

COURSERA CAPSTONE (IBM)

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Opening a New Shopping Mall in
Singapore

Introduction.

For many shoppers, visiting shopping malls is a great way to relax and enjoy themselves during weekends and holidays. They can do grocery shopping, dine at restaurants, shop at the various fashion outlets, watch movies, playing games and perform many more activities. Shopping malls are like a one-stop destination for all types of shoppers. For retailers, the central location and the large crowd at the shopping malls provides a great distribution channel to market their products and services. Property developers are also taking advantage of this trend to build more shopping malls to cater to the demand. As a result, there are many shopping malls in the city of Singapore and many more are being built. Opening shopping malls allows property developers to earn consistent rental income. Of course, as with any business decision, opening a new shopping mall requires serious consideration and is a lot more complicated than it seems. Particularly, the location of the shopping mall is one of the most important decisions that will determine whether the mall will be a success or a failure.

Singapore



Business Problem.

The objective of this capstone project is to analyse and select the best locations in the city of Singapore to open a new shopping mall. Using data science methodology and machine learning techniques like clustering, this project aims to provide solutions to answer the business question: In the city of Singapore, if a property developer is looking to open a new shopping mall, where would you recommend that they open it ?

Data

To solve the problem, we will need the following data:

- List of neighborhoods in Singapore. This defines the scope of this project which is confined to the city of Singapore.
- Latitude and longitude coordinates of those neighborhoods. This is required in order to plot the map and also to get the venue data.
- Venue data, particularly data related to shopping malls. We will use this data to perform clustering on the neighborhoods.

Source of data:

- Wikipedia page for neighborhoods
(https://en.wikipedia.org/wiki/Category:Shopping_malls_in_Singapore)
- Geo-coder package for latitude and longitude coordinates
- Foursquare API for venue data

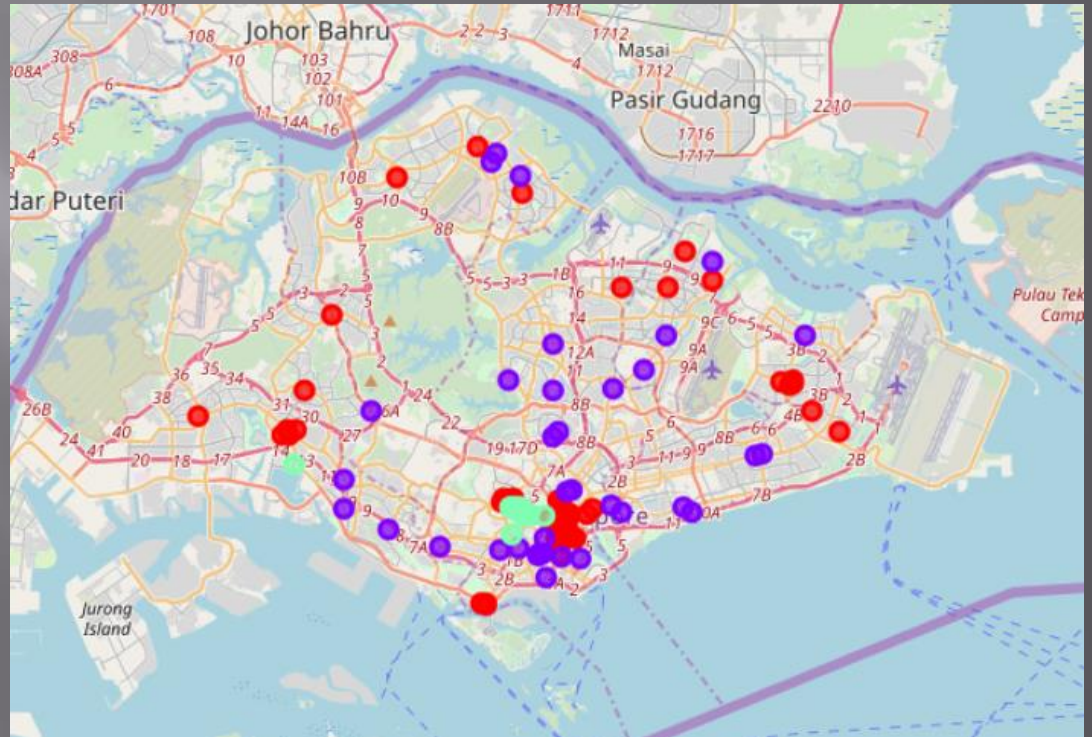
Methodology :

- Web scraping Wikipedia page for neighborhoods list
- Get latitude and longitude coordinates using Geo-coder
- Use Foursquare API to get venue data
- Group data by neighborhood and taking the mean of the frequency of occurrence of each venue category
- Filter venue category by Shopping Mall
- Perform clustering on the data by using k-means clustering
- Visualize the clusters in a map using Folium

Result:

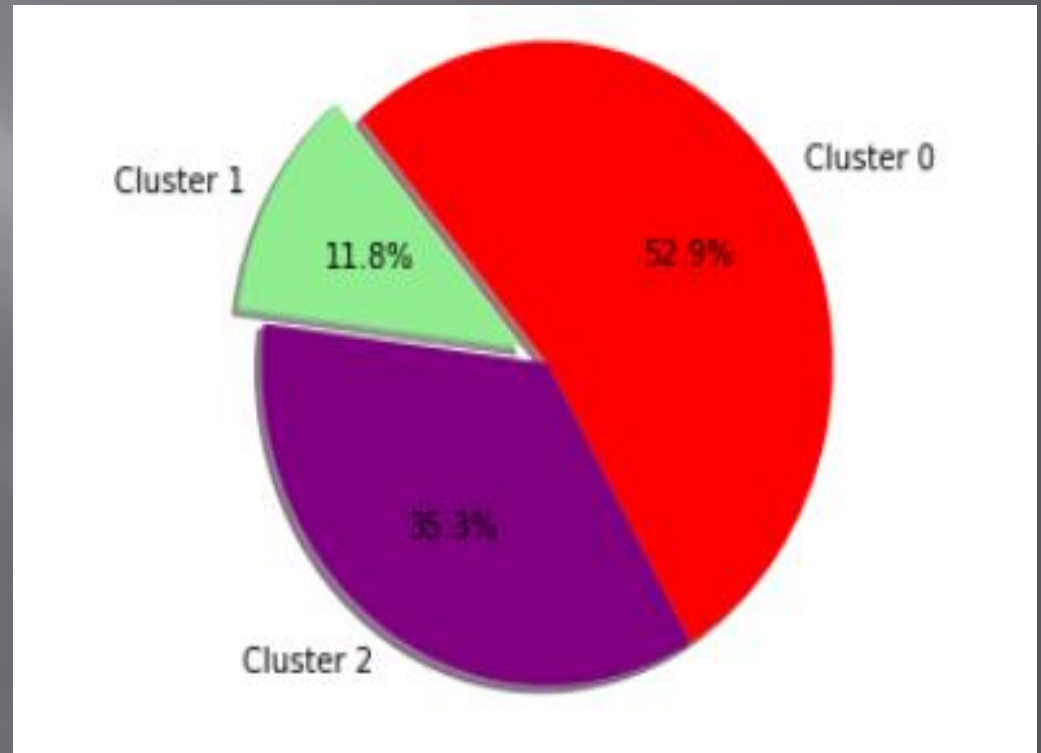
The results from the k-means clustering show that we can categorize the neighborhoods into 3 clusters based on the frequency of occurrence for “Shopping Mall”:

- Cluster 0: Neighborhoods with highest number of shopping malls
- Cluster 1: Neighborhoods with low numbers of shopping malls
- Cluster 2: Neighborhoods with moderate number of shopping malls



Observations:

Most of the shopping malls are concentrated in the central area of Singapore city, with the highest number in cluster 0 and moderate number in cluster 2. On the other hand, cluster 1 has very low number of shopping malls in the neighborhoods.



Recommendations:

- Open new shopping malls in neighborhoods in cluster 1 with little to no competition.
- Can also open in neighborhoods in cluster 2 with moderate competition if have unique selling propositions to stand out from the competition.
- Avoid neighborhoods in cluster 0, already high concentration of shopping malls and intense competition.

Conclusion :

- Answer to business question: The neighborhoods in cluster 1 are the most preferred locations to open a new shopping mall.
- Findings of this project will help the relevant stakeholders to capitalize on the opportunities on high potential locations while avoiding overcrowded areas in their decisions to open a new shopping mall

Thank You.