

The most optimal community in Calgary to open a new Liquor Store

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Background

Calgary is the fifth largest city in Canada and the third most populated city after only Toronto and Montreal with a population of nearly 1.4 million. Calgary is located in southern Alberta and it is famous for being the centre of oil industry of Canada. The city ranked 32 in the Mercer's "2019 Quality of living city ranking" better than some famous cities such as San Francisco, Paris, London and New York

Business Problem

The aim of this project is to find the most optimal community to open a new Liquor Store business. The criteria to consider in order to identify the optimal location will be the current number of liquor stores and also the population of age group of 19-64 in each community.

Target Audience

The result of this project will be interesting for someone who is already in the Liquore Store business and wants to open another branch or those who are new in this business and looking for an ideal community to open their first Liquor Store

Data

The information regarding community names, their addresses and the population of each community will be collected from the **City of Calgary's Open Data Portal and Citizen Dashboard** The Community names and codes will be collected from the following link: <https://data.calgary.ca/Demographics/Census-by-Community-2019/rkfr-buzb>

The following source will be used to get the data of the population of age group 20-64 : <https://data.calgary.ca/Demographics/Civic-Census-by-Community-Age-and-Gender/vsk6-ghca>

The geographical coordinates of the centroid of each community are available here: <https://data.calgary.ca/Base-Maps/Community-Points/j9ps-fyst>

The **Foursquare** API will be used to explore each community to find the number of the Liquor Stores that are currently available within each community

Methodology

The **Socrata Open Data API** will be used to fetch the data from the **City of Calgary's Open Data Portal and Citizenship Dashboard** and conver it to Pandas Dataframe. As a result, we will have three dataframes: the *Census by Community 2019* dataframe will include the community codes and names, the *Census by Community, Age and Gender* will contain the community codes, the population of 10 different age groups in each community and lastly the *Community Point* dataframe will have the geographical coordinate of the centroid of each community.

First, I will aggregate the *Census by Community, Age and Gender* dataframe into only 3 different age groups namely 0-19, 20-64 and 65+, then add up the population of all the genders in the 20-64 age group. Then, I will drop the non-residential communities. Then I will consolidate the resulted dataframe with the other two and drop all unnecessary columns. The remaining columns will be Community name, Population of 19-64, Latitude and Longitude

	age_range	code	females	males	other	year
20280	0-4	ABB	175	191	0	2019
20281	5-14	ABB	419	527	0	2019
20282	15-19	ABB	168	193	0	2019
20283	20-24	ABB	148	185	0	2019
20284	25-34	ABB	428	407	0	2019

	name	total adults	longitude	latitude
0	LEGACY	4310	-114.005999006031	50.8576170329455
1	HIGHLAND PARK	2736	-114.062066898001	51.0880232734306
2	CORNERSTONE	1831	-113.930582035357	51.1573690704188
3	MONTGOMERY	3159	-114.162261375791	51.0710992820493
4	TEMPLE	6762	-113.946767730631	51.0887951436987

Second, I will use Foursquare API to find all the Liquore Stores within 4 Kilometers of the centroid of each community

Third, I will use the **Folium library** to visulize the location of the liquor store in City of Calgary

	name	address	categories	distance
0	Liquor Depot	2525 Woodview Drive SW	Liquor Store	671
2	Canyon Creek Liquor	NaN	Liquor Store	3239
3	Liquor Depot Braecenter	NaN	Liquor Store	1601
5	Woodpark Liquor	NaN	Liquor Store	1410
6	Liquor Depot	NaN	Liquor Store	3845
7	Liquor Co	NaN	Liquor Store	3793

Forth, I will append my dataframe with a new column which represents the number of Liquore Stores within Four kilometers of the centroid of each community

Fifth, I will divide the population of 20-64 by the number of the liquor stores in each community and add the result as a new column to our dataframe. The result numbers represent the number of people between 20 and 64 years old per liquor store in each community. Therefore the community corresponding with the biggest number is the most optimal community to open a new Liquor Store

	name	total adults	longitude	latitude	nStores	adultsPerStore
0	LEGACY	4310	-114.005999006031	50.8576170329455	8.0	538.750000
1	HIGHLAND PARK	2736	-114.062066898001	51.0880232734306	18.0	152.000000
2	CORNERSTONE	1831	-113.930582035357	51.1573690704188	3.0	610.333333
3	MONTGOMERY	3159	-114.162261375791	51.0710992820493	15.0	210.600000
4	TEMPLE	6762	-113.946767730631	51.0887951436987	15.0	450.800000

Results

The below table that is the result of sorting the dataframe based on the number of adults residing in each community per available liquor store within four kilometers of each community demonstrates the most optimal communities to open a new liquor store. Based on the results Skyview Ranch, Cranston and Beltline are the best three communities to start a liquor store business

	name	total adults	longitude	latitude	nStores	adultsPerStore
57	SKYVIEW RANCH	7808	-113.958374584808	51.1561260801993	4.0	1952.000000
131	CRANSTON	12257	-113.979988807808	50.8782053378332	8.0	1532.125000
197	BELTLINE	22025	-114.055186108942	51.0374499480811	16.0	1376.562500
65	SADDLE RIDGE	13864	-113.94562255923	51.1305800978341	11.0	1260.363636
85	TUSCANY	11735	-114.24083757895	51.1219158894765	10.0	1173.500000

Discussion

Based on the observations, most of the communities with high adult population with respect to the number of available liquore stores are located in the North East quarter of the City of Calgary with the Skyview Ranch being the most optimal community to open a new liquor store. There are four liquore stores located within 4 kilometers from the centroid of the Skyview Ranch community with the population of 7808 among the age group of 20-64. Community of Cranston located in the south of Calgary is the second most optimal community to open a new liquor store. There are eight liquore stores located within 4 kilometers from the centroid of the Skyview Ranch community with the population of 12257 among the age group of 20-64

Conclusion

This study analyzed the number of available liquore stores within 4 kilometers of the centroid of each community in the City of Calgary to find an optimal location to open a new liquor store. The population of the people between 20 and 64 years old was found from the 2019 Civic Census results published in the **City of Calgary's Open Data Portal and Citizenship Dashboard**. The socrata API was used to extract the required data from the Census results and conver it to Pandas dataframes so they can be used in this analysis. Foursquare API was used to search fo the liquore stores and find the number of available liquor stores within 4000 meters from the centroid of each community. The population of 20-64 age group residing in each community then was divided by the number of liquore stores found from the Foursquare API. The result showed that the most optimal community to open a new liquor store is Skyview Ranch followed by the Cranston community.

Disclaimer

This study was solely done as part of the capstone project to complete the **IBM Data Science Professional Certificate** and it is by no mean should be considered as business or financial advice.