

# AIRBNB MARKET ANALYSIS

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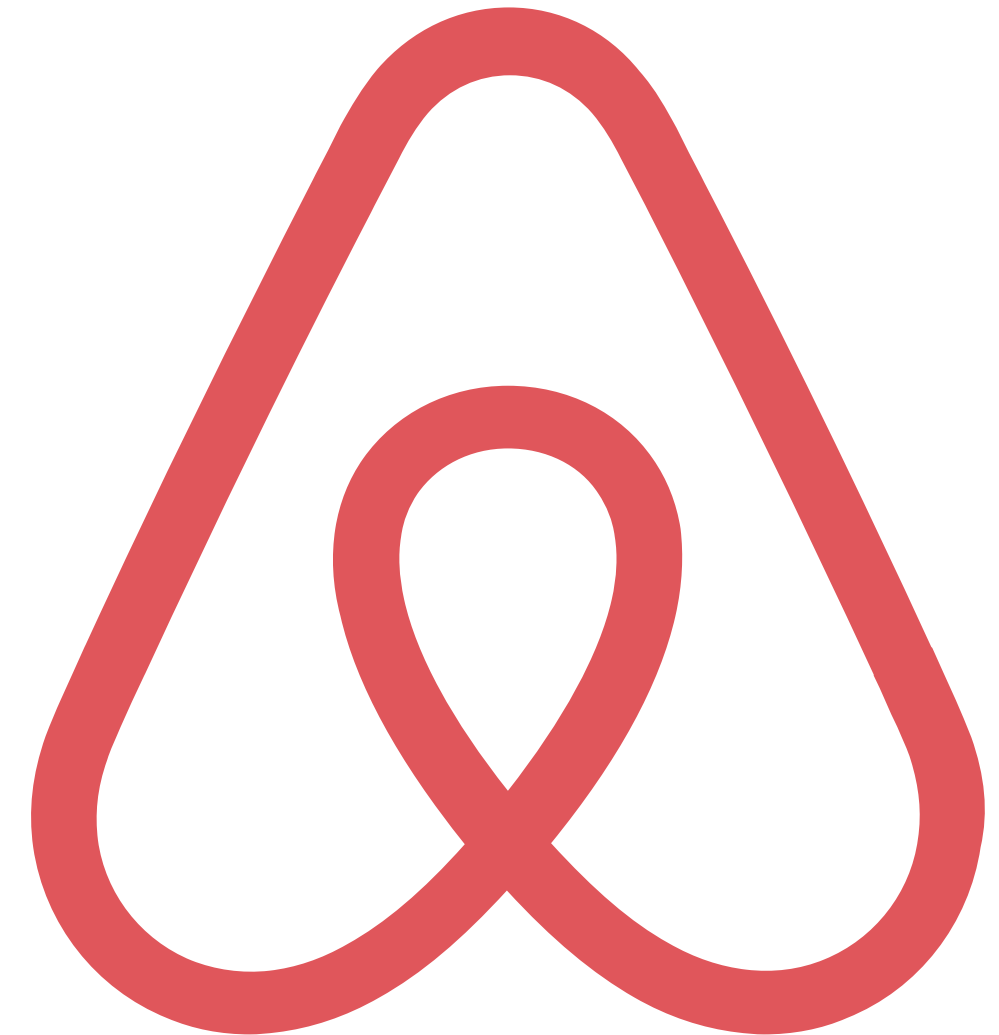
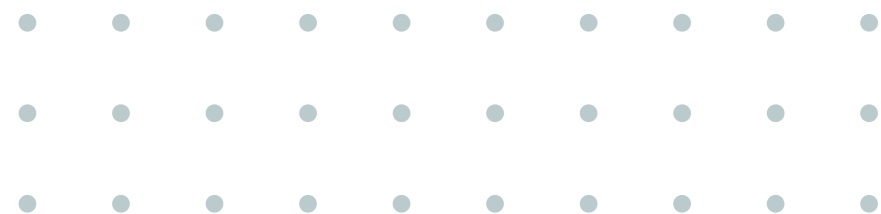
# HELLO!

Airbnb has changed how people find places to stay. It's not just hotels anymore; you can rent unique places from regular folks.



# INTRODUCTION

- Explore Airbnb customer data for insights using advanced data mining techniques.
- Utilize clustering analysis to uncover trends, patterns, and strategies.
- Enhance customer experience and optimize business operations.
- Crucial for hosts and platform administrators to make informed decisions.
- .
- Improve overall satisfaction through understanding Airbnb customer behavior.



## DATA:

The data comprises of various attributes about customers and rental properties including unified IDs, location details (such as zip code and city), host type, property characteristics (number of bedrooms, bathrooms, maximum occupancy), financial metrics (revenue, nightly rate), and booking dynamics (lead time, length of stay). These attributes provide a comprehensive view of the Airbnb ecosystem and offer rich insights into customer preferences and behaviors.



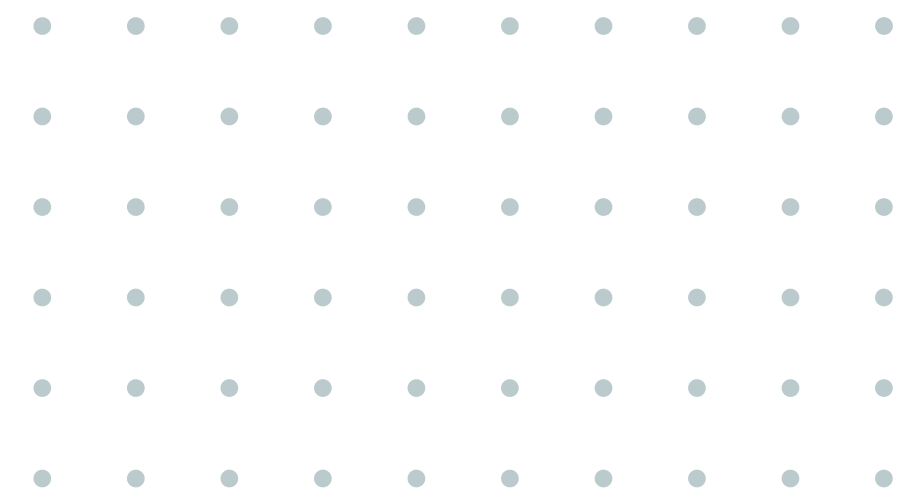


## MARKET ANALYSIS:

- The file contains data from 2019, organized by month, focusing on individual property listings on Airbnb.
- Key metrics include unique property codes (unified\_id), revenue generated, availability (openness), occupancy ratios, nightly rates, lead times, and average length of stay for each month's reservations.

## AMENITIES:

- The file records the presence or absence of specific amenities in Airbnb listings using a binary system (1 for presence, 0 for absence).
- It particularly highlights the availability of a pool or hot tub in each listing.



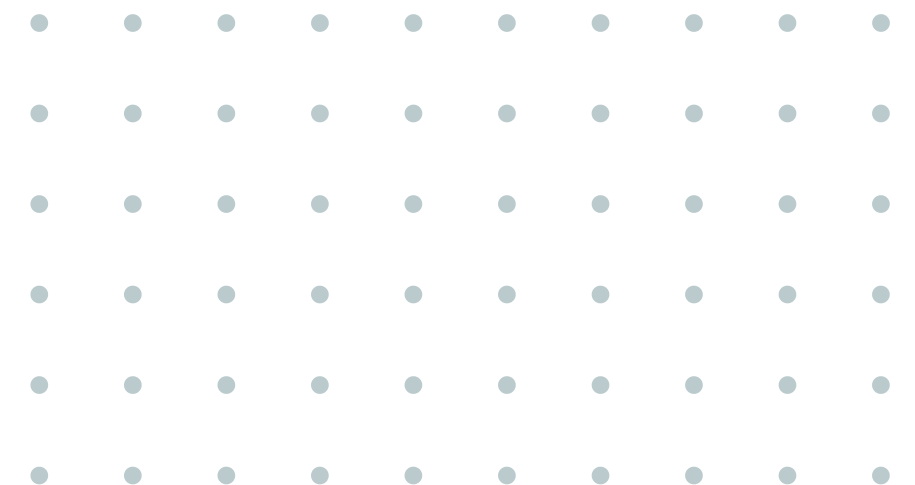


## LOCATION:

- This file contains latitude and longitude coordinates for each listing, enabling precise spatial analysis and visualization.

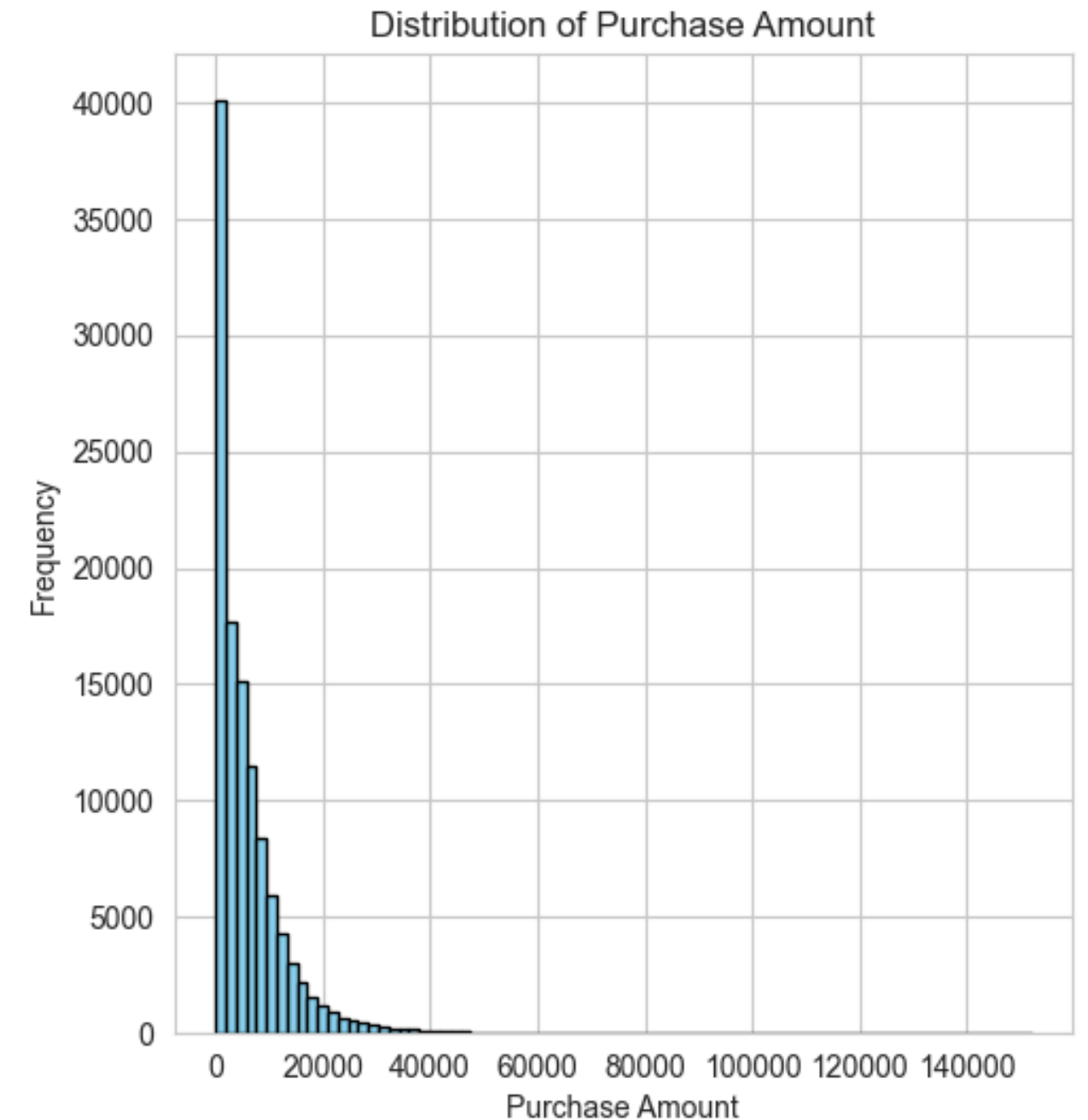
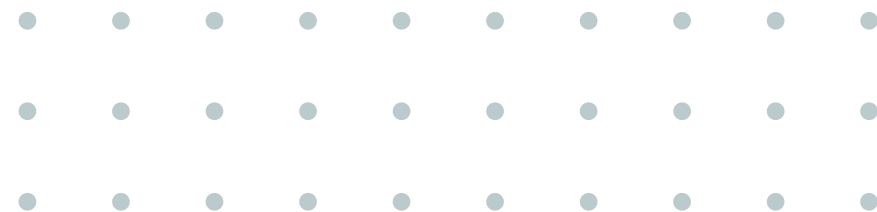
## SALES PROPERTIES:

- there are two separate files—one presenting the overall information about sales properties and the other focusing on properties with pools.



# DATA PREPROCESSING:

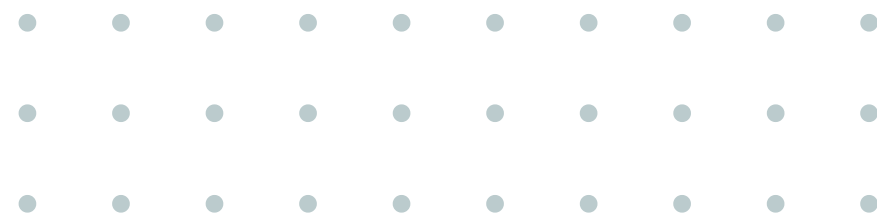
- Conducted comprehensive Exploratory Data Analysis (EDA) in the initial data preprocessing phase.
- Utilized diverse visualization techniques such as pie plots, scatter plots, and histograms.
- Visualizations aided in understanding dataset distribution, tendencies, and identifying potential outliers.
- Addressed extreme values in revenue metric to uphold data integrity.
- Employed rigorous statistical methodologies for identification and removal of extreme values.
- Ensured robustness of subsequent analyses through removal of extreme values.
- Adopted z-score methodology post-outlier removal for outlier detection
- Identified data points deviating significantly from the mean.
- Enhanced reliability and accuracy of subsequent analyses



# Why DBSCAN?

- **DBSCAN excels at identifying clusters of various shapes, making it suitable for datasets with non-globular or complex structures.**
- **It effectively handles clusters of varying densities, distinguishing between high-density core points and low-density noise or border points.**
- **DBSCAN is robust to outliers, ensuring the clustering process is not unduly influenced by noisy data points.**

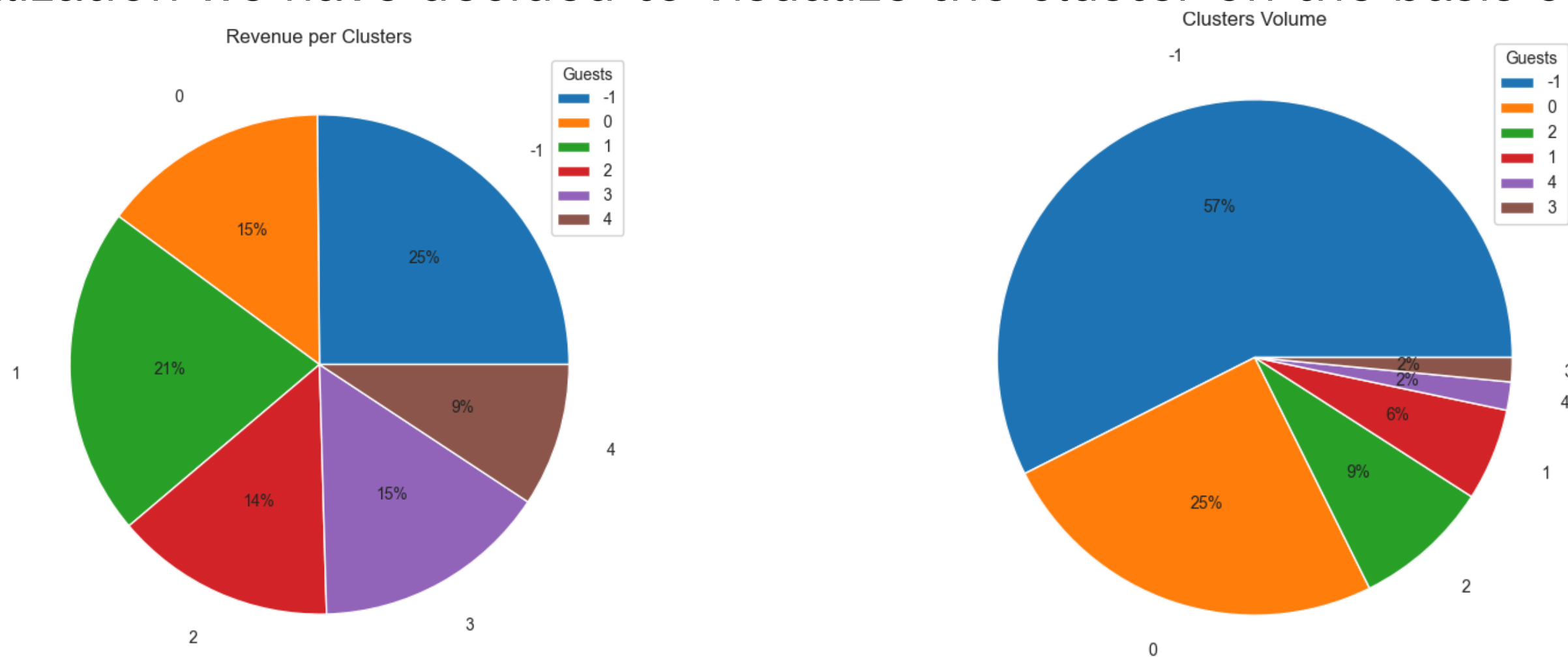
**Eps = 1.2 ; Min\_sample = 1000**





# FINDINGS

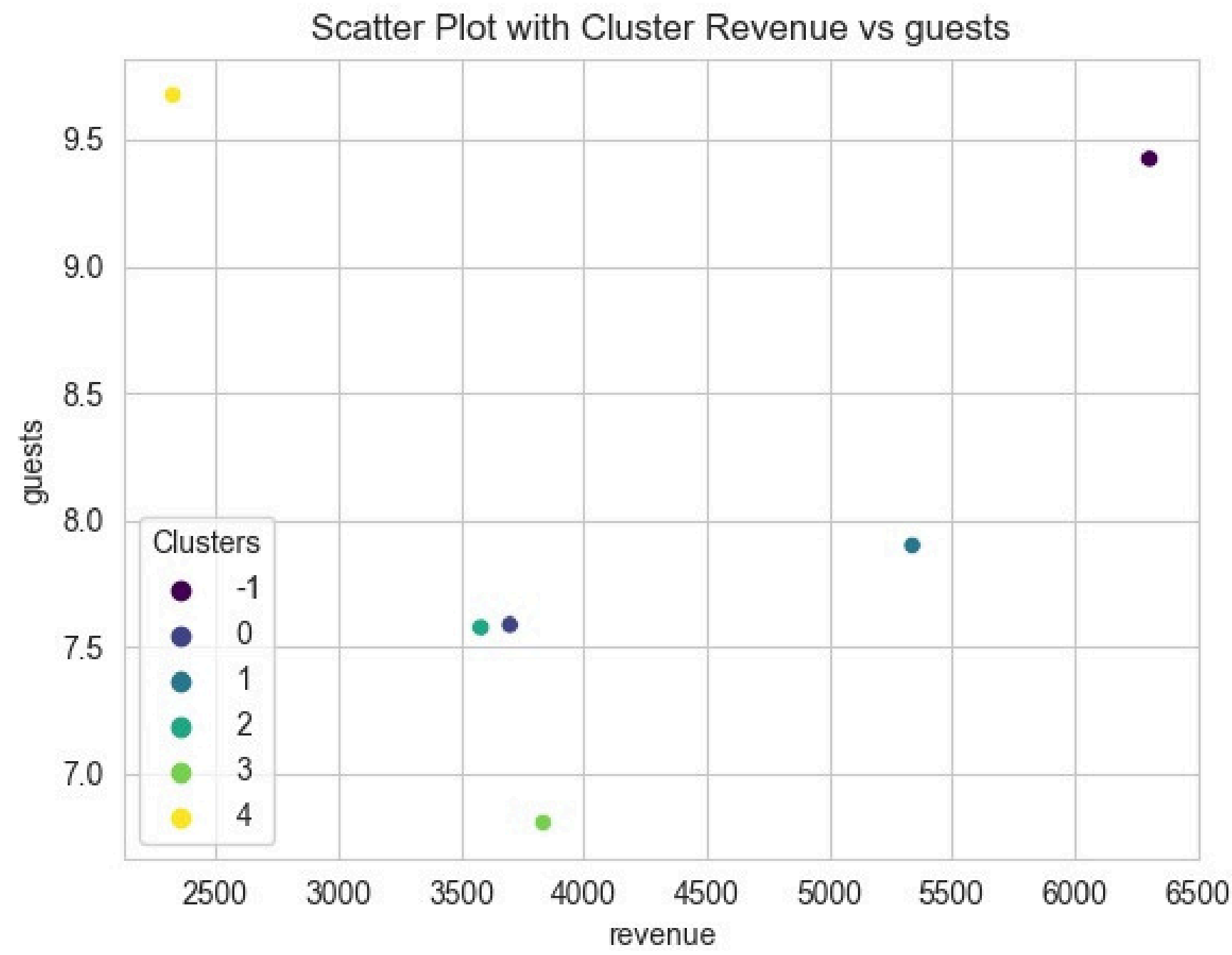
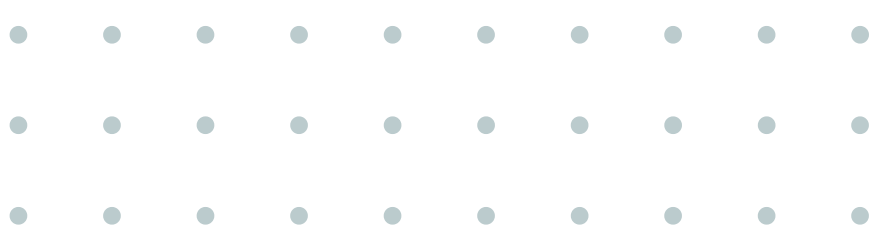
We have found 5 clusters and their mean attributes are shown as follows.  
For better visualization we have decided to visualize the cluster on the basis of their mean values.



bedrooms	bathrooms	guests	revenue	openness	hot_tub	pool	city_encoded	host_type Encoded	ID Encoded	Cluster
4	3	9	6304.93	28.81	0.30	0	1.24	0.98	2634.73	-1
3	2	8	3698.06	30.26	0	0	0.72	1	3048.37	0
3	2	8	5339.51	30.30	1	0	0.96	1	1218.47	1
3	2	8	3579.08	30.27	0	0	0.55	2	2722.87	2
3	2	7	3832.64	30.37	0	0	1.00	0	2123.70	3
4	2	10	2324.08	30.44	0	0	0.99	1	3370.23	4

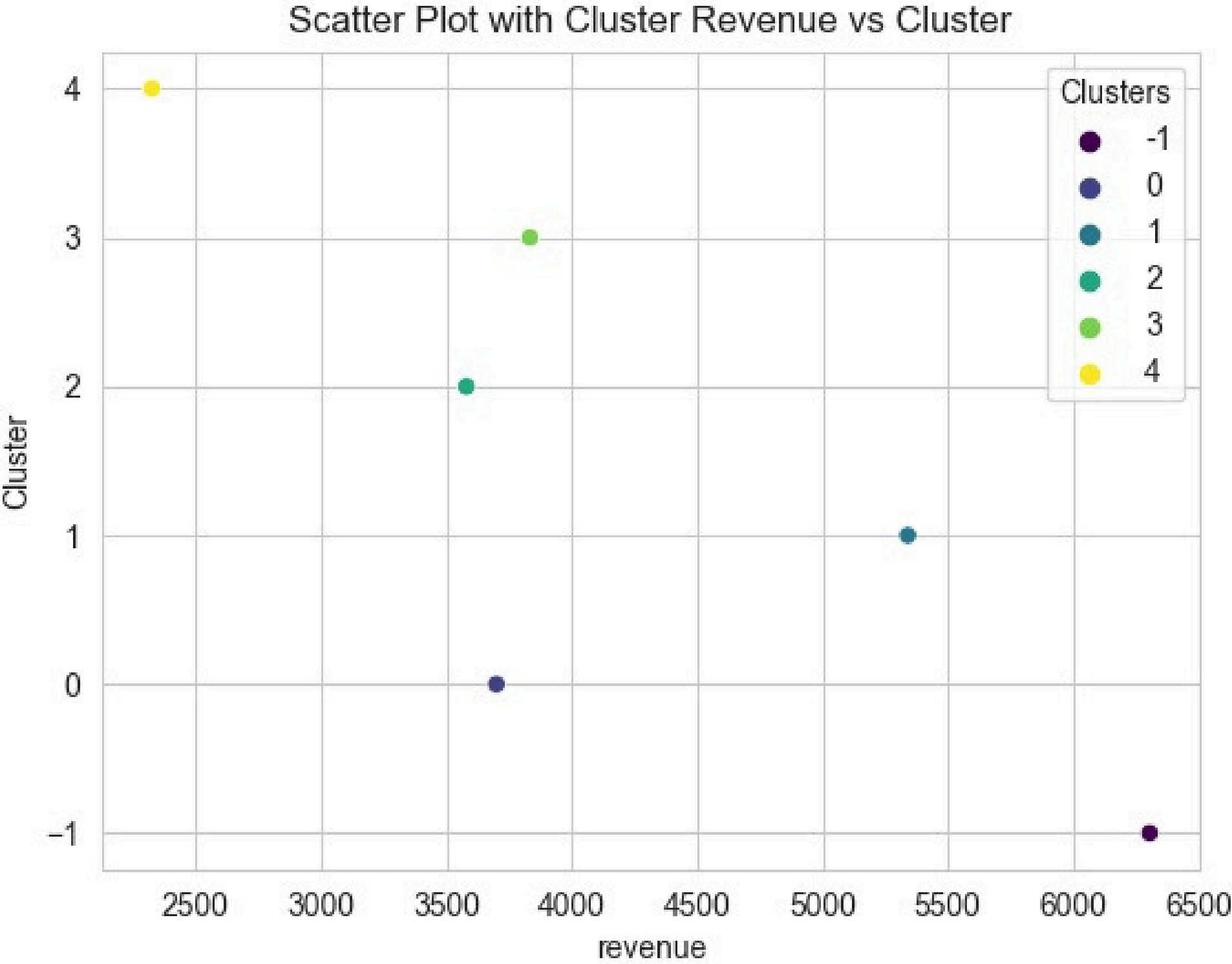
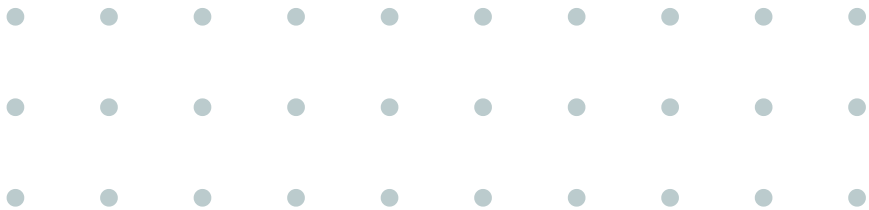
# REVENUE VS GUESTS

- **Cluster 0 (Dark Blue):** Moderate revenue, moderate guest count - likely semi luxury properties.
- **Clusters 1 & 2 (Blue & Light Green):** Balanced revenue and guest numbers - mid-range accommodations.
- **Cluster 3 (Light green):** Decent revenue, low guest count - budget accommodations or well-located properties.
- **Cluster 4 (Yellow):** High guest count and low revenue - located in Tier 2-3 cities and charges are below market rate.
- **- Noise Cluster (-1, Purple):** Outliers or general properties.

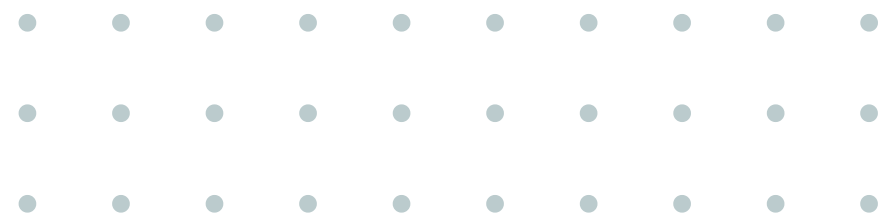
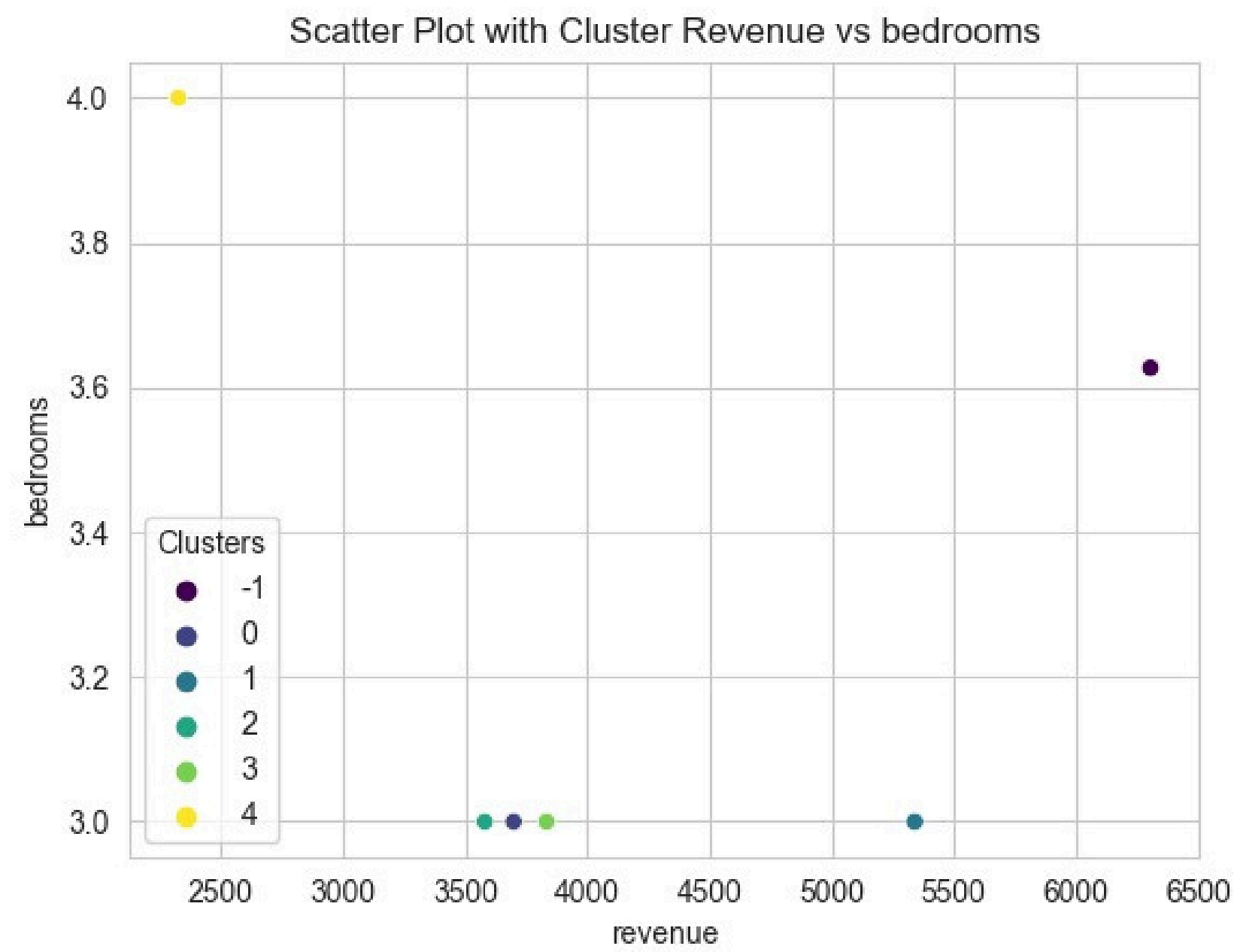
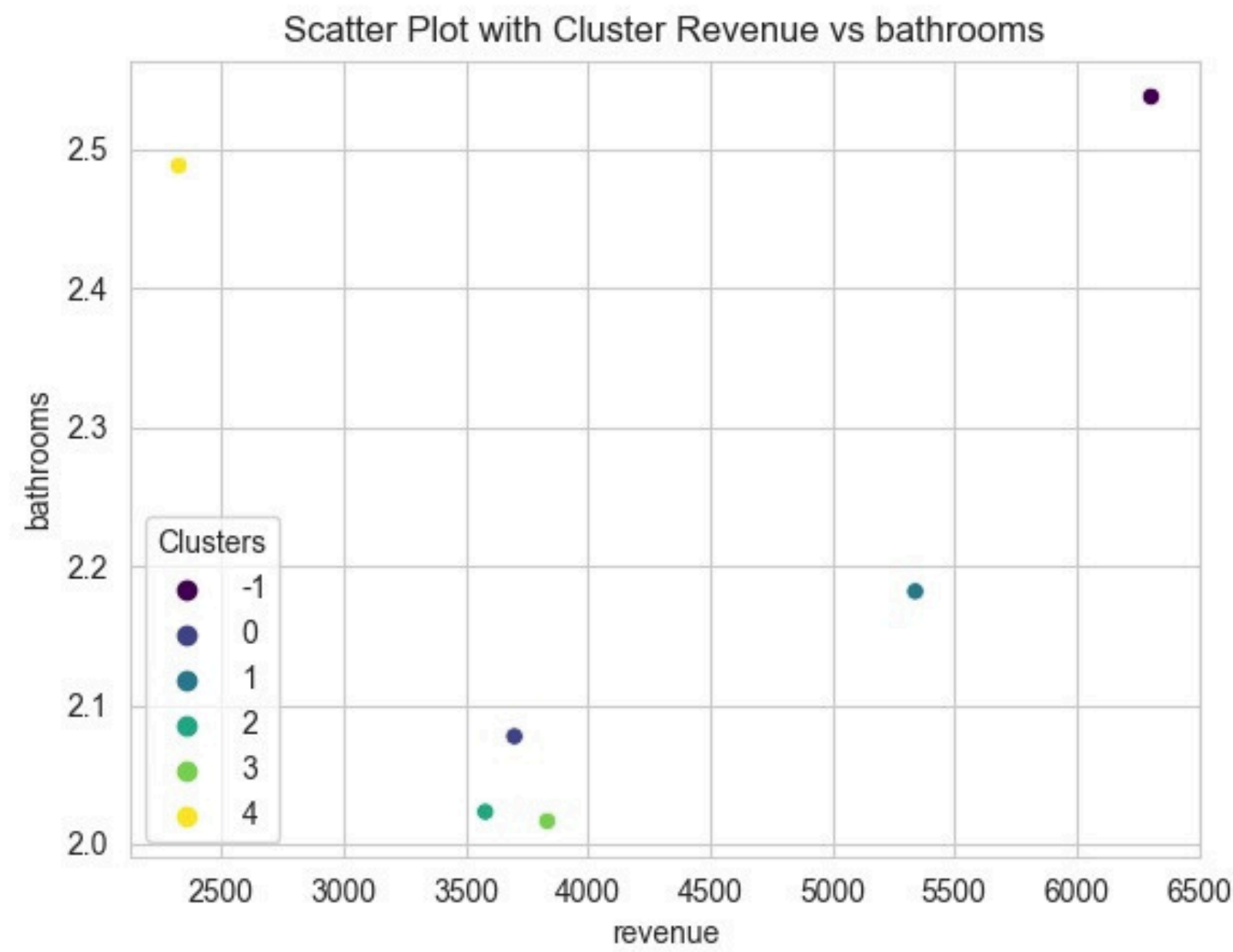


# CLUSTER VS REVENUE

- Cluster 1 (Blue): Among all the clusters cluster 1 is generating highest revenue.



# REVENUE VS BEDROOM AND BATHROOM

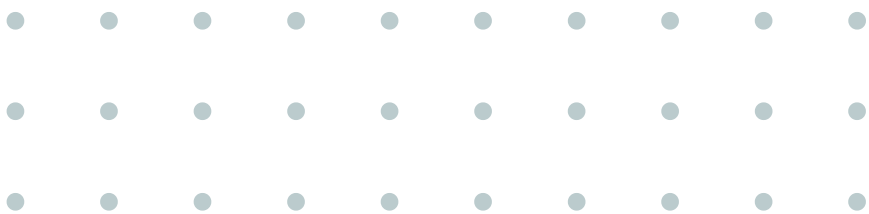


# INVESTMENT OPTIONS

- Recommendations are based on our observation that cluster 1 is generating the highest revenue per month. On further analysis, we found that most of the properties belong to a particular zip code i.e. 92315.
- Based on our earlier observations of the scatter plot we decided to go with architecture of 3 bedrooms and 2 bathrooms for maximum profitability.

The recommendation based on these observation has been shown below.

Average revenue of Cluster 1 =		5339.51									
Recommendation											
Url	Zestimate	Price	Rent Zestimate	Bathrooms	Bedrooms	Living Area	Home Type	Street Address	City	Zip	Repayment Period
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	472362	475000	1952	2	3	876	SINGLE_FAMILY	745 Eureka Dr	Big Bear Lake	92315	7.41
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	494232	499000	2329	2	3	1174	SINGLE_FAMILY	42998 Monterey St	Big Bear Lake	92315	7.79
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	566000	525000	2329	2	3	1200	SINGLE_FAMILY	1144 Sheephorn Rd	Big Bear Lake	92315	8.19
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	559190	565000	2499	2	3	1287	SINGLE_FAMILY	732 Conklin Rd	Big Bear Lake	92315	8.82
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	559200	579900	2199	2	3	1120	SINGLE_FAMILY	43869 Mendocino Dr	Big Bear Lake	92315	9.05
Average revenue for cluster 2		3698.06									
Url	Zestimate	Price	Rent Zestimate	Bathrooms	Bedrooms	Living Area	Home Type	Street Address	City	Zip	Repayment in Years
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	289000	289000	2028	2	3	903	SINGLE_FAMILY	2149 1st Ln	Big Bear City	92314	6.51
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	464900	380000		2	3	1322	SINGLE_FAMILY	369 Greenspot Blvd	Big Bear City	92314	8.56
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	418057	419000	2728	2	3	1428	SINGLE_FAMILY	1526 Monte Vista Dr	Big Bear City	92314	9.44
<a href="https://www.zillow.com/hom">https://www.zillow.com/hom</a>	445500	449500	2484	2	3	1326	SINGLE_FAMILY	400 San Martin St	Big Bear City	92314	10.13
<a href="https://www.zillow.com/homedetails/913">https://www.zillow.com/homedetails/913</a>	479900		2808	2	3	1456	SINGLE_FAMILY	913 Mount Doble Dr	Big Bear City	92314	10.81



**Thank You**