

BANGKOK AIRBNB: ROOM PRICING

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Room Pricing

Using Decision Tree, Random Forests, and Linear Regression models to predict fair pricing for rooms in specific areas in Bangkok

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2021 VS 2022 AIRBNB ANALYSIS



MARKET TRENDS OF 2021 VS 2022

PRICING OF ROOMS IN BANGKOK



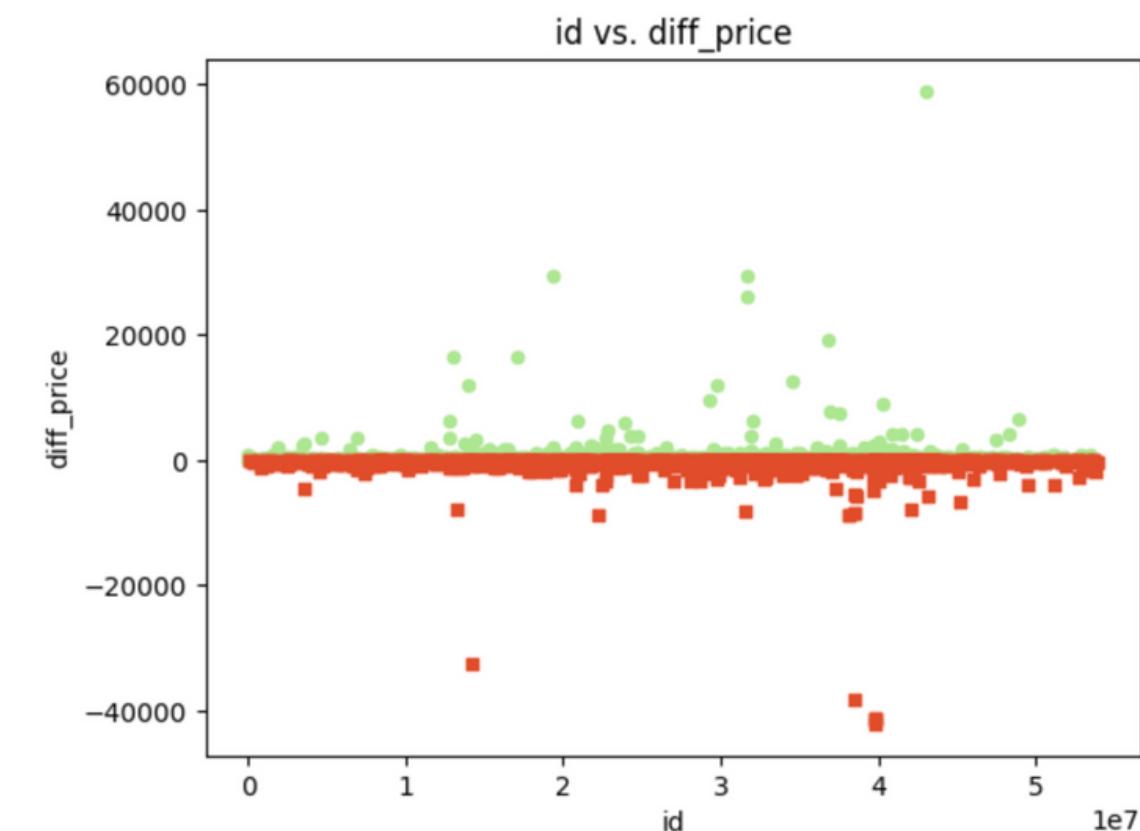
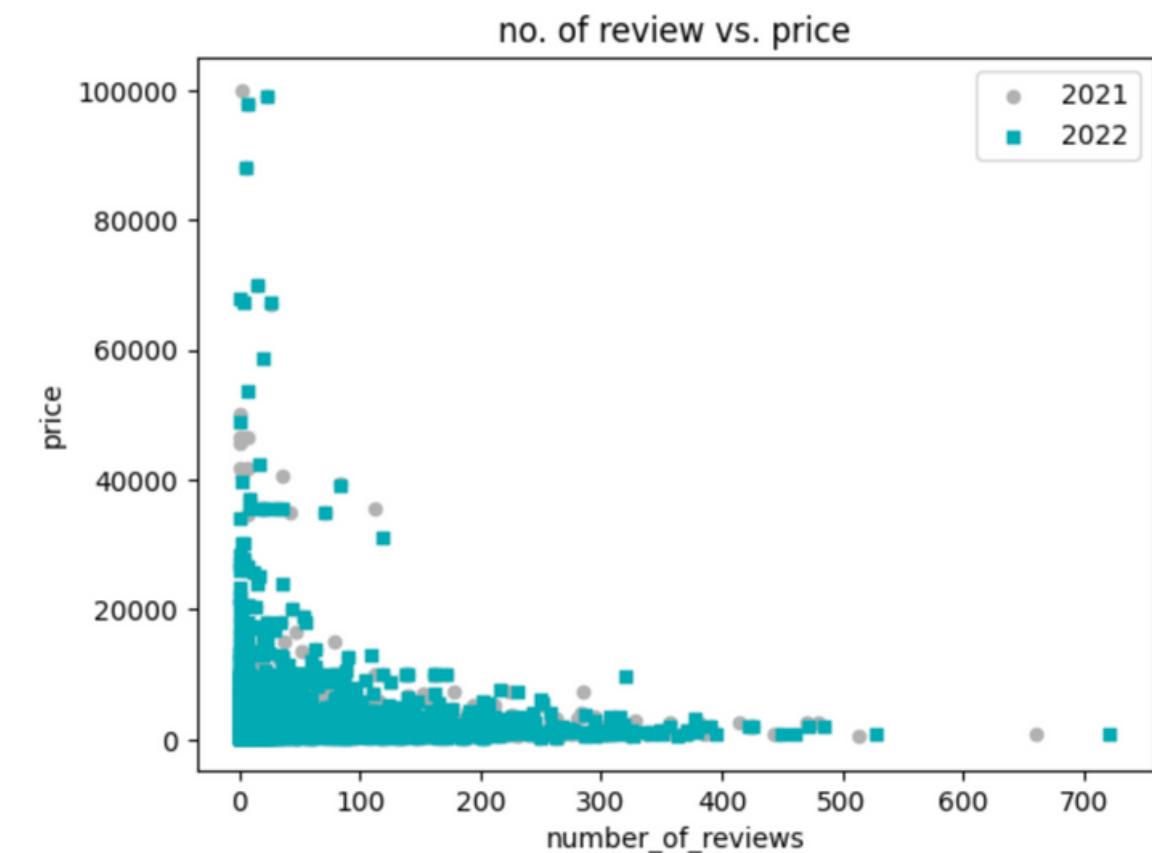
From the correlation between number_of_reviews and price in both years, we considered that the number of reviews almost has no effect on the price.

The number of rooms which increase their price from 2021 to 2022 is 6506. In comparison, the ones which decrease their price are 1370. Therefore, the room's prices tend to be higher in 2022, when compared to 2021.

ANALYSIS

MODEL

PRICING



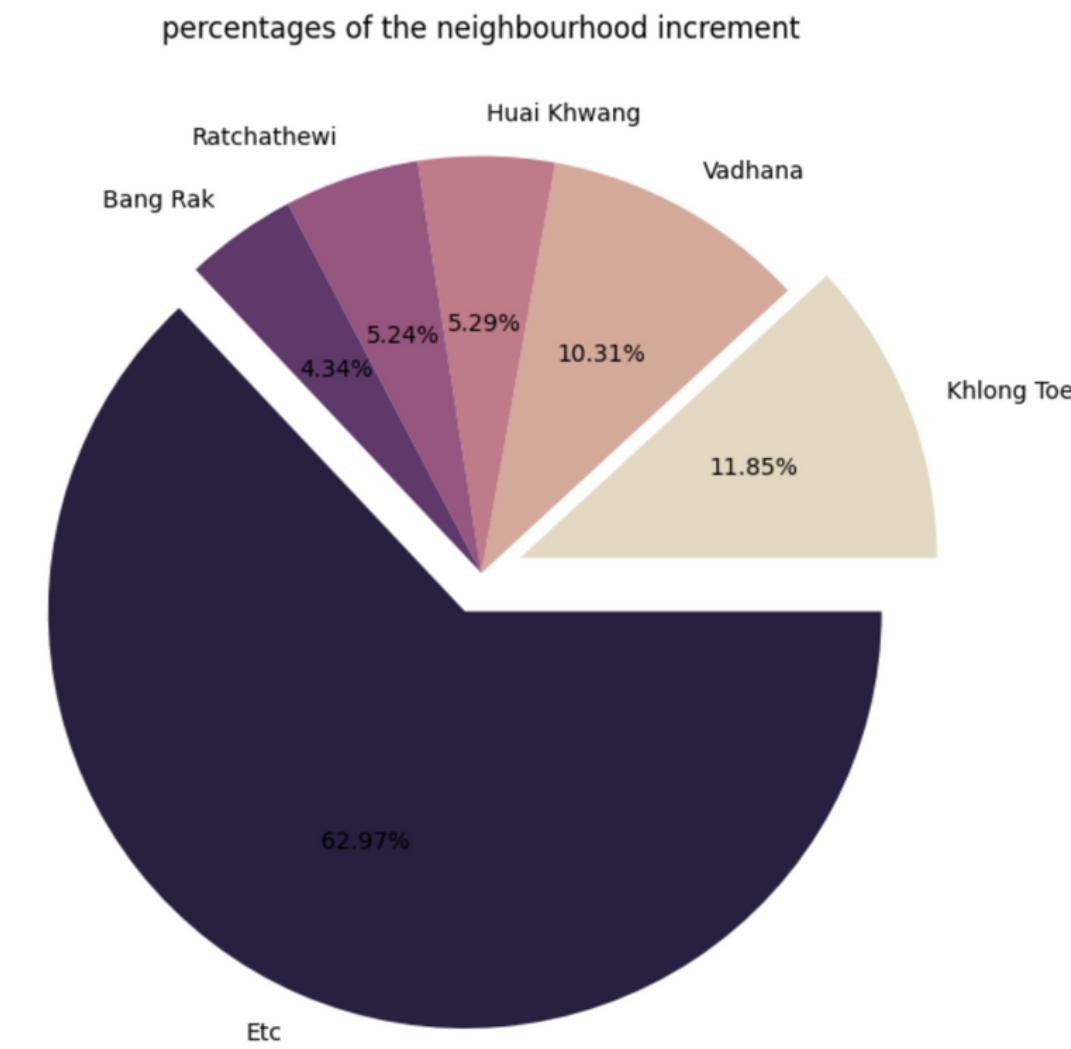
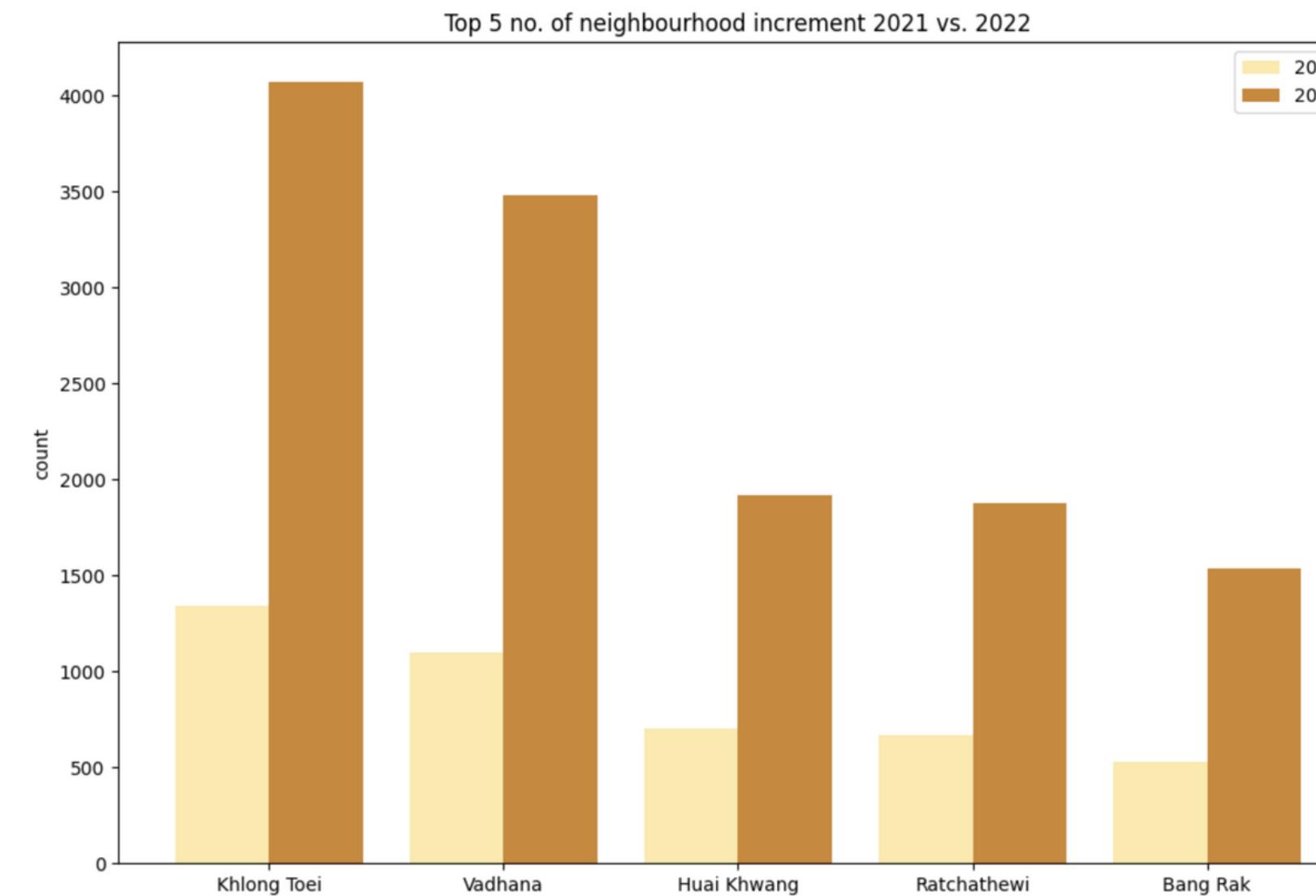
DATA ANALYSIS

ANALYSIS

MODEL

PRICING

PRICING OF ROOMS IN BANGKOK



From 2021 to 2022, Khlong Toei has the most increasing room among all the neighbourhoods.

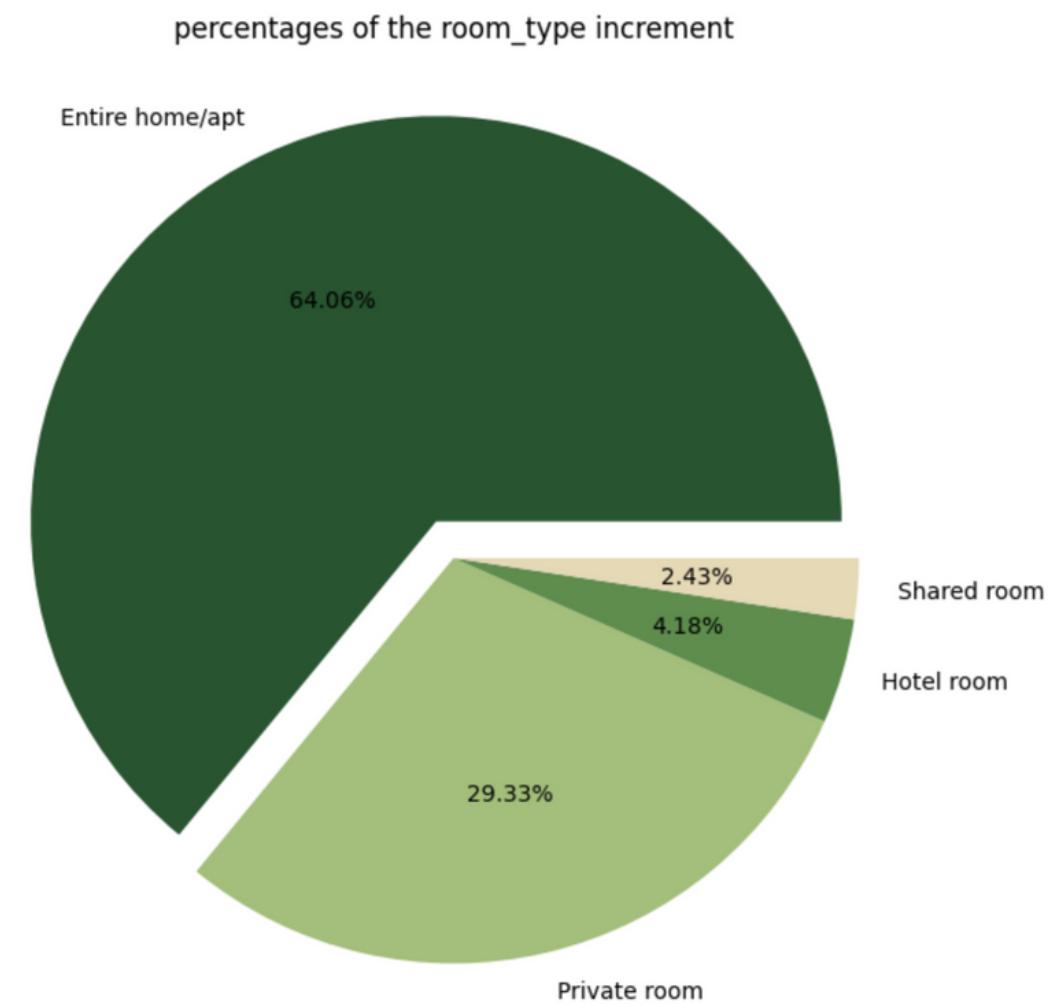
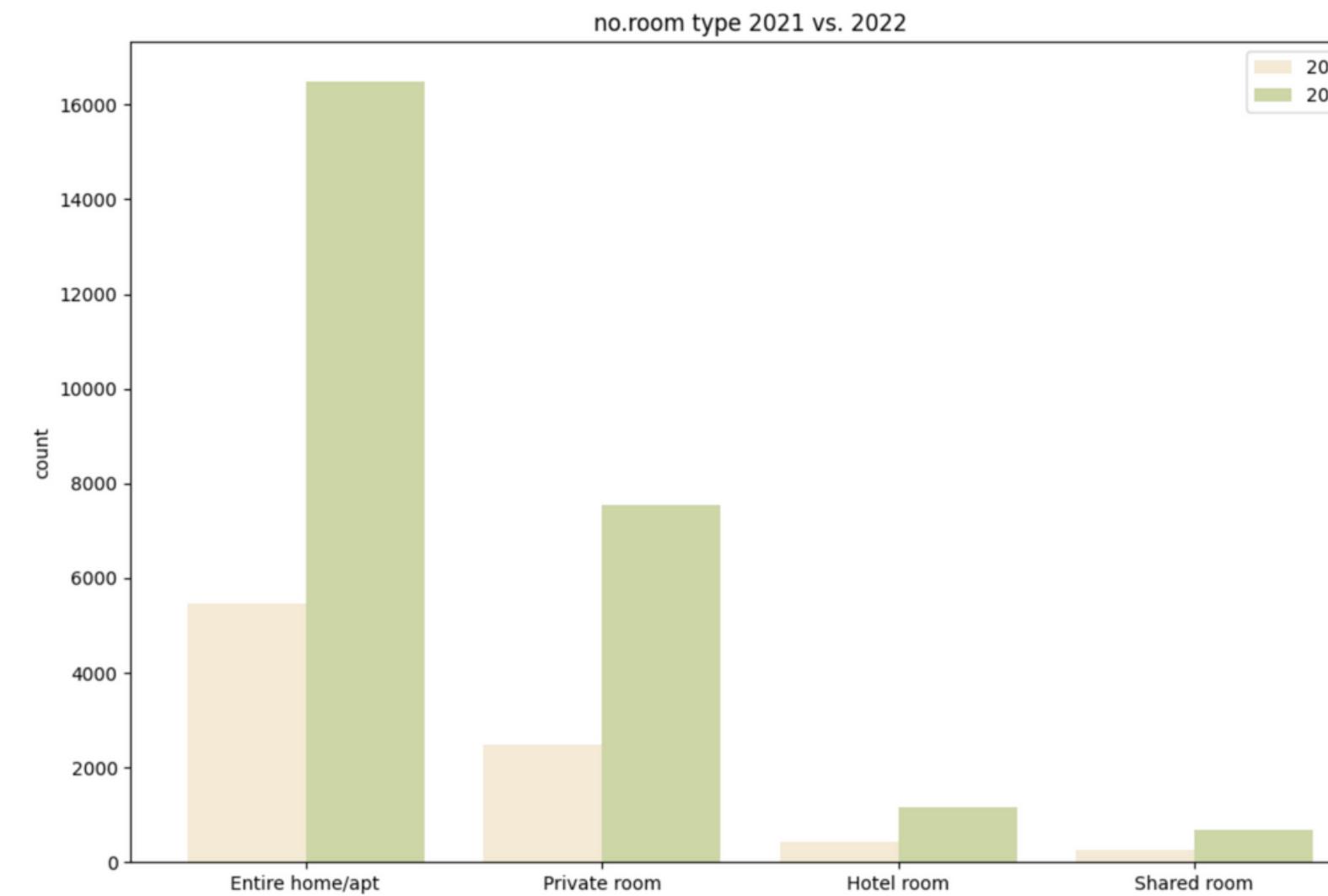
DATA ANALYSIS

ANALYSIS

MODEL

PRICING

PRICING OF ROOMS IN BANGKOK



In 2022, hosts tend to let customers rent their entire home, rather than a private room, hotel room, and shared room when compared to 2021.

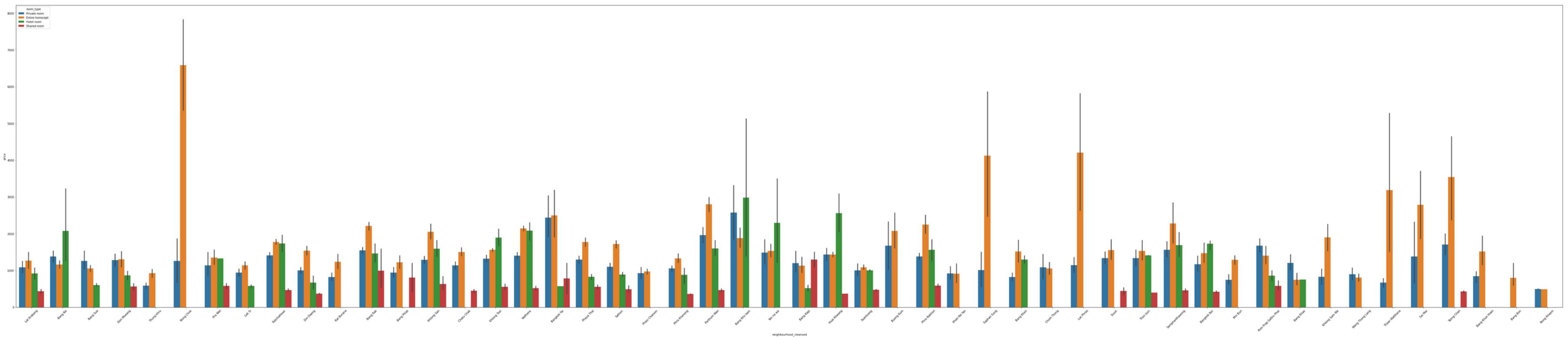
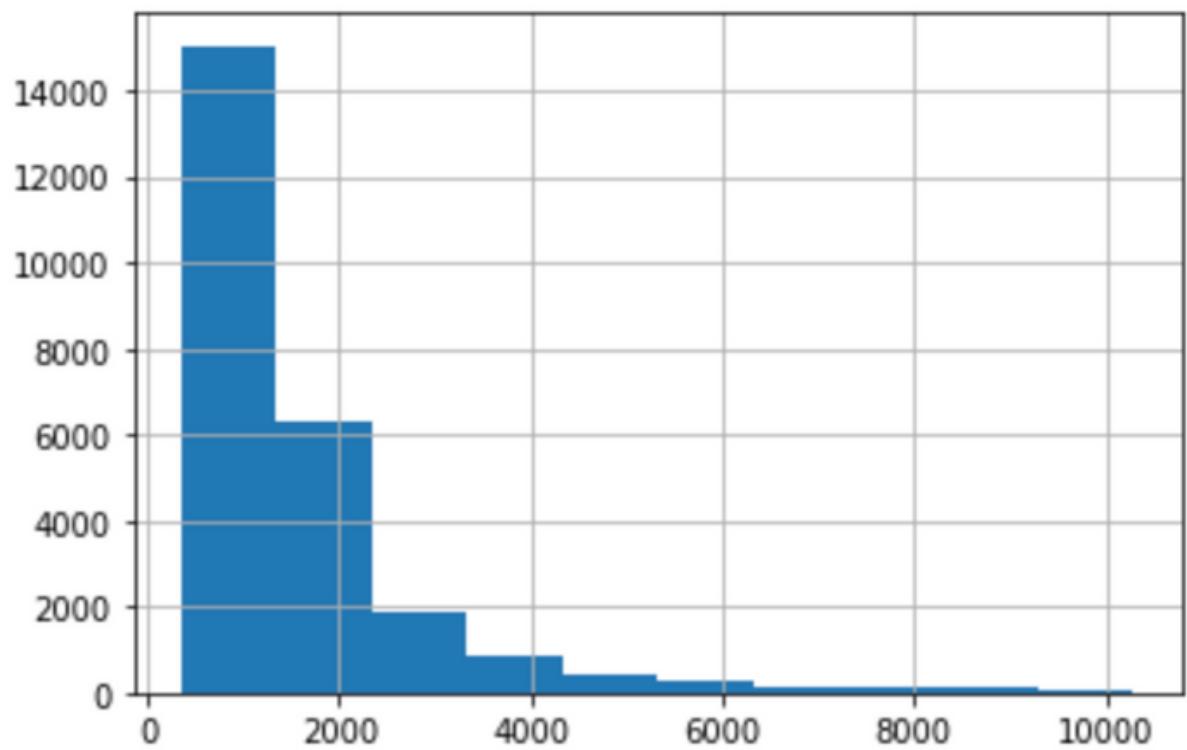
2022 ANALYSIS



BASIC UNDERSTANDINGS OF "PRICE"

Among the 50 Bangkok districts, it is not necessary for all of them to have every single room type (Entire Home/Apt, Hotel Room, Private Room, and Shared Room). Price may also vary but the highest one belongs to one of the Entire Home in Nong Chok.

ount	25214.000000
ean	1554.905013
td	1326.277063
in	351.000000
5%	799.000000
0%	1157.000000
5%	1785.750000
ax	10286.000000



FACTORS THAT AFFECT THE PRICE

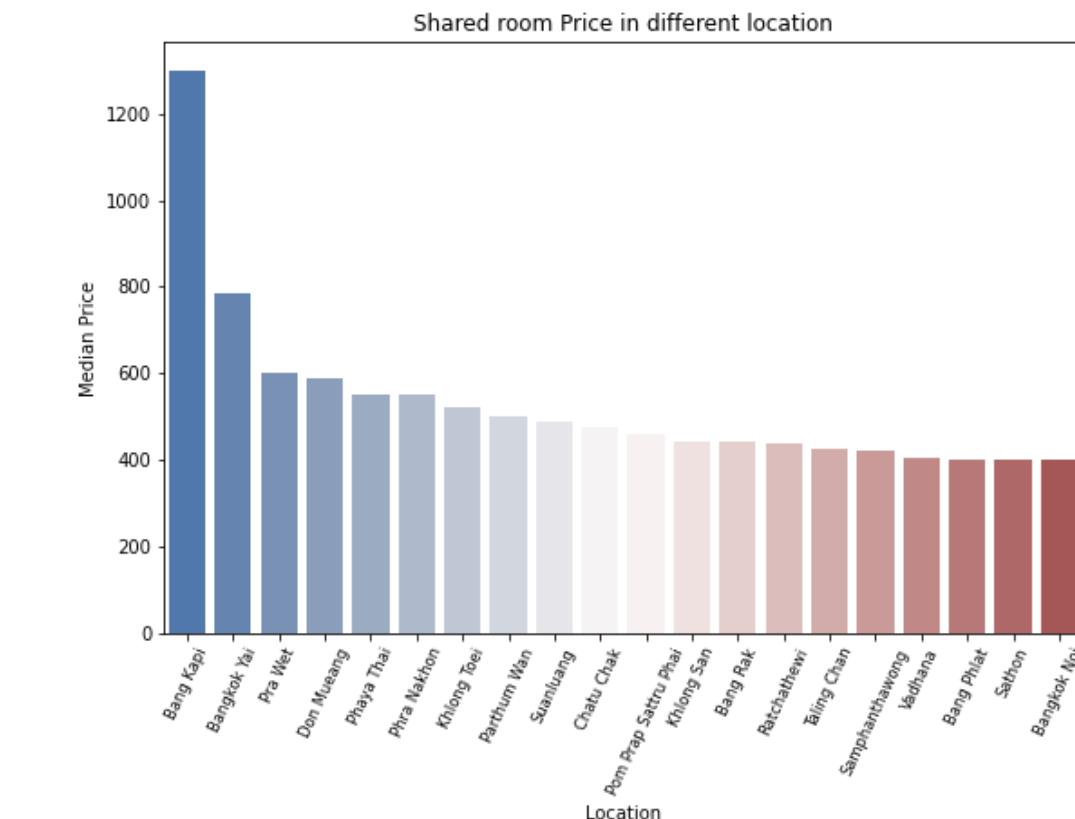
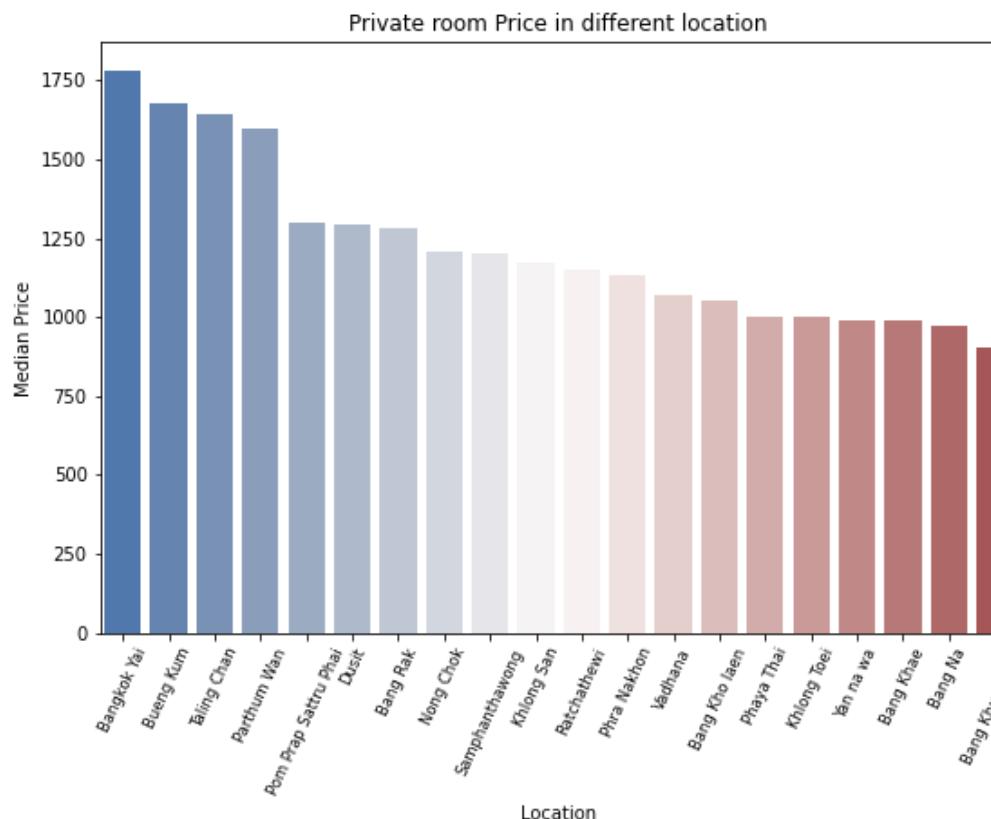
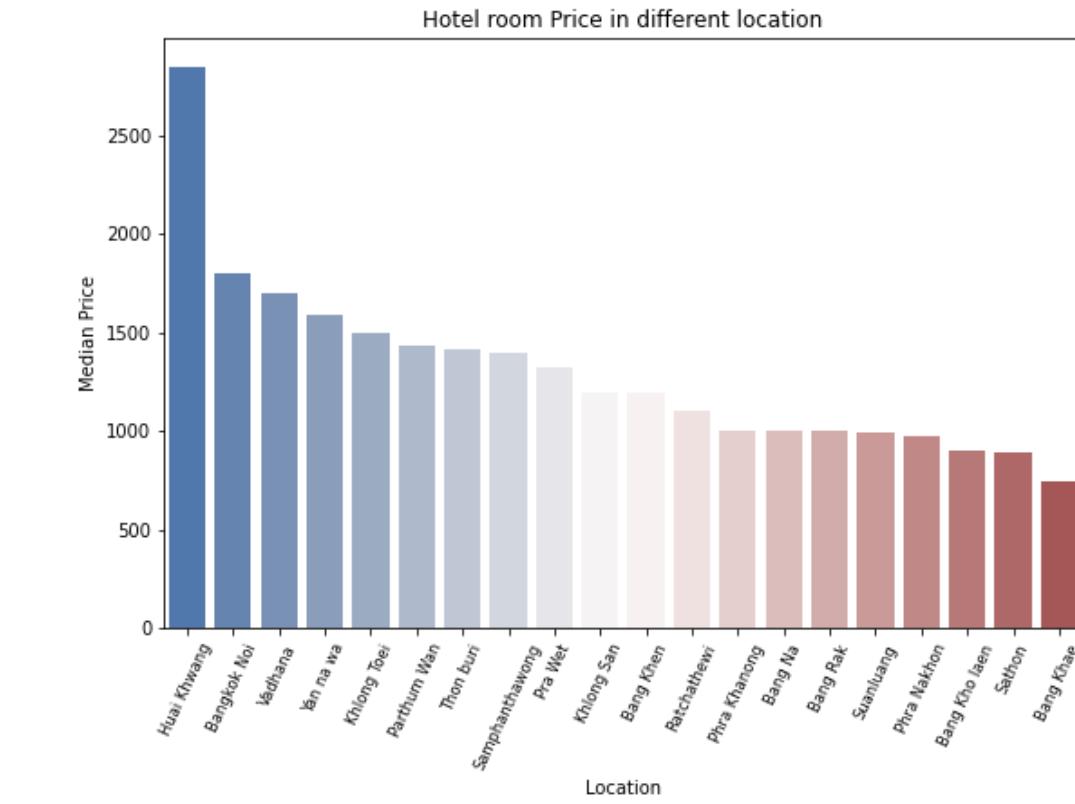
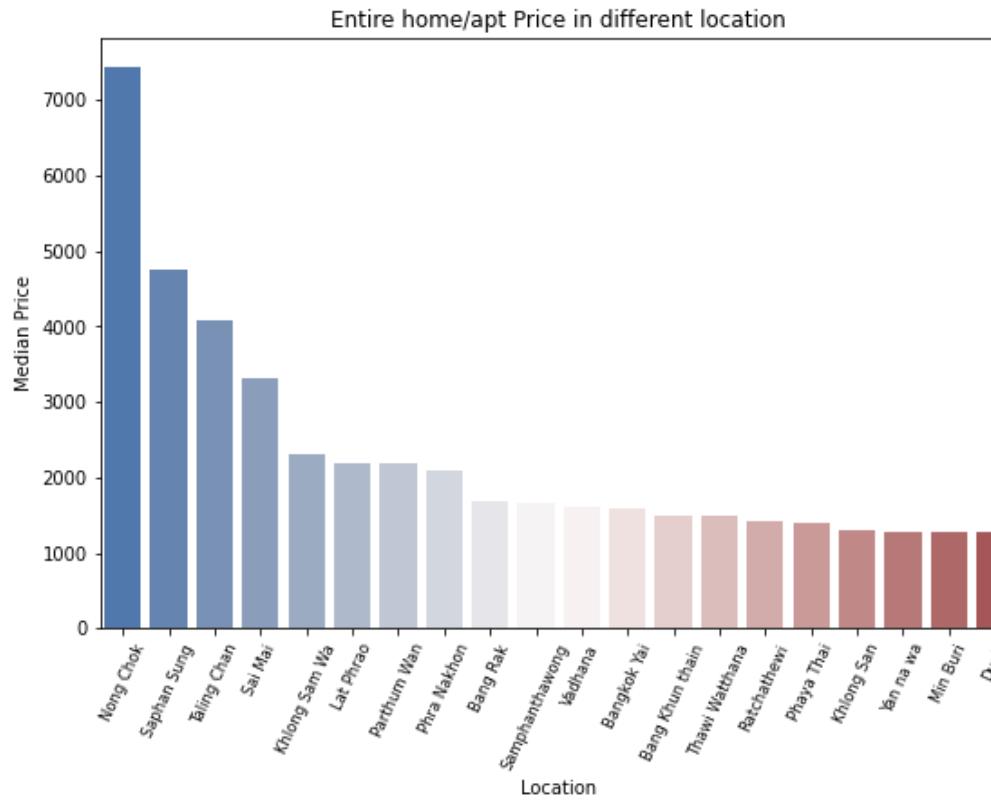
Each room type has its own price range in which the price of "Entire Home/Apt" is founded to be extremely high than the rest.

The price range is then followed by "Hotel Room", 'Private Room" and "Shared Room" respectively.

ANALYSIS

MODEL

PRICING



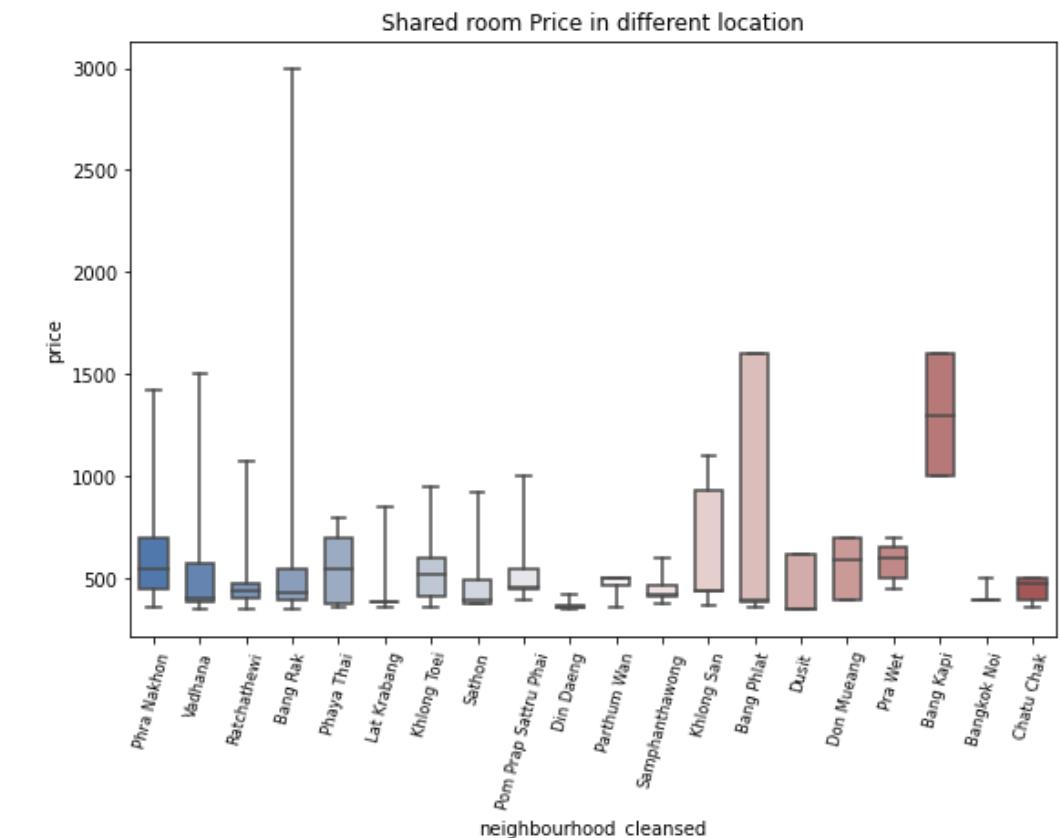
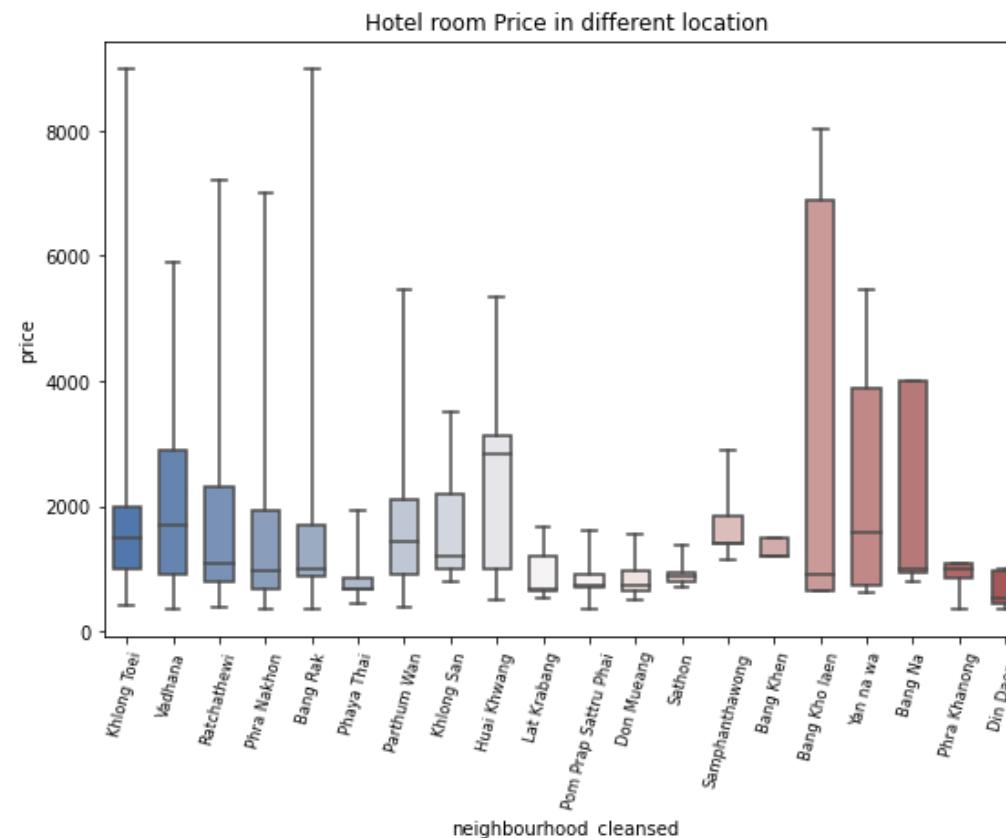
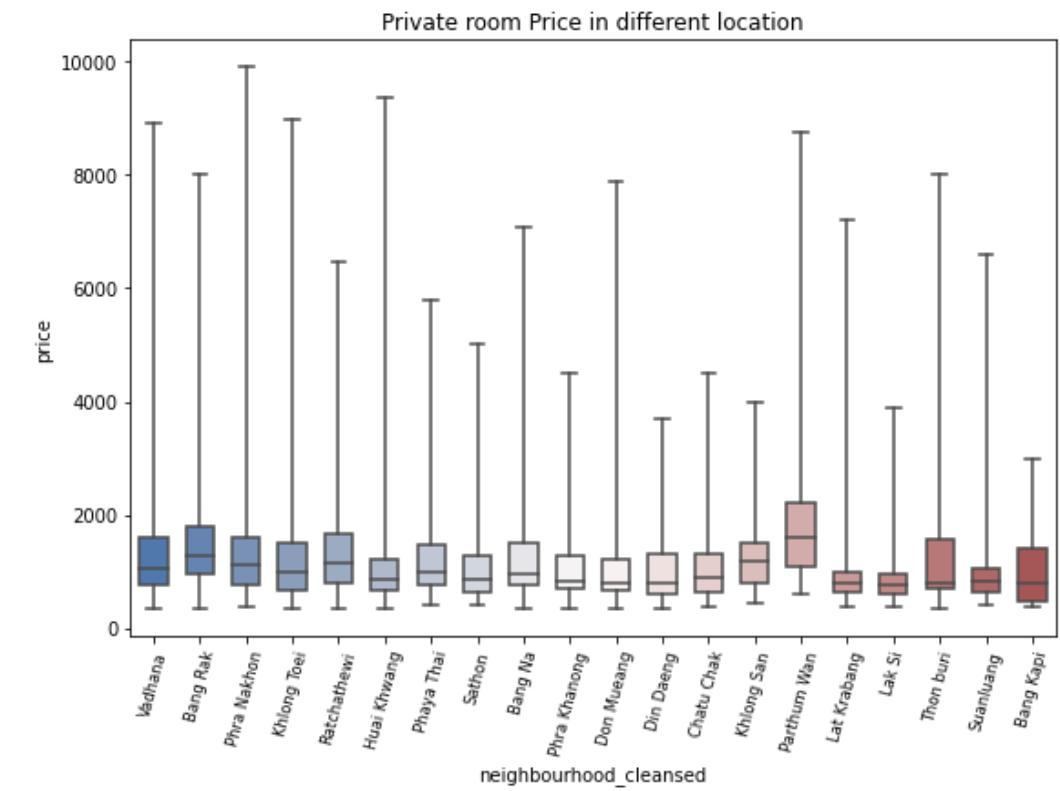
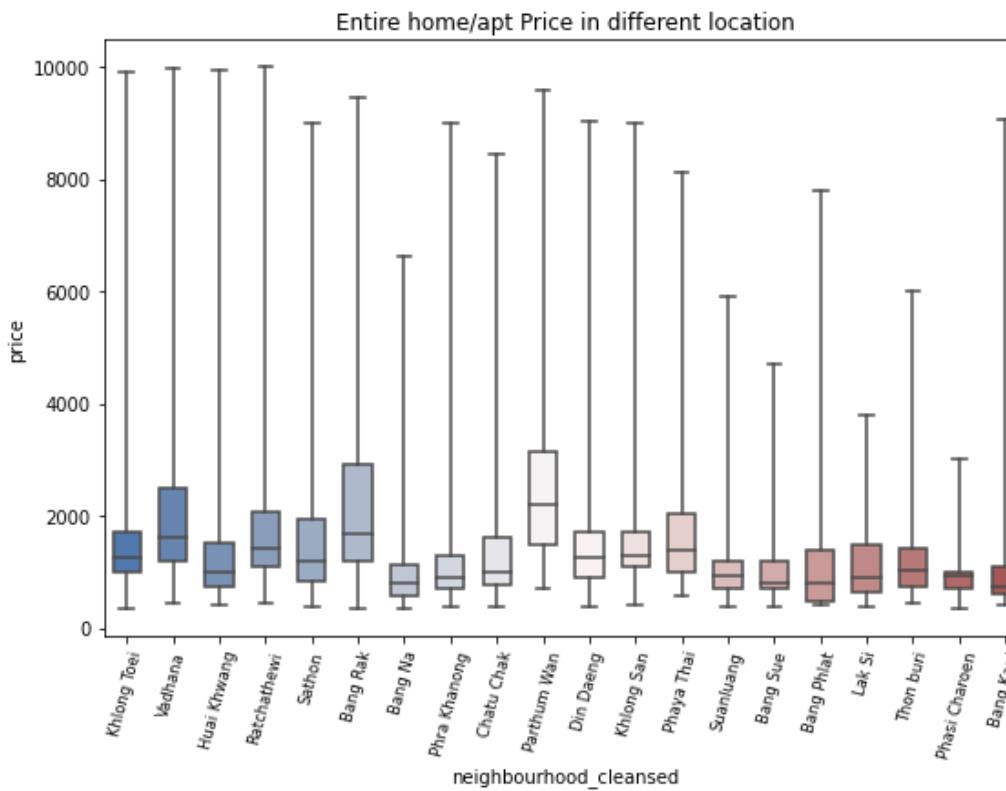
FACTORS THAT AFFECT THE PRICE

The location of different districts in Bangkok does not have much impact on the price of each listing, most either have relatively similar trends to one another or no relation at all.

ANALYSIS

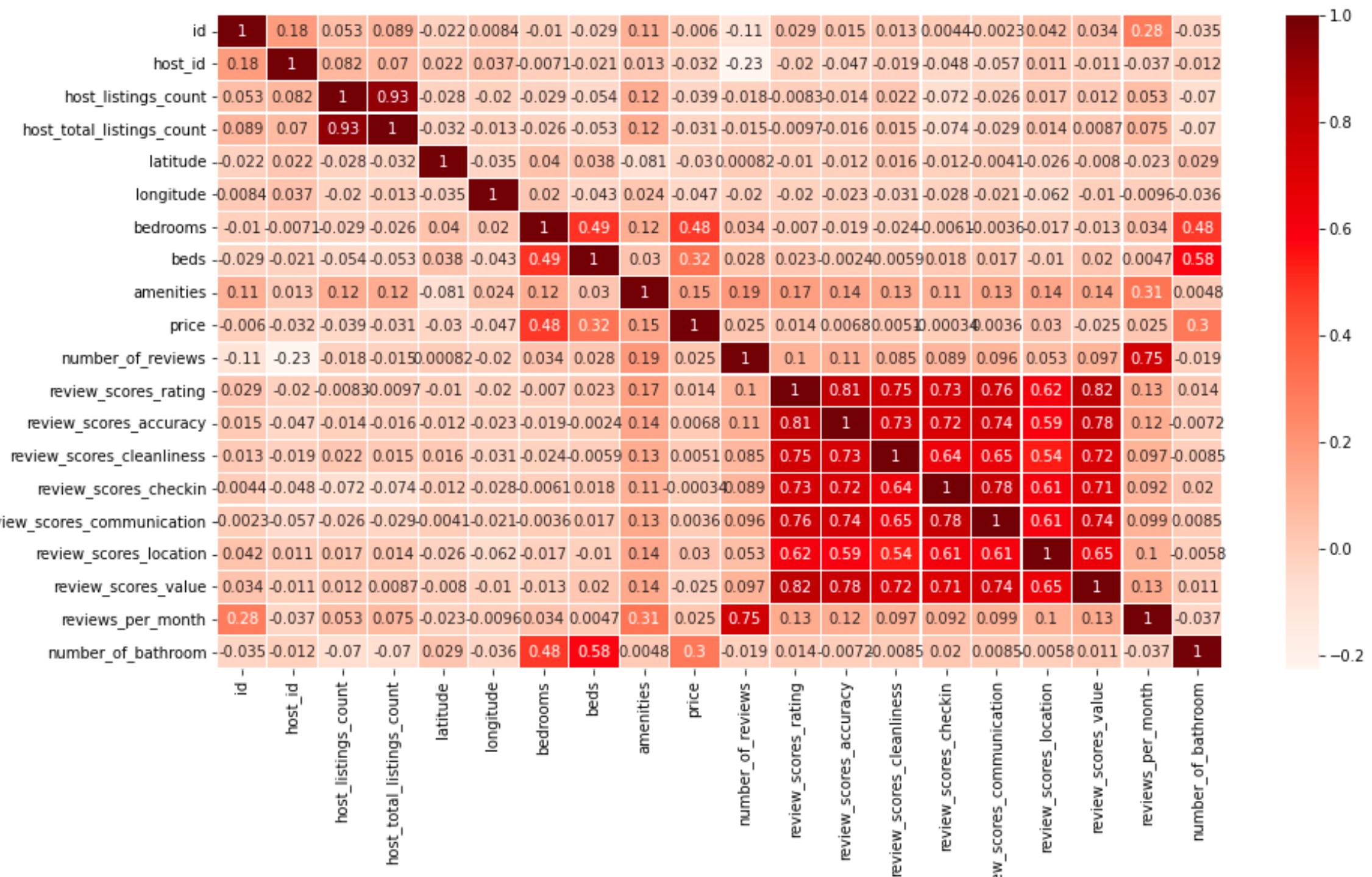
MODEL

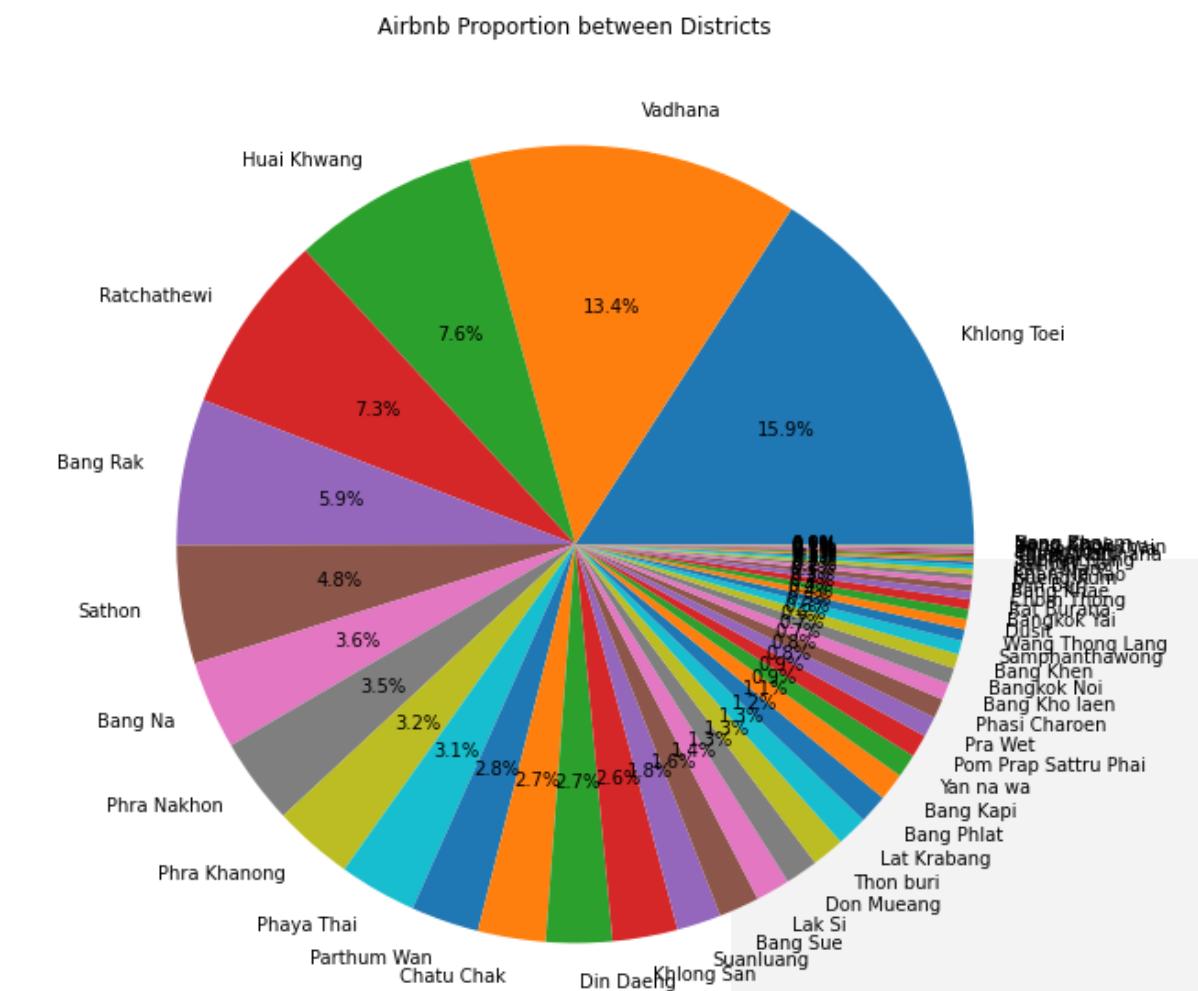
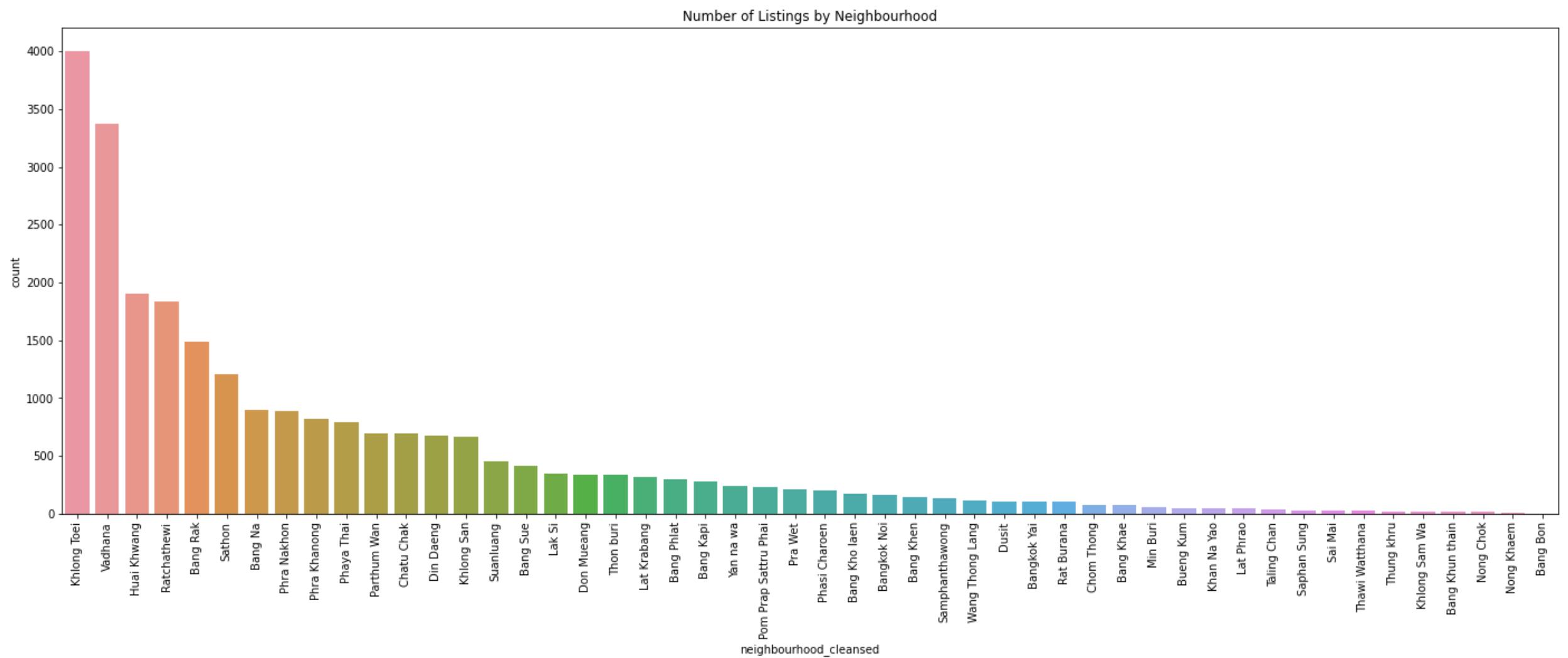
PRICING



FACTORS THAT AFFECT THE PRICE

When price is focused on the heatmap, there seems to be a high correlation with the number of bedrooms, beds, bathroom, and amenities respectively.

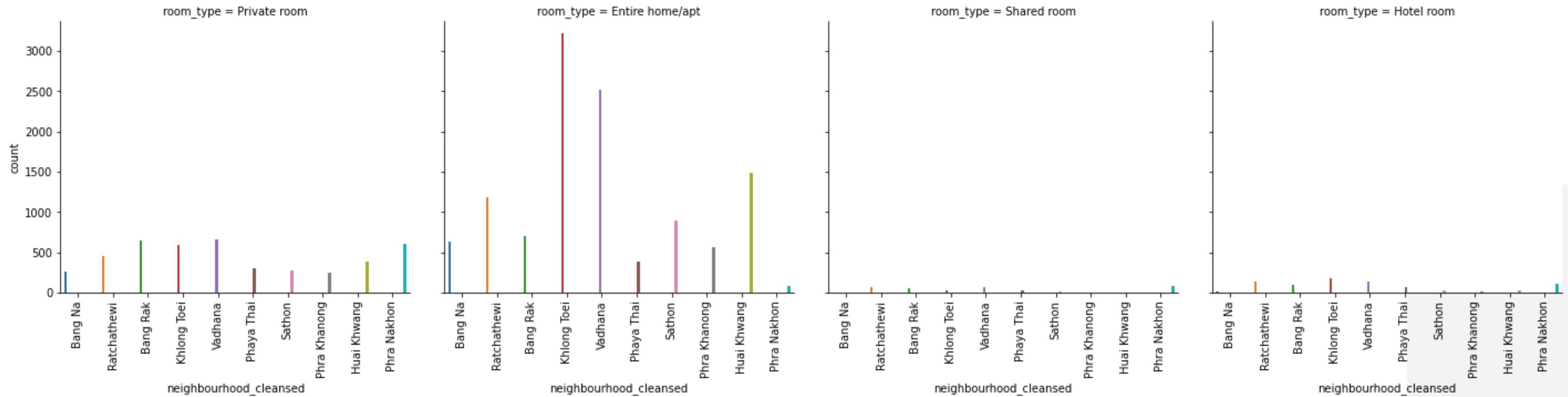




HIGHLIGHTS ON EACH DISTRICTS OF BANGKOK

There are a total of 50 unique neighborhoods in the dataset and the highest number of registered Airbnb in Bangkok is in the Khlong Toei area.

Number of Top 10 neighbourhood room type



HIGHLIGHTS ON EACH DISTRICTS OF BANGKOK

Using the top 10 districts with the most registered Airbnb, Entire Home/Apt have the highest number

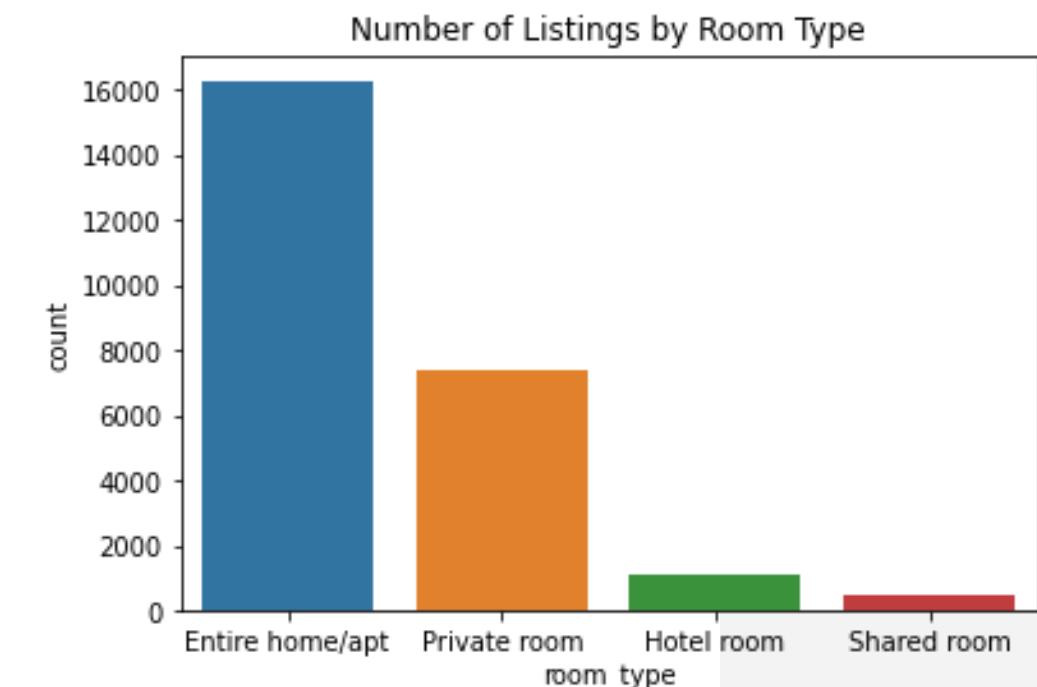
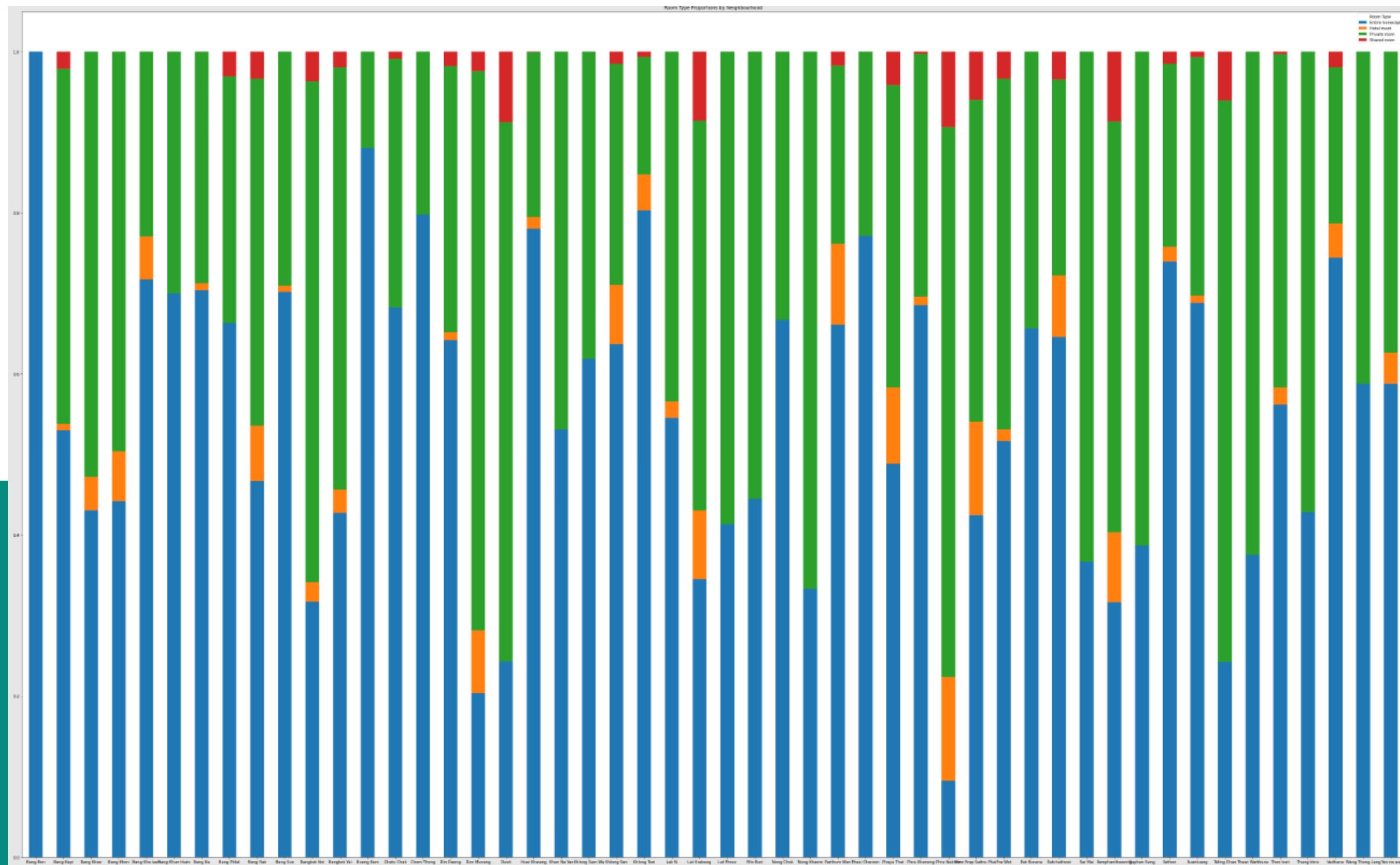
HIGHLIGHTS ON EACH DISTRICTS OF BANGKOK

ANALYSIS

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PRICING

Entire home/apt	16242
Private room	7383
Hotel room	1102
Shared room	487



The left-hand side figure shows the proportion of different room types in each district of Bangkok in accordance with the colors of the Room Type chart. The Entire Home and Hotel are higher in number.

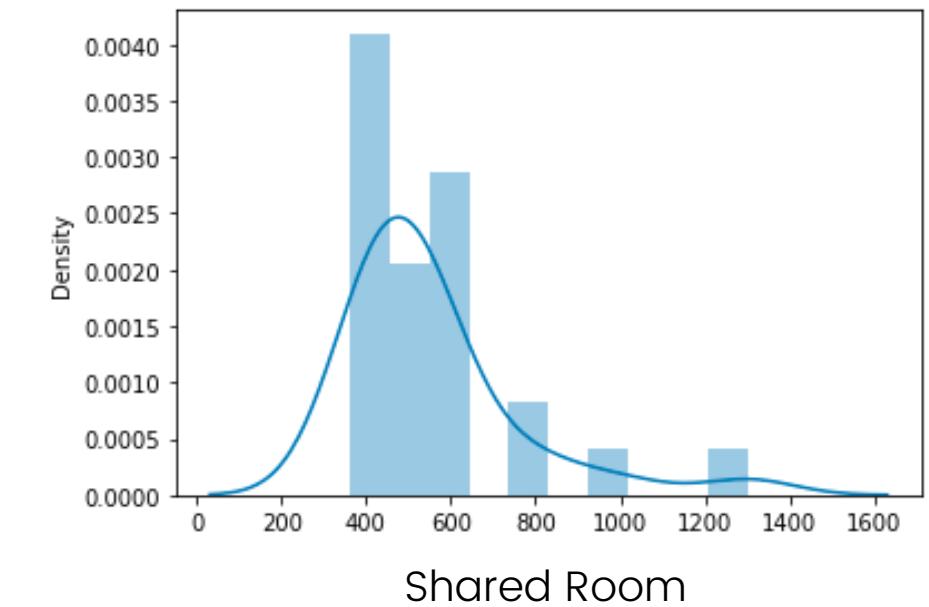
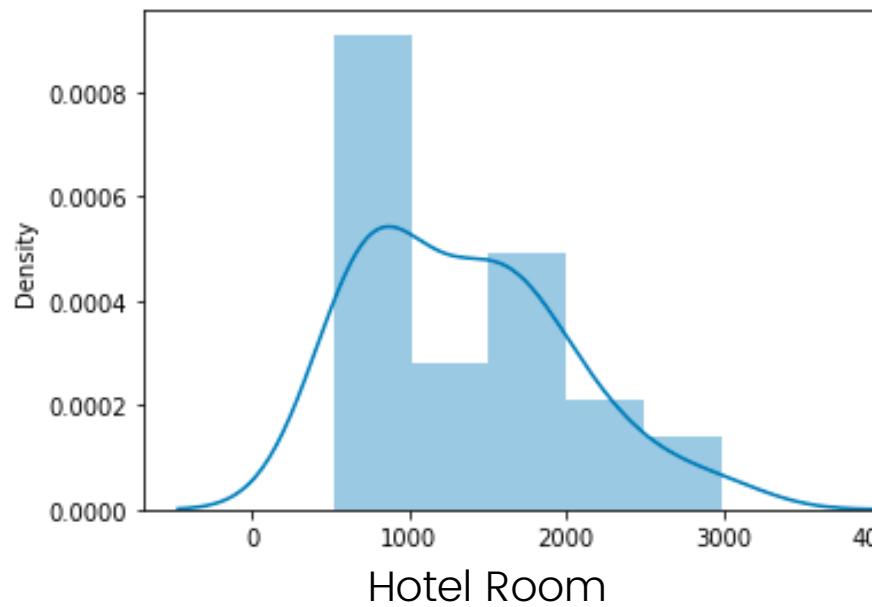
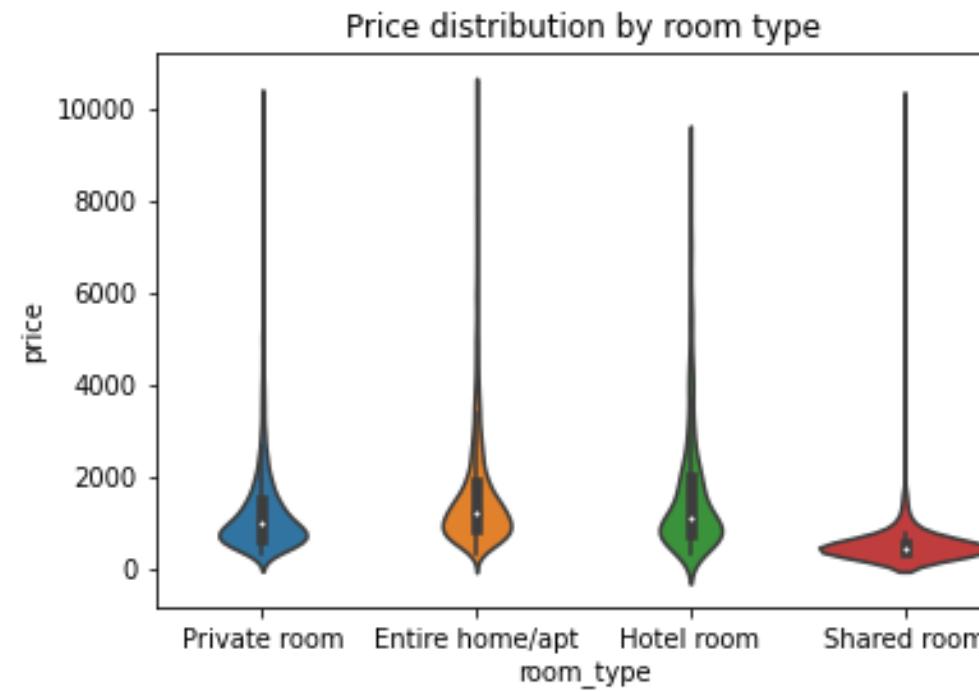
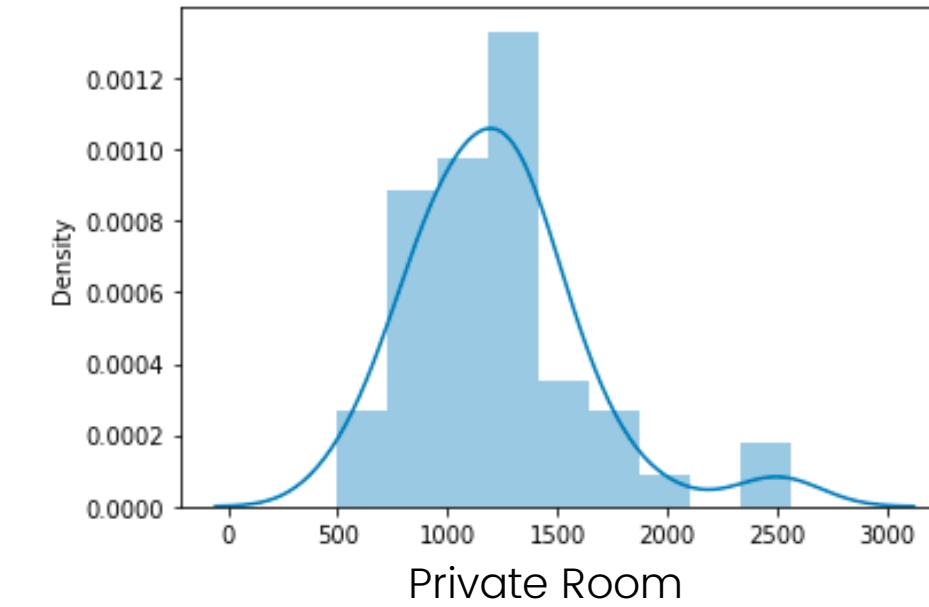
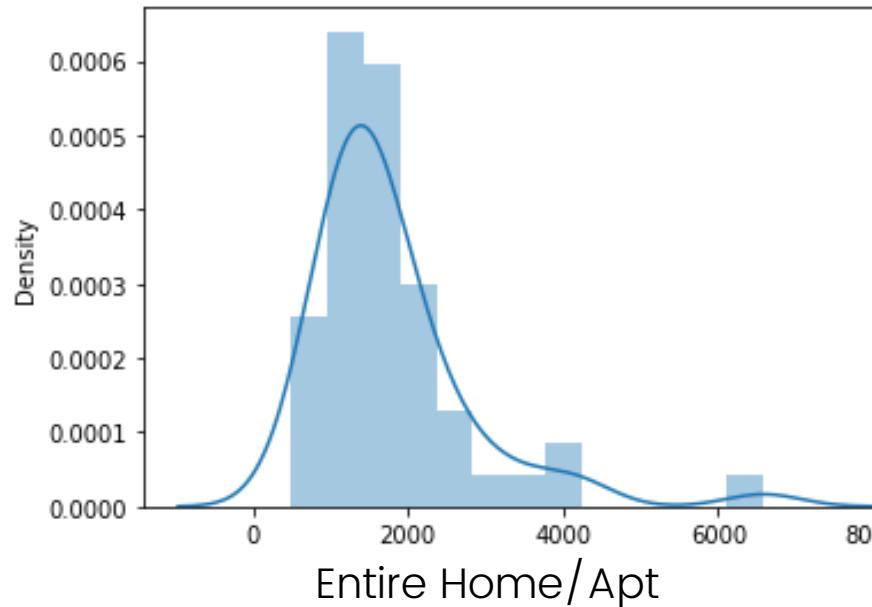
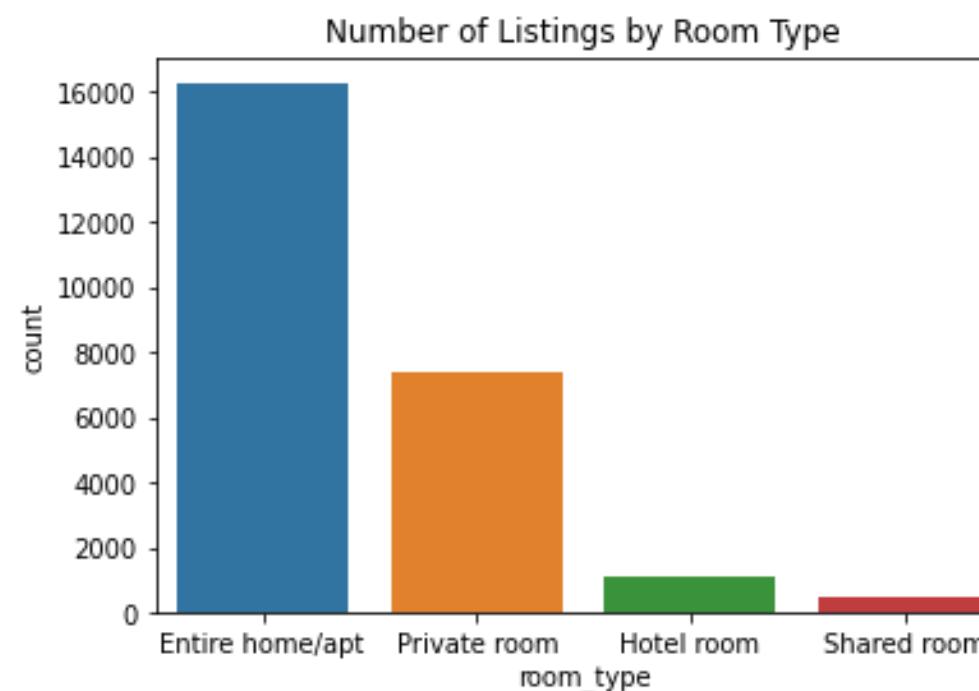
HIGHLIGHTS ON EACH DISTRICTS OF BANGKOK

ANALYSIS

MODEL

PRICING

Price Distribution of Each Room Type



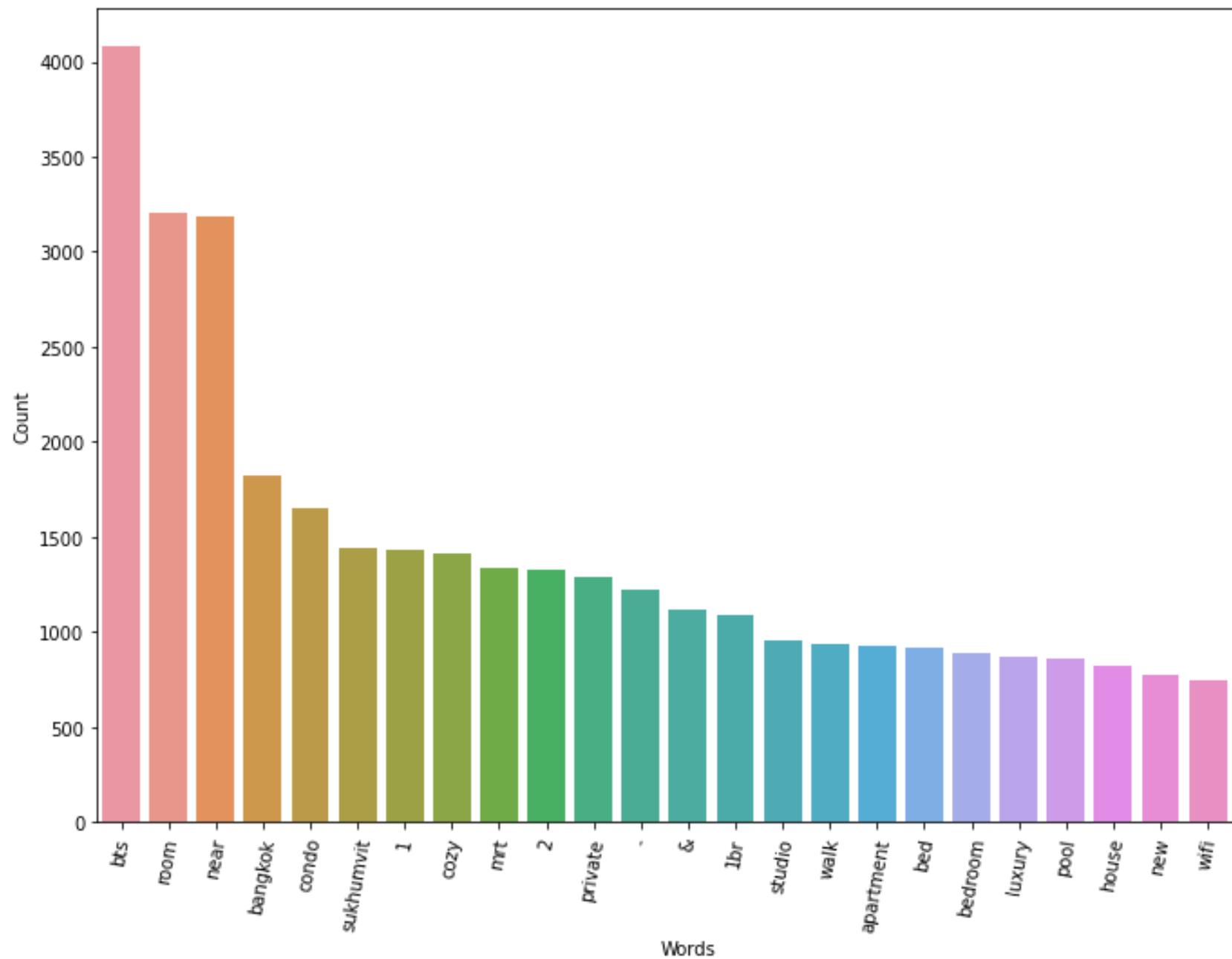
HIGHLIGHTS ON EACH DISTRICTS OF BANGKOK

ANALYSIS

MODEL

PRICING

Top 25 Words Used in Bangkok Airbnb Names



0	0	1	12	&	1115
0	bts	4079	13	1br	1085
1	room	3204	14	studio	953
2	near	3187	15	walk	937
3	bangkok	1824	16	apartment	931
4	condo	1654	17	bed	917
5	sukhumvit	1446	18	bedroom	886
6	1	1437	19	luxury	873
7	cozy	1416	20	pool	857
8	mrt	1338	21	house	821
9	2	1325	22	new	773
10	private	1286	23	wifi	750
11	-	1223	24	nana	746

Top 25 Words Used in Bangkok Airbnb Names:

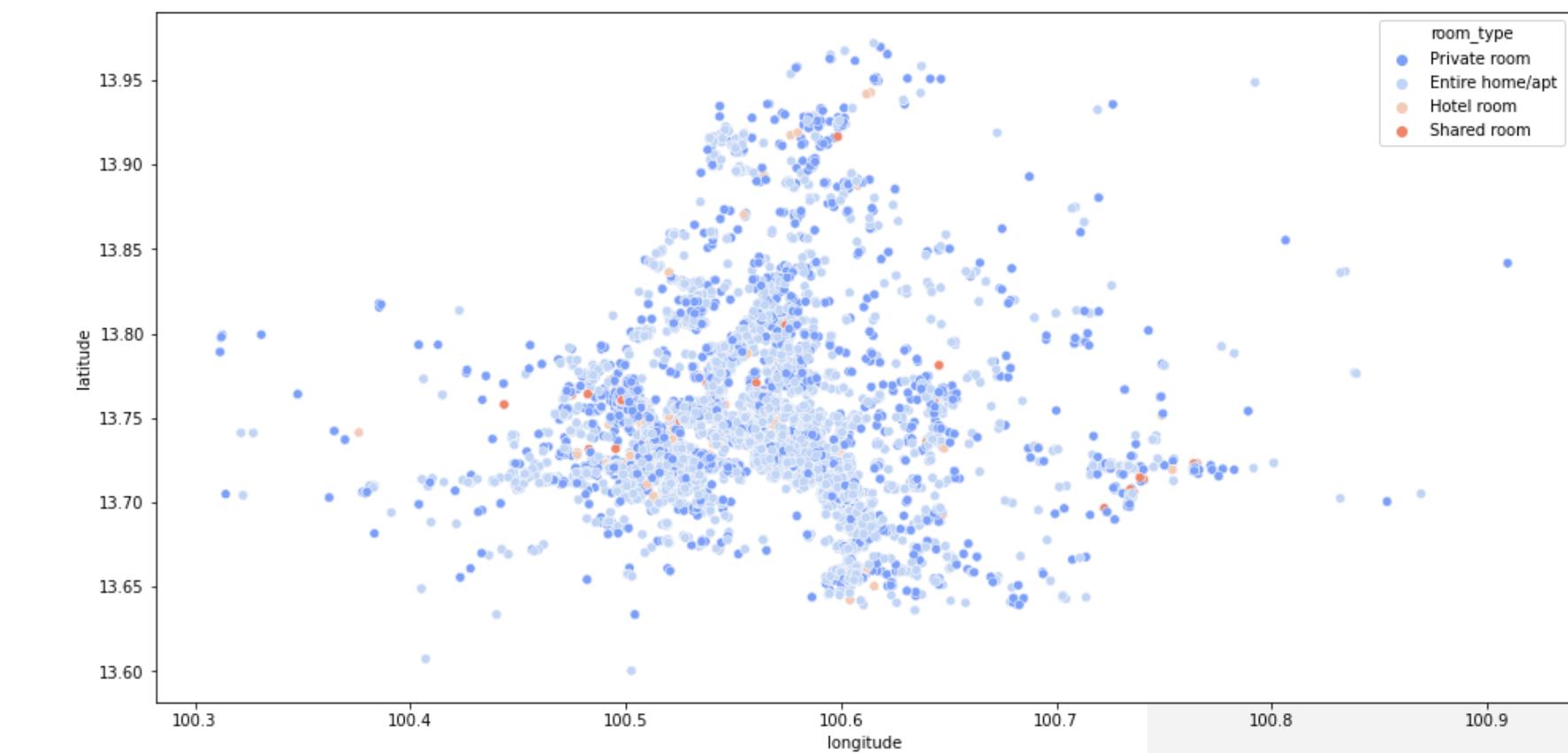
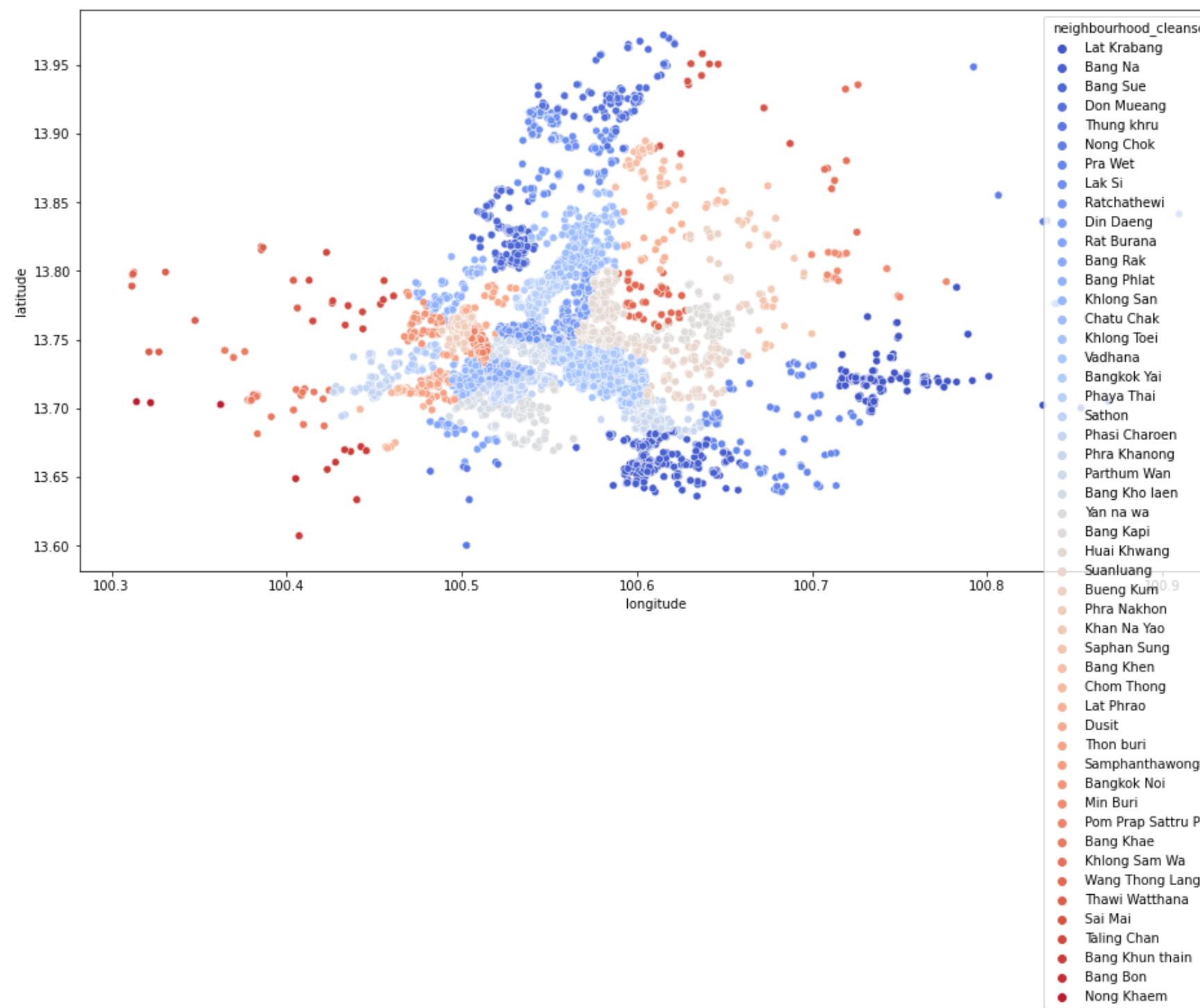
The words either refer to the accommodation itself like style of rooms and locations (e.g. condo and Sukhumvit) or the availability of facilities around or within the place (e.g. BTS and wifi).

HIGHLIGHTS ON EACH DISTRICTS OF BANGKOK

ANALYSIS

MODEL

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EXPLORE ADDITIONAL DATA

— GOOGLE MAP API

REASONS

Public transportation has played an important role in transporting in one of the most crowded city in the world – Bangkok. Rooms that are located near public transportation tend to be priced more when compared to rooms further to those transportation.

GOOGLE MAP API

In this model, the rapid transit station locations from Google Map API are used to measure the distance to the rooms and calculate the distance of the nearest public transit station.



Google Maps

$$d = 3963.0 * \arccos((\sin(\text{latitude1}) * \sin(\text{latitude2})) + \cos(\text{latitude1}) * \cos(\text{latitude2}) * \cos(\text{longitude1}-\text{longitude2}))$$

Code	Station_ENG	Station_THAI	Line(s)	Station_Name	location	latitude	longitude
N16	11th Infantry Regime	กรมทหารราบที่ 11	BTS	BTS 11th Infantry R	[{"address_componer": "11th Infantry Regime, Bangkok, Thailand"}]	13.867528	100.59194
N5	Ari	อาเรีย	BTS	BTS Ari	[{"address_componer": "Ari, Bangkok, Thailand"}]	13.779689	100.544646
E4	Asoke	อโศก	BTS	BTS Asoke	[{"address_componer": "Asoke, Bangkok, Thailand"}]	13.7756379	100.543198
A3	Ban Thap Chang	บ้านทับช้าง	ARL	ARL Ban Thap Cha	[{"address_componer": "Ban Thap Chang, Bangkok, Thailand"}]	13.7331049	100.6886425
RW05	Bang Bamru	บางบامรุ	SRT	SRT Bang Bamru	[{"address_componer": "Bang Bamru, Bangkok, Thailand"}]	13.791703	100.4776576
N15	Bang Bua	บางบัว	BTS	BTS Bang Bua	[{"address_componer": "Bang Bua, Bangkok, Thailand"}]	13.855994	100.585171
E10	Bang Chak	บางจาก	BTS	BTS Bang Chak	[{"address_componer": "Bang Chak, Bangkok, Thailand"}]	13.6968	100.6055
BL37	Bang Khae	บางแค	MRT	MRT Bang Khae	[{"address_componer": "Bang Khae, Bangkok, Thailand"}]	13.7119364	100.4223971
RN04	Bang Khen	บางเขน	SRT	SRT Bang Khen	[{"address_componer": "Bang Khen, Bangkok, Thailand"}]	13.864387	100.6146434
BL04	Bang Khun Non	บางขุนนท์	MRT	MRT Bang Khun No	[{"address_componer": "Bang Khun Non, Bangkok, Thailand"}]	13.7631942	100.473206
PP10	Bang Krasor	บางกระสอ	MRT	MRT Bang Krasor	[{"address_componer": "Bang Krasor, Bangkok, Thailand"}]	13.861694	100.5044336
E13	Bang Na	บางนา	BTS	BTS Bang Na	[{"address_componer": "Bang Na, Bangkok, Thailand"}]	13.6681228	100.6046478
BL07	Bang Phlat	บางพลัด	MRT	MRT Bang Phlat	[{"address_componer": "Bang Phlat, Bangkok, Thailand"}]	13.7601366	100.5659859
PP04	Bang Phlu	บางพลู	MRT	MRT Bang Phlu	[{"address_componer": "Bang Phlu, Bangkok, Thailand"}]	13.8757993	100.4337717
PP06	Bang Rak Noi Tha It	บางรักน้อย-ท่าอิฐ	MRT	MRT Bang Rak Noi	[{"address_componer": "Bang Rak Noi Tha It, Bangkok, Thailand"}]	13.87467	100.45621
PP05	Bang Rak Yai	บางรักใหญ่	MRT	MRT Bang Rak Yai	[{"address_componer": "Bang Rak Yai, Bangkok, Thailand"}]	13.876655	100.4449102
RW02	Bang Son (Light Red)	บางซื่อ	SRT	SRT Bang Son (Ligl	[{"address_componer": "Bang Son (Light Red), Bangkok, Thailand"}]	13.8202164	100.5325217
PP15	Bang Son (Purple)	บางซื่อ	MRT	MRT Bang Son (Pur	[{"address_componer": "Bang Son (Purple), Bangkok, Thailand"}]	13.8202164	100.5325217
RN01	Bang Sue (Dark Red)	สถานีรถไฟฟ้าบีทีเอส	SRT	SRT Bang Sue (Dar	[{"address_componer": "Bang Sue (Dark Red), Bangkok, Thailand"}]	13.828253	100.5284507
RW01	Bang Sue (Light Red)	สถานีรถไฟฟ้าบีทีเอส	SRT	SRT Bang Sue (Ligl	[{"address_componer": "Bang Sue (Light Red), Bangkok, Thailand"}]	13.828253	100.5284507
BL11	Bang Sue (MRT)	บางซื่อ	MRT	MRT Bang Sue (MR	[{"address_componer": "Bang Sue (MRT), Bangkok, Thailand"}]	13.8043718	100.5399431
S12	Bang Wa (BTS)	บางหว้า	BTS	BTS Bang Wa (BTS	[{"address_componer": "Bang Wa (BTS), Bangkok, Thailand"}]	13.7203785	100.4571807
BL34	Bang Wa (MRT)	บางหว้า	MRT	MRT Bang Wa (MRT	[{"address_componer": "Bang Wa (MRT), Bangkok, Thailand"}]	13.7203785	100.4571807
BL05	Bang Yi Khan	บางยี่ขัน	MRT	MRT Bang Yi Khan	[{"address_componer": "Bang Yi Khan, Bangkok, Thailand"}]	13.7774358	100.4852436
E14	Bearing	แบริ่ง	BTS	BTS Bearing	[{"address_componer": "Bearing, Bangkok, Thailand"}]	13.6612072	100.6019066
N21	Bhumibol Adulyadej	โรงพยาบาลจุฬาลงกรณ์	BTS	BTS Bhumibol Adul	[{"address_componer": "Bhumibol Adulyadej, Bangkok, Thailand"}]	13.910722	100.617423
E17	Chang Erawan	ช้างเอราวัณ	BTS	BTS Chang Erawan	[{"address_componer": "Chang Erawan, Bangkok, Thailand"}]	13.62145	100.59011

FAIR PRICE MODEL

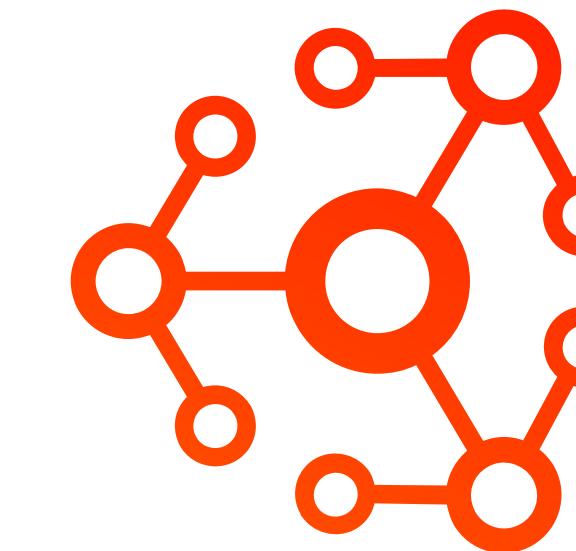
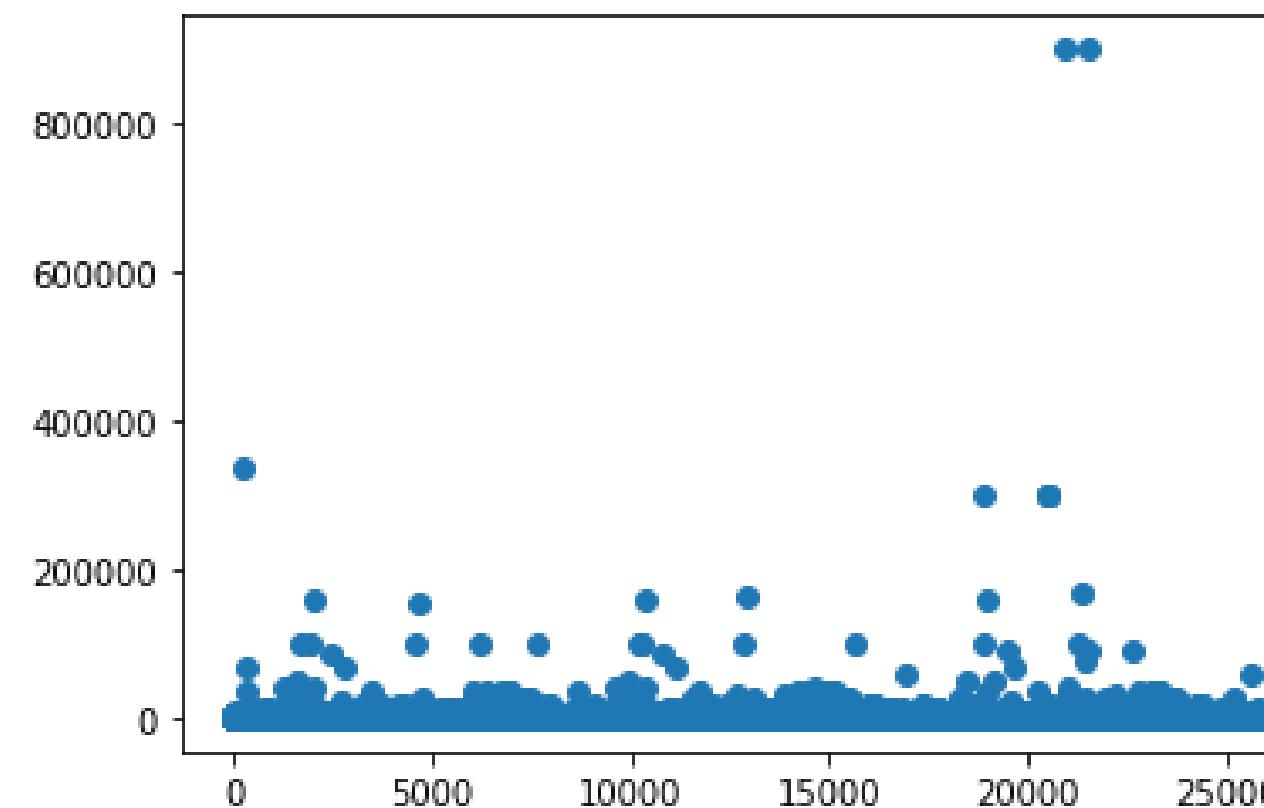


FINE TUNING METHOD

ANALYSIS

MODEL

PRICING



REMOVE OUTLIERS

Reduce training times, more accurate
models, and better results.

USE HYPERPARAMETER

Parameters whose values control
the learning process

COMPARING ALL MODELS

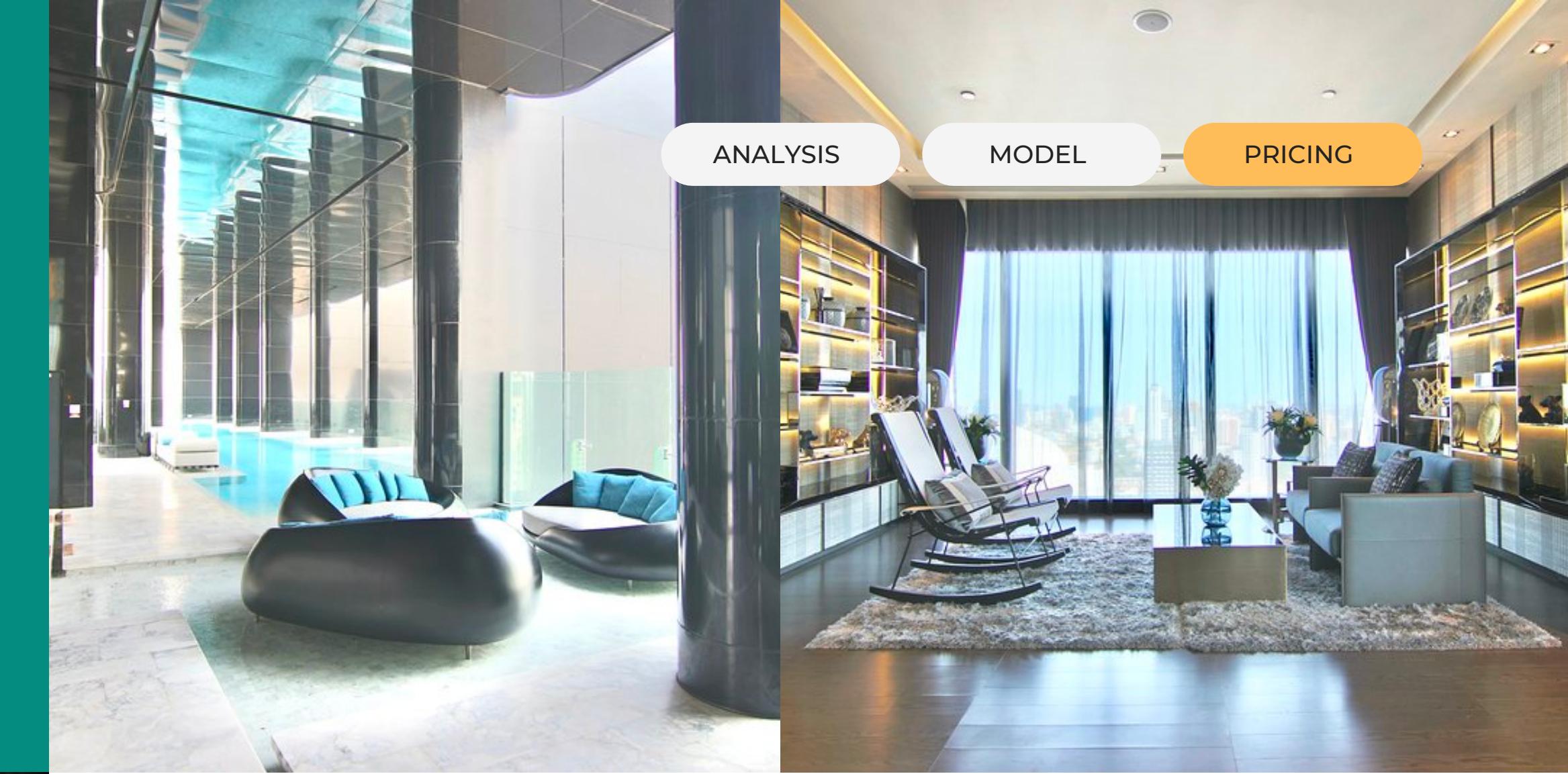
[ANALYSIS](#)[MODEL](#)[PRICING](#)

	R ²	MAE
Linear Regression	16.4%	902.49
Decision Tress	73.5%	344.07
Random Forest	78.9%	399.58
XG Boost	80.1%	443.93

PRICE SUGGESTIONS WITH SUPPORTING METHODS



Luxurious & Romantic in the Heart of BKK #L MRT/BTS



ANALYSIS

MODEL

PRICING

฿1948 PER NIGHT

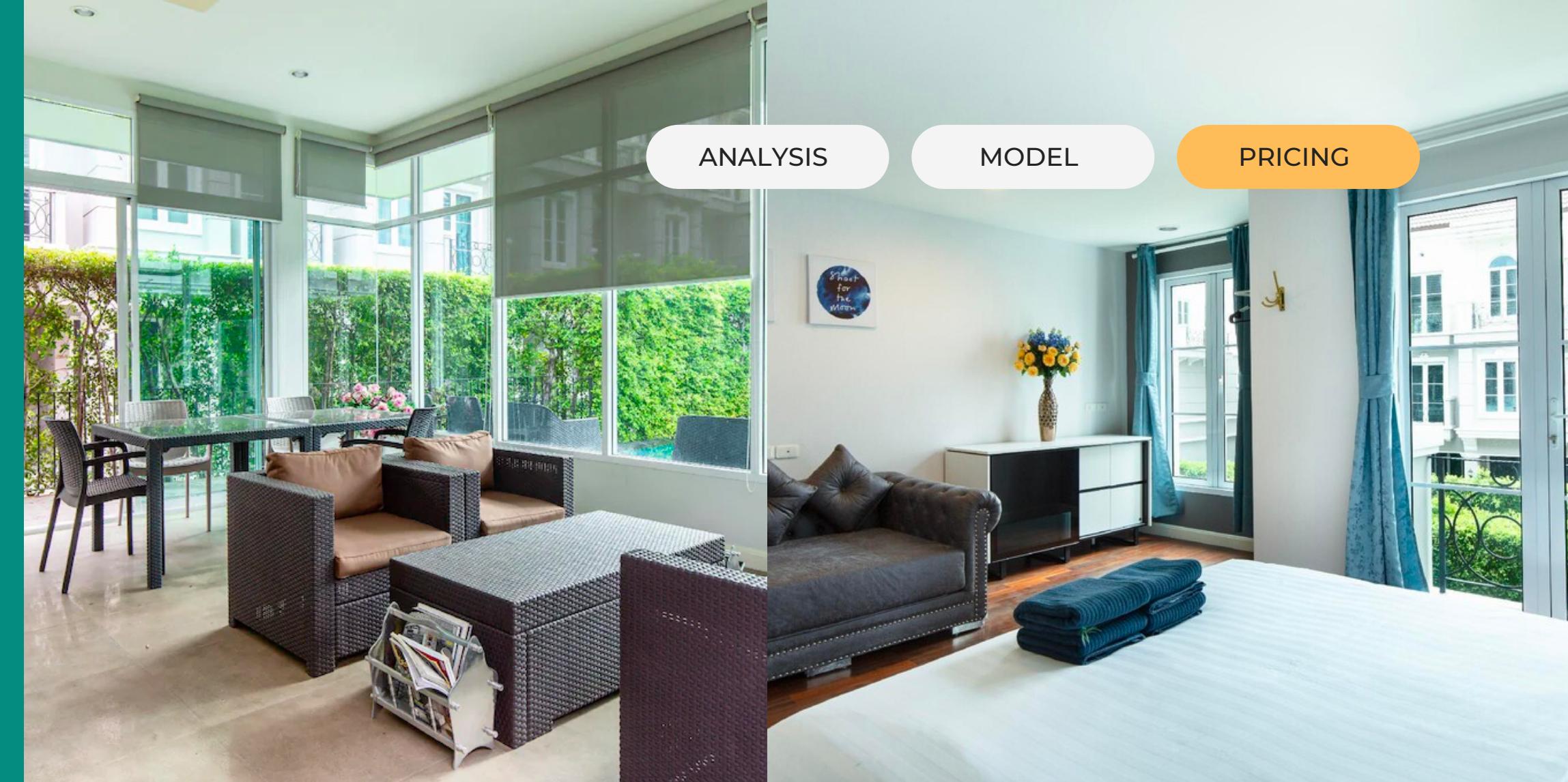
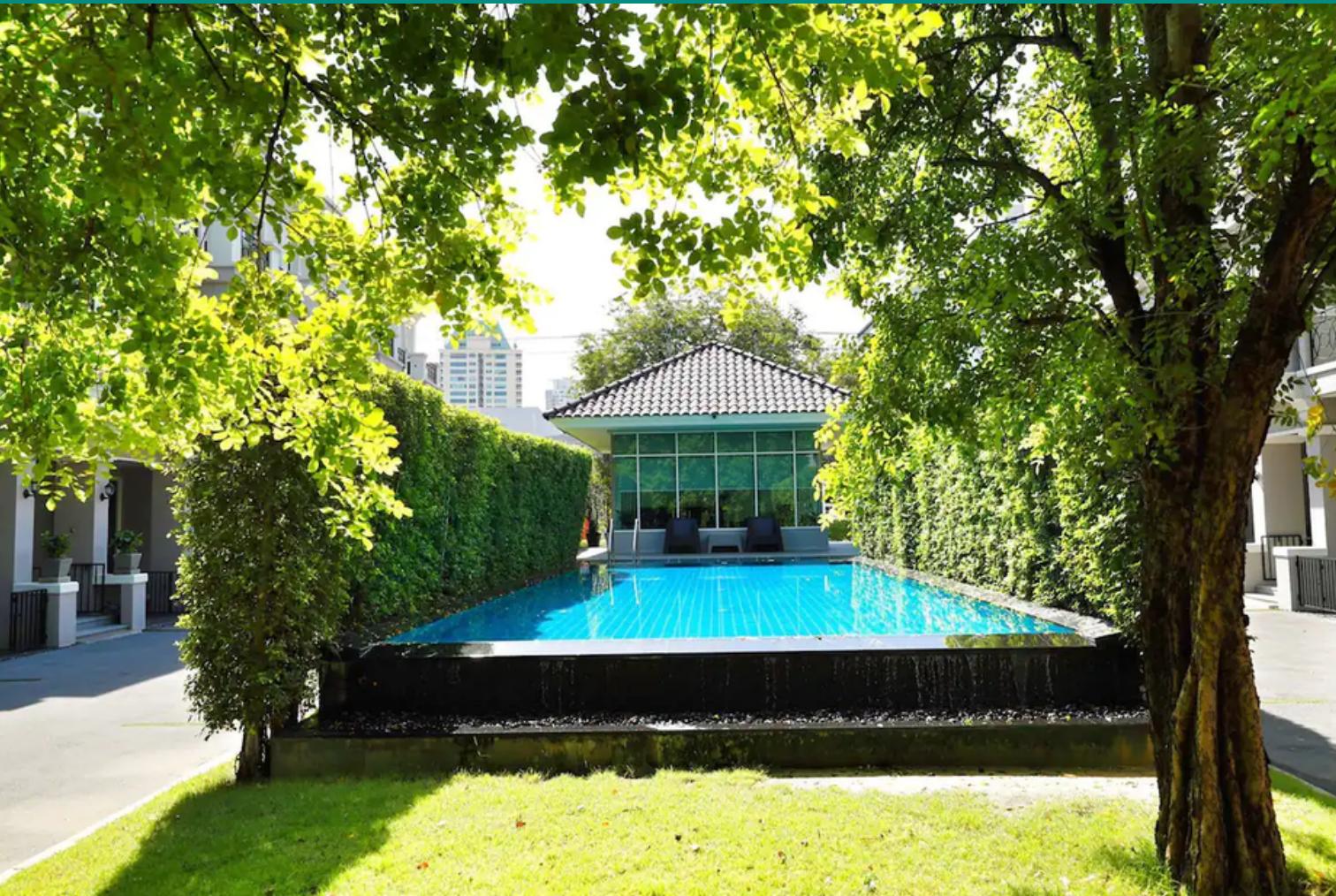
OVERPRICE

Suggested Price from the model: 1,488

The random forest model, suggest the fair price of the listing at 1488 bath per night; however the mean error of the model is 344. The fair price of the listing should be in range from 1,144 to 1,832. In conclusion, the price of the listing is slightly overprice



Breezy Haus in Asoke Pool, walk to BTS/MRT 22pax



ANALYSIS

MODEL

PRICING

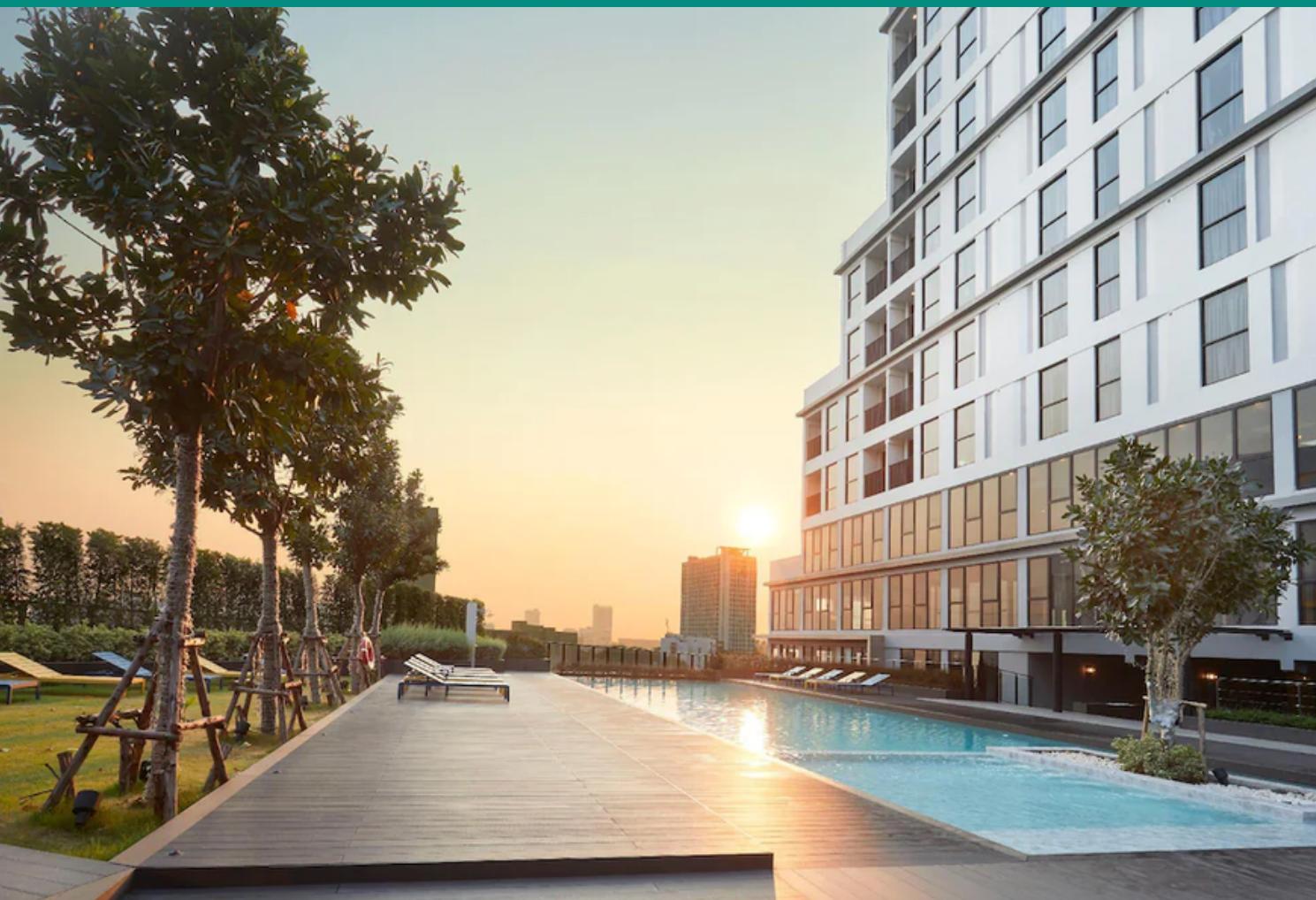
฿7,027 PER NIGHT

FAIR PRICE

-Suggested Price from the model: 16,883

The suggested price from the random forest model is very high because of the outlier data. This listing has a number of bed and bathroom in the outlier range which may cause an inaccuracy to the model. Despite the issue, It is believed that the listing price is still in the fair price range.

The Quarter Ladprao by UHG SHA Plus+



\$2,400 PER NIGHT

OVERPRICE

Suggested Price from the model: 1,598

The random forest model, suggest the fair price of the listing at 1598 bath per night, so it is overprice.

FUTURE IMPROVEMENT

ANALYSIS

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- Enhance the hyper parameter tuning process to solve the overfitting issue.
- Integrate CNN method to the picture to classify the level of luxury of the room