

## Case Study Title: Airbnb Price Prediction for San Francisco

**Background:** You work for a real estate company interested in understanding the factors that affect the rental prices of Airbnb listings in San Francisco. The company is looking to develop a pricing model that can provide pricing recommendations for property owners.

**Objective:** Develop a predictive model to estimate the nightly rental price of Airbnb listings in San Francisco.

### Instructions for Candidates:

**Data Source:** To access the dataset for this case study, please visit the Inside Airbnb website (<http://insideairbnb.com/>) and navigate to the San Francisco section. You will find a downloadable dataset named "listings.csv." This dataset contains detailed information about Airbnb listings in San Francisco, including property attributes, location, pricing, reviews, and more.

### Key Tasks:

- **Data Collection:** Download the "listings.csv" dataset from the Inside Airbnb website.
- **Data Preprocessing:** Clean and preprocess the data, handling missing values and outliers as needed.
- **Exploratory Data Analysis (EDA):** Explore the data to understand the relationships between various features and the rental price. Use visualizations and statistical analyses to identify key factors that influence pricing.
- **Feature Engineering:** Create relevant features, such as neighborhood-specific indicators, review scores, and other derived variables that could impact rental prices.
- **Model Building:** Build a predictive model for estimating rental prices. You can use regression models like linear regression, decision tree regressors, or ensemble models.
- **Model Evaluation:** Evaluate the model's performance using metrics like mean absolute error (MAE) or root mean squared error (RMSE). Cross-validation and hyperparameter tuning are essential.
- **Interpretability:** Explain which features are most influential in predicting Airbnb rental prices in San Francisco.
- **Price Recommendations:** Provide recommendations for property owners on how to set competitive rental prices for their Airbnb listings based on your analysis.
- **Presentation:** Prepare a presentation summarizing your findings, methods, and recommendations and be ready to present it to our team.

This case study allows you to demonstrate your skills in data preprocessing, EDA, feature engineering, regression modeling, and your ability to provide practical recommendations based on your analysis. The data for Airbnb listings in San Francisco is readily available on the Inside Airbnb website, making it easily accessible for you to work on this case study.