The Battle of The Big Durian:
Exploring Regions of Jakarta

Coursera Applied Data Science Capstone Project

Week 4 Submission – Introduction and Data

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1. Introduction

Jakarta is the special capital region of Indonesia, an archipelago in Southeast Asia. It is located on the northwest coast of Java and is home to a population of 10.5 million. The greater Jakarta metropolitan area, which extends over 6,300 km^2, has a staggering population of 35 million and is the second-largest urban area in the world[1]. A melting pot of many Indonesian cultures, Jakarta is the center of Indonesia's economic activities which has attracted people from across the archipelago to move to the city in search of opportunities and a potentially better standard of living.

Business opportunities abound in Jakarta, but the food-and-beverage (F&B) sector has long been an attractive target for investors. It has recorded the largest investment realization among secondary sectors in Indonesia over the last five years, totaling IDR 293 trillion[2]. According to a research by Toffin[3], the coffee shop has been a booming F&B business in Indonesia, reflected on the significant rise in number of outlets and domestic coffee consumptions in the recent years[4]. The market value of coffee shops is also estimated to reach over IDR 4 trillion per year. With the aforementioned prospect, various stakeholders (entrepreneurs, investors) may be interested to explore the capital's regions in order to find the best candidate for a coffee shop location.

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[1] United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision, Online Edition.
[2] "Food Industry Can Weather Global Economic Shock: BKPM". The Jakarta Post. 27 May 2020.
[3] "The Emerging Business of Coffee Shops in Indonesia". Now! Jakarta. 5 January 2020.
[4] United States Department of Agriculture. Indonesia Coffee Annual Report 2019.

Nevertheless, stakeholders setting up to open a business in the city need to also take into account the regions that are more prone to flooding, in order to avoid having their business severely affected. Jakarta geography and the way it is navigated by multiple waterways and rivers all in their downstream, makes the city very vulnerable to flood risk[5]. It is nothing new to Jakartans, as it frequently occurs especially during the months where precipitation is intense (January-February). In fact, the greater Jakarta metropolitan area welcomed 2020 with the worst flooding in years, where 75% of the capital was inundated and up to 400,000 people were displaced[6].

Since the early 2020, Jakarta and the rest of the world have been grappling with the COVID-19 pandemic and its devastating effects. In such a densely-populated area, there is a greater risk of viral transmission and therefore the availability of proper health care facilities is crucial, especially in regions where case number is alarmingly high. As of January 2021, there are 101 referral hospitals in Jakarta providing treatments for COVID-19 patients. Should the Jakarta government decide to collaborate with more hospitals, an assessment of the current distribution of COVID referral hospitals is needed to understand which regions would benefit from additional care facilities.

Based on the backgrounds described above, this capstone project is thus carried out to answer the following questions:

1. What are the most common venues within the different regions of Jakarta and, based upon that, which regions are strategic for opening a coffee shop business?
2. Which cluster of regions in Jakarta is more flood-prone than the others?
3. What is the current situation of the COVID-19 pandemic in Jakarta and how evenly distributed are the treatment facilities?

2. Data

The following data sets were collected from various sources and will be utilized to explore potential answer to the problems:

1. Administrative subdivisions in Jakarta (i.e., Cities, Districts, Subdistricts) and corresponding postal codes, scraped from a directory on indonesiapostcode.com.
2. Geographical coordinates of Jakarta and its subdistricts, obtained via Nominatim API. These coordinates are needed to utilize Foursquare API in the subsequent steps.
3. Venues across Jakarta districts, explored using Foursquare API. K-Means clustering will be applied to the venues data to segment the districts and find the best location candidate for opening coffee shops.

[5] "Jakarta Floods January 2020". Esri Indonesia's Emergency Spatial Support Center (ESSC).
[6] "A Stark Reminder of Jakarta's Increasing Vulnerability to Flood Risk". JBA Risk Management. 1 January 2020.

4. Flood-prone areas and population density (2019) in Jakarta by districts, which are publicly available at Jakarta Open Data. The latter data will be used to investigate whether flood-prone areas and number of COVID-19 cases are interrelated with the population density of a region.
5. COVID-19 cases in Jakarta (13 February 2021), available at ArcGIS Hub. Visual approach with Folium library will be used to show the current distribution of COVID-19 cases and the availability of referral hospitals across Jakarta.
6. List of special referral hospitals for COVID-19, scraped from corona.jakarta.go.id.