Clustering Philippine Cities

Applied Data Science Capstone
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Introduction/Business Problem

The year 2020 will be remembered as the year when the COVID-19 pandemic changed the world. Its impact covers all levels and aspects of society. As of December 6, 2020, the World Health Organization reports that over 65 million people have contracted the virus and over 1.5 million have died. Governments continue to impose restrictions on human activity in order to limit the spread of the virus and they are looking for ways to address its economic and societal impact.

On May 6, 2020, Philippine President Rodrigo Duterte issued Executive Order No. 114, instituting the *Balik Probinsya* program. This goal of program is to "develop the quality of life in the rural areas, in effect decongesting the densely populated areas of the country such as Metro Manila by encouraging people to move to the countryside once COVID-19-related quarantine measures are lifted." (https://en.wikipedia.org/wiki/Balik_Probinsya)

While most migrants to the National Capital Region (NCR) of the Philippines might consider going back to their home cities or provinces as a first choice, a presentation of other options could be invaluable. This is where a clustering exercise of Philippine cities can help.

The audience that can benefit from this project are:

- Metro Manila residents who want to identify which rural areas/provinces are potentially good options for relocation.
- Provincial governments that can use this as a reference for what establishments they can promote and incentivize to make locations more attractive for relocation.

Being originally from the Philippines, this project is personally interesting to me as I want to see which areas are similar to my home town in Iligan City.

Data

The following data will be used in clustering Philippine cities.

- **List of Philippine cities** from https://en.wikipedia.org/wiki/List_of_cities_in_the_Philippines. This data will be read into Python using pandas. This is the list that will be clustered based on common venues.
- **Foursquare API** will be used to get the most common venues in each city. From an initial exploration of Foursquare data, it might be necessary to group the

venue types into larger buckets. For example, venues like American Restaurant and Japanese Restaurant can be grouped into Restaurant.

- **Google Maps** will be used to get the coordinates of each city. The longitude and latitude are inputs required in the Foursquare API.

References

1. Coronavirus cases and deaths from WHO Coronavirus Disease (COVID-19) Dashboard (https://covid19.who.int/)

2. List of Philippine cities snapshot from Wikipedia (https://en.wikipedia.org/wiki/List_of_cities_in_the_Philippines)

A · B · C · D · E · F · G · H · I · J · K · L · M · N · O · P · Q · R · S · T · U · V · W · X · Y · Z

City	Population (2015) [4]	Area [5][i]	Density (2015)	Province [5][ii]	Region	Legal class [6]	Charter [iii]	Date of	
								Approval [iv]	Ratification [v]
Alaminos	89,708	164.26 km² (63.42 sq mi)	550/km² (1,400/sq mi)	Pangasinan	I	CC	RA 09025 [7]	March 5, 2001 [7]	March 28, 2001 [8]
Angeles	411,634 [vi]	60.27 km² (23.27 sq mi)	6,200/km² (16,000/sq mi)	*Pampanga*	III	HUC	RA 03700 [9]	June 22, 1963 [9]	January 1, 1964
Antipolo	776,386	306.10 km² (118.19 sq mi)	2,500/km² (6,500/sq mi)	Rizal	IV-A	CC	RA 08508 [10]	February 13, 1998 [10]	April 4, 1998
Bacolod	561,875	162.67 km² (62.81 sq mi)	3,500/km² (9,100/sq mi)	*Negros Occidental*	VI	HUC	CA 326 [11]	June 18, 1938 [12]	October 19, 1938 [13]
Bacoor	600,609	46.17 km² (17.83 sq mi)	13,000/km² (34,000/sq mi)	Cavite	IV-A	CC	RA 10160 [14]	April 10, 2012 [14]	June 23, 2012 [15]
Bago	170,981	401.20 km² (154.90 sq mi)	430/km² (1,100/sq mi)	Negros Occidental	VI	CC	RA 04382 [16]	June 19, 1965 [16]	February 19, 1966 [17]
Baguio	345,366	57.51 km² (22.20 sq mi)	6,000/km² (16,000/sq mi)	*Benguet*	CAR	HUC	Act 1963	September 1, 1909	*September 1, 1909*
Bais	76,291	319.64 km² (123.41 sq mi)	240/km² (620/sq mi)	Negros Oriental	VII	CC	RA 05444 [18]	September 9, 1968 [18]	September 9, 1968