

Airbnb Stay Sale Price and Data Analysis of Perth, Western Australia

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Contents

1	Introduction	2
	1.1 Problem definition and Objectives	2
2	Available Data	2
3	Procedure, Methodology and Discussion	2
	3.1 Clearing the Data	2
	3.2 Popularity of Different Suburbs	3
	3.3 Sale prices based on the accommodation types	4
	3.4 Clustering the Data	7
4	Conclusion	7

1 Introduction

Airbnb, Inc. is an online marketplace for arranging or offering lodging, primarily home-stays, or tourism experiences. The company does not own any of the real estate listings, nor does it host events; it acts as a broker, receiving commissions from each booking [1]. The company is based in San Francisco, California, United States.

The company was conceived after its founders put an air mattress in their living room, effectively turning their apartment into a bed and breakfast, in order to offset the high cost of rent in San Francisco; Airbnb is a shortened version of its original name, AirBedandBreakfast.com. Airbnb is becoming popular all over the world as it can provide a home stay feeling in a local community. Australia is also a popular touristic place in the world and has many attractions for tourists from every where. Evidently Airbnb stay is a good choice for majority of them due to its cheaper price and helping the guest to have a feeling about local culture and community.

1.1 Problem definition and Objectives

Since Airbnb stay is becoming a source of investment for some local peoples, having a better insight on its market can provide useful information for potential investors. In this brief report we focus on Airbnb market in Perth, capital of Western Australia and its suburbs. We will analyze the popularity of the different suburbs and will provide an insight about the sale price based on the available data. Finally we will provide advice for a potential investor who may want to have a portfolio of houses or apartments for short term renting purposes.

2 Available Data

Fortunately there is an available source of structured data through Inside Airbnb [2]. We will use “Summary information and metrics for listings in Western Australia” data set for our analysis. This data set is available through the following link:

“ <http://data.insideairbnb.com/australia/wa/western-australia/2019-12-08/visualisations/listings.csv>”.

3 Procedure, Methodology and Discussion

In this section we implement the methods we learnt so far to achieve the described objective in section 2. Cleaning data and filtering it is the first step to approach our objective. Applying the Data Analysis techniques from courses 4,6 and 7 is the next step to explore the data set. In the third step we will use data visualization methodologies from course 7 to present the findings and insights to Airbnb market in Perth through graphs, charts and geographical maps. Finally, we will discuss the explored data and will provide insights about the market share of different suburbs.

3.1 Clearing the Data

First step to approach our objective is filtering the data and making it ready for further processing. Downloaded data base includes the following columns:

Since for our analysis we do not need some of these columns lets drop them and obtain our new data base with the following columns:

This data base includes Airbnb sale in whole Western Australia and consists of 13193 rows and 9 columns, respectively. Since we want to focus on the capital city of Perth and its suburb we need to filter out this data set in a way that it includes only information for properties inside Perth and its suburbs. For this purpose we obtain the latitude and longitude of Perth using Foluim [3] which is -31.9527121 , 115.8604796 respectively. Lets

```
['id', 'name', 'host_id', 'host_name', 'neighbourhood_group',
'neighbourhood', 'latitude', 'longitude', 'room_type', 'price',
'minimum_nights', 'number_of_reviews', 'last_review',
'reviews_per_month', 'calculated_host_listings_count',
'availability_365'],
```

Figure 1: Coulmns of the data based

	id	name	neighbourhood	latitude	longitude	room_type	price	minimum_nights	availability_365
0	37688	Living in our family home	MELVILLE	-32.06806	115.87674	Private room	73	1	364
1	42713	Bed with Breakfast	IRWIN	-29.25216	114.93205	Private room	94	1	353
2	45825	St James for short-longer stay?	CANNING	-32.00395	115.91394	Private room	60	3	365
3	58329	Trewent Farmhouse - rustic & rambling	MANJIMUP	-34.35542	116.18267	Entire home/apt	215	2	41
4	59311	family home in canning vale	GOSNELLS	-32.07592	115.93188	Private room	64	1	362

Figure 2: New columns in filtered data

maintain only those properties whose longitude and latitude lie in within the interval of latitude= $[-32.05 \ -31.9]$ and longitude= $[115.7 \ 116]$. This new filtered data set consists of 4208 rows and 9 columns, respectively. The following picture Fig. 3 shows the first two thousands of such properties in the filtered data base.

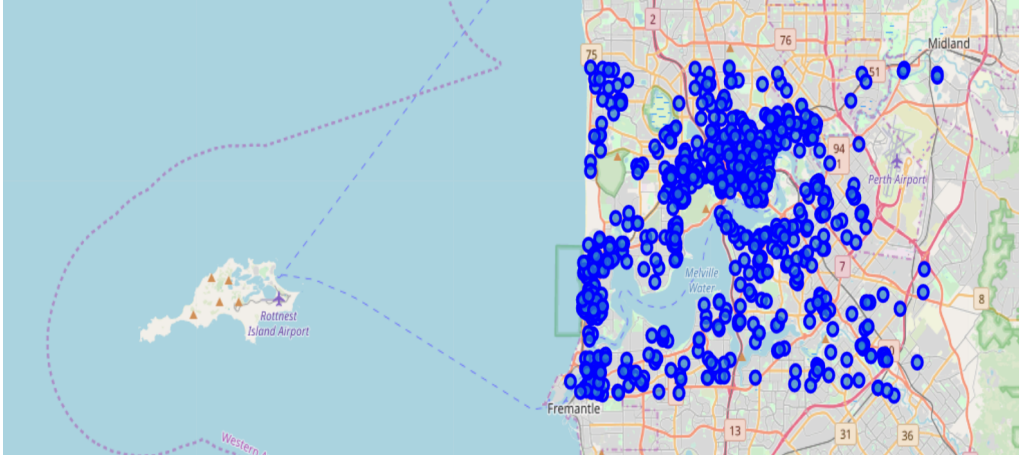


Figure 3: Map of Perth suburbs and a sample of Airbnb sales in 2019

3.2 Popularity of Different Suburbs

Now let's take a look to the filtered data to see which suburbs are more popular. This sub-task is achievable by grouping the data based on the neighborhood and counting the number of sales in different areas. The following figure, Fig. 4 shows the result of this operation which we did through IBM Watson studio notebook [4].

From this figure it is evident that Perth down town area along with Vincent and Belmont suburbs are the most popular areas while "Pepermint Grouve" and "Cockburn" are the least popular area of the Airbnb sale in 2019.

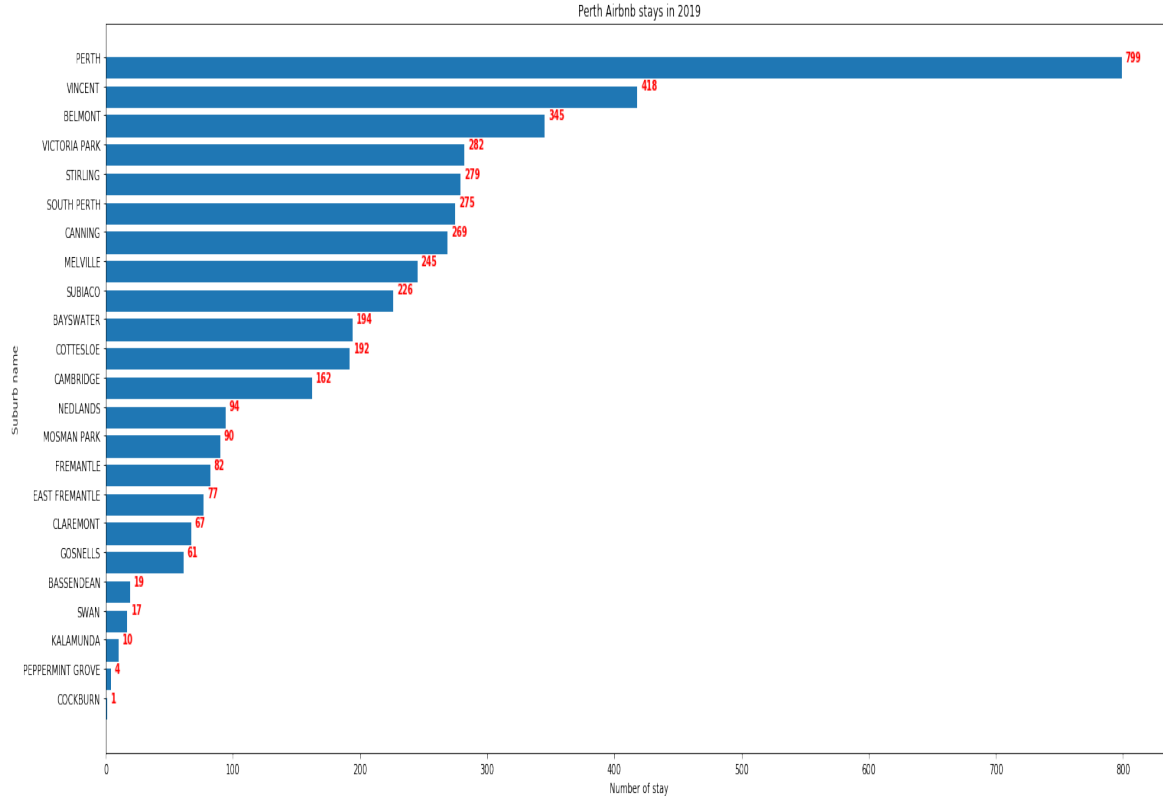


Figure 4: Number of properties rented out as Airbnb sale in Perth, 2019

3.3 Sale prices based on the accommodation types

In this section we investigate Airbnb sale price based on the type of available accommodation in Perth. From the filtered data column “room-type” represents four available types of accommodations which are “Entire home/apt”, “Hotel room”, “Private room” and “Shared room”. Figures 5, 6, 7 and 8 show the average price of these accommodation types in different suburbs of Perth.

From figure 5 we can see that “Cockburn” and “PeppermintGroove” suburbs stand far beyond the other suburbs for “Entire home-Apt” type of accommodation. Obviously the type of the house-flat and its available features has a significant impact on the offered price and we can guess these two areas are expensive suburbs of Perth. Sale price for this type of accommodation in other suburbs are reasonably in the range of [107 230] AUD with “Nedlands” on the top and “Basendean” at the bottom.

Figure 6 shows that for “Hotel room” type of accommodation “South Perth” and “Belmont” stand on the top of the list with sale price of 145 and 124 AUD, receptively. This figure also reveals that this type of accommodation is not available in majority of the suburbs. The cheapest available accommodation for “Hotel room” are in “Canning” and “Vincent” with price of 39 and 85.9 AUD, respectively.

From figure 7 we can see that “Private room” is available in all suburbs except “Cockburn” with a price range of [39.2 108.6]. For this type of accommodation, “Belmont” is on the top of the list while “Gossnells” is the cheapest one.

Figure 8 shows that “Shared room” type of accommodation is not available in some suburbs. Sale price of this type of accommodation lies in the range of [21.3 54.5] with “Kalamonda” and “Mellville” on the top and

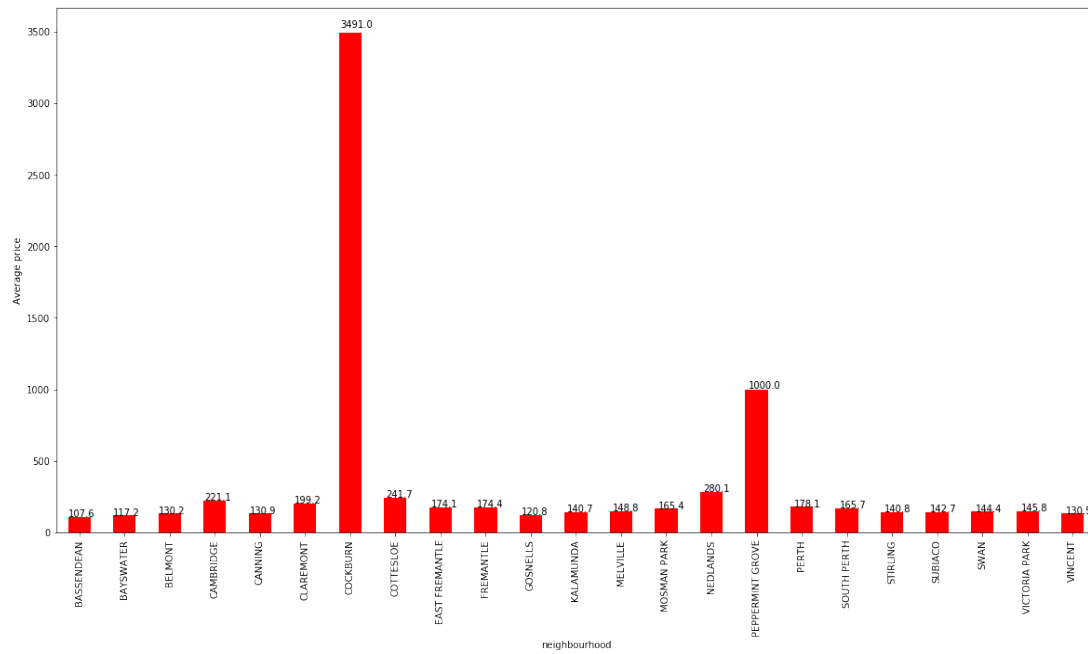


Figure 5: Average sale price of “Entire home-apt” Airbnb accommodation sale in Perth, 2019

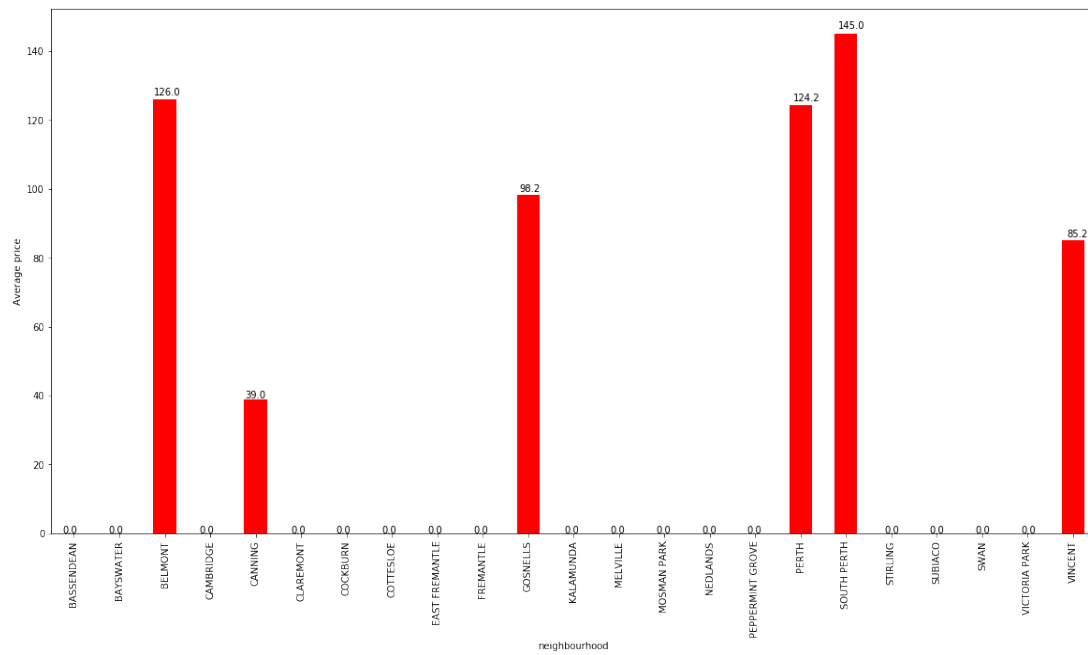


Figure 6: Average sale price of “Hotel room” Airbnb accommodation sale in Perth, 2019

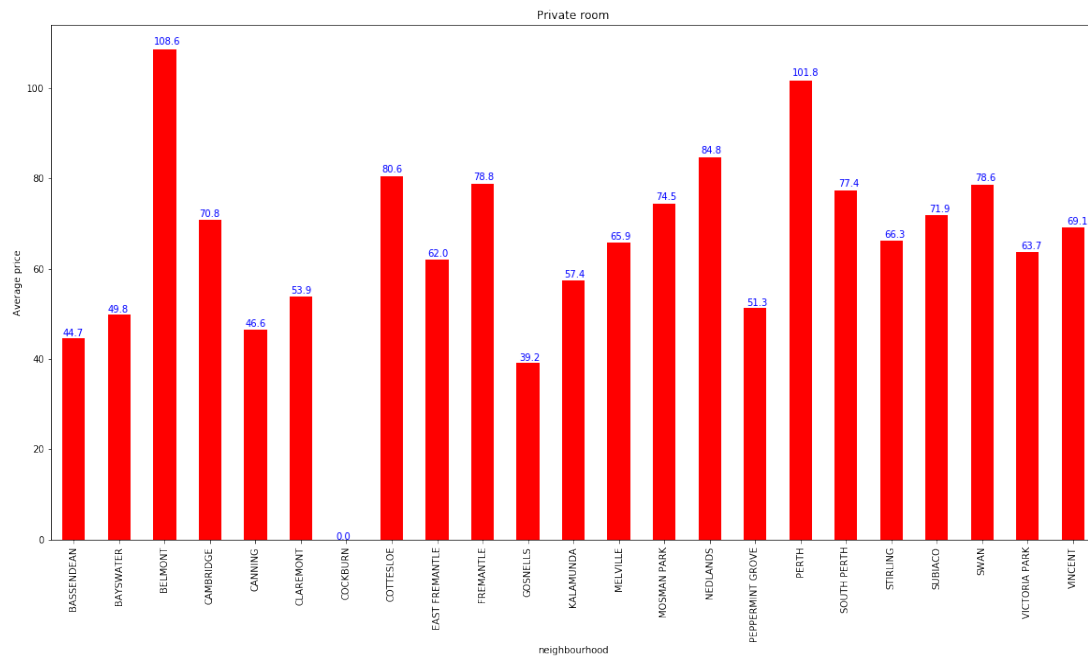


Figure 7: Average sale price of “Private room” Airbnb accommodation sale in Perth, 2019

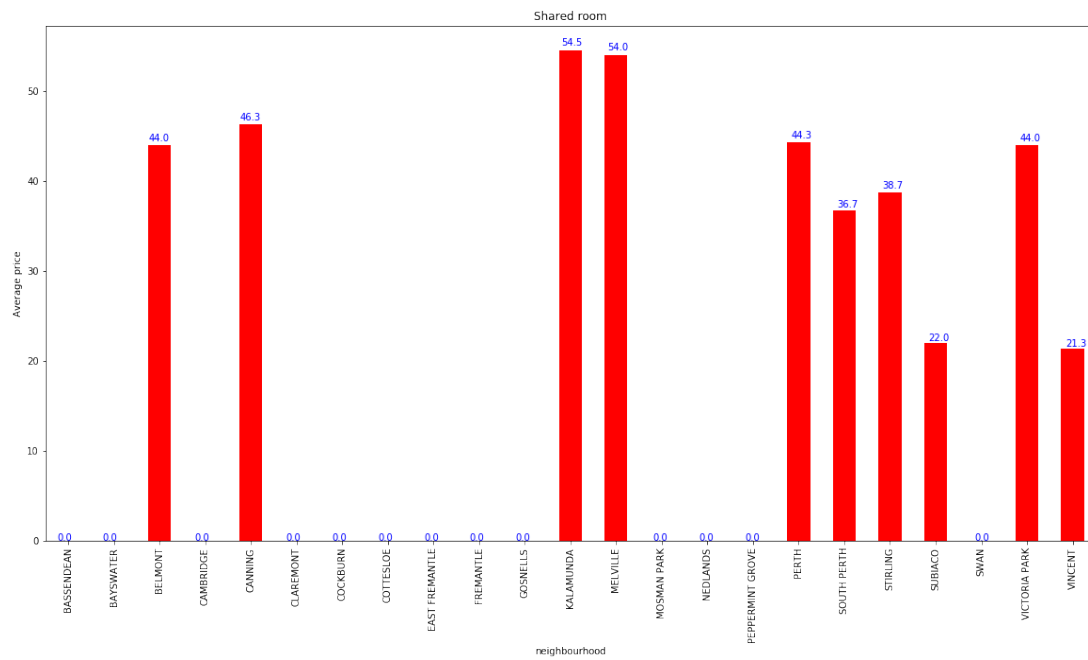


Figure 8: Average sale price of “Shared room” Airbnb accommodation sale in Perth, 2019

“Vincent” at the bottom.

3.4 Clustering the Data

Now we can use k-means algorithm to cluster our filtered data into some sub-groups based on the sale price in different suburbs. In order to ensure suburbs with similar range of price lie in a same cluster lets set the number of cluster to 8. Please notice that lower number of cluster will include suburbs with wider range of price in one cluster while larger number will put suburbs with a narrower range of price in one cluster. Figure 9 shows such a clustering for different suburbs.

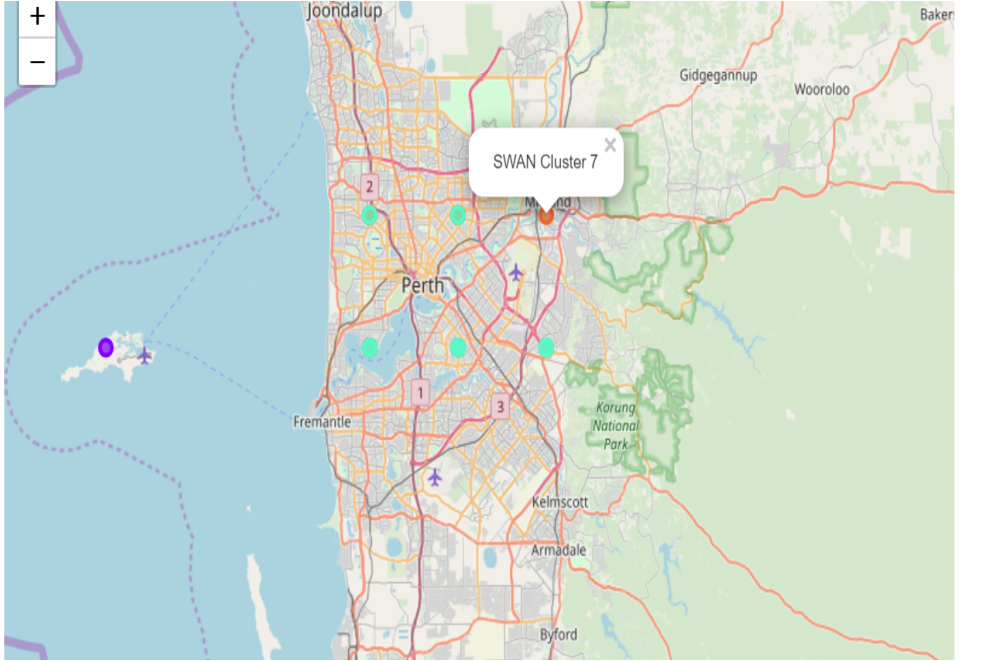


Figure 9: Clustering of different suburbs of Perth based on their Airbnb sale price

4 Conclusion

Based on the analysis we made in the previous section, the three suburb of “Perth CBD”, “Vincent” and “Belmont” are the best suburbs in terms of popularity. Any property in these suburbs is easier for renting out compare to the others. In other words, number of Airbnb sales of properties in these suburbs is higher than the other regions. As the price of different type of accommodations in “Perth CBD” are higher than the two others we can make a conclusion that this suburb is the best one for investment purposes. Although “Vincent” is more popular than “Belmont” how ever the sale price in the latter are higher than the former. Hence, we can conclude that these two suburbs can be considered equivalent for the investment purpose.

Three suburbs “Cockburn”, “Pepermintgrouve” and “Kalamanda” have the lowest popularity and number of sales. From the analysis in the previous section we can see the market of “Cockburn” is very special with only one sale and a very high prices. Definitely, the size of the house and its available features have a great impact on the sale price and unfortunately we do not have any information in this regard. Hence, we exclude this suburb from the recommendation list for investment purpose. “Pepermintgrouve” and “Kalamanda” are

also not recommended for Airbnb investment purpose as they have low number of sales and not high sale price, specifically for private room type of accommodation.

Similar conclusion can be made for the suburbs which lie at the middle cluster.

Bibliography

- [1] Airbnb. *What are Airbnb service fees?*
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- [3] Folium. map. "<https://python-visualization.github.io/folium>."
- [4] Ibm watson studio notebook. https://dataplatform.cloud.ibm.com/analytics/notebooks/v2/acfca593-52f4-49f3-b15c-80ca7337e791/view?access_token=3f20fc932efc77ff5b4e7b5cf51baea90e4cf41da6c226e4c0e7357560d841c0.