INTERNSHIP PROJECT

AIRBNB PRICING ANALYSIS

Introduction:

In today's competitive short-term rental market, dynamic pricing plays a critical role in maximizing revenue and occupancy rates. This project focuses on developing a Dynamic Pricing Recommendation System for Airbnb listings using data analytics and machine learning. By analyzing historical booking data, seasonal trends, property features, and market demand, the system provides optimized pricing recommendations that adapt in real-time. The goal is to help hosts make data-driven decisions to enhance profitability while staying competitive in the evolving hospitality landscape.

Abstract :

This project presents a comprehensive analysis of Airbnb listing data, focusing on data preprocessing, exploratory data analysis (EDA), and insightful visualization. Python was utilized for data cleaning and EDA, employing libraries such as Pandas and Matplotlib to handle missing values, standardize formats, and identify key trends and anomalies within the dataset. SQL queries were applied to extract, filter, and aggregate data efficiently, enabling detailed insights into pricing patterns, availability, and neighborhood distributions. Finally, Power BI was used to create dynamic dashboards, allowing interactive exploration of listing performance, host behavior, and geographical patterns. The integrated approach enabled a robust understanding of the Airbnb marketplace, supporting data-driven decision-making for stakeholders.

Tools Used:

- Python- pandas, numpy, matplotlib, seaborn
- MySQL
- Excel
- Power BI

Steps Involved in Building the Project

1. Dataset and Preprocessing
- **Source File:** Airbnb_Data.csv
- **Output File:** Airbnb_data_.csv (Cleaned)

Python was used to clean the dataset by handling missing values, correcting data types, and exploring patterns through visualizations. Key variables such as price, location, room type, and number of reviews were examined to identify outliers and trends.

2. Data Querying (SQL): SQL queries enabled efficient filtering, joining, and summarizing of data, such as identifying top-rated listings, average prices by neighborhood, and host activity levels.

3. Dashboarding (Power BI):

Power BI dashboards showcased key metrics like:

- Average price by location
- Distribution of property types
- Availability trends
- Host listing counts
- Review ratings by region

These visuals provided a user-friendly, interactive way to analyze and compare Airbnb listings across different regions.

Conclusion

The Airbnb dashboard effectively highlights crucial trends in listing performance, pricing, and guest engagement across different room types and neighborhoods. Entire homes/apartments dominate the platform in both availability and pricing, while specific neighborhoods like Chevy Chase, MD, command the highest average rates. Review volume and ratings show seasonal patterns, with peak activity occurring between May and August. Additionally, instant bookable listings perform similarly in terms of ratings compared to non-instant listings, suggesting booking convenience does not significantly impact guest satisfaction. These insights can guide hosts, investors, and platform managers in optimizing pricing strategies, improving guest experience, and targeting high-demand areas for expansion.