

Covid-19 cases locations in Hong-Kong

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1. Introduction

The 2019–20 coronavirus pandemic is an ongoing pandemic of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The outbreak started in Wuhan, Hubei Province, China, in December 2019. The World Health Organization (WHO) declared the outbreak to be a Public Health Emergency of International Concern on 30 January 2020 and recognised it as a pandemic on 11 March 2020

(source : https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic).

In order to better understand and fight this pandemic, geospatial data are crucial. Countries that have been able to track accurately locations of outbreaks (South Korea, Taiwan...), often using smartphones geolocation features, are also those who have been able to take the most efficient measures.

In this report we will focus on covid-19 cases in Hong-Kong :

- In the first part we will visualize on a map buildings where cases have been reported. We will also show how the buildings locations can be segmented using k-means algorithm.
- In the second part, we will search (using foursquares API) venues located within a 150m radius of each building linked to cases. We will sort these venues according to the number of buildings with covid-19 cases located in their neighborhood and provide informations (name, category, position) retrieved via foursquares.

2. Data

The original dataset is a csv file : **building_list_eng.csv** updated daily on this website : <https://data.gov.hk/en-data/dataset/hk-dh-chpsebcddr-novel-infectious-agent>

We downloaded it on march 25. It contains the following data (see table next page) :

	District	Building name	Last date of residence of the case(s)	Related probable/confirmed cases
0	Sai Kung	Yee Ching House Yee Ming Estate	NaN	58,128
1	Wan Chai	Envoy Garden	NaN	114, 213
2	Southern	Block 28, Baguio Villa	NaN	Case notified by the health authority of Canad...
3	Tai Po	Heng Tai House, Fu Heng Estate	NaN	119, 124, 140
4	Tuen Mun	On Hei House, Siu Hei Court	NaN	120, 121
...
432	Central & Western	33 Des Voeux Road Central (non-residential)	23/03/2020	402
433	Central & Western	Wah Po Building (non-residential)	24/03/2020	319
434	Yau Tsim Mong	Silvercord (non-residential)	24/03/2020	388
435	Sham Shui Po	Lander Hotel Prince Edward (non-residential)	24/03/2020	388
436	Yau Tsim Mong	Mary Building (non-residential)	24/03/2020	388

437 rows × 4 columns

Thanks to google geocoding API, we can find latitude and longitude of each building from their name and district :

	District	Building name	Last date of residence of the case(s)	Related probable/confirmed cases	Latitude	Longitude
0	Sai Kung	Yee Ching House Yee Ming Estate	NaN	58,128	22.307034	114.263220
1	Wan Chai	Envoy Garden	NaN	114, 213	22.264584	114.188604
2	Southern	Block 28, Baguio Villa	NaN	Case notified by the health authority of Canad...	22.262689	114.131696
3	Tai Po	Heng Tai House, Fu Heng Estate	NaN	119, 124, 140	22.457911	114.170456
4	Tuen Mun	On Hei House, Siu Hei Court	NaN	120, 121	22.373186	113.967726
...
432	Central & Western	33 Des Voeux Road Central (non-residential)	23/03/2020	402	22.283049	114.157233
433	Central & Western	Wah Po Building (non-residential)	24/03/2020	319	22.283902	114.129211
434	Yau Tsim Mong	Silvercord (non-residential)	24/03/2020	388	22.297496	114.169367
435	Sham Shui Po	Lander Hotel Prince Edward (non-residential)	24/03/2020	388	22.326621	114.164267
436	Yau Tsim Mong	Mary Building (non-residential)	24/03/2020	388	22.296243	114.171714

437 rows × 6 columns

Then, using foursquares API, we can find venues located within a 150 m radius of each building :

	District	Building	Building Latitude	building Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Wan Chai	Envoy Garden	22.264584	114.188604	Happy Valley (Upper) Bus Stop 跑馬地 (上) 巴士站	22.264392	114.188966	Bus Stop
1	Wan Chai	Envoy Garden	22.264584	114.188604	Yogo Happy Valley	22.264002	114.188833	Cupcake Shop
2	Wan Chai	Envoy Garden	22.264584	114.188604	Envoy Garden Bus Stop (安慈苑巴士站)	22.264389	114.188804	Bus Stop
3	Southern	Block 28, Baguio Villa	22.262689	114.131696	Baguio Villa (Lower) Minibus Stop 碧瑤灣 (下) 小巴站	22.261945	114.132117	Bus Stop
4	Southern	Block 28, Baguio Villa	22.262689	114.131696	The Arcade, Cyberport (數碼港商場)	22.263127	114.132820	Shopping Mall