Problem Statement -

The Airbnb dataset contained **inconsistent, incomplete, and noisy data** (missing values, duplicates, extreme outliers).
To extract value, the project aimed to:

- **Clean and preprocess** the dataset for reliability.
- **Explore pricing, availability, and neighbourhood patterns** through visualizations.
- **Generate actionable insights** to guide hosts, travellers, and investors in decision-making.

Data Visualization

- **Pair plot**: To see correlations among price, availability, and number of reviews.
- **Heatmap**: Showing correlations among numerical features.
- **Histograms and Boxplots**: To detect outliers in price.
- **Bar Charts**: Displaying room types and neighbourhood group distributions.

Actions Performed

- Cleaned and structured Airbnb dataset by handling nulls, duplicates, and data types, improving reliability of insights.
- Removed pricing outliers using filtering and boxplot analysis, ensuring accurate trend detection for decision-making.
- Engineered a "price per bed" feature and used group by analysis to reveal neighbourhood-level pricing patterns.
- Conducted EDA with Seaborn & Matplotlib, uncovering trends in availability, geography, and room types to guide market analysis.

Key Insights

- **Pricing Trends**: Outliers above $2000/night skewed results; filtering improved clarity. Normalized price per bed revealed significant variation across neighbourhoods.
- **Availability Patterns**: Properties with 0- or 365-days availability indicated inactive or fully commercial listings, while 100–250 days suggested active hosts.
- **Room Type Preferences**: Entire homes/apartments commanded premium pricing, while private/shared rooms represented affordability clusters.
- **Geographic Distribution**: Spatial clustering showed activity concentrated in central neighbourhoods with premium pricing hotspots.

Recommendations

- **Pricing Strategy**: Use price per bed as a benchmark; remove unrealistic listings to improve market fairness and trust.
- **Host Optimization**: Flag extreme availability properties; encourage flexible booking and dynamic pricing.
- **Market Expansion**: Promote affordable rooms in high-demand areas for budget travellers; target entire homes in premium markets.
- **Business Application**: Insights guide investors and hosts on where to list, how to price, and which room types maximize revenue.