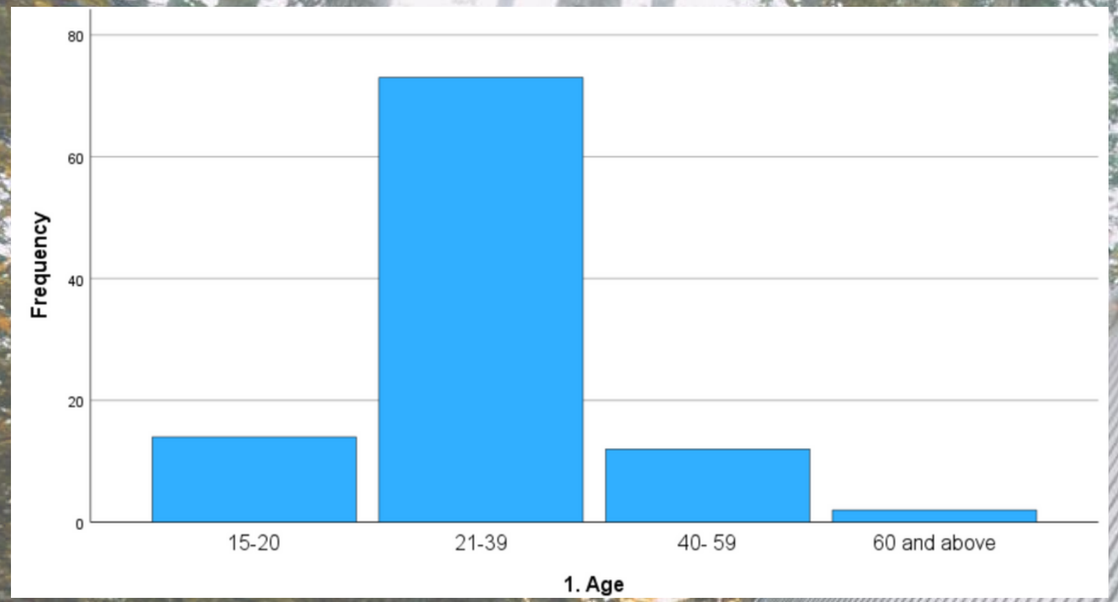
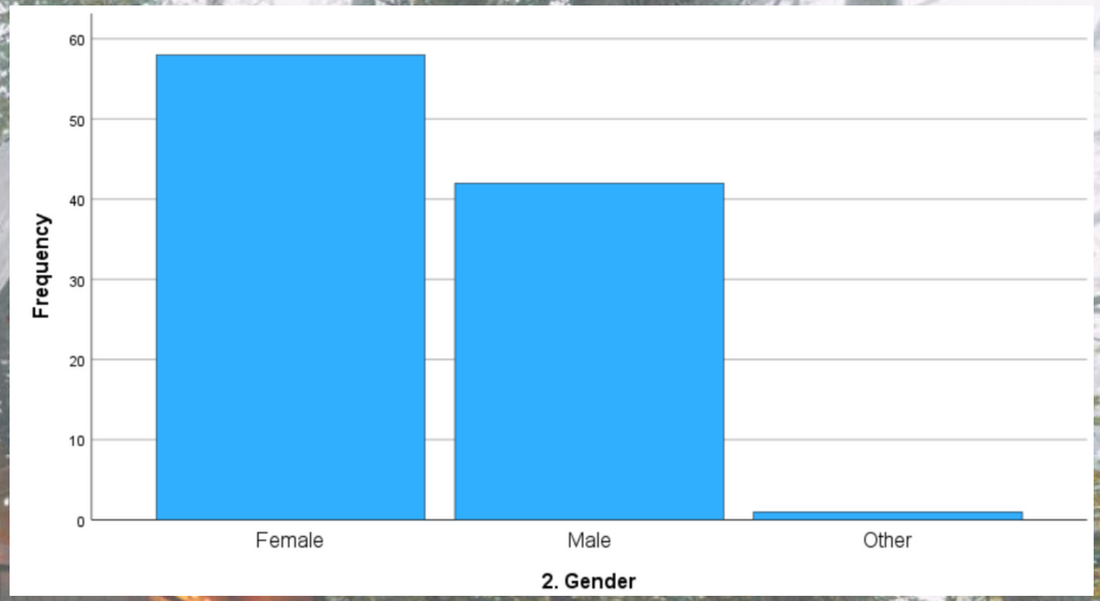
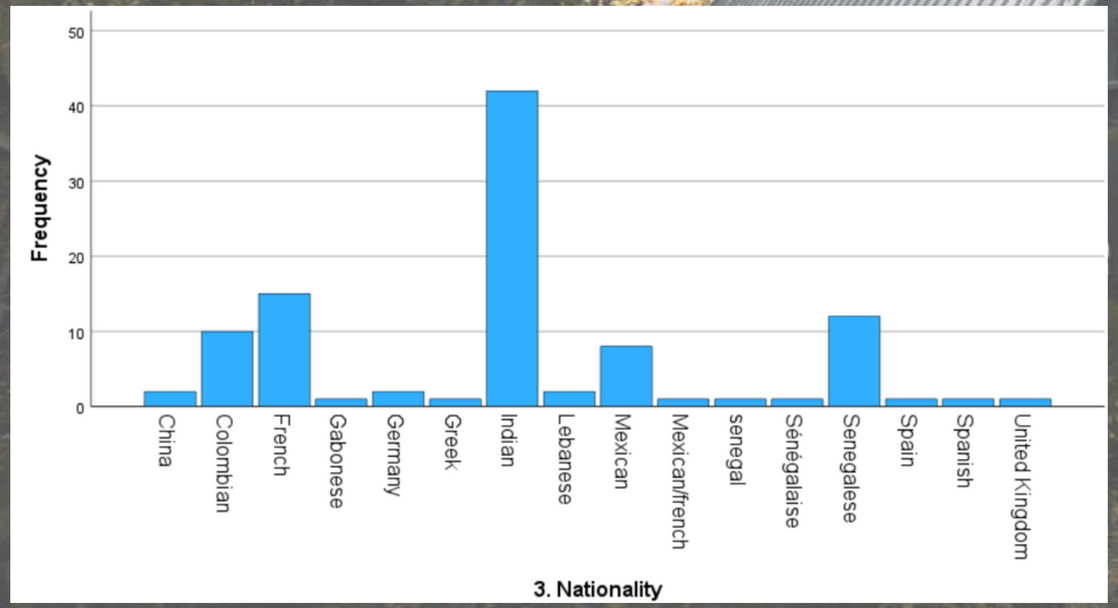
SALES FORECAST USING PYTHON

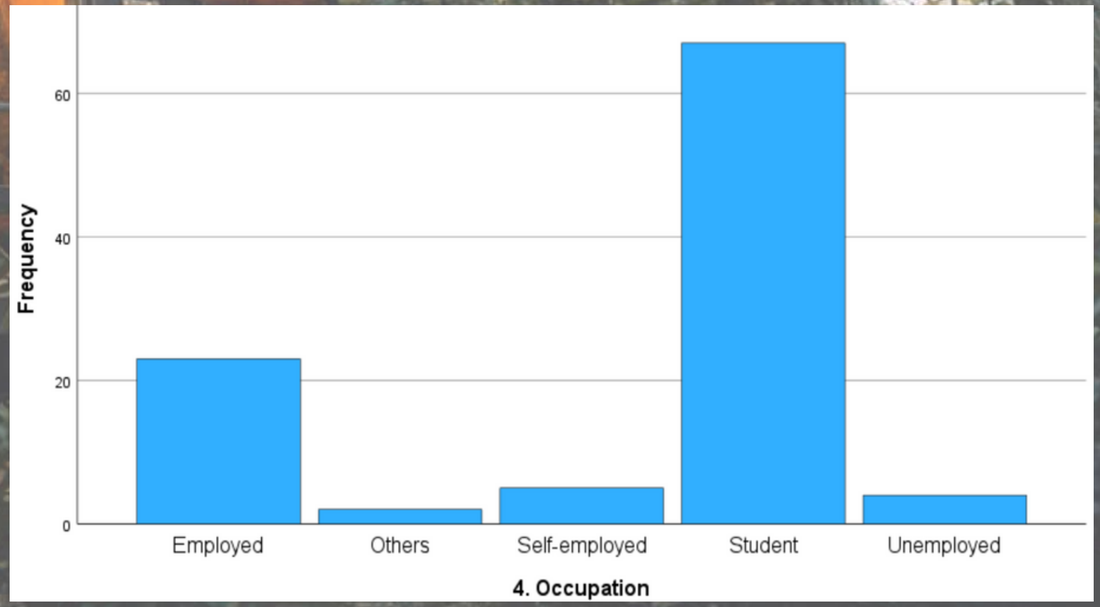
SURVEY QUESTIONS

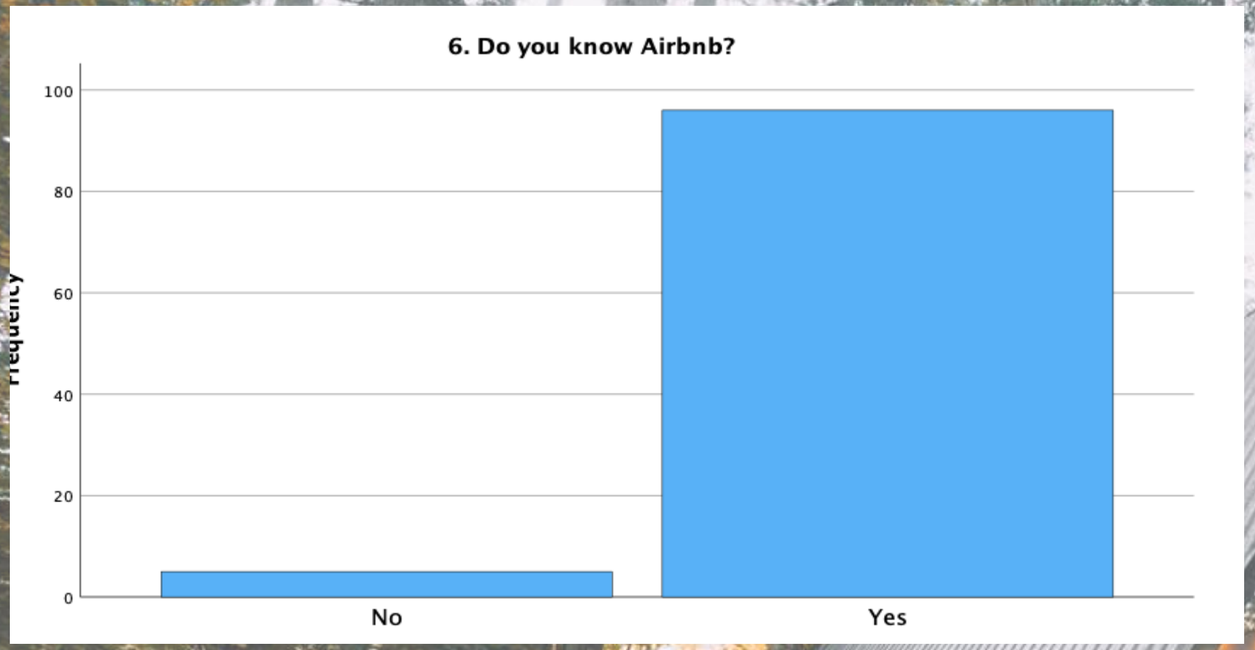
1. What is your range of age?
2. What is your gender?
3. What is your nationality?
4. What is your occupation?
5. From the below options, mention the factors you consider before choosing an accommodation that determines your choice of stay.
6. Do yow know Airbnb?
7. Have you ever stayed in an Airbnb?
8. If yes, select the reasons of your stay.
9. How often do you stay in an Airbnb property?
10. For what purposes do you prefer using Airbnb?
11. On a scale of 1 to 5, how do you rate your experience using Airbnb?
12. On a scale of 1 to 5, rate your preferences of Airbnb over a Hotel.
13. Please rate your opinion on safety factors related to Airbnb booking.
14. How likely are you to recommend Airbnb to your friends and family?

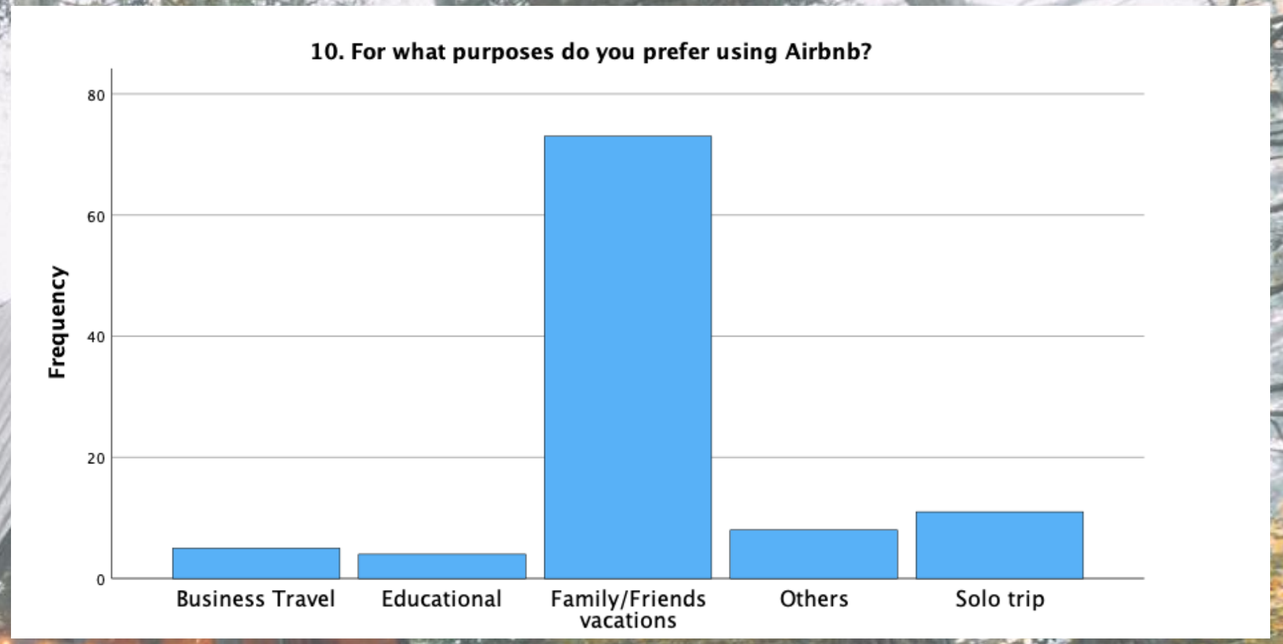

Frequency
80
60
40
20
0
15-20
21-39
40- 59
60 and above
1. Age

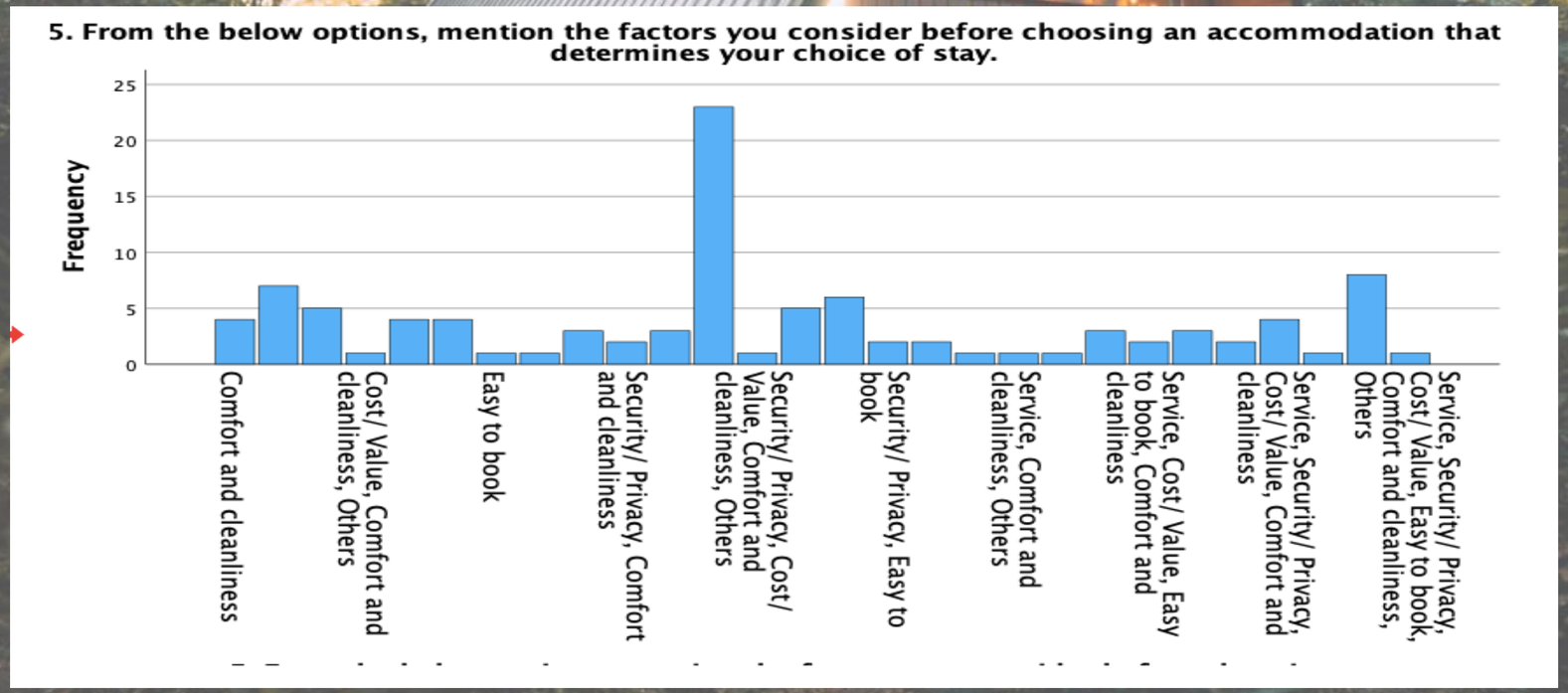

Frequency
60
50
40
30
20
10
0
Female
Male
Other
2. Gender

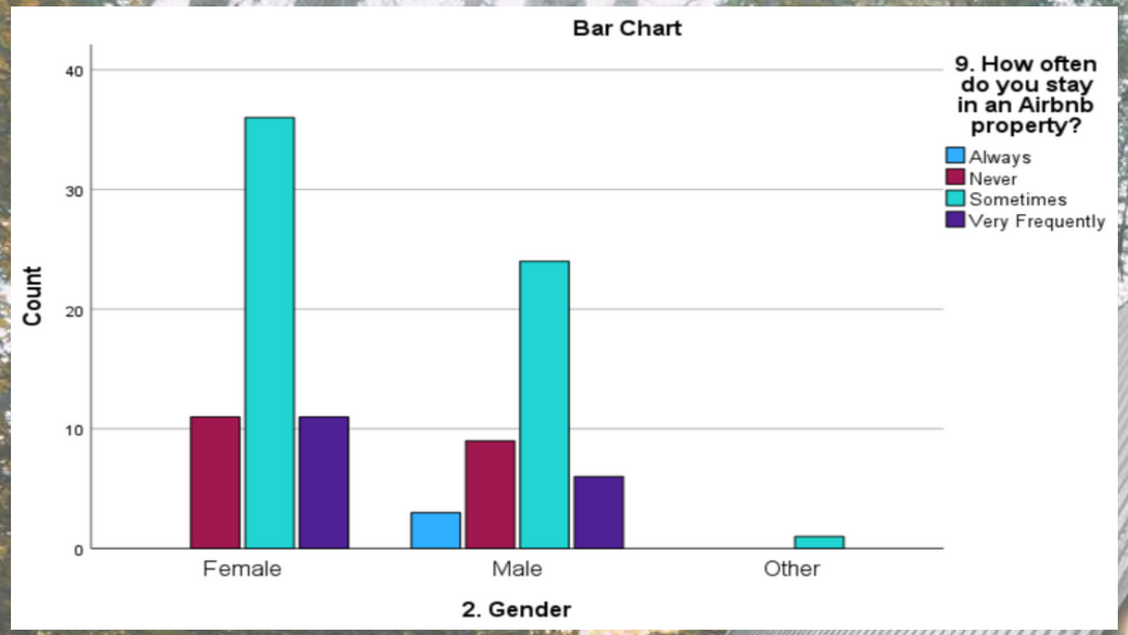

Frequency
50
40
30
20
10
0
China
Colombian
French
Gabonese
Germany
Greek
Indian
Lebanese
Mexican
Mexicanfrench
senegal
Sénégalaise
Senegalese
Spain
Spanish
United Kingdom
3. Nationality

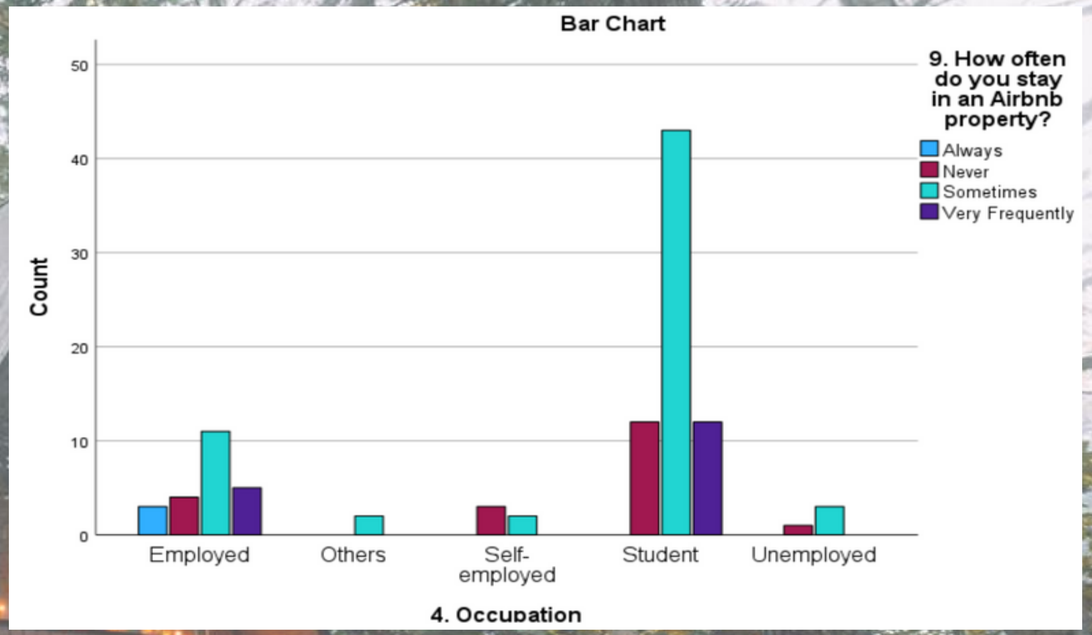

Frequency
60
40
20
0
Employed
Others
Self-employed
Student
Unemployed
4. Occupation

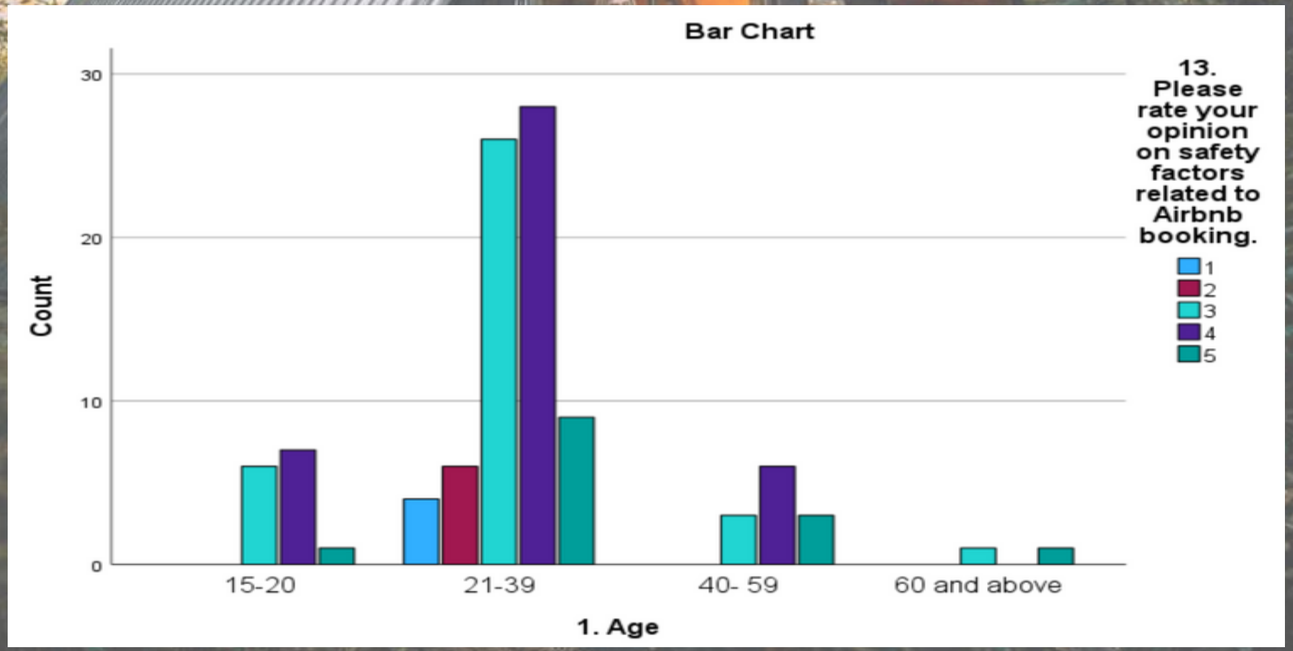

6. Do you know Airbnb?
Frequency
100
80
60
40
20
0
No
Yes

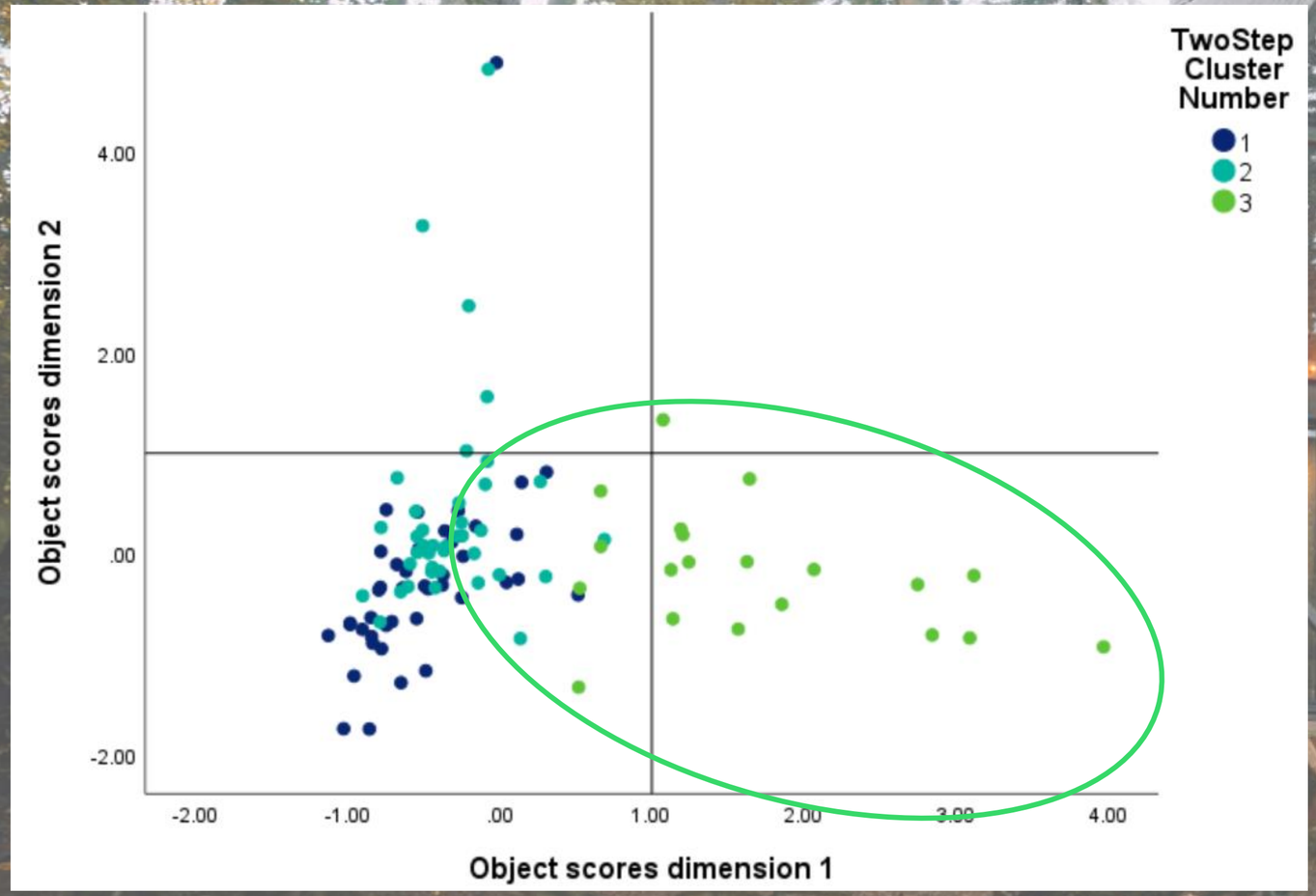

10. For what purposes do you prefer using Airbnb?
Frequency
80
60
40
20
0
Business Travel
Educational
Family/Friends vacations
Others
Solo trip

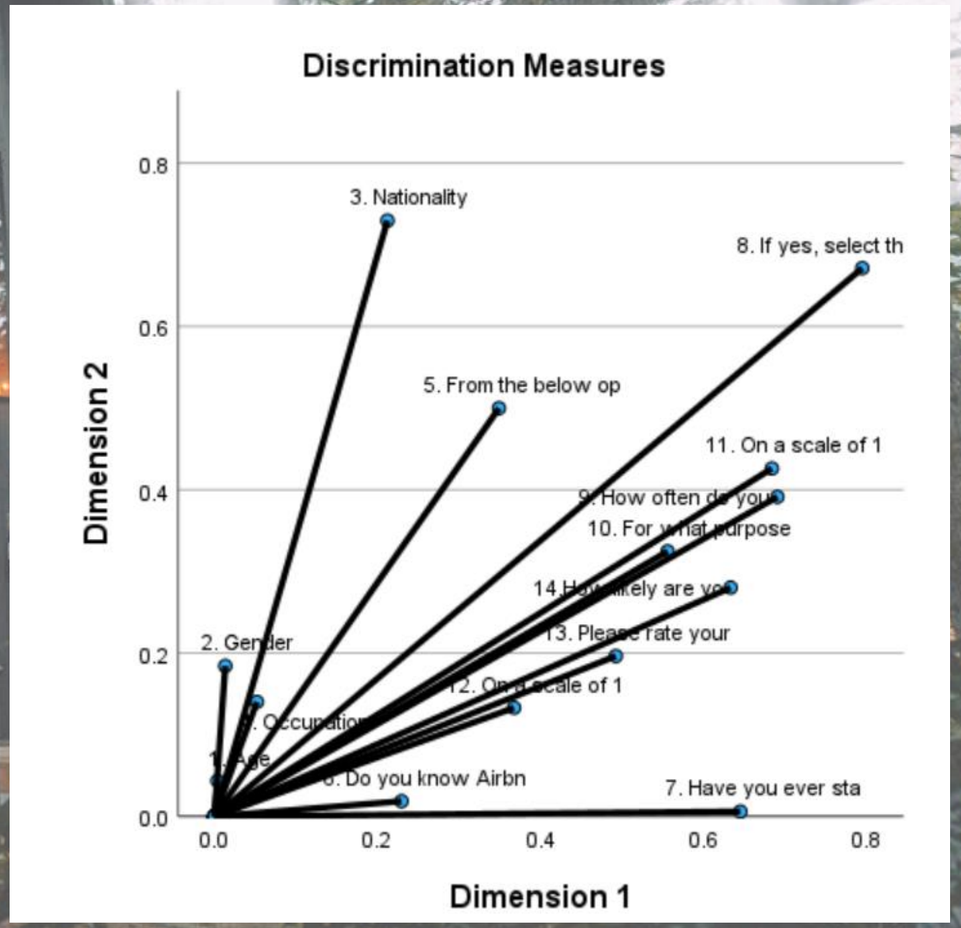

5. From the below options, mention the factors you consider before choosing an accommodation that determines your choice of stay.
Frequency
25
20
15
10
5
0
Comfort and cleanliness
Cost/ Value, Comfort and cleanliness, Others
Easy to book
Security/ Privacy, Comfort and cleanliness
Security/ Privacy, Cost/ Value, Comfort and cleanliness, Others
Security/ Privacy, Easy to book
Service, Comfort and cleanliness, Others
Service, Cost/ Value, Easy to book, Comfort and cleanliness
Service, Security/ Privacy, Cost/ Value, Comfort and cleanliness
Service, Security/ Privacy, Cost/ Value, Easy to book, Comfort and cleanliness, Others


Bar Chart
9. How often do you stay in an Airbnb property?
Always
Never
Sometimes
Very Frequently
Count
40
30
20
10
0
Female
Male
Other
2. Gender


Bar Chart
9. How often do you stay in an Airbnb property?
Always
Never
Sometimes
Very Frequently
Count
50
40
30
20
10
0
Employed
Others
Self-employed
Student
Unemployed
4. Occupation

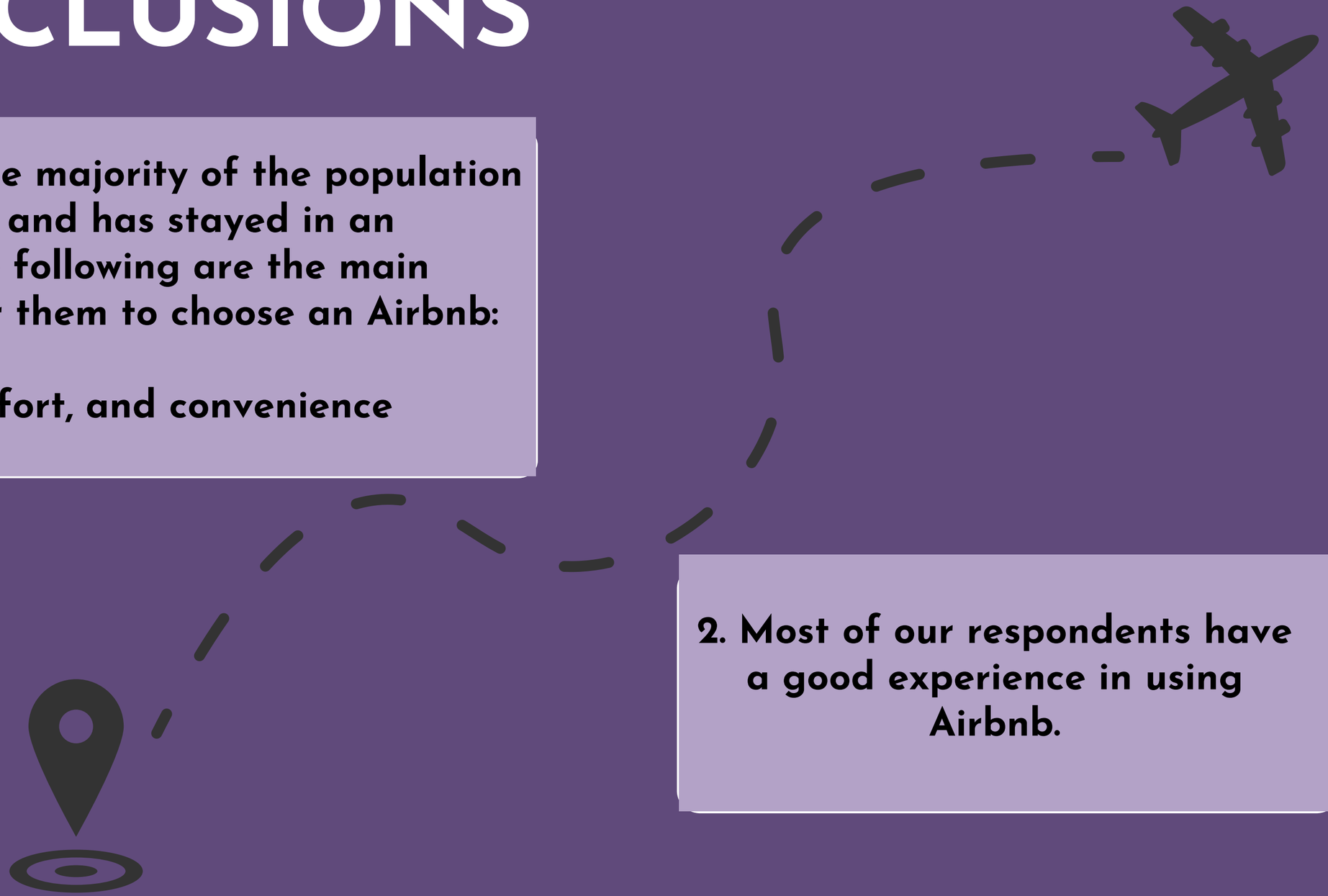

Bar Chart
13. Please rate your opinion on safety factors related to Airbnb booking.
1
2
3
4
5
Count
30
20
10
0
15-20
21-39
40- 59
60 and above
1. Age


TwoStep Cluster Number
1
2
3
Object scores dimension 2
4.00
2.00
.00
-2.00
-2.00
-1.00
.00
1.00
2.00
3.00
4.00
Object scores dimension 1


Discrimination Measures
Dimension 2
0.8
0.6
0.4
0.2
0.0
3. Nationality
8. If yes, select th
5. From the below op
11. On a scale of 1
9. How often do you
10. For what purpose
14. How likely are yo
13. Please rate your
2. Gender
12. On a scale of 1
4. Occupation
1. Age
6. Do you know Airbn
7. Have you ever sta
0.0
0.2
0.4
0.6
0.8
Dimension 1

CONCLUSIONS

1. Out of the majority of the population that knows and has stayed in an Airbnb, the following are the main reasons for them to choose an Airbnb:
- Location
- Cost, comfort, and convenience



2. Most of our respondents have a good experience in using Airbnb.

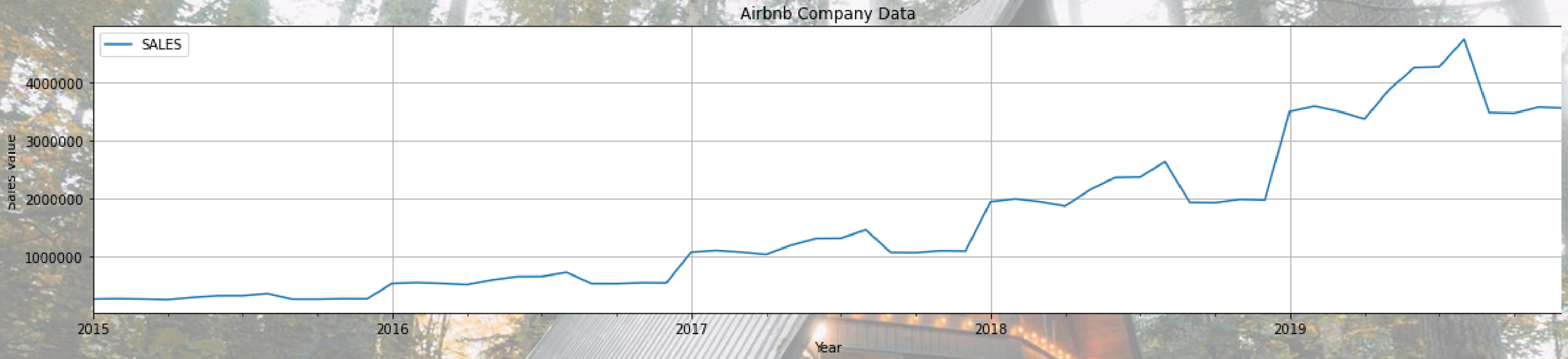
CONCLUSIONS

3. Airbnb is very frequently preferred by females over males.

4. Based on the survey, students use Airbnb the most for their stay compared to other occupants.

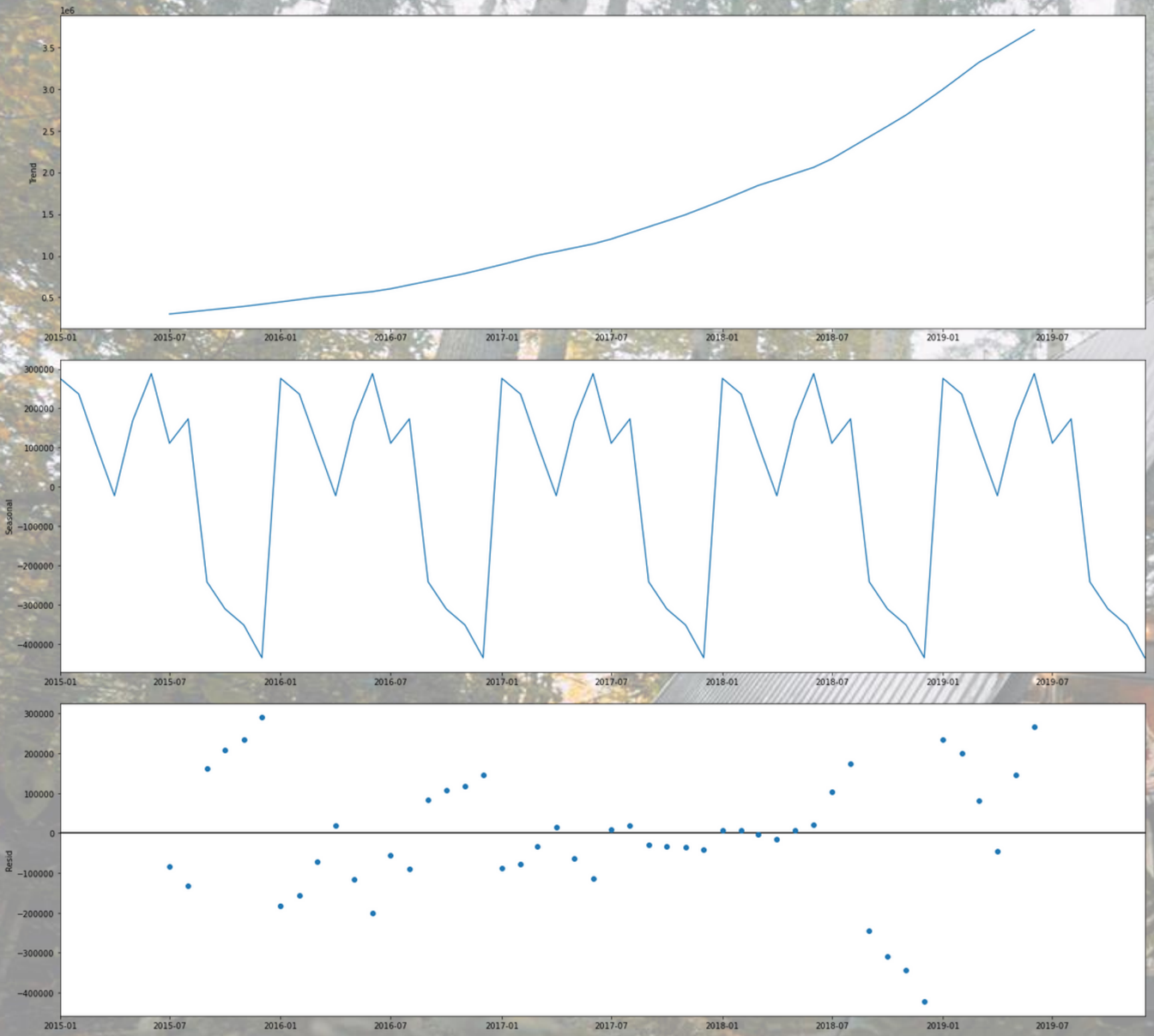
BUSINESS DATA ANALYTICS FORECASTING

DEMAND BEHAVIOUR



- TREND WITH SEASONAL PATTERN: GRADUAL INCREASE IN BOOKINGS OVER TIME
- SEASONAL PATTERN WITH HIGHER BOOKINGS IN SUMMER MONTHS & LOWER IN WINTER MONTHS

TIME SERIES -ADDITIVE

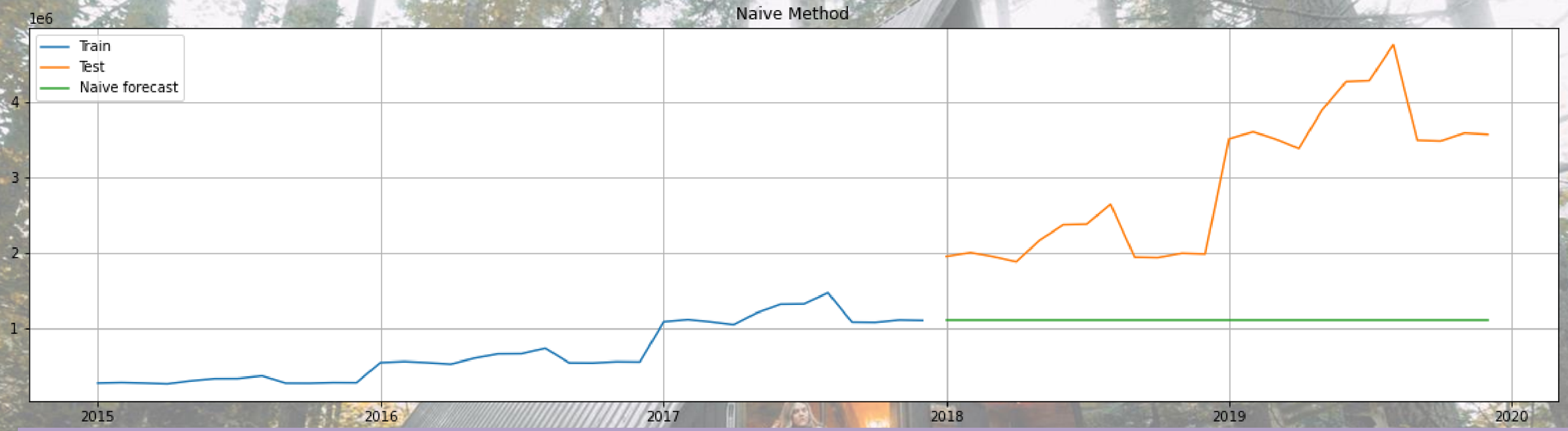


Trend : Upward linear trend

Seasonality: Peaks in Summer and Troughs in Winter

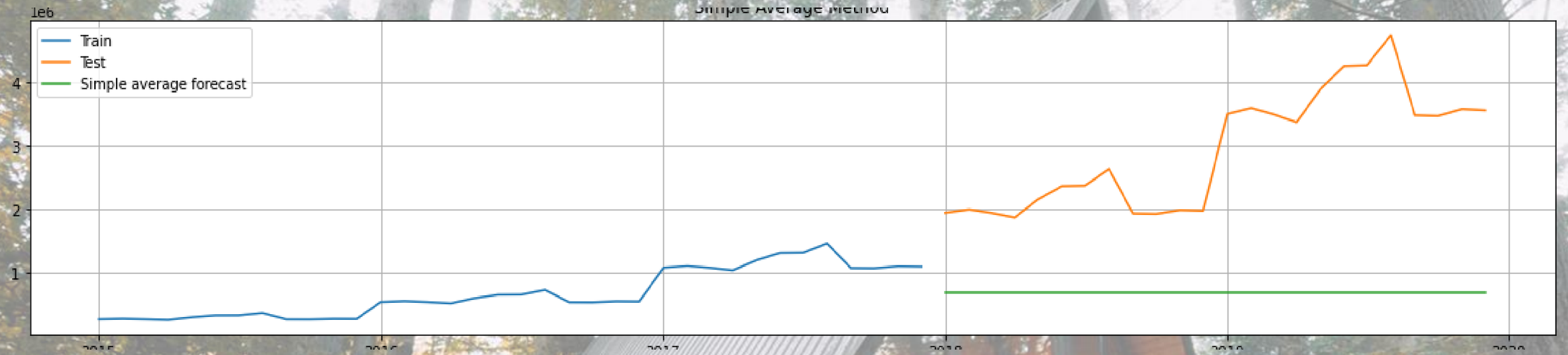
Residual : No visible pattern

NAIVE METHOD



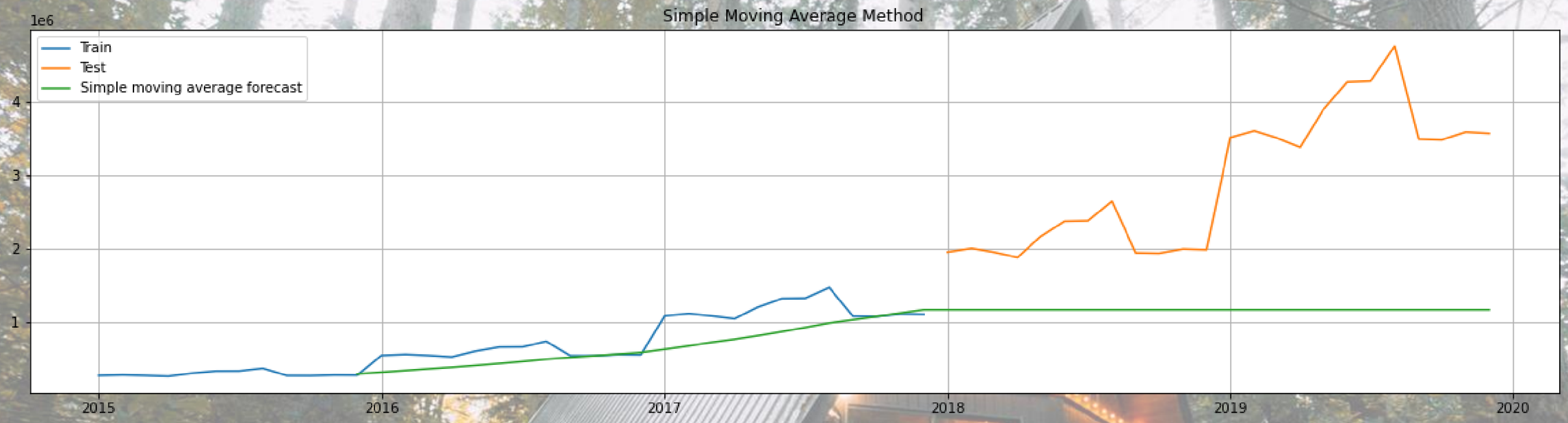
- Large gap between actual test data & naive straight line forecast
- Significantly underestimates peaks and overestimates troughs
- Lack of consideration towards trend and seasonality

SIMPLE AVERAGE



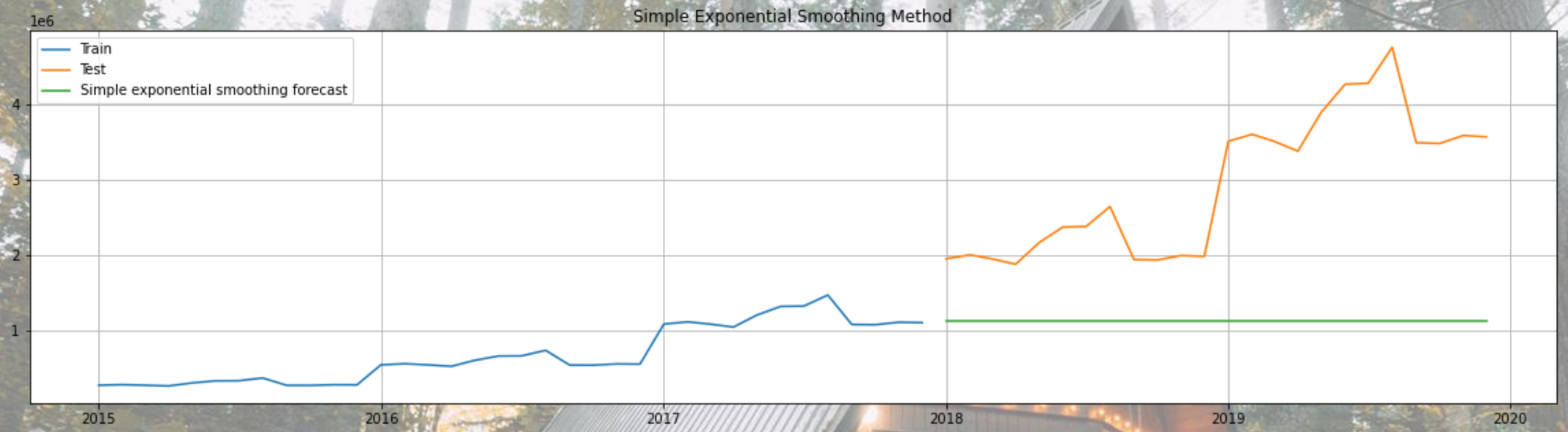
- Flat horizontal forecast line that does not account for any trend or seasonality

SIMPLE MOVING AVERAGE



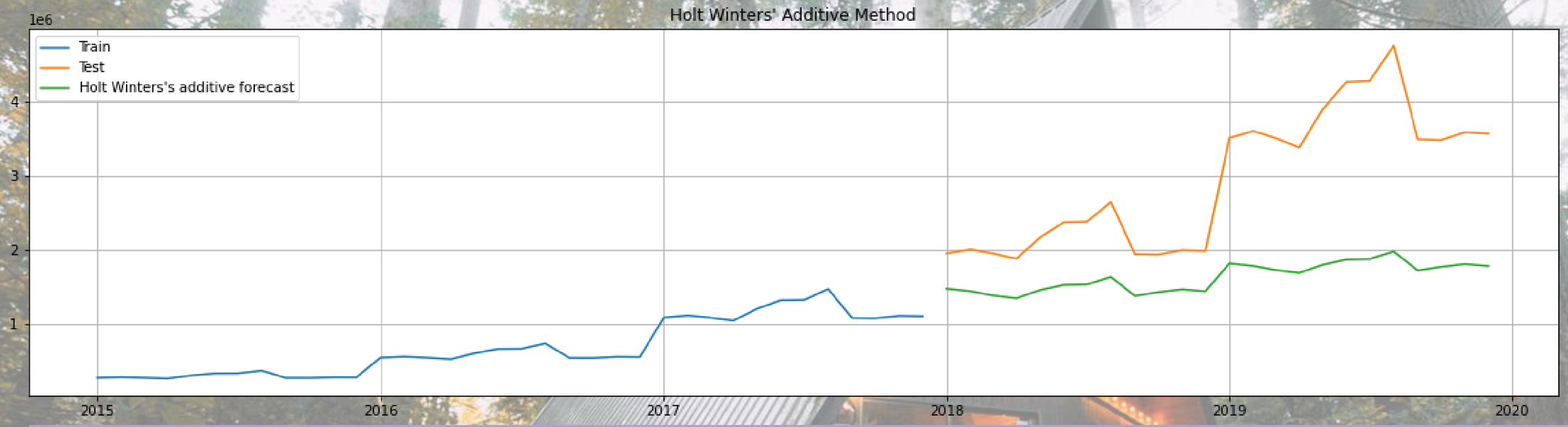
- Follows the trend of actual values more closely than the naive method
- Smoothens out seasonal ups and downs
- Lack of consideration of Seasonality

SIMPLE EXPONENTIAL



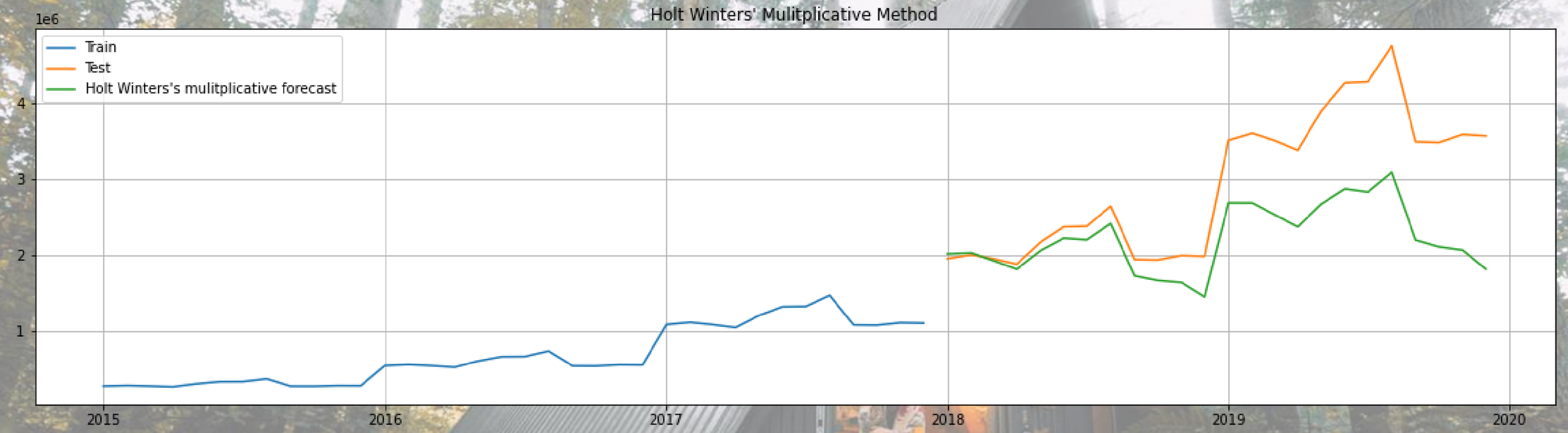
- **Basic trend identifier but is lacking seasonality information**

HOLT WINTER ADDITIVE



- Minor deviations exist where actual peaks/troughs are underestimated/overestimated.
- Peaks and troughs are better differentiated compared to the flattened curves from SES/SMA
- Able to capture both trends and seasonality with minor deviation

HOLT WINTER MULTIPLICATIVE



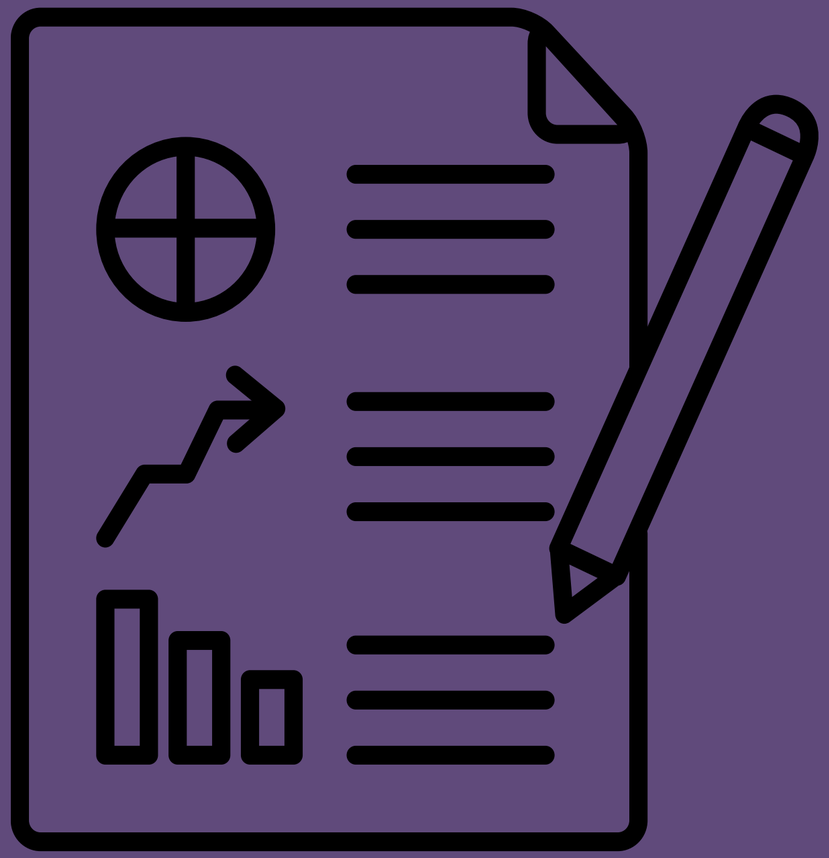
- Forecast line captured the fluctuations in actual values
- MAPE and RMSE errors are lowest compared to other techniques
- Able to capture both trend and seasonality near to the actual values

FORECAST ERROR COMPARISON

Method	RMSE	MAPE
Naive method	2045566.39	58.74
Simple average method	2430457.95	74.52
Simple moving average forecast	1987926.60	56.33
Simple exponential smoothing forecast	2031942.28	58.17
Holt Winters' additive method	1493886.85	41.08
Holt Winters' multiplicative method	944715.39	21.45

Data Analytics

We deducted from our forecasting on Python that Airbnb draws more interest during summer time. Therefore it should try to boost its activities during the summer and reduce the throughs during winter by doing promotions and offers



Data Analytics

Airbnb suffers from seasonality, the company should should focus on providing diversified offers and promotions during that period to reduce the gap.