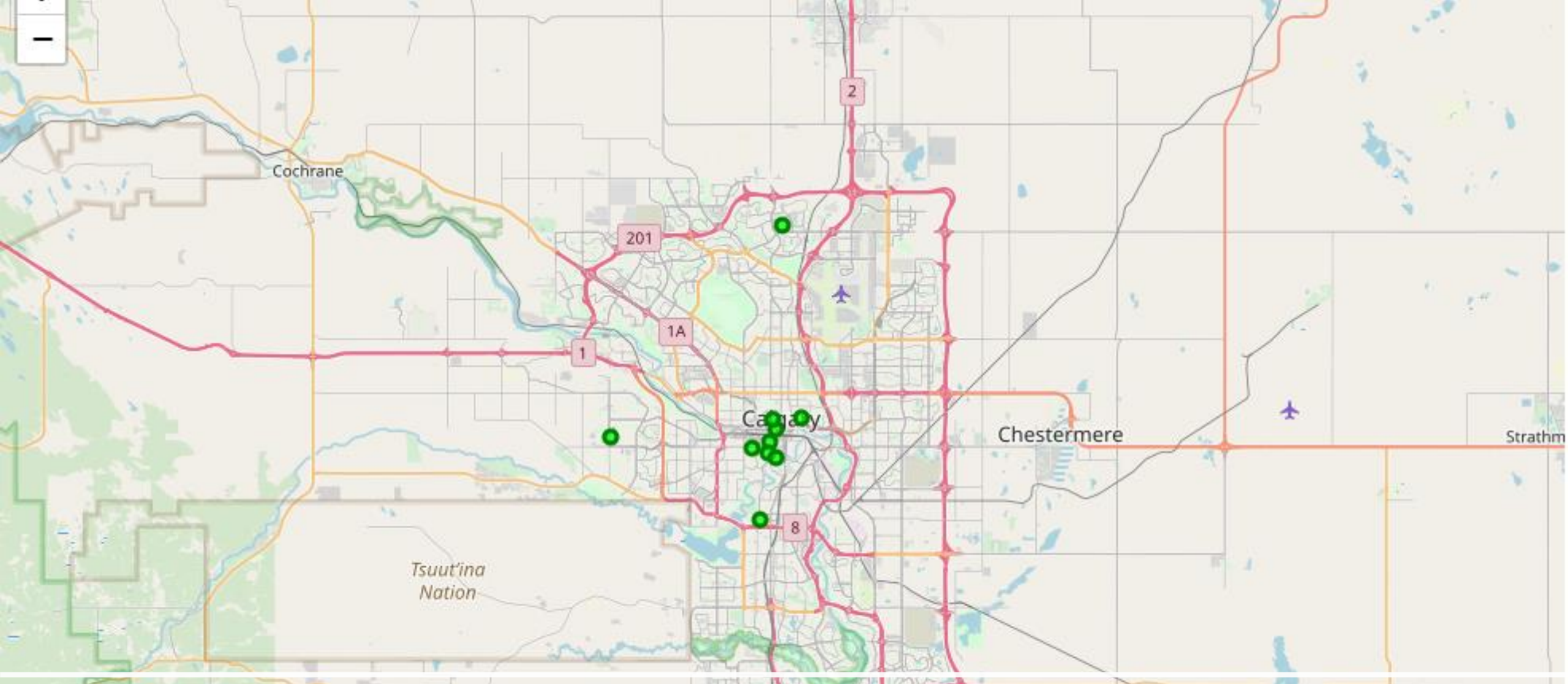
	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Abbeydale	51.058836	-113.929413	Subway	51.059215	-113.934836	Sandwich Place
1	Abbeydale	51.058836	-113.929413	Mac's	51.059376	-113.934425	Convenience Store
2	Abbeydale	51.058836	-113.929413	roadside pub	51.059277	-113.934529	Wings Joint
3	Acadia	50.968655	-114.055587	Highwest Electric Ltd	50.965847	-114.057257	Construction & Landscaping
4	Acadia	50.968655	-114.055587	Home Diner	50.967631	-114.060319	Diner

Data3. Calgary geographical coordinate data will be utilized as input for the Foursquare API.

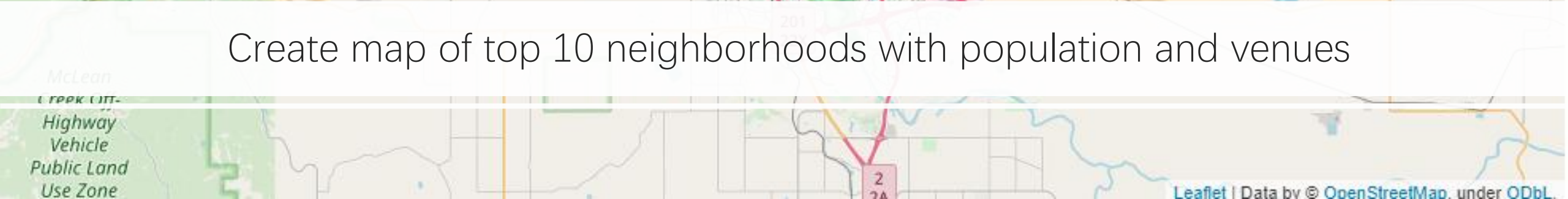
Methodology

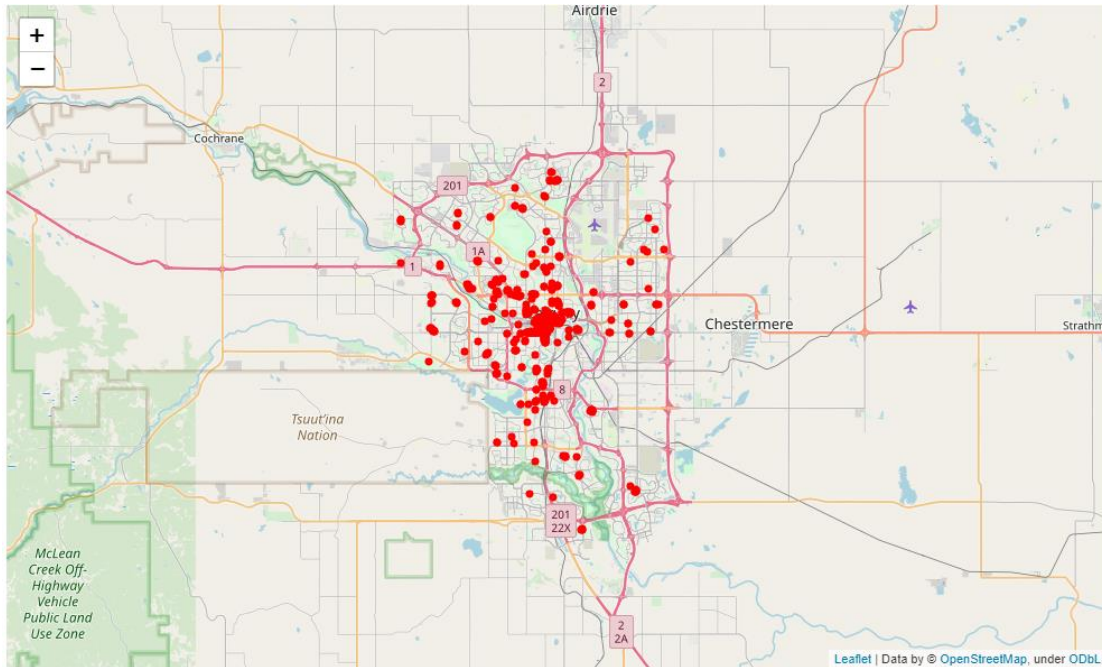
- Exploratory Data Analysis
 - Transform the data scrapped from Wikipedia into a pandas dataframe
 - Convert the neighborhoods into longitude and latitude
 - Create a map of Calgary with neighborhoods on top
 - Plot the top 10 neighborhoods with venues





Create map of top 10 neighborhoods with population and venues

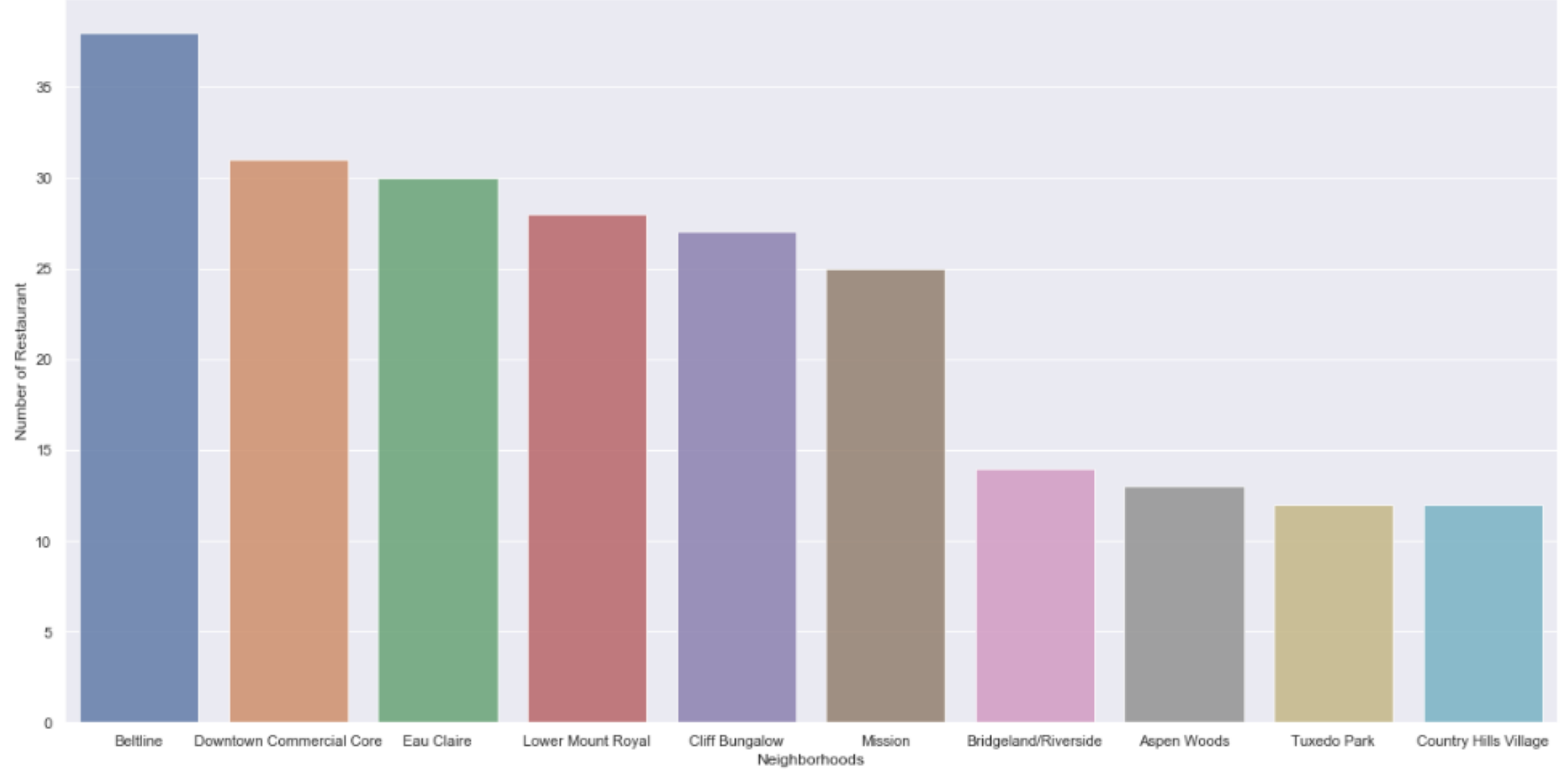




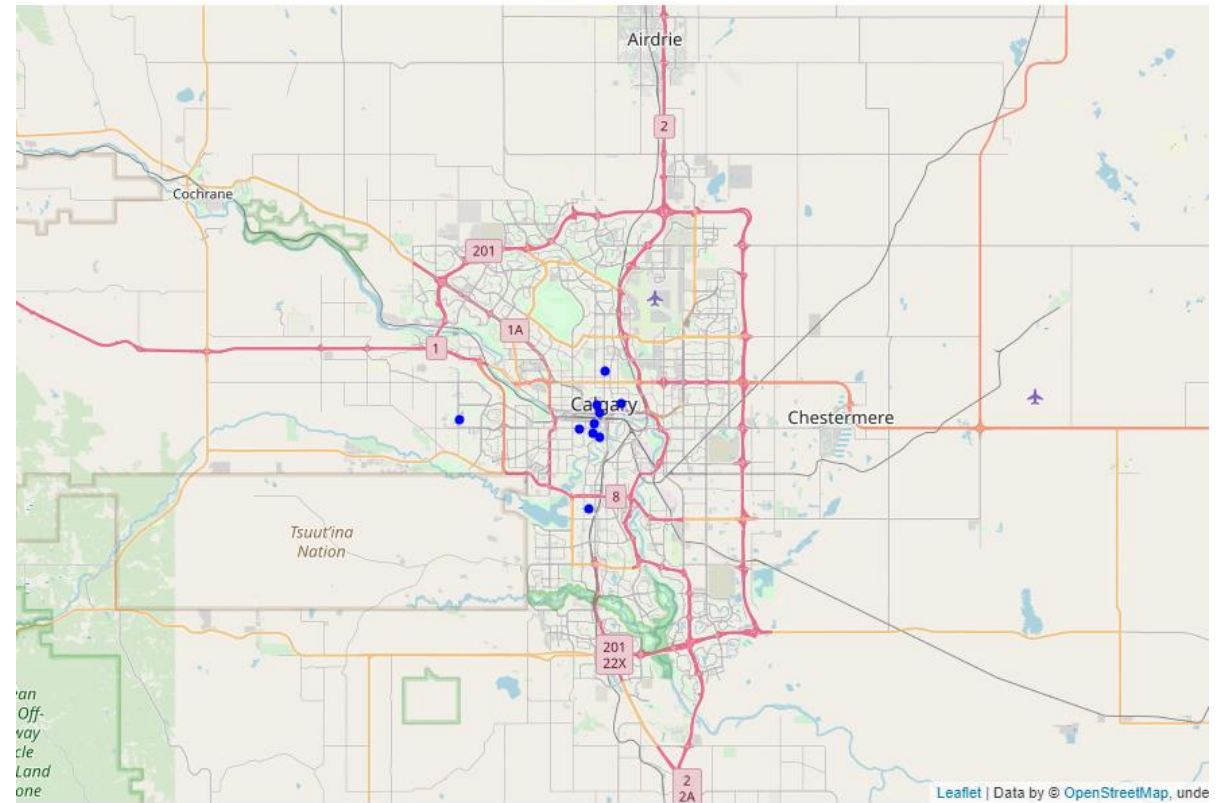
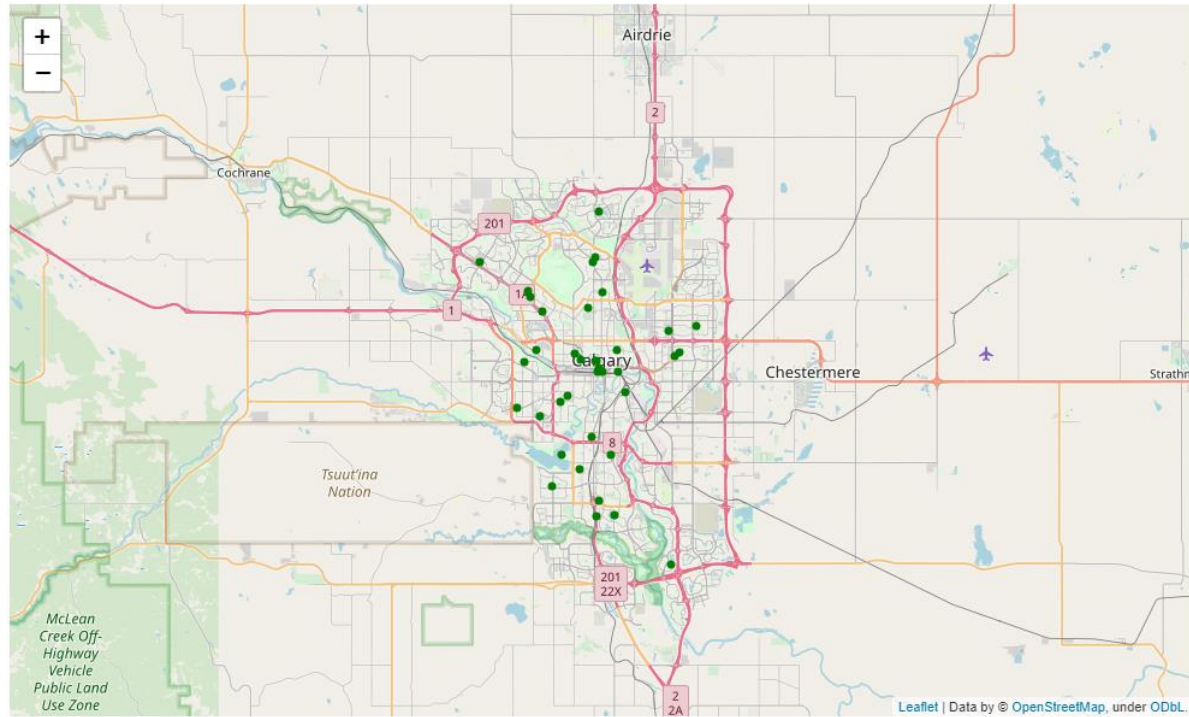
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2	Abbeydale	51.058836	-113.929413	roadside pub	51.059277	-113.934529	Wings Joint
4	Albert Park/Radisson Heights	51.044845	-113.990195	New Dynasty	51.047540	-113.990004	Asian Restaurant
5	Albert Park/Radisson Heights	51.044845	-113.990195	Vern's Pizza	51.047874	-113.990340	Pizza Place
8	Altadore	51.015104	-114.100756	Monogram Coffee	51.010967	-114.100054	Coffee Shop

- Fuzzy Matching

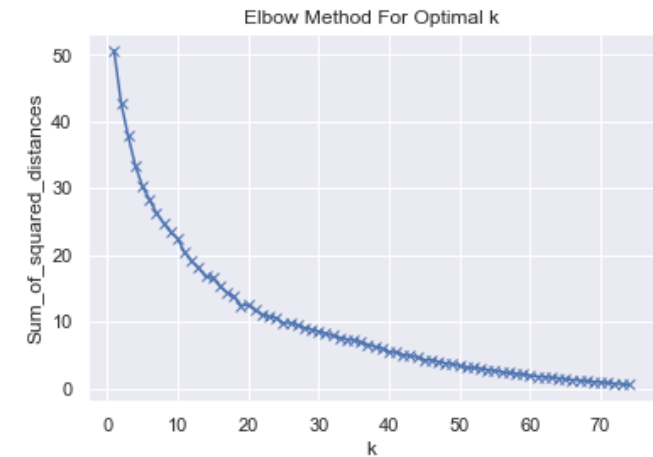
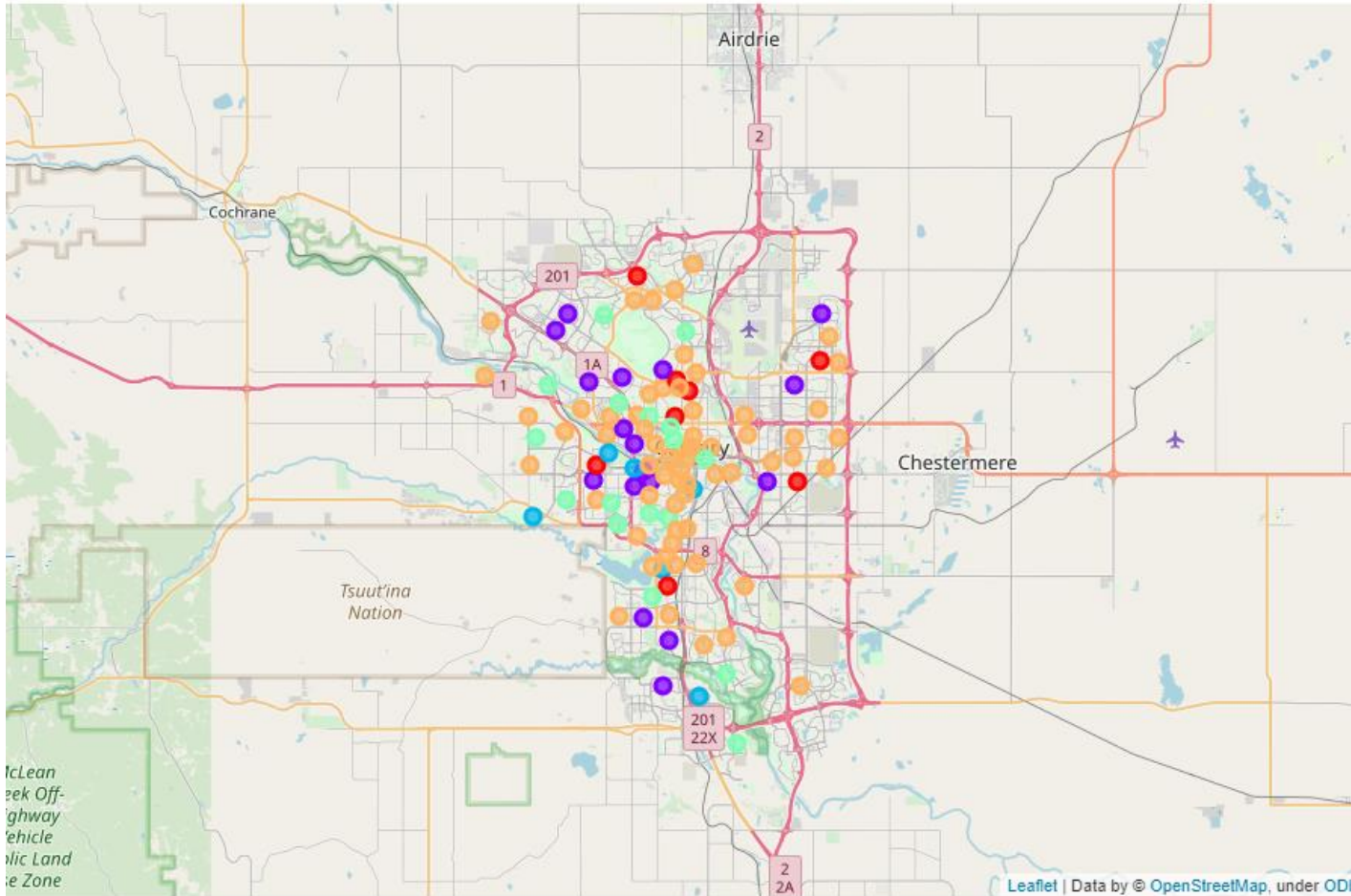
Restaurant in top 10 neighborhoods in Calgary



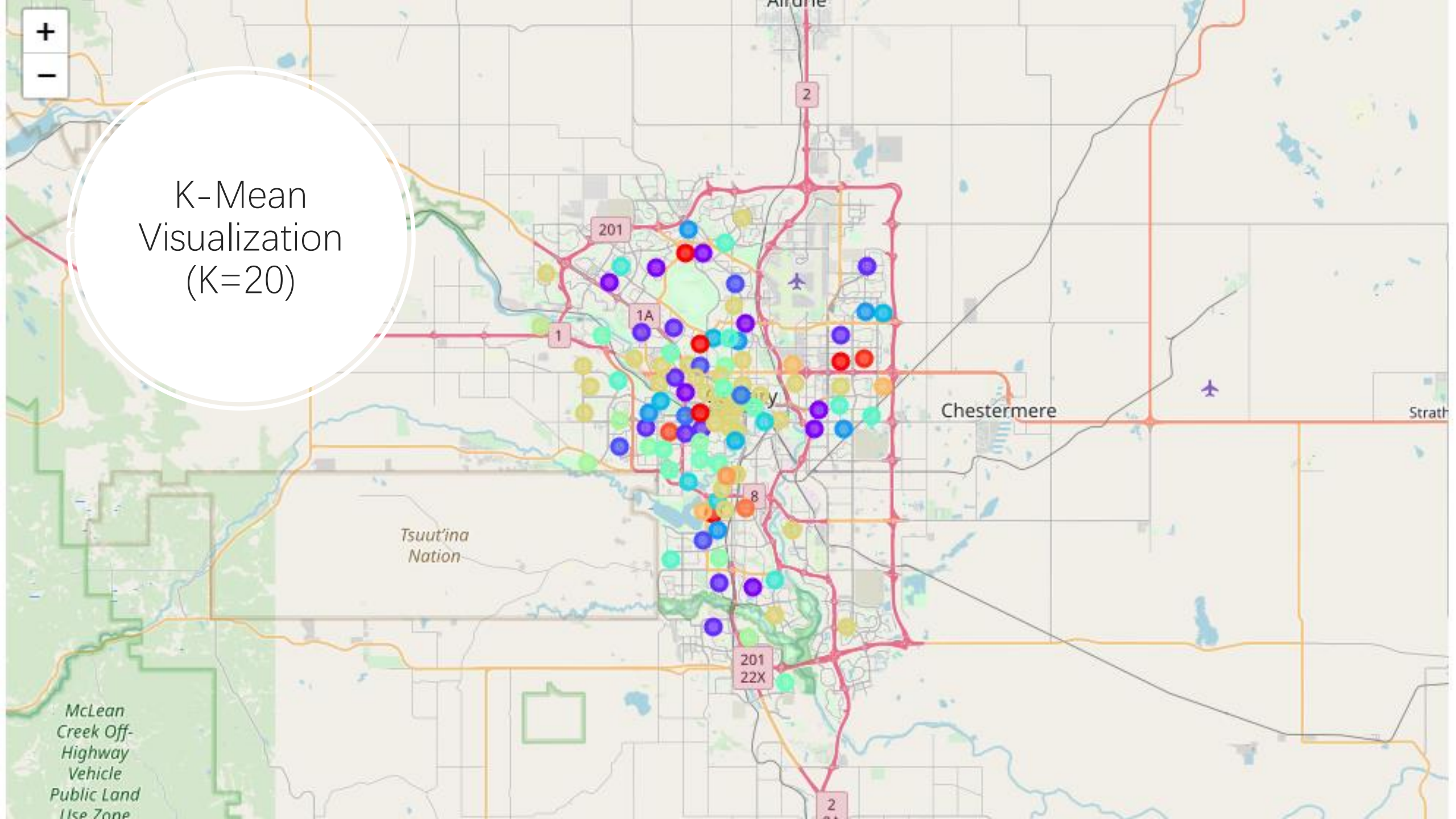
Map of the market related with Farmer Market



K-Mean Visualization (K=5)



K-Mean
Visualization
(K=20)



Results

- In this study, we have found that the location of venues in Calgary have no significant relationship with the population of neighborhoods. The top 10 neighborhoods with large population are not have more venues.
- The relationship between the location of restaurant in Calgary and population are not significant as well.
- There are 522 restaurants located in Calgary. A large amount of restaurant was located in downtown area of Calgary.

There are 10 neighborhoods in cluster2 which include Bankview, Brentwood, Canyon Meadows, Glendale, and so on. Neighborhoods in this cluster would be a potential competition place for pizza place.



	Name	Cluster_Labels3	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
11	Bankview	2	Pizza Place	Coffee Shop	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
19	Brentwood	2	Pizza Place	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant
27	Canyon Meadows	2	Pizza Place	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant
86	Glendale	2	Pizza Place	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant
134	Millrise	2	Pizza Place	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant
181	Richmond	2	Pizza Place	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant

There are 5 neighborhoods in cluster5 which include Falconridge, Forest Lawn, Haysboro, and so on. Those neighborhoods would have a strong competition for fast food and wings joint.



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77	Falconridge	5	Fast Food Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
81	Forest Lawn	5	Fast Food Restaurant	Vietnamese Restaurant	Wings Joint	Eastern European Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
97	Haysboro	5	Fast Food Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
98	Hidden Valley	5	Fast Food Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
100	Highland Park	5	Fast Food Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
187	Rosscarrock	5	Fast Food Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant



	Name	Cluster_Labels3	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
25	Cambrian Heights	6	Indian Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant
44	Coral Springs	6	Indian Restaurant	Wings Joint	Falafel Restaurant	Italian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant
188	Roxboro	6	Indian Restaurant	Bar	Café	Wings Joint	Fast Food Restaurant	Italian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant
220	Spruce Cliff	6	Indian Restaurant	Café	Wings Joint	Falafel Restaurant	Italian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant

There are 4 neighborhoods in cluster 6 which include Cambrian, Coral Springs, Roxboro and Spruce Cliff. Those four neighborhoods got many Indian Restaurant which would not be the best place to open a new Indian Restaurant.



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85	Glenbrook	11	Sushi Restaurant	Sports Bar	Wings Joint	Eastern European Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant
138	Mount Pleasant	11	Sushi Restaurant	Fast Food Restaurant	Restaurant	Wings Joint	Eastern European Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant
215	South Calgary	11	Sushi Restaurant	Breakfast Spot	Sandwich Place	Wings Joint	Falafel Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant
218	Southwood	11	Sushi Restaurant	Wings Joint	Eastern European Restaurant	Indian Restaurant	Hotpot Restaurant	Hotel Bar	Hookah Bar	Hong Kong Restaurant	Greek Restaurant	Gluten-free Restaurant

- There are 4 neighborhoods clustering in cluster 11, which include Glenbrook, Mount Pleasant and so on. Those community have a lot of competition between Japanese cuisine investor.



Discussion

- Vietnamese restaurants located in Country Hills and Forest Heights
- 522 of 1187 venues are restaurant. More venues not means more restaurants
- A lot of new pubs open in southern Calgary which means more competition in southern Calgary
- It all depends on which kind of restaurant the investor wants to open

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- A top-down view of a wooden table covered with various fresh ingredients. On the left, there is a whole fish, a piece of salmon, and some shrimp. In the center, there are several carrots, a purple eggplant, a red tomato, and some potatoes. On the right, there are green grapes, a red apple, a small glass bottle of oil, and a bowl of red beans. At the bottom, there are slices of bread, a bunch of asparagus, and some cheese. The background is a dark wooden surface.
- Conclusion
 - The northern Calgary neighborhoods such as Country Hills, Panaroma Hills were optimal location for open Vietnamese Restaurant although there are no farmer market nearby.
 - The downtown of Calgary has high concentration of restaurant business. There are very competitive market near the core of Calgary.
 - As per the neighborhood or restaurant type mentioned like Chinese restaurant analysis can be done further. A venue with lowest risk and competition can be identified.