# Neighbourhood analysis in Hong Kong

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**Introduction**

Hong Kong is among the most developed cities around the world. As an international financial centre, Hong Kong has been performing the role of a bond between China and other countries. Thus, the city is also well known for its cultural diversity, especially the integration of Chinese and western culture. This project is to understand better the neighbourhood of Hong Kong by using Foursquare.

As an international city, Hong Kong attracts visitors from all cultural background and with different traveling purposes. For example, many Chinese tourists enjoy eating Dim Sum and shopping luxury in Hong Kong, while Western tourists may prefer bars and traditional Chinese cultural spots. Accordingly, when selecting hotels and arranging routes, the visitors need to know the differences between the neighbourhoods. Besides, students should know better the neighbourhood of the city to decide whether to study and live here. In sum, this study can help people who are planning trips to Hong Kong.

**Data**

The neighbourhoods in Hong Kong are from the official polling stations during 2019 district council election. This is because unlike Toronto, Hong Kong does not have postal codes, thus it is not possible to get neighbourhood information by postal codes. The official polling station are distributed uniformly around the communities where most residents live. Thus, the data are expected to be useful and effective to the neighbourhood analysis.

The Geopy package is used to obtain the location information of Hong Kong and each neighbourhood. Note that the location of some polling stations cannot be obtained by Geopy, especially for those rural regions. Considering the purposes of our neighbourhood study are mainly related to urban regions, if the data cannot be obtained by Geopy, then the neighbourhood is excluded. Finally, around 80, 110 and 210 neighbourhoods, respectively in Hong Kong island, Kowloon, and New Territories are analysed (Fig 1). Foursquare will be used to explore the neighbourhood further.
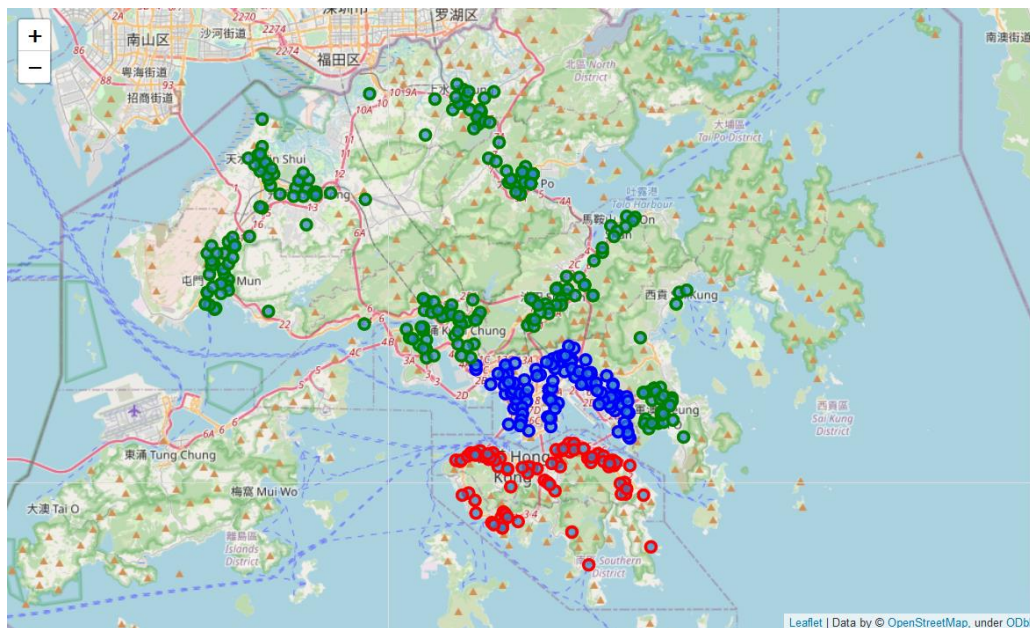
Fig. 1 Distribution of the neighbours that will be analysed (Red: Hong Kong Island, Blue: Kowloon, Green: New Territory)

**Methodology**

K-means clustering is used to study the neighbourhoods. To determine the number of clusters k, the 'elbow' method is used. The method uses different k to conduct clustering and calculate the distortion (i.e. the within-cluster sum of squared errors), then select the optimal k at the elbow position as shown in Fig. 2. Here, k is selected as 12. By removing the outliers with less than 10 neighbourhoods, 5 clusters remain.
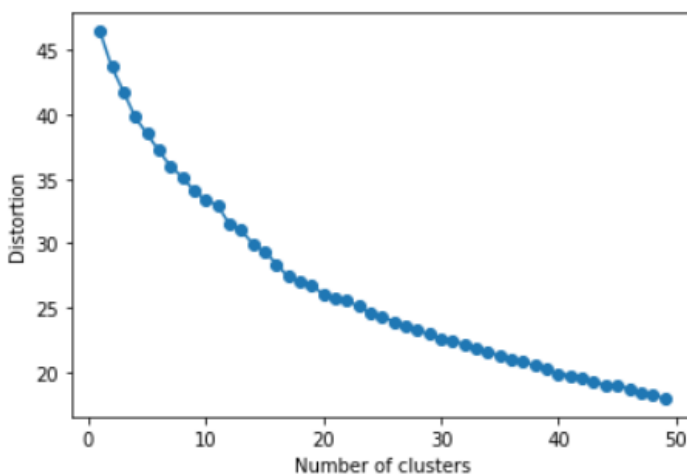


Fig. 2 The 'elbow' method to determine the number of clusters k.

**Results & Discussion**

Firstly, the frequencies of the cluster labels in the three areas are given in Fig. 3. The result shows that the structure of neighbourhoods in Hong Kong Island and Kowloon are similar to each other. This can be caused by the similar urbanization of the two areas. On the other hand, New Territories, the urbanization of which has been taking place in recent years, are different. The cluster 0 and cluster 3 are more common in New Territories while the others are less common.
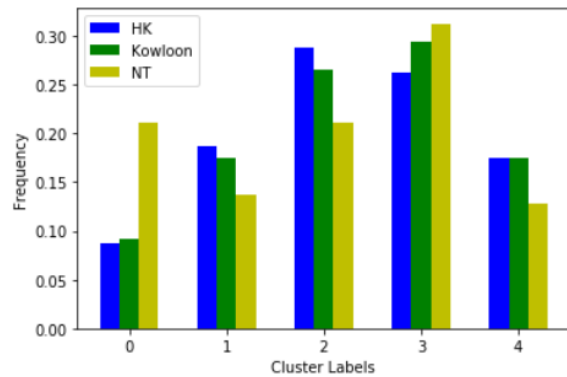


Fig. 3 Frequencies of cluster labels in three areas (HK for Hong Kong Island and NT for New Territory)

Then each cluster is analysed by summarizing the most common venues, as in Fig.4. As can be seen, Chinese restaurants and fast food restaurants top almost all clusters. Besides, all of clusters 0 – 4 include shopping mall and/or supermarket in top 5. This corresponds to the fact that eating and shopping in Hong Kong are very convenient in Hong Kong. The overwhelming number of Chinese restaurants may be related to the eating habit of Hong Kong people, who prefer to eat outside rather than cook at home. It should also be noted that the light rail station is typical of Cluster 0. In Hong Kong, the light rail station is different from traditional subway and is more in newly developed regions as in New Territorries.
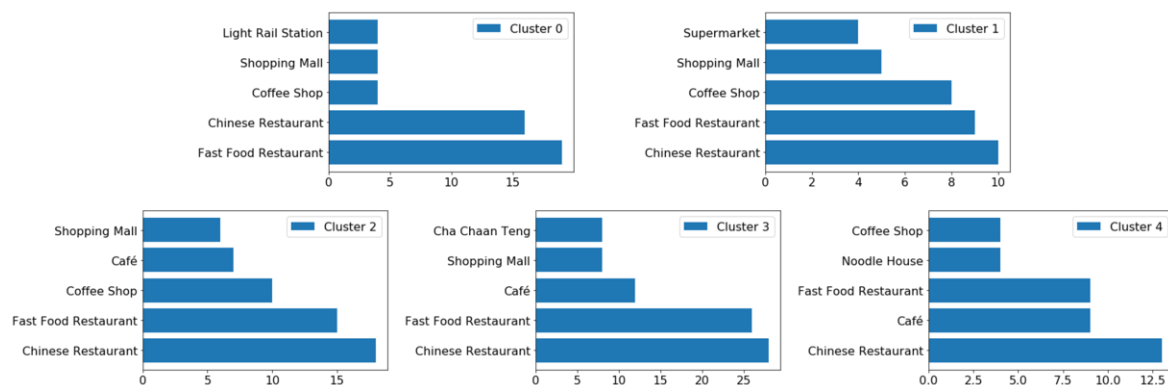


Fig. 4 Counts of the most common venues in different clusters

**Conclusion**

Although the deeper future analysis can be based on this study, several conclusions can be drawn from the current results and discussion, which might be constructive for people who want to know more about the neighbourhoods in Hong Kong:

(1) The neighbourhoods in Hong Kong island and Kowloon are close to each other, probably due to the similar urbanization history.
(2) Hong Kong is a convenient city where supermarket and shopping malls are distributed in many neighbourhoods around the city
(3) Chinese restaurants and fast food restaurants are the most common venues in Hong Kong, which may be related to the eating habit in this city.