

Selecting a place in Winnipeg for an Asian restaurant business

- Capstone project of IBM data science professional certificate

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Introduction/Business Problem

Many new immigrants arrive in Manitoba Canada through entrepreneur pathway from China in recent years. Opening an Asian restaurant in Winnipeg as the business investment is a popular option. Winnipeg is a big city with population 750,000 (Ref. 1) and 32 municipal areas (Ref. 2) e.g. Fort Garry NW / Tuxedo. It would be a challenge to choose an appropriate place in a certain area. This project will recommend a list of areas to choose from by avoiding areas with high density of Asian restaurants.

Data

Post code and municipal areas is available in Wikipedia table (Ref. 1), for example St. James-Assiniboia NE/YWG is the area with the post code R3H. Location longitude and latitude of each area could be extracted by querying OSM data (Ref. 3) using post code through python tool nominatim API (Ref. 4) Number of Asian restaurants for each area could be extracted by querying Foursquare location database server by entering longitude and latitude (Ref. 5). Areas could be categorized as low and high density of Asian restaurants. The areas with low density of Asian restaurants is recommended in the list to choose a place from. A map with marked selected areas will be created for visualization.

Methodology

Area table of post code, location longitude and latitude of each municipal area in Winnipeg was acquired at the section [Get Post code, Longitude and Latitude of each area in Winnipeg](#) in the Jupyter notebook (Ref. 6). Asian restaurant density category table of each municipal area in Winnipeg (Table 2) was obtained through Foursquare location data server and analyze at the section [Get Asian restaurants for each area in Winnipeg from Foursquare location data server; Categorize areas by density of Asian restaurant](#) in the Jupyter notebook (Ref. 6). Three density categories were decided, which are

1. Zero: area without any Asian restaurants
2. Low density: area below or equal average number restaurant of each area ≤ 11
 - a. Average number restaurant was calculated based on all areas with restaurants
3. High density: area above average number restaurant of each area > 11

The recommended areas were plotted in Winnipeg map (Figure 1) through the following sections [Get Winnipeg longitude and latitude for creating location map](#); [Create Winnipeg Map and mark each area](#); [Recommendation of opening an Asian restaurant in an area with zero or low density](#); [Create Winnipeg Map and mark recommendation areas in the Jupyter notebook](#)

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[2]:
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	Post Code	Area	Longitude	Latitude
0	R3A	Centennial	-97.1489	49.9038
1	R3B	Chinatown / Civic Centre / Exchange District / ...	-97.1401	49.8980
2	R2C	Transcona	-96.9563	49.9247
3	R3C	Broadway / The Forks / Portage and Main)Manito...	-97.2184	50.0110
4	R3E	Sargent Park / Daniel McIntyre / Inkster SE	-97.1779	49.9081

Table 1 Area table of post code, location longitude and latitude of each municipal area in Winnipeg

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Density of asian restaurant by area

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	area	density
32	Fort Garry West	zero
28	Grassie / Eastern North Kildonan	zero
19	Old Kildonan	zero
21	Inkster West	zero
23	Wilkes South	zero
25	West Kildonan	zero
10	St. James-Assiniboia SE	zero
26	Fort Garry South	zero
30	St. Boniface South / St. Vital SE	zero
31	St. James-Assiniboia NW	zero
3	Broadway / The Forks / Portage and Main)Manito...	zero
2	Transcona	zero
17	St. Vital SW	zero
27	Point Douglas East	low density
18	River Heights West	low density
29	Point Douglas West / Inkster East	low density
22	Assiniboine South / Betsworth	low density
20	Fort Garry NW / Tuxedo	low density
16	Crescentwood Central	low density
15	St. Vital North	low density
14	River Heights East	low density
13	Elmwood	low density
12	St. James-Assiniboia SW	low density
11	East Kildonan	low density
9	St. Boniface NE	low density
8	St. James-Assiniboia NE / YWG	low density
6	Minto / St. Mathews / Wolseley	low density
5	North Kildonan North	low density
1	Chinatown / Civic Centre / Exchange District /...	high density
24	Fort Garry NE / University of Manitoba	high density
7	St. Boniface NW	high density
4	Sargent Park / Daniel McIntyre / Inkster SE	high density
0	Centennial	high density

Table 2 Asian restaurant density table of each municipal area in Winnipeg

Results

A list of municipal areas in Winnipeg with low density of existing Asian restaurants (Table 3) were analyzed using a Wikipedia postal code table of Manitoba and Foursquare location data server etc. The list of areas was recommended to select a place from to open an Asian restaurant for new immigrant as a business investment.

Discussion

This recommendation avoids the high density of existing Asian restaurants. The advantages of this selection are staying away from the strong competition and increase the business chance in the areas without or with low density of Asian restaurants. From the recommendation list, the business needs for Asian restaurant in Winnipeg is very good overall. The existing restaurants are very condensed in a few areas. Most areas are the fresh market or in high demand. Therefore, new immigrants should spend more time on the selection from the recommendation list and might integrate other factors e.g. nearby shopping mall, companies into consideration.

Conclusion

This analysis project generated a recommendation area list (Table 3) to select from for opening an Asian restaurant. The location data sets i.e. Wikipedia Manitoba postal code table and Foursquare location database etc. and python Jupyter notebook (Ref. 6) was used to access Foursquare API.

	area	density
32	Fort Garry West	zero
28	Grassie / Eastern North Kildonan	zero
19	Old Kildonan	zero
21	Inkster West	zero
23	Wilkes South	zero
25	West Kildonan	zero
10	St. James-Assiniboia SE	zero
26	Fort Garry South	zero
30	St. Boniface South / St. Vital SE	zero
31	St. James-Assiniboia NW	zero
3	Broadway / The Forks / Portage and Main)Manito...	zero
2	Transcona	zero
17	St. Vital SW	zero
27	Point Douglas East	low density
18	River Heights West	low density
29	Point Douglas West / Inkster East	low density
22	Assiniboine South / Betsworth	low density
20	Fort Garry NW / Tuxedo	low density
16	Crescentwood Central	low density
15	St. Vital North	low density
14	River Heights East	low density
13	Elmwood	low density
12	St. James-Assiniboia SW	low density
11	East Kildonan	low density
9	St. Boniface NE	low density
8	St. James-Assiniboia NE / YWG	low density
6	Minto / St. Mathews / Wolseley	low density
5	North Kildonan North	low density

Table 3 Recommended areas for opening an Asian restaurant

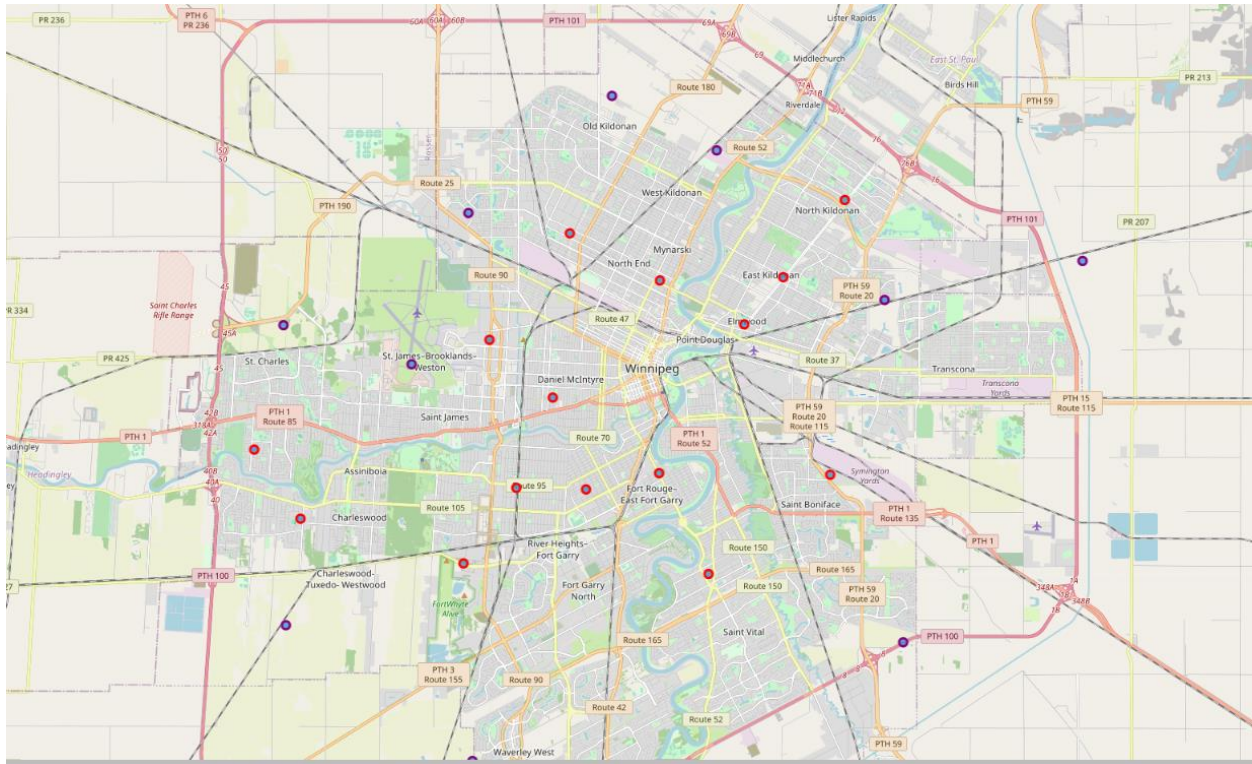


Figure 1 Winnipeg map with recommended areas (purple – zero density; red – low density)

Reference

1. <https://en.wikipedia.org/wiki/Winnipeg>
2. https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_R
3. [https://wiki.openstreetmap.org/wiki/Nominatim#:~:text=Nominatim%20\(from%20the%20Latin%2C%20'on%20the%20OpenStreetMap%20home%20page](https://wiki.openstreetmap.org/wiki/Nominatim#:~:text=Nominatim%20(from%20the%20Latin%2C%20'on%20the%20OpenStreetMap%20home%20page)
4. <https://pypi.org/project/pgeocode/>
5. <https://developer.foursquare.com/docs/api-reference/venues/search/>
6. https://github.com/justin-mbca/Coursera_Capstone/blob/master/capstone2.ipynb