THE BATTLE OF NEIGHBORHOODS

Final Presentation

Content

1. Introduction of the business problem

    1.1 Description of the Problem and Background
    1.2 Who could be interested in the research

2. Data to solve the problem

3. Methodology

    3.1 Data Preparation

    3.2 Data Mapping and Neighborhood Analysis

    3.3 Data Clustering

4. Execution and Discussion

    4.1 Execution and observations

    4.2 Recommendations

5.Conclusion

1. Introduction of the business problem

I am a Data Analyst from Canada. It's a world-known fact that Canada, as well as US, is a land of immigrants from all over the world. Before arriving in Canada, the immigrant should prove he/she will be independent in the settlement and know what to do and where to start his/her family life in the new country. Being a Data Analyst, I am contacted by different people who ask about pre-arrival support which helps them to settle in absolutely new city. Knowing the city will make it easy for immigrants to adapt and settle successfully. Mostly they are interested in choosing the best area to live with the family based on the following factors:

- the residential area far from Downtown
- 3 bedroom condo (for a standard family of 2 adults and 2 kids)
- rent price in the limit of 1000-1200 CAD
- school availability in the area (high schools, university etc.)
- walking distance to other desirable places such as restaurants, cinemas, liquor stores, gyms, close distance to any of the food stores etc.

Having in mind statistical data that Manitoba is the most popular destination of Canada and open province for Oversees Immigration Programs, let's assume that a potential immigrant would like to live in the capital city of the province -Winnipeg (705,000 population).
The second big city of Manitoba has 50,000 of residence, so I would limit my research on the biggest city which can give more opportunities for the newcomers.

➨ **Who could be interested in the research ?**
According to Citizenship and Immigration office
https://www150.statcan.gc.ca/n1/en/catalogue/11-630-X
and other official sources like
https://www.statista.com/topics/2917/immigration-in-canada/
hundred thousands of people from Europe, Asia, and other areas migrate to Canada each year. This research could be applicable to anyone interested in starting their life in a new country (potentially, any new place).
It can help any immigrant to prepare a part of the settlement plan without actually being in a country which is a thousand miles from their original place. With reference to the provided map, the case becomes the more visualized basis for making a decision about a new home far from home.

2. Data to Solve the Problem

The following data is required for the area research:

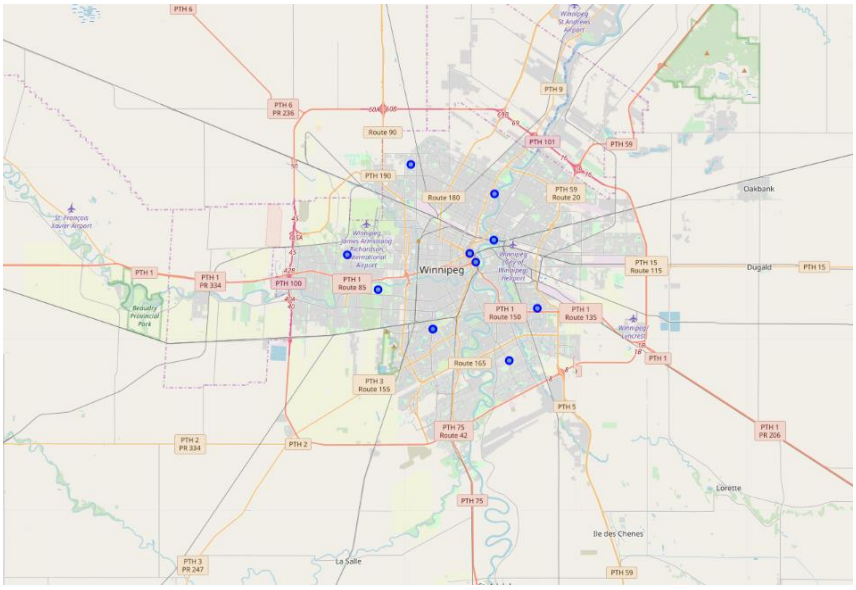
- Areas/neighborhoods of the city
- List of condos/houses for rent in the desired price range and other valuable details
- List of schools split by type of schools (high, university etc. as an example)
- Analysis of the eating, shopping facilities based on geographic coordinates of neighborhood venues (cinema, cafes or restaurant, sports places)
  Clusters might be proposed (if required) to focus on area strengths.

Foursquare API will be used for venues nearby (schools, shopping centers, entertaining zones)
The city areas will be provided in the report based on
Wikipedia: https://en.wikipedia.org/wiki/Subdivisions_of_Winnipeg
Rental listing will be consolidated from local agencies websites to csv and geo data will be added by means of Foursquare plus:
https://www.rentfaster.ca
https://winnipeg.rentspot.com & others
The data will answer the questions and illustrate the advantages of a new location for family settlement.
The maps will be provided in the presentation.

3. Methodology

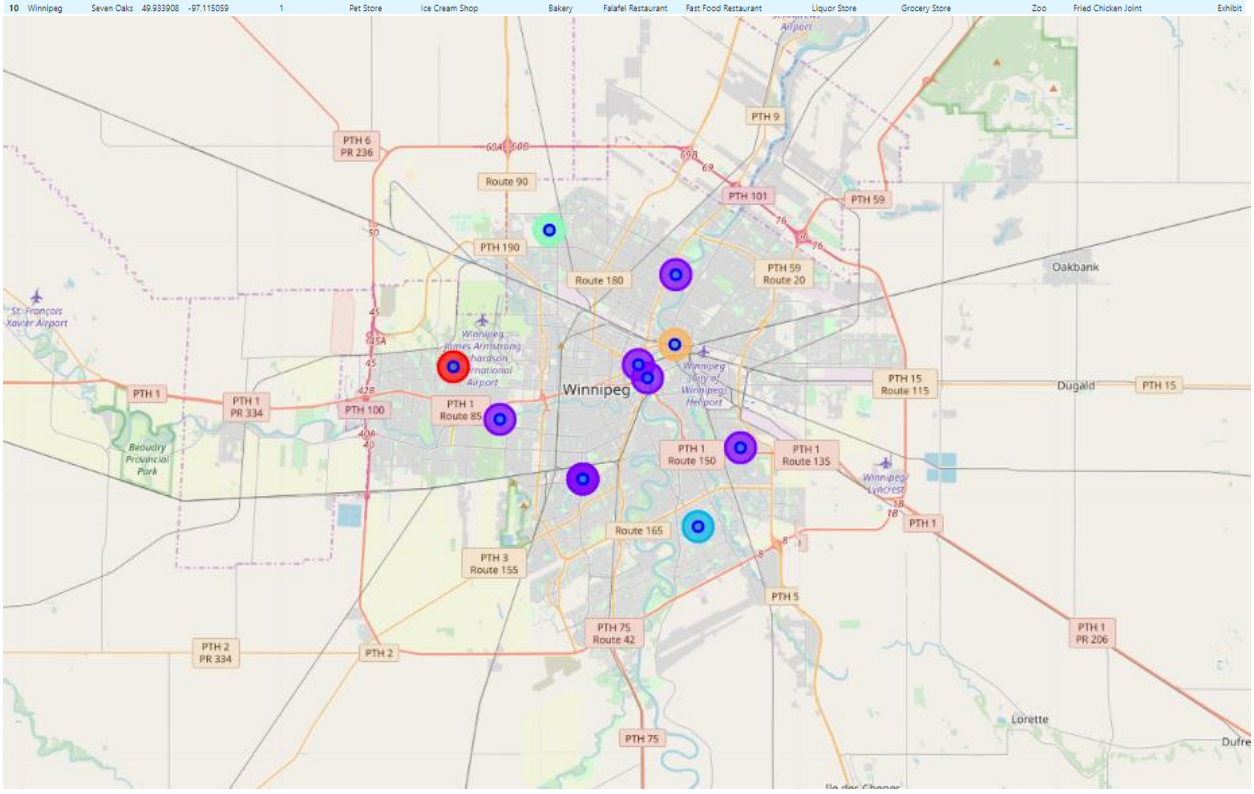
Data preparation and cleansing is a necessary step to provide ready database for further processing. Then the geodata and coordinates will be extracted from Foursquare (the school venues, eating, and shopping places) to determine the most appropriate area to choose.
Foursquare API will be used also for mapping the locations of rental condos and other required venues. Rental addresses will be converted to geo data using Geopy-distance and local rental website.
The content-based technique is going to be implemented to solve the problem and give recommendations.
Combining with Foursquare, a matrix could be built to capture characteristic of venues nearby and be applied to the required areas for proving the recommendations to the interested audience.
Taking into consideration a big number of needed transactions for the analysis, sites browser technique is implemented for consolidating data-frame information and saved as csv files.

- **Data mapping and Neighborhood Analysis** (please see the details in the Notebook)



	Neighbourhood	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
0	Assiniboine South	Garden	Playground	Snack Place	Exhibit	Other Great Outdoors	Café	Zoo	Train Station	Baseball Stadium	French Restaurant
1	Downtown	Coffee Shop	Restaurant	Hotel	Nightclub	Pizza Place	Asian Restaurant	Concert Hall	Café	Sandwich Place	Caribbean Restaurant
2	Fort Garry	Hotel	Breakfast Spot	Coffee Shop	Indian Restaurant	Restaurant	Market	Burger Joint	Italian Restaurant	Spa	Museum
3	Inkster	Business Service	Zoo	Fried Chicken Joint	Donut Shop	Exhibit	Falafel Restaurant	Fast Food Restaurant	Fish & Chips Shop	Food Court	French Restaurant
4	Point Douglas	Construction & Landscaping	Trail	Park	Chinese Restaurant	Dive Bar	Zoo	French Restaurant	Exhibit	Falafel Restaurant	Fast Food Restaurant
5	River East	Sandwich Place	Italian Restaurant	Fast Food Restaurant	Coffee Shop	Breakfast Spot	Business Service	Zoo	Exhibit	Falafel Restaurant	Fish & Chips Shop
6	River Heights	Sandwich Place	Italian Restaurant	Fast Food Restaurant	Coffee Shop	Breakfast Spot	Business Service	Zoo	Exhibit	Falafel Restaurant	Fish & Chips Shop
7	Seven Oaks	Pet Store	Ice Cream Shop	Bakery	Falafel Restaurant	Fast Food Restaurant	Liquor Store	Grocery Store	Zoo	Fried Chicken Joint	Exhibit
8	St.Boniface	Fast Food Restaurant	Pizza Place	Liquor Store	Pharmacy	Park	Coffee Shop	Mobile Phone Shop	Sandwich Place	Discount Store	Pet Store
9	St.James-Assiniboia	Dance Studio	Bus Station	Donut Shop	Exhibit	Falafel Restaurant	Fast Food Restaurant	Fish & Chips Shop	Food Court	French Restaurant	Fried Chicken Joint
10	St.Vital	Recreation Center	Zoo	Fried Chicken Joint	Donut Shop	Exhibit	Falafel Restaurant	Fast Food Restaurant	Fish & Chips Shop	Food Court	French Restaurant

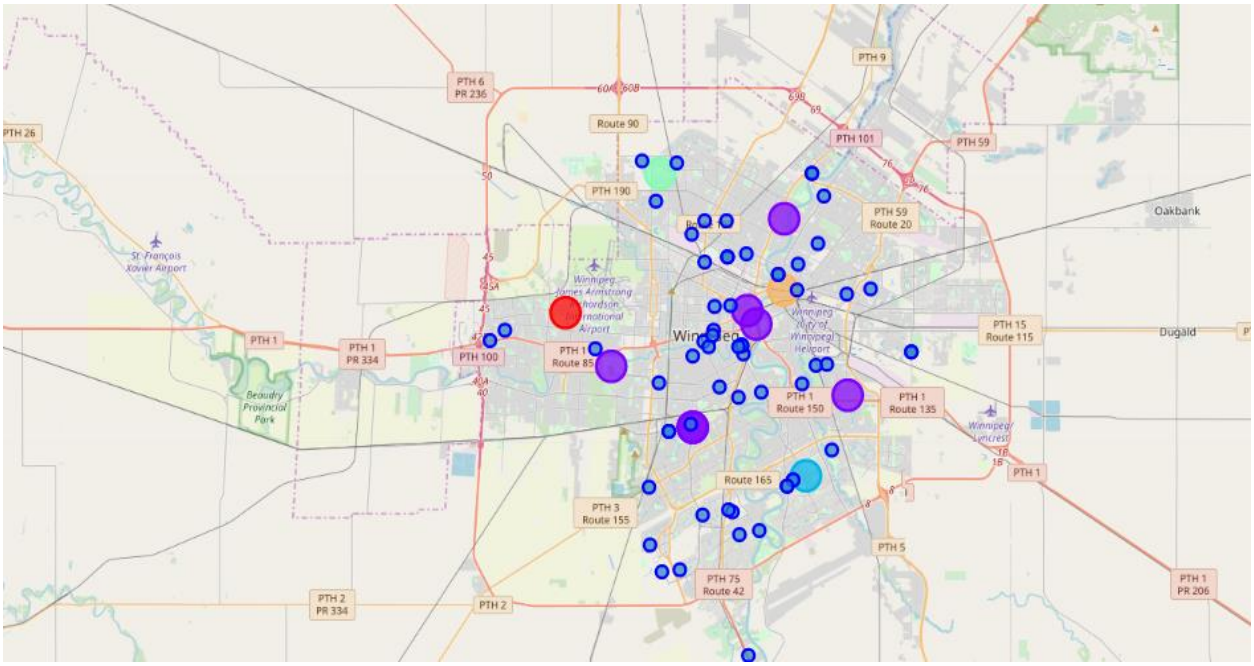
	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Winnipeg	Assiniboine South	49.870759	-97.234721	1	Garden	Playground	Snack Place	Exhibit	Other Great Outdoors	Café	Zoo	Train Station	Baseball Stadium	French Restaurant
1	Winnipeg	Downtown	49.894557	-97.140109	1	Coffee Shop	Restaurant	Hotel	Nightclub	Pizza Place	Asian Restaurant	Concert Hall	Café	Sandwich Place	Caribbean Restaurant
2	Winnipeg	Fort Garry	49.888984	-97.134289	1	Hotel	Breakfast Spot	Coffee Shop	Indian Restaurant	Restaurant	Market	Burger Joint	Italian Restaurant	Spa	Museum
3	Winnipeg	Inkster	49.953411	-97.200944	3	Business Service	Zoo	Fried Chicken Joint	Donut Shop	Exhibit	Falafel Restaurant	Fast Food Restaurant	Fish & Chips Shop	Food Court	French Restaurant
4	Winnipeg	Point Douglas	49.903370	-97.116020	4	Construction & Landscaping	Trail	Park	Chinese Restaurant	Dive Bar	Zoo	French Restaurant	Exhibit	Falafel Restaurant	Fast Food Restaurant
5	Winnipeg	River East	49.844651	-97.178063	1	Sandwich Place	Italian Restaurant	Fast Food Restaurant	Coffee Shop	Breakfast Spot	Business Service	Zoo	Exhibit	Falafel Restaurant	Fish & Chips Shop
6	Winnipeg	River Heights	49.844651	-97.178063	1	Sandwich Place	Italian Restaurant	Fast Food Restaurant	Coffee Shop	Breakfast Spot	Business Service	Zoo	Exhibit	Falafel Restaurant	Fish & Chips Shop
7	Winnipeg	St.Boniface	49.858513	-97.071372	1	Fast Food Restaurant	Pizza Place	Liquor Store	Pharmacy	Park	Coffee Shop	Mobile Phone Shop	Sandwich Place	Discount Store	Pet Store
8	Winnipeg	St.James-Assiniboia	49.893583	-97.266200	0	Dance Studio	Bus Station	Donut Shop	Exhibit	Falafel Restaurant	Fast Food Restaurant	Fish & Chips Shop	Food Court	French Restaurant	Fried Chicken Joint
9	Winnipeg	St.Vital	49.823758	-97.099641	2	Recreation Center	Zoo	Fried Chicken Joint	Donut Shop	Exhibit	Falafel Restaurant	Fast Food Restaurant	Fish & Chips Shop	Food Court	French Restaurant
10	Winnipeg	Seven Oaks	49.933908	-97.115059	1	Pet Store	Ice Cream Shop	Bakery	Falafel Restaurant	Fast Food Restaurant	Liquor Store	Grocery Store	Zoo	Fried Chicken Joint	Exhibit



4. **Execution and Discussion** *(please see details in Notebook and Presentation)*

To choose a condo for rent, let's make some analysis of the area proposals.
Using the general statistic of the Apartment rental listings of the city,
https://www.rentboard.ca/rentals/rental_rates.aspx?locid=1523
the price of 3-bedroom condos ranges from $1,124*t* to $4,200 CAD where the average one is $1,731 CAD.
Our request is 3 bedroom condo (for a standard family of 2 adults and 2 kids) in the limit of 1000-1200 CAD
I will use rent listing from different local agencies and rent browsers as

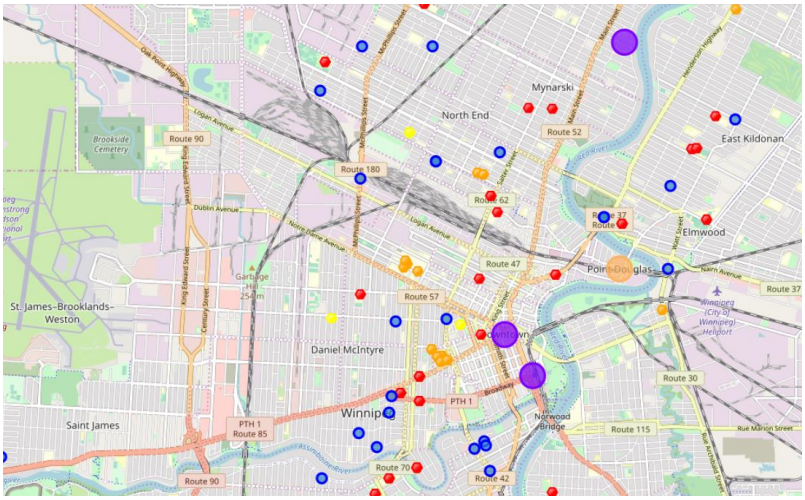
https://www.rentfaster.ca, https://winnipeg.rentspot.com etc.
Then, to prepare the data for map visualization, I will work with Nominatim to get a latitude and longitude of the rental listing. The outcome has been saved as csv for making the process simplified for the next processing.



Analyzing around 100 rentals, we can confirm the official city statistic that the price varies from $1200-1700 CAD.
To be in the limit of $1200 CAD (max), it's more realistic to find a place in the city area which is Coved in Cluster # 2 *(except Downtown as it was initially requested)*
The type of housing doesn't impact the price when the client searches for a 3+ Bedroom place.

Recommendations:

- **831 Flora Avenue (1,070 CAD)**
- **201 Powers St (995 CAD)**



- **Both condos are far from the Downtown of the city**
- **North-West/Point Douglas areas**
- **3 Bedroom apartments that fit the family of 2 adults and 2 kids**

In the city the type of the accommodation (condo, house or townhouse) doesn't impact the price when the client searches for a 3-Bedroom place.
Both condos are located not more than 1000 meters from schools (if a school is located more that 1km from the home, the Area School Division provides a bus transportation for a student). The requestor can use the bus stations nearby.
If any small children in the family, the nursery school is in 5-10 min of walking distance. There are 2 Universities in the same area (on Selkirk Ave).
The additional research showed the variety of venues for these condos (shopping, sports etc.). They can be tracked in Cluster #2 and #5 analysis.
The research is not limited by the chosen venues. Consider any other provided category to learn about the area advantages

5. Conclusions

Any family moving to the other country can refer for the product created by such powerful data science tools as Foursquare API, machine learning techniques of segmentation, clustering etc. to find the best area for their living taking into account any personal preferences based on the number of venues nearby in eating, shopping, education categories and more.
Content-based filtering machine learning technique is the most suitable method to combine different pieces of “wish-list” to meet together.
Folium mapping is one more tool that allows to combine science data and real-life location for better visualization for the requestor of information.
Having developed tools, anyone can search for desired locations and the closest venues simply adjusting the criteria of the search.
The Capstone Project outcome impressed me a lot. It has shown us:

- what enormous opportunities we can have, mastering our experience with data science tools
- what other new business projects could be launched obtaining the information provided by machine-learning techniques.

THANK YOU, COURSERA, FOR MY FIRST DATA-SCIENCE JOURNEY!!!!

THE CAPSTONE PROJECT IS GREAT!!

Prepared by: NKh

Aug-2019