Capstone Final Project

Suggesting best location for a restaurant in Manitoba, Canada.

1.0 Intro and Description of the Problem

My well-wisher runs a successful restaurant chain in the Eastern Region of Canada with 4 restaurants spread between Ottawa, Toronto and a Montreal now wants to explore the pizza restaurant opportunities and has decided to start with the largest communities in Manitoba.

As a owner, it is obvious and success factor that your business is should not be close to the competitors while ensuring it is also close to major attractions in the city. Therefore, he wants to know the best possible places to locate his new restaurant that will be have the least competition and the most attractions.

1.1 Target Audience

This project helps anyone wants to setup business in Manitoba and would want to know what is the competition around the communities.

1.2 Discussion on the background¶

Manitoba is a province at the longitudinal centre of Canada. It is often considered one of the three prairie provinces (with Alberta and Saskatchewan) and is Canada's fifth-most populous province with its estimated 1.3 million

people. The province is bordered by the provinces of Ontario to the east and Saskatchewan to the west, the territories of Nunavut to the north, and Northwest Territories to the northwest, and the U.S. states of North Dakota and Minnesota to the south. Winnipeg and Brandon are the most populated communities. Winnipeg is the capital and largest city of the province of Manitoba in Canada. As of 2011, Winnipeg is the seventh most populated municipality in Canada. Known as the "Gateway to the West", Winnipeg is a railway and transportation hub with a diversified economy. This multicultural city hosts numerous annual festivals.

2.0 Data

This project relies on public data from Wikipedia and details from FourSquare. List of communities in Manitoba by population has been retrieved from Wikipedia (https://en.wikipedia.org/wiki/List_of_communities_in_Manitoba_by_population) which is the foundation of the analysis.

Details about the venues in Manitoba had been received from Foursquare API. https://developer.foursquare.com/docs/api/venues/explore endpoint specifically helps us giving venue recommendations. It will return a list of recommended venues near the location specified. We have two different types of endpoints: Regular and Premium. Regular endpoints include basic venue firmographic data, category, and ID. Premium endpoints include rich content such as ratings, URLs, photos, tips, menus, etc. Restrictions apply based on your account type, with further details documented on our rate limits page. Additional work on marking attractions and identifying competition had performed by owner of the restaurent chain on a scale of 0-10 (0-low 10-high).

For example, Higher score in attraction (10) and Minimun score in competition (2) gives a weightage of 8 (10-2). For a clutser of venues, we consider the average of of all venue weights and the cluster with the highest average weight will the best location for the restaurent.

3.0 Analysis

Extracted the list of populated communities from Wikipedia using panda's read_html method. This gave me a dataframe of Manitoba's communities by population.

Using Geopy library, I have obtained the GPS coordinates (lat lng) of the each community.

	Rank	Community name	Community type	Latitude	Longitude
0	1	Winnipeg	City	49.884	-97.1686
1	2	Brandon	City	49.8511	-99.9609
2	3	Steinbach	City	49.5306	-96.6934
3	4	Thompson	City	55.7433	-97.8635
4	5	Portage la Prairie	City	49.9724	-98.2892
5	6	Winkler	City	49.1871	-97.9376
6	7	Selkirk	City	50.147	-96.8802
7	8	Morden	City	49.1927	-98.1015
8	9	Dauphin	City	51.1535	-100.044
9	10	The Pas	Town	53.8615	-101.197
10	11	Flin Flon	City	54.7744	-101.882
11	12	Norway House 17	Indian Reserve	53.9667	-97.8333
12	13	Stonewall	Town	50.1342	-97.3287
13	14	Niverville	Town	49.6056	-97.0385

Looped through each community to obtain first few venues within 2000m radius. This should be enough to cover the while communities. Duplicate venues were removed and obtained a list of categories of all the venues. Assigned Attraction and competition and calculated weightage as mentioned in the data section.

KMeans clustering used to create 20 cluster.

	name	categories	lat	lng	Attraction	Competition	Weight
0	De Luca's Specailty Foods	Grocery Store	49.884594	-97.173227	2	1	1
1	Boon Burger Cafe	Vegetarian / Vegan Restaurant	49.881129	-97.159562	7	6	1
2	Thom Bargen	Café	49.880807	-97.159700	8	3	5
3	Vimy Ridge Park	Park	49.884460	-97.168101	10	1	9
4	The Tallest Poppy	Diner	49.881979	-97.159522	8	6	2

The clusters have been sorted for the highest average weight which was identified as Cluster 14
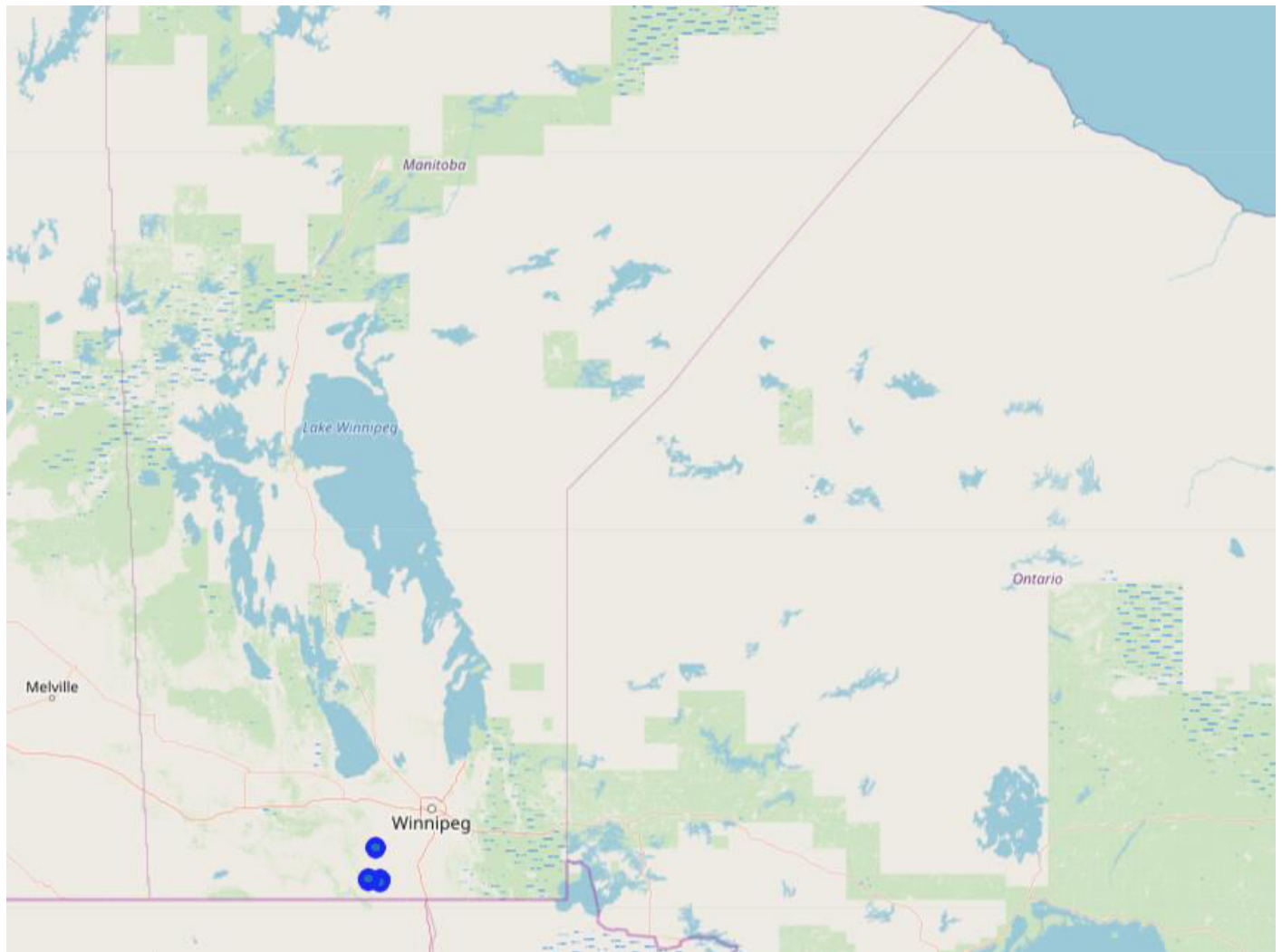
]:

Cluster Labels	Weight	Count	avg
6	9	1	9.000000
15	9	1	9.000000
18	5	1	5.000000
8	32	7	4.571429
7	58	13	4.461538

49.22966741847628

	Cluster Labels	name	categories	lat	lng	Attraction	Competition	Weight
184	14	Whitecap Coffee	Coffee Shop	49.183470	-97.939395	10	5	5
185	14	Real Canadian Superstore	Grocery Store	49.186168	-97.931562	2	1	1
186	14	A&W Canada	Fast Food Restaurant	49.193229	-97.939649	8	7	1
187	14	Coffee Culture	Café	49.194069	-97.936208	8	3	5
188	14	Dairy Queen	Fast Food Restaurant	49.190816	-97.938853	8	7	1

Plotted the cluster on the map using Folium library and the location turned out to be Winkler in Winnipeg.

Conclusion

The best location for the restaurant is near Winnipeg out of all communities in Manitoba. To be precise, The Location is near highway 14, Winkler, Winnipeg. This is inline with what we are expecting.