

# Plan your trip to Singapore -- Nature lover tourist

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## 1. Introduction

Being the “Garden City” in South East Asia, Singapore is packed with natural parks. This is one of the attractions for tourists to visit Singapore, especially nature lovers. Singapore is a very small city, with convenient public transportation. Properly plan ahead of the travel would save tourist a lot of time and cost. A thorough understanding of the good natural parks and their surroundings are essential for travelers.

### 1.1 Problem

Can we provide a list of the good reviewed natural parks in Singapore and their neighborhood information, to help the tourists to plan their trip in terms of the venue of hotel, restaurants for food and drinks, etc.?

## 2. Data Description

To solve the problem, we need two sets of data:

### 2.1 A list of good natural parks in Singapore

I searched online and find a list of parks in Singapore with detailed description (by a click on the name). Everyone is very famous place of interest.

<https://www.latlong.net/category/parks-199-53.html>

I extract the table information from the website and save it as my list of parks.

### 2.2 Foursquare API to check for neighborhood information

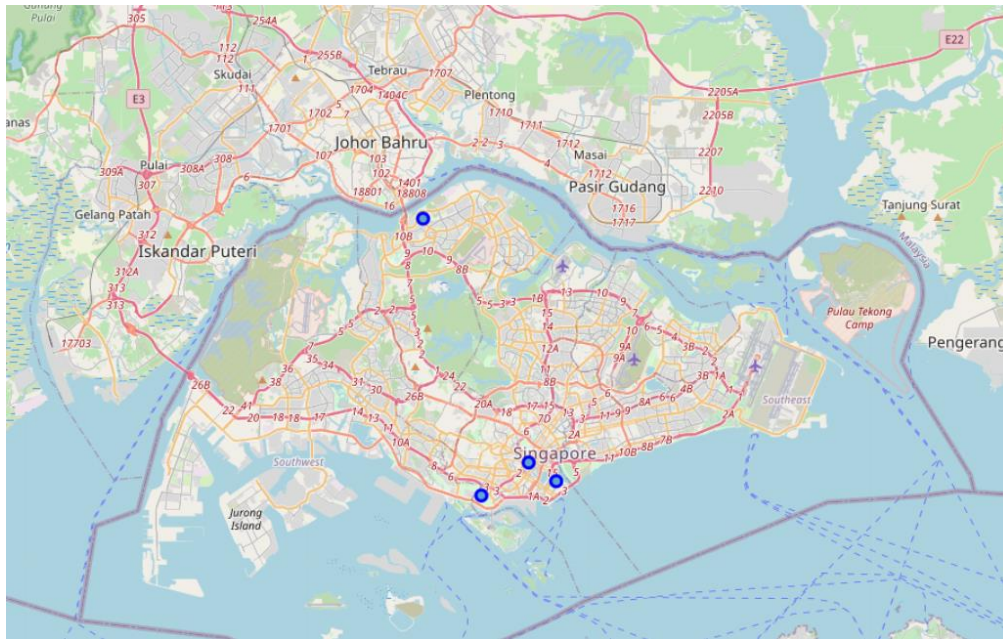
I used Foursquare API to get the most common venues surrounding the parks in the list.

## 3. Methodology

I used GitHub repository as the database for my project. My master data has the parks name, Latitude and Longitude information that I have extracted from the website.

	Place Name	Latitude	Longitude
0	Fort Canning Hill, Singapore	1.294444	103.846947
1	Admiralty Park, Singapore	1.446392	103.780655
2	Mount Faber Park, Singapore	1.273806	103.817497
3	Gardens by the Bay, Singapore	1.282375	103.864273

I used python folium library to visualize geographic details of the parks in Singapore, by creating a map as below:



I utilized the Foursquare API to explore the parks and segment them. I designed the limit as 100 venue and the radius 500 meter for each park from their given latitude and longitude. There are all together 66 venues identified surrounding the 4 parks. Here is a head of the list Venues name, category, latitude and longitude information from Forsquare API.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Fort Canning Hill, Singapore	1.294444	103.846947	Fort Canning Park	1.295075	103.846421	Park
1	Fort Canning Hill, Singapore	1.294444	103.846947	National Museum of Singapore	1.296498	103.848462	Museum
2	Fort Canning Hill, Singapore	1.294444	103.846947	Le Bistrot Du Sommelier	1.294645	103.849577	French Restaurant
3	Fort Canning Hill, Singapore	1.294444	103.846947	The Substation	1.294367	103.849443	Art Gallery
4	Fort Canning Hill, Singapore	1.294444	103.846947	Hotel Fort Canning	1.295854	103.845453	Hotel

There are total 42 unique categories of venues returned by Foursquare, a table of the top 10 venue category for each park is shown below:

	Neighborhood	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
0	Admiralty Park, Singapore	Park	Waterfront	Gastropub	Garden	Fried Chicken Joint	French Restaurant	Food Court	Dim Sum Restaurant	Coffee Shop	Club House
1	Fort Canning Hill, Singapore	Hotel	French Restaurant	Waterfront	Park	Bar	Business Service	Coffee Shop	Spa	Lighthouse	Movie Theater
2	Gardens by the Bay, Singapore	Garden	Scenic Lookout	Hotel	Bridge	Seafood Restaurant	Bar	Botanical Garden	Lounge	Food Court	Gastropub
3	Mount Faber Park, Singapore	Scenic Lookout	Chinese Restaurant	Hong Kong Restaurant	Park	Grocery Store	Gym	Food Court	Karaoke Bar	Club House	Mountain

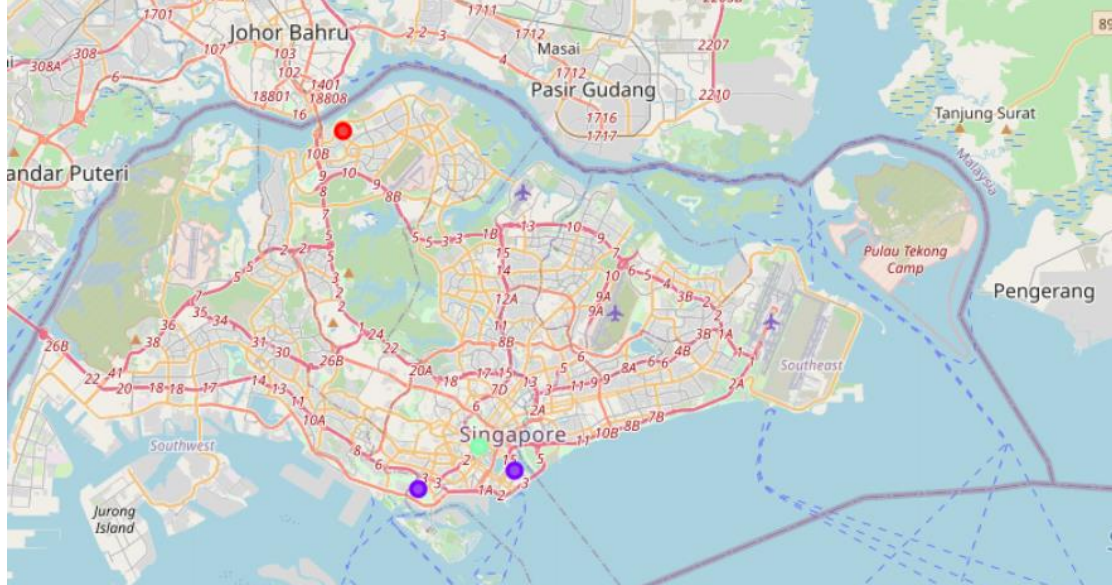
To see if there are some common features among the parks, I tried unsupervised learning K-means algorithm. The K-Means elbow method indicates 3 degree for optimum k of the K-Means.

#### 4. Results

The table below shows the final cluster results for the 4 famous parks in Singapore:

	Place Name	Latitude	Longitude	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
0	Fort Canning Hill, Singapore	1.294444	103.846947	2	Hotel	French Restaurant	Waterfront	Park	Bar	Business Service	Coffee Shop
1	Admiralty Park, Singapore	1.446392	103.780655	0	Park	Waterfront	Gastropub	Garden	Fried Chicken Joint	French Restaurant	Food Court
2	Mount Faber Park, Singapore	1.273806	103.817497	1	Scenic Lookout	Chinese Restaurant	Hong Kong Restaurant	Park	Grocery Store	Gym	Food Court
3	Gardens by the Bay, Singapore	1.282375	103.864273	1	Garden	Scenic Lookout	Hotel	Bridge	Seafood Restaurant	Bar	Botanical Garden

To show the clusters on the map:



Based on the common venues in each cluster, we can name them based on their features:

Cluster 0: “Wild Nature” – As shown by both the map and the Foursquare AI, park in cluster 0 is joint with other parks, waterfronts. It is in the far north of Singapore, away

from the bustle of the city. Together with the joined parks, it reserves the wild nature view of Tropical Rainforest.

Cluster 1: "Scenic Lookout". The parks in this cluster are surrounded by a lot of scenic lookout, hotels and restaurants. They are the famous place for visit.

Cluster 2: "CBD". The park in this cluster is near to the business center. It is the best example of "Garden City" of Singapore.

## **5. Discussion**

Visitors can plan their trip efficiently based on the results provided in this project.

Firstly, they can choose hotels near the parks in cluster 1 for the following reasons:

- More choice of hotels
- Live in a place near nature parks is the best choice for nature lover, they can experience the parks early in the morning and late in sun set.
- There are restaurants and grocery stores nearby which is convenient for visitors.
- Other scenic lookouts are within the working distance, save time and cost for visitors.

Secondly, they can visit Fort Cannon Hill near the CBD area to see how people enjoy peacefulness in the bustle of the city in the "Garden City of Singapore". This park is not far from the parks in cluster 1, one can plan a half day trip here.

Lastly, they can plan a whole day to visit Admiralty park in cluster 0. It is very different from the other parks. Hope it will be a non-forgetful experience.

## **6. Conclusion**

We have identified 4 highly recommended parks in Singapore for the nature lover tourists and clustered them based on their neighborhood venues. There are parks near Scenic lookouts, within CBD area and far away in the wild natures. With the information I provided here, visitors can plan their trip cleverly ahead, so they can maximize their visit by minimum time and cost!