Venue Data Analysis and Population Density of Yangon

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28th October, 2020

1. Introduction

1.1 Background

Yangon, the commercial capital of Myanmar and a member of 'Asian Network of Major Cities 21', is a densely populated city with an average urban density of 8,600/km² living over an area of 598.75 km². The city is divided into 33 townships or neighborhoods. Being the commercial center, a number of different kinds of business are squeezed in each neighborhood.

1.2 Problem

As most crowded neighborhoods are already densed with shops, stakeholders may have a problem of finding a suitable location to start their business. Depending on their type of business, the owners may want to set up where their type of business is less intense or where related types of business exist. They will also want an appropriate location for specific customers. This may be a complex problem to solve without fine data.

2.Data Description

2.1 Data Sources

- Population density of each neighborhood from **Wikipedia**
- Population **growth rate**
- **Json** file for townships (neighborhood) boundaries
- **Foursquare API** for venue data

2.2 Data Wrangling

(A) Population Density

The exact population data of **Yangon** is only available for the **2014 Census**. So, I made a new dataframe for the population of each township in Yangon according to the 2014 Census. Then, I used the **annual population growth rate** to estimate the current population. Lastly, the **population density** of each township was obtained.

(Something quite problematic is that the names of townships are represented differently on different websites as English can't be used to pronounce the exact Myanmar names for specific words.
That's why a custom data frame had to be generated in order to match the names on the geojson file we have got.)
This is how the data frame looks like :

	Township	Latitude	Longitude	Population_2014_Census	Area_sqkm	Population_2020_Estimated	Population_density/sqkm
0	BOTAHTAUNG	16.767500	96.151389	40995	2.40	45062	18775
1	DAGON SEIKKAN	16.856667	96.282778	167448	85.40	184060	2155
2	DAWBON	16.666667	96.183333	75325	3.70	82797	22377
3	EAST DAGON	16.883333	96.283333	165628	91.03	182059	1999
4	MINGALARTAUNGNYUNT	16.783333	96.166667	132494	5.06	145638	28782

(B) <u>Nearby Venues</u>

By using the above data frame and **Foursquare API,** I obtained the nearby venues of each neighborhood. But, some venues were missing and so, I filtered off those which returned less than 30 venues within 2.5 km radius leaving me 21 neighborhoods to analyze.
This is how the filtered data frame looks like :

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	BOTAHTAUNG	16.7675	96.151389	Oishii Sushi	16.775120	96.150391	Sushi Restaurant
1	BOTAHTAUNG	16.7675	96.151389	Burma Bistro	16.772176	96.156015	Restaurant
2	BOTAHTAUNG	16.7675	96.151389	DONG JING (DVD,VCD,CD Centre)	16.776719	96.150417	Video Store
3	BOTAHTAUNG	16.7675	96.151389	Rangoon Tea House	16.772273	96.161735	Tea Room
4	BOTAHTAUNG	16.7675	96.151389	Little Yangon Hostel	16.772335	96.163245	Hostel

2.3 Data Selection

- **Population density**

The **demand** of a service and business greatly depends on the population (the number of customers).

- **Venues**

After generating the nearby venues, it was found out that more than **80%** of the venues generated by **Foursquare** for the target location were **hotels, restaurants, cafe(s) & bakeries**, and so are the most common venues of each neighborhood.
Hence, these will be our area of study.

- **Distance between specific venues**

A restaurant located near a hotel or in the city center may have a huge advantage. However, this factor depends on the target customer.