

AIRBNB DYNAMIC PRICING RECOMMENDATION ENGINE

1. PROJECT OVERVIEW

The objective of this project is to analyze historical Airbnb data and create a Dynamic Pricing Recommendation Engine. The engine suggests optimal pricing based on factors like location (city), property type, and reviews.

Tools used:

- Python (for Data Analysis and Modeling)
- Power BI (for Dashboard Visualization)
- Excel (for data management and support)

2. METHODOLOGY

The project was completed in the following steps:

- Data Exploration: Analyzed key categorical columns like city, property_type, and number_of_reviews.
- Data Preprocessing: Handled missing values and selected important features.
- Regression Modeling: Built a Linear Regression model using number_of_reviews and review_scores_rating to predict price.
- Dashboard Development: Created a professional Power BI dashboard with filters and interactive visuals.

3. PYTHON PRICING ENGINE

A simple and effective Python script was developed to:

- Import and clean Airbnb data
- Train a Linear Regression model
- Predict listing prices based on review scores and number of reviews
- Save the output data for use in the dashboard
- (Optional) Predict prices dynamically based on user input

Output file: airbnb_final_for_tableau.csv

4. POWER BI DASHBOARD OVERVIEW

The final Power BI dashboard is titled:

"Airbnb Dynamic Pricing Recommendation Dashboard"

It includes:

- - KPI Cards: Show total listings, average price, average review score
- Bar Chart (Price by City): Compare pricing across cities
- Bar Chart (Price by Property Type): Compare property types
- Scatter Plot (Review Score vs Price): Visualize the impact of reviews on pricing
- Table (Top 10 Expensive Listings): Highlight the highest priced properties
- Slicers (City, Property Type): Interactive filters
- Price Range Slider: Dynamic filtering based on predicted prices

5. FINAL SUGGESTIONS & RECOMMENDATIONS

- Review scores significantly impact prices — listings with higher scores can demand higher prices.
- City and property type are major factors — luxury apartments and specific cities (like New York or San Francisco) have much higher prices.
- Number of reviews also affects price slightly — more reviewed listings are generally more trusted and priced higher.
- Dynamic pricing strategy is recommended — adjusting pricing seasonally and based on reviews will maximize revenue.
- Data Refresh: It's suggested to refresh the dataset every 3–6 months to keep the pricing recommendations accurate.

CLOSING NOTE

This project successfully demonstrates how data-driven decision making can optimize Airbnb pricing and enhance profitability. The final Python engine and Power BI dashboard can be further scaled for real-world deployment.

Deliverables Attached:

- Python Script (pricing_engine.py)
- Power BI Dashboard (airbnb_dashboard.pbix)
- Final Report (this document)