

Analyzing the features of different cities in Metro Vancouver Area

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1.Introduction

1.1 Background

Metro Vancouver is a Canadian political subdivision and corporate entity representing the metropolitan area of Greater Vancouver. It consists of 21 municipalities. In the 2016 Census of Population conducted by Statistics Canada, the Metro Vancouver Regional District recorded a population of 2,463,431, making it the regional district in British Columbia with the greatest population and population density.

1.2 Problem

The aim of this project is to investigate the features of different cities in Metro Vancouver Area. Also, the project clusters the area into 5 clusters and explore the rank of popular venues in each cluster.

1.3 Interest

Since different cities in Metro Vancouver area has its unique characteristics, the project would be interesting to people who are potential travellers or residents. Since they are able to make a decision on which areas to explore based on their own preferences.

2.Data Sources

The postal codes for all British Columbian cities are scraped from wiki page (title: List of postal codes of Canada: V, website: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_V.) The data was filtered based on the scope of cities included under Metro Vancouver Area umbrella. The city list can be found at Metro Vancouver official website. The latitude and longitude of each city is retrieved using Python pgeocode

library. The venues explored within each city is implemented using foursquare API. The

3. Methodology

Data scraped from wiki page was filtered based on Metro Vancouver member Municipalities. After attaching the latitude and longitude of each city using geocode library. The data frame was cleaned use pandas library, leaving only the columns named postal codes, city, latitude and longitude. The top venues were retrieved using foursquare API and then grouped by each city. To cluster the area, K means clustering methodology was used.

4. Results

A visualization of all cities in Metro Vancouver area is shown in Fig 1.

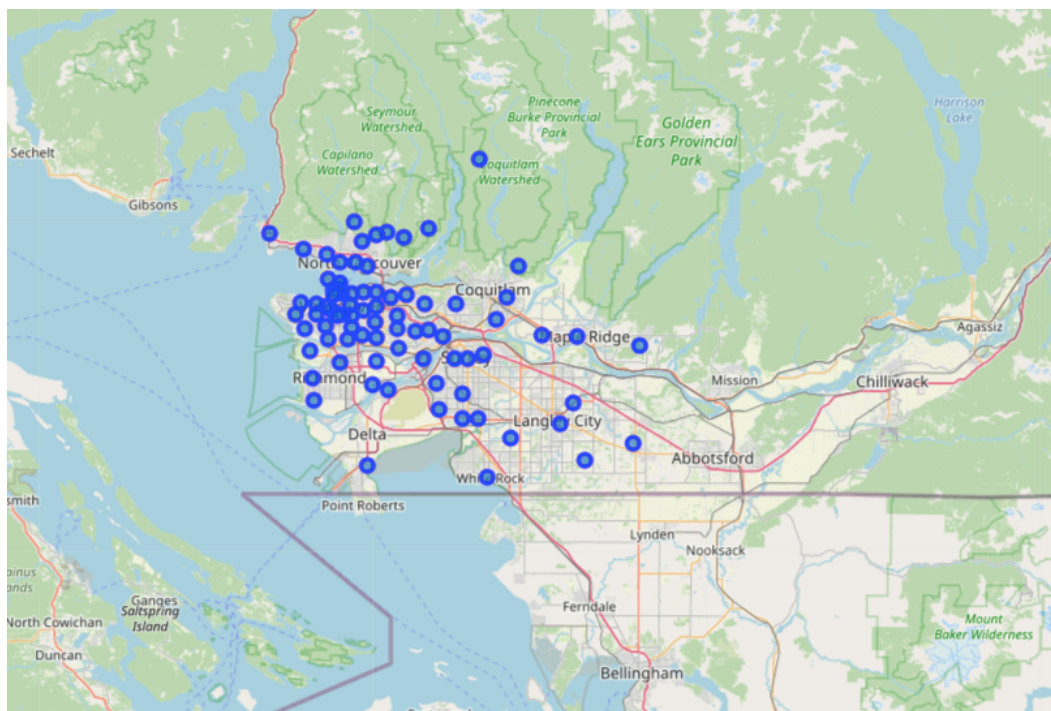


Figure 1. Metro Vancouver Map

After the latitude and longitude of each city were retrieved. The top venues in each city were obtained using foursquare API. Figure 2 shows the top

venues in the city of Langley, along with the venue category, latitude and longitude.

Venue name	Venue Latitude	Venue Longitude	Venue Category
Ban Chok Dee	49.103026	-122.652841	Thai Restaurant
Venetis Restaurant	49.103380	-122.653730	Steakhouse
Maru Sushi Japanese Restaurant	49.103715	-122.650223	Sushi Restaurant
McBurney Coffee and Tea House	49.104015	-122.653886	Café
Michael's No Frills	49.102296	-122.658170	Grocery Store
Katy's Restaurant	49.103213	-122.653373	American Restaurant
Shiraz	49.103890	-122.653744	Persian Restaurant
Langley One Way Gourmet	49.104109	-122.653635	Sandwich Place

Figure 2. Top Venues in the city of Langley

Cities are then grouped and dummy-coded to find out the top 5 venues in each city. Figure 3 and 4 shows the top 5 venues in the city of Burnaby and CoquitlamNorth respectively.

The next, different cities were clustered into 5 clusters and the top venues in each cluster were further explored. Figure 5 shows the top 10 most popular venues in different clusters including RichmondNorthwest DeltaEast and West Vancouver.

```

-----Burnaby-----
              venue  freq
0              Park  0.10
1    Coffee Shop  0.09
2        Pharmacy  0.04
3    Golf Course  0.04
4        Bus Stop  0.04

```

Figure 3. Top 5 venue categories in the City of Burnaby

```

-----CoquitlamNorth-----
              venue  freq
0          Mountain  0.5
1              Park  0.5
2    Accessories Store  0.0
3    Other Great Outdoors  0.0
4          Movie Theater  0.0

```

Figure 4. Top 5 venue categories in the City of CoquitlamNorth

	City	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
12	RichmondNorthwest	1.0	Trail	Shopping Plaza	Yoga Studio	Elementary School	Fish & Chips Shop	Financial or Legal Service	Filipino Restaurant	Field	Fast Food Restaurant	Farmers Market
14	DeltaEast	1.0	Trail	Yoga Studio	Elementary School	Fish Market	Fish & Chips Shop	Financial or Legal Service	Filipino Restaurant	Field	Fast Food Restaurant	Farmers Market
68	West VancouverWest	1.0	Trail	Tapas Restaurant	Yoga Studio	Ethiopian Restaurant	Fish Market	Fish & Chips Shop	Financial or Legal Service	Filipino Restaurant	Field	Fast Food Restaurant

Figure 5. Top 10 venues in cluster 1

5. Discussion

From this project, one would be able to find out which city he/she might travel to or move to based on own interest. A person who loves to enjoy outdoor activities may benefit from the trails in cluster 1 cities. Others like to watch movies may find the city of Burnaby has more to offer. The complete analysis of each city can be found available in Jupyter notebook, uploaded along with this report.

6. Conclusion

Metro Vancouver with its 21 municipalities offer great selections for people with different background and preferences. From this project, recommendations can be drawn in the situation of travel and relocation.

