

Capstone Project Report

Introduction:

Hangzhou is one of the top 5 developed cities in China and in 2022 the Asian Games is going to take place in Hangzhou. As you may know, there are several world-class companies, especially IT giants in Hangzhou like Alibaba and Netease. Among them, Alibaba has become the largest retailer company in the world which also indicates its asset is considerable. For the purpose of this capstone project, let's say Alibaba wants to build a luxury hotel before 2022 so that it can serve VIPs from all over the world when Asian Games begin. But first they want to build the hotel in a place where there are **not so many peers** to compete and also the hotel has to be near train or subway stations to guarantee the **convenience of transportation**. Therefore, I am chosen to provide information to help the board of directors of Alibaba company decide ideal place to build the hotel. Thus, Foursquare system can offer me location data of main transportation stations and big hotels in Hangzhou to help me accomplish my mission.

Data:

The data collected and arranged in this project is mainly about hotels and stations in Hangzhou, China obtained from Foursquare system on 2/4/2020. The data includes latitude and longitude, i.e. the geographic location coordinates. A table about stations is shown below.

	name	categories	address	lat	lng	postalCode	state
0	Amethyst Hotel (浙江紫晶大酒店 Amethyst Hotel)	Hotel	78 Qinchun E Rd 庆春东路78号	30.260068	120.187794	310016	浙江
1	杭州大酒店 Hangzhou Hotel	Hotel	下城区延安路546号	30.240637	120.187955	NaN	NaN
2	SORL Hotel Hangzhou (杭州瑞立江河汇酒店)	Hotel	NaN	30.258688	120.221039	NaN	浙江
3	Hong Lou Hotel (杭州红楼大酒店)	Hotel	上城区西湖大道2号	30.247297	120.177491	NaN	浙江
4	Shangri-La Hotel Hangzhou Midtown (杭州城中香格里拉大酒店)	Hotel	长寿路6号 No.6 changshou Rd	30.262363	120.156609	NaN	浙江
5	云顶之星杭州店 Genting Star Hotel (Hangzhou)	Hotel	上城区秋涛路264号	30.240459	120.184398	NaN	NaN
6	Evergreen Hotel (四季青大酒店)	Bed & Breakfast	No. 136	30.260398	120.185587	310000	浙江
7	Relax Hotel (瑞莱克斯大酒店)	Hotel	No. 333, Wangjiang Dong Road	30.230867	120.187229	310006	浙江

	name	categories	address	lat	lng	postalCode	state
0	Citizen Center Metro Station (地铁市民中心站)	Metro Station	NaN	30.247062	120.207784	NaN	浙江
1	Jiangjin Road Metro Station (地铁江锦路站)	Metro Station	NaN	30.252395	120.211201	NaN	浙江
2	Hangzhou East Railway Station (杭州东站)	Train Station	1 Tiancheng Rd	30.293664	120.208347	NaN	浙江
3	Qianjiang Road Metro Station (地铁钱江路站)	Metro Station	NaN	30.258252	120.209398	NaN	浙江
4	Chengxing Road Metro Station (地铁城星路站)	Metro Station	NaN	30.241718	120.202274	NaN	浙江
5	Jinjiang Metro Station (地铁近江站)	Metro Station	Fuchun Rd 富春路	30.232866	120.193369	NaN	浙江
6	Qingling Road Metro Station (地铁庆菱路站)	Metro Station	NaN	30.260176	120.189105	310000	浙江
7	Hangzhou Railway Station (杭州站)	Train Station	环城东路1号	30.246055	120.178242	NaN	浙江

Method:

Based on obtained Foursquare data, I used Folium package to visualize the marks for each station and hotel location on a map of Hangzhou so that we can see the clustering of these places. In addition, for explorative analysis I used the scatter plot to plot the latitude and longitude data of both hotels and stations so that we can observe if there is a special pattern for how these places locate.

Results:

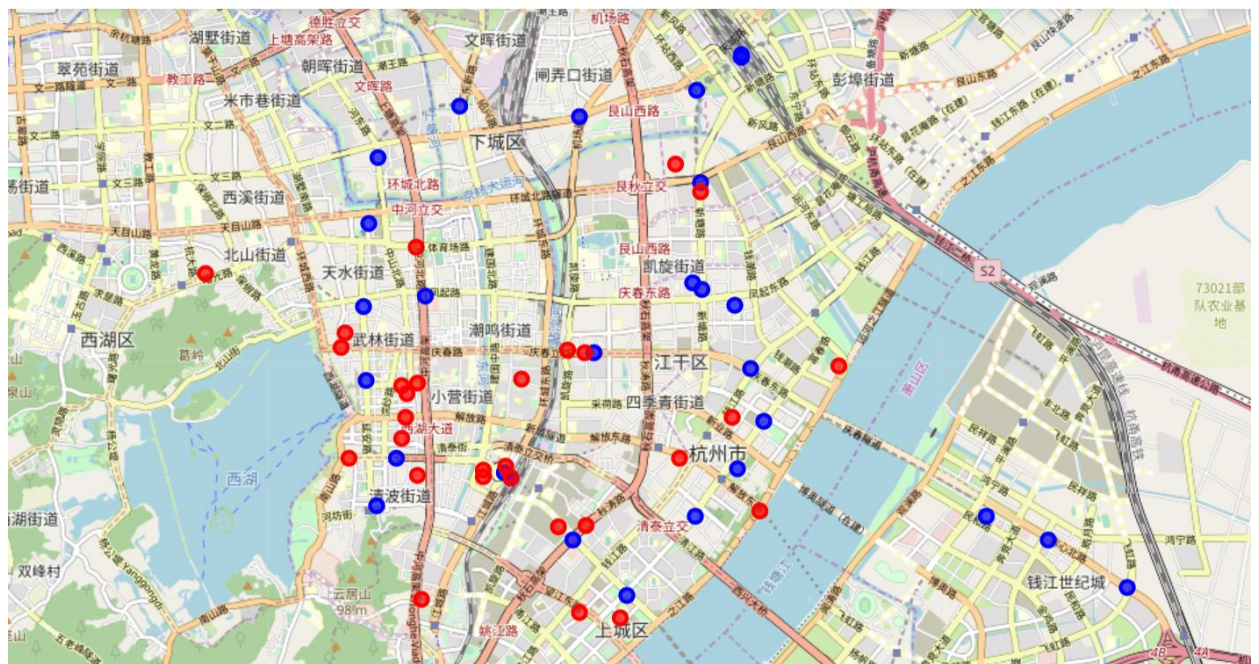


Fig.1 The blue dots represent the stations including train stations and subway stations. The red dots represent major hotels.

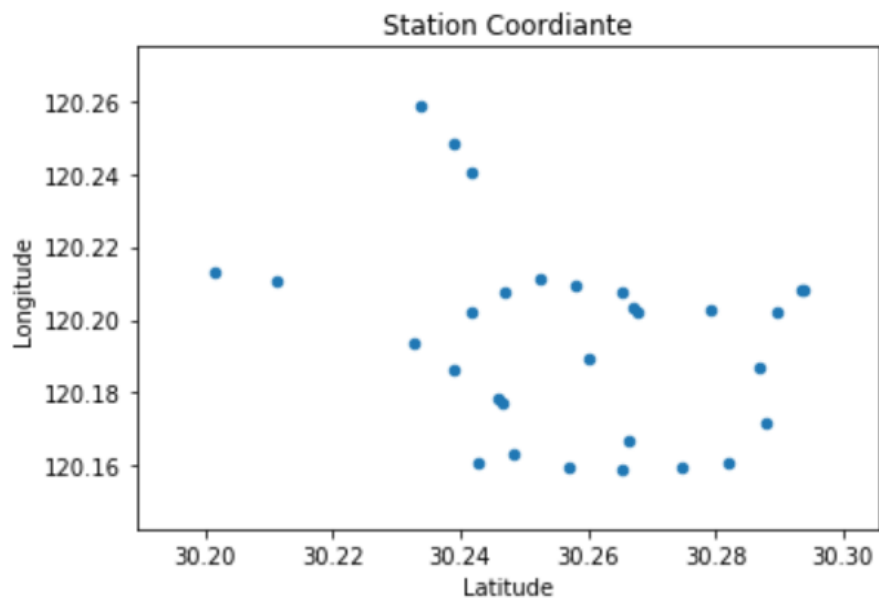


Fig.2 Scatter plot for locations of stations

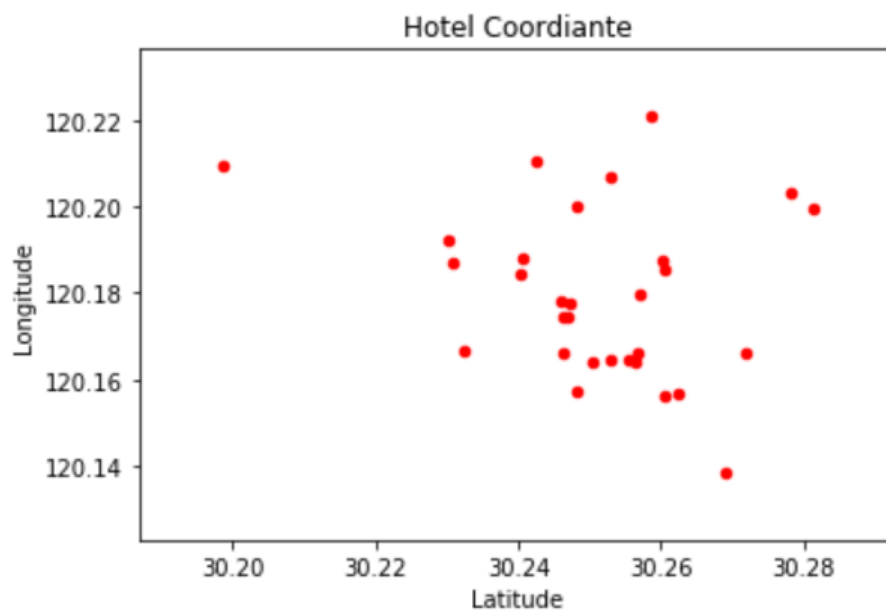


Fig.2 Scatter plot for locations of hotels

Discussion:

Based on our results, we can see that although there seems not to be clear patterns for how the hotels and stations locate, stations and hotels tend to cluster within latitude 30.24-30.28. Hotels spread more freely in terms of longitude while stations mainly locate between longitude 120.16-120.22. If we carefully view the Folium map, it's interesting that hotels and stations are at the left side of the river while on the opposite side there are a few stations while only one hotel is found. Therefore, it's evident that although left part of Hangzhou is more convenient for transportation, the hotel business can be rather competitive in the same time. However, the right side, basically BinJiang and Xiaoshan area, seems to be a good place for building a hotel and it's quite likely that more stations will be built in this part, which shows much potential in the near future.

Conclusion:

In brief, I recommend the hotel to be built in right part of Hangzhou near the stations because the transportation is good and there are few competitors.

