



ANALYSIS OF NEIGHBORHOODS IN PENANG (PULAU PINANG) STATE OF MALAYSIA FOR STARTING A FOOD BUSINESS

Capstone Project – The Battle of Neighborhoods (Week 2)

Introduction

Penang (also known as Pulau Pinang) is famous tourist state in Malaysia. “George Town” of Penang is announce by UNESCO as World Heritage Site in 2008. This let me to have a thought about food business in around the city of Penang. I decided to make a clustering analysis on most common venues around different city in Penang where most common venues attract visitors and that will be the source of business for food.

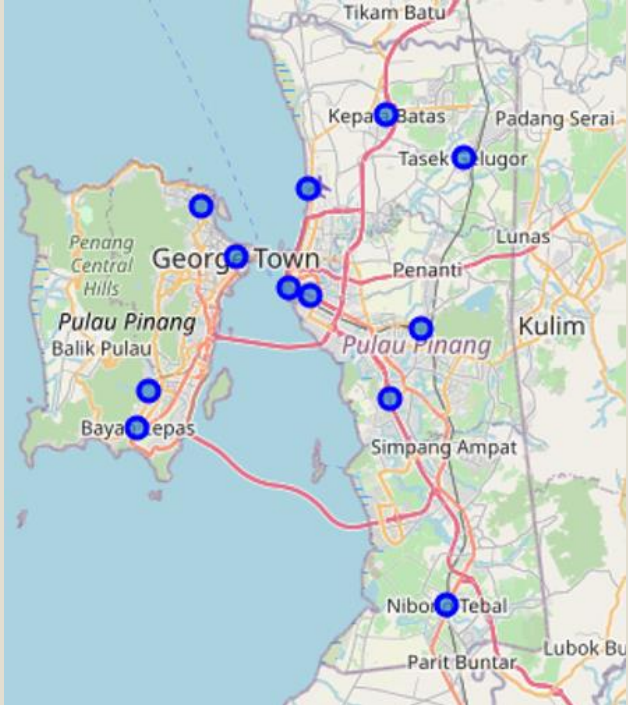


Data

- Neighborhood dataset is extract from https://www.weatherdatasource.com/MY-Pulau_Pinang
- Latitude and Longitude of city is retrieve by using Geolocator with Geopy library.
- Venues of each coordinates is extracted with FourSquare API

Methodology

- Dataset which includes “City”, “Latitude” and “Longitude” information of Penang.
- Python Folium library was used to visualize city for map of Penang. In order to get Latitude and Longitudes of city, Geopy and geocoder are used.
- Foursquare API was used to retrieve Venue Category with Limit was set to 100 and Radius was set to 1000 meters. With the returned list of venues, only top 20 venues will be considered.



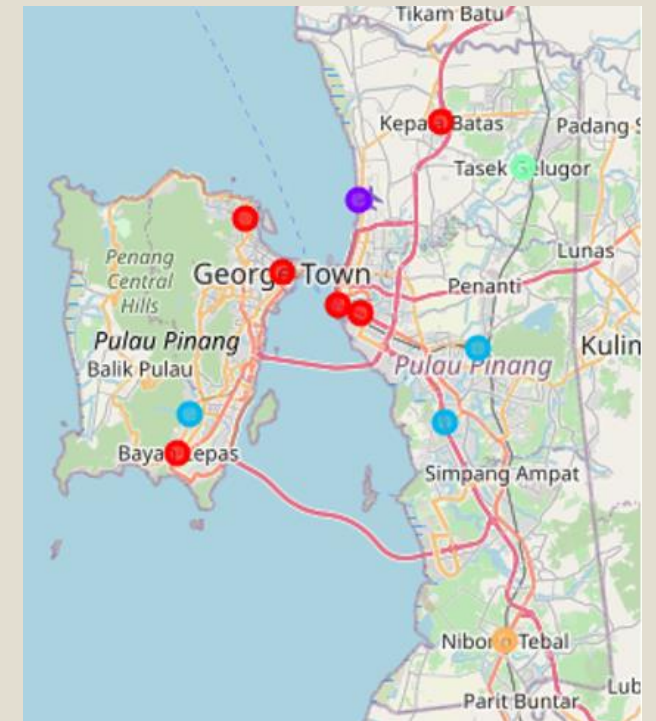
	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Bayan Lepas	5.29513	100.26	Nasi Dalca Briyani	5.296738	100.259892	Malay Restaurant
1	Bayan Lepas	5.29513	100.26	Bawal Goreng Pokok Cheri	5.299255	100.262345	Malay Restaurant
2	Bayan Lepas	5.29513	100.26	Cargas Cafe	5.294794	100.258380	Malay Restaurant
3	Bayan Lepas	5.29513	100.26	Pasar Ramadhan Bayan Lepas	5.295330	100.262206	Food Truck
4	Bayan Lepas	5.29513	100.26	Fizzy Cafe Mee Udang Ketam	5.296352	100.259004	Asian Restaurant

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	11th Most Common Venue	12th Most Common Venue
Bandaraya George Town	Café	Hotel	Chinese Restaurant	Vegetarian / Vegan Restaurant	Bakery	Food Truck	Dessert Shop	Bed & Breakfast	Halal Restaurant	Wine Bar	Hostel	Ind Re
Bayan Lepas	Café	Malay Restaurant	Asian Restaurant	Coffee Shop	Convenience Store	Pharmacy	Food Truck	Indian Restaurant	Thai Restaurant	Pastry Shop	Outdoors & Recreation	Nox Ho
Bukit Mertajam	Chinese Restaurant	Malay Restaurant	Food Court	Food Truck	Coffee Shop	Asian Restaurant	Electronics Store	Pizza Place	Market	Department Store	Café	Bus Sta
Butterworth	Asian Restaurant	Harbor / Marina	Malay Restaurant	Coffee Shop	Thai Restaurant	Electronics Store	Burger Joint	Business Service	Platform	Pier	Convenience Store	Hor Bar
Juru	Malay Restaurant	Chinese Restaurant	Asian Restaurant	Food Truck	Breakfast Spot	Shipping Store	Hotel	Comfort Food Restaurant	Coffee Shop	Food Court	Food	Par

Methodology

- With K-means clustering, city was clustered into 5 clusters.
- Clustering of City was plot on the map with Folium library.

	Neighborhood	State	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	8th Most Common Venue	9th Most Common Venue
0	Bayan Lepas	Penang	5.29513	100.26	0	Café	Malay Restaurant	Asian Restaurant	Coffee Shop	Convenience Store	Pharmacy	Food Truck	Indian Restaurant	Thai Restaurant
1	Bukit Mertajam	Penang	5.36424	100.461	2	Chinese Restaurant	Malay Restaurant	Food Court	Food Truck	Coffee Shop	Asian Restaurant	Electronics Store	Pizza Place	Market
2	Butterworth	Penang	5.39349	100.366	0	Asian Restaurant	Harbor / Marina	Malay Restaurant	Coffee Shop	Thai Restaurant	Electronics Store	Burger Joint	Business Service	Platform
3	Bandaraya George Town	Penang	5.41457	100.33	0	Café	Hotel	Chinese Restaurant	Vegetarian / Vegan Restaurant	Bakery	Food Truck	Dessert Shop	Bed & Breakfast	Halal Restaurant
4	Juru	Penang	5.31572	100.438	2	Malay Restaurant	Chinese Restaurant	Asian Restaurant	Food Truck	Breakfast Spot	Shipping Store	Hotel	Comfort Food Restaurant	Coffee Shop



Discussion

- The analysis is showing that restaurant are the most common business in each city.
- Cluster 0 represent the major city in Penang, they are more 'famous' compared to other city. This could be a good spot for food truck business as the competition is that high.
- Cluster 1 is near to military based and it is not really common venues to visit by tourist.
- Cluster 2 and 3 is considered as outskirts and not quite a tourist hotspot where local restaurant is among the top venues where local frequently visit.
- Cluster 4 is far from center of Penang and it is close to fishing village, hence seafood restaurant is famous in that area.

Conclusion

- In this project, neighborhood of Penang had been successfully analyse.
- It provide an idea on what business is popular in the above mentioned city.
- As tourist state, those venues will be heart of attraction and with crowd of tourist, food will be one of the necessity and it present opportunity opening restaurant.
- Final decision on optimal restaurant location will be made by stakeholders based on specific characteristics of neighborhoods and locations in every city zone.