

The background image shows two glasses of iced bubble tea with boba pearls and a bowl of boba pearls on a wooden table. The glasses are filled with a light brown liquid, ice cubes, and boba pearls. The bowl is also filled with boba pearls. The wooden table has a dark brown, textured surface.

IBM Data Science Final Capstone Project

Opening A Bubble Tea Shop in Singapore

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What is Bubble Tea?

- Also known as pearl milk tea or boba tea
- Growing popular drink in Asian countries
- Pearls/ bobas: Made of tapioca
- Base Drink:
 - Freshly brewed tea: Black tea, green tea or oolong tea
 - Other flavors: Earl grey, passion fruit, taro, plum etc.

What's Bubbling?

- Increasing number of bubble tea shops opening over the years and food establishments offering bubble tea on their menu.
- Global bubble tea market valued at US\$1.96 billion in 2016 and projected to reach US\$3.21 billion by 2023

Business Problem

- Many established Taiwan bubble tea brands have started selling bubble tea in Singapore more than 10 years ago and have many outlets present island wide
- Singapore is a small country, with the saturated bubble tea market, where should a new entrant open a store in Singapore?

Datasets Required

- Singapore Planning Areas as demarcated by the government
<https://data.gov.sg/dataset>
- Corresponding household population size residing in each Planning Area. 2019 Statistics taken from the Singapore government portal
- Latitude and Longitude coordinates taken using OpenCage Geocoder API <https://opencagedata.com/>
- List of bubble tea shops and shops selling bubble tea within the planning areas retrieved using Foursquare API
<https://developer.foursquare.com/>

Data cleaning

Planning Areas

- Drop planning areas that are non-residential or for non-commercial use.
- Combine planning areas together that have overlaps
- Check for outliers and missing household population figures

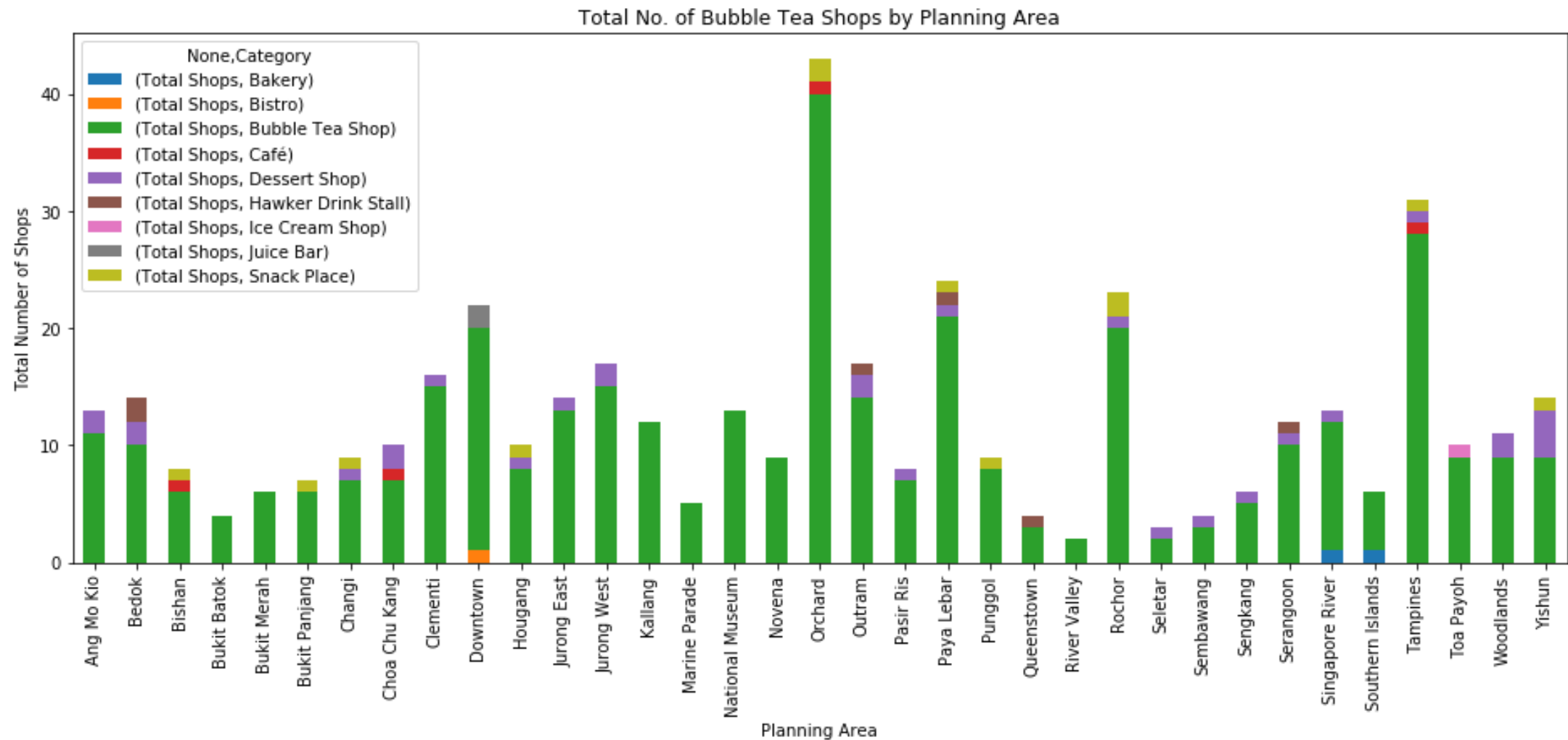
Geolocation

- Check through latitude and longitude coordinates whether they are retrieved correctly

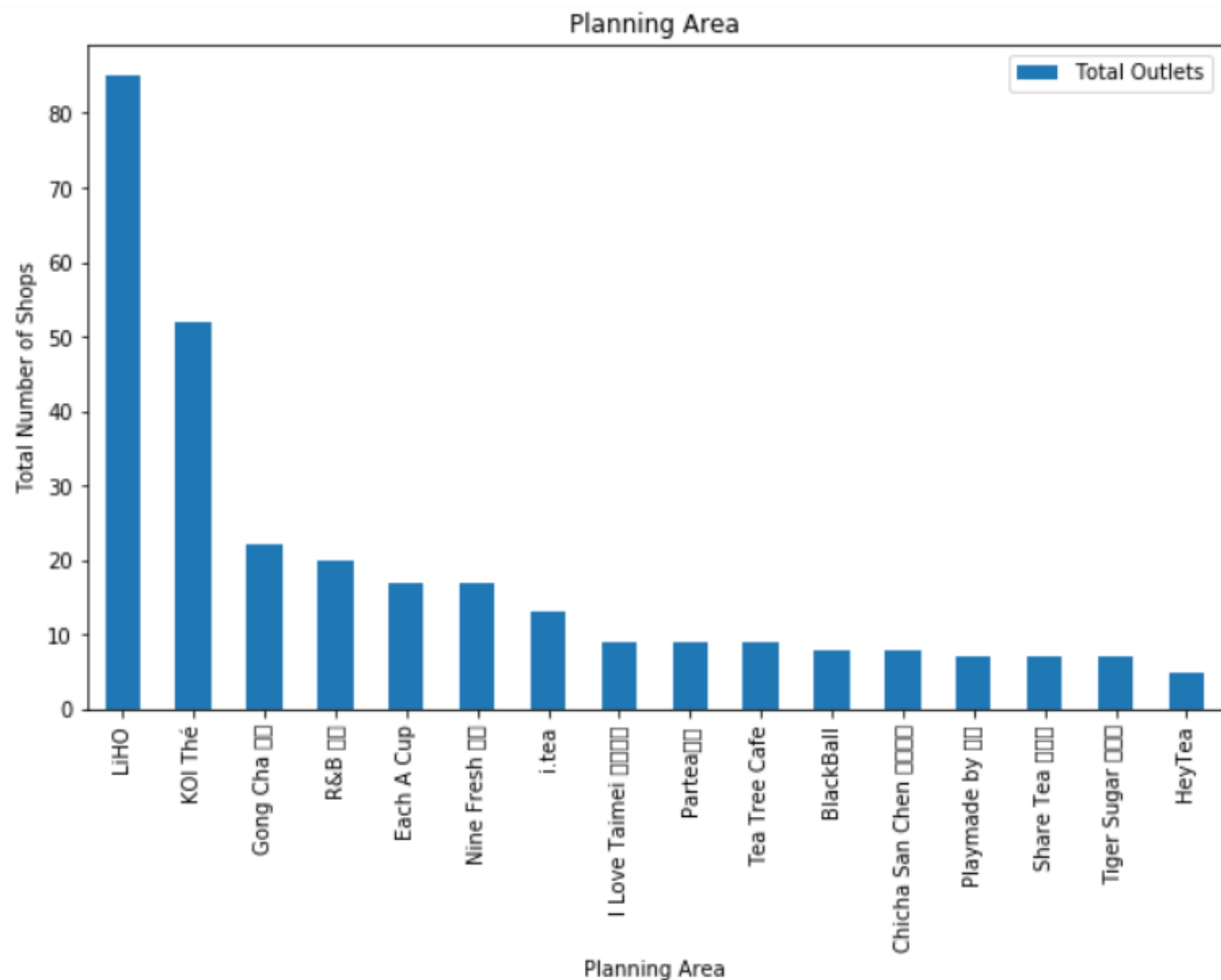
Foursquare API

- Drop duplicate shop IDs selling bubble tea retrieved using Foursquare API
- Check through list of shops if they are still in operation by validating against the shops' website
- Add in missing brand outlets that are not found in Foursquare's Database
- Edit inconsistencies in shop brand names to be the same

Exploratory Analysis



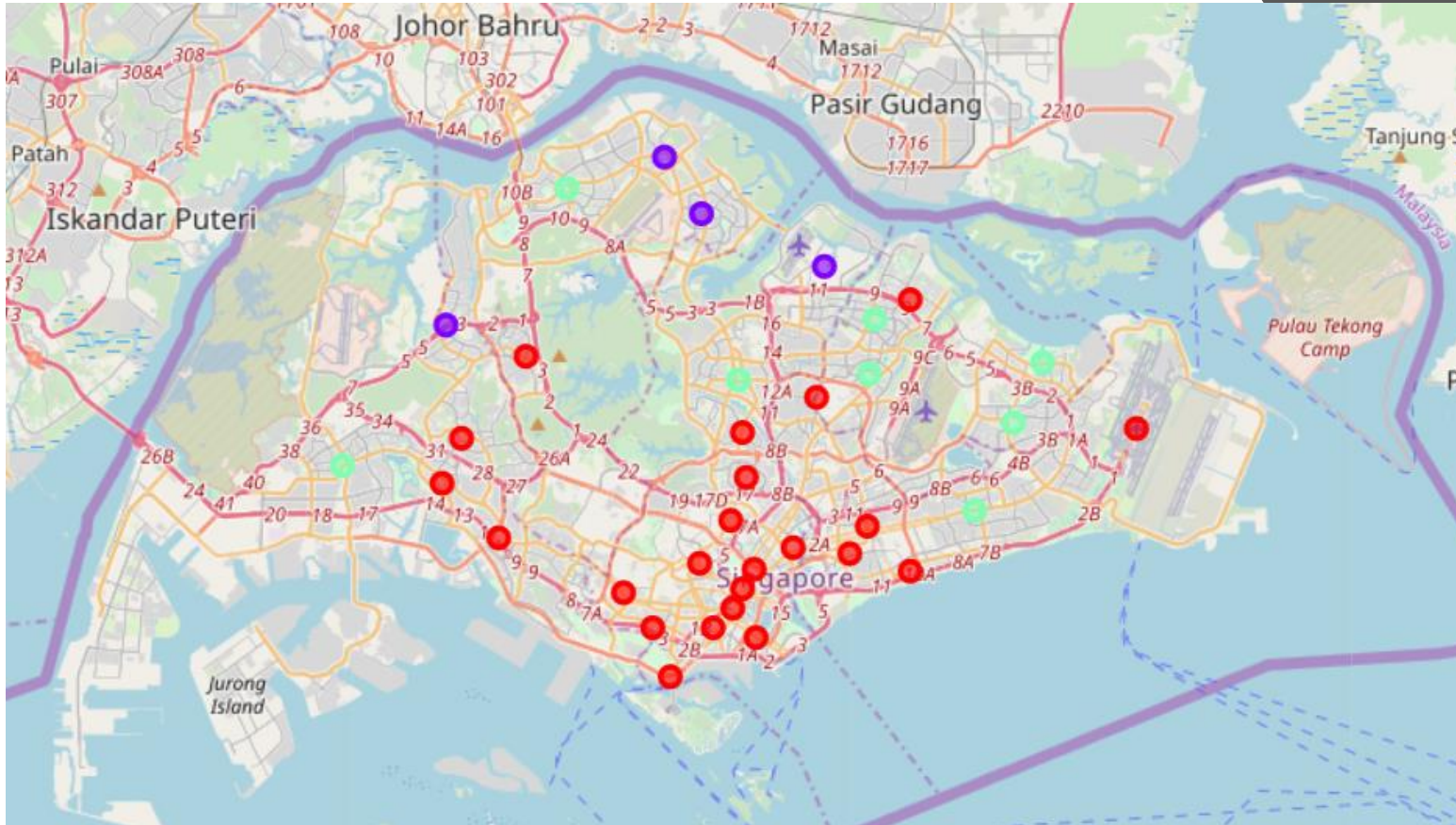
Main Brand Competitors



	Shop Name	Total Outlets
42	LiHO	85
37	KOI Thé	52
28	Gong Cha 贡茶	22
62	R&B 巡茶	20
24	Each A Cup	17
50	Nine Fresh 九鲜	17
113	i.tea	13
34	I Love Taimei 我愛台妹	9
56	Partea 茶派	9
79	Tea Tree Cafe	9
9	BlackBall	8

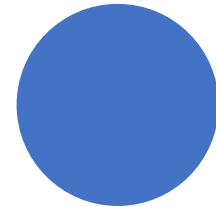
K-Means Clustering

Optimal K is 3 determine by elbow method and silhouette score



Interpreting Cluster Results

- Cluster 1 (red markers): Planning area with high density of bubble tea shops and majority low household population
- Cluster 2 (green markers): Planning area with low density of bubble tea shops medium size household population
- Cluster 3 (purple markers): Planning area with moderate density of bubble tea shops high household population



Limitations

- No. of bubble tea shops retrieved dependent on Foursquare database, limitations set in the query
- Datasets to get deeper insights but unavailable:
 - Average income of the residents of each Planning Area (denotes spending power)
 - Customers votes for drink or brand preference



Conclusion

- Cluster 3
 - Stable customer traffic flow and healthy level of competition
- Other factors to consider:
 - Store location accessibility
 - Amenities around the area
 - Brand competitiveness
 - Competing brands offering- drink menu, price points, brand standing in Singapore