

Project Initialization and Planning Phase

Date	18 JULY 2024
Team ID	740111
Project Title	Unveiling Airbnb price patterns :machine learning for forecasting
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) report

The proposed solution for forecasting Airbnb prices involves developing a machine learning model using comprehensive data from listings, pricing, booking patterns, and external factors. The project will utilize various algorithms, such as Random Forests and Gradient Boosting, and evaluate model performance with metrics like MAE and R-squared. The final model will be deployed via an API for real-time predictions, aiding property owners and guests in making informed pricing and booking decisions.

Project Overview	
Objective	<p>The project's objective is to develop a machine learning model that accurately forecasts Airbnb prices by analyzing historical data and identifying pricing patterns. This will enable property owners to optimize pricing strategies and assist guests in making well-informed booking decisions.</p> <hr/>
Scope	<p>The project scope includes collecting and analyzing Airbnb listing details, historical pricing, booking trends, and external factors to build a predictive machine learning model. It covers data preprocessing, model development, validation, and deployment for real-time price forecasting. The focus will be on enhancing pricing strategies for property owners and improving decision-making for guests.</p> <hr/>
Problem Statement	
Description	<p>This project aims to develop a machine learning model to forecast Airbnb prices by analyzing data on listings, historical pricing, booking patterns, and external factors. The model will utilize advanced algorithms to uncover pricing patterns and provide accurate predictions. The resulting forecasts will assist property owners in optimizing pricing strategies and help guests make informed booking decisions.</p> <hr/>

Impact	<p>The project will enhance pricing accuracy for Airbnb properties, enabling owners to optimize revenue and set competitive rates. It will also provide guests with reliable price forecasts, improving their booking decisions. Overall, the insights generated will contribute to a more efficient and informed Airbnb marketplace.</p> <hr/>
Proposed Solution	
Approach	<p>The project approach involves collecting comprehensive data on Airbnb listings, pricing, and external factors, followed by data preprocessing and feature engineering. Machine learning models, including Random Forests and Gradient Boosting, will be trained and validated to forecast prices. The final model will be deployed via an API to provide real-time pricing predictions.</p> <hr/>
Key Features	<p>Key features of the project include the analysis of comprehensive Airbnb listing data, dynamic pricing adjustments based on historical trends and external factors, and real-time price forecasting through advanced machine learning models. Additionally, the project will integrate external influences such as local events and economic indicators to enhance prediction accuracy.</p> <hr/>

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	T4 GPU
Memory	RAM specifications	8 GB

Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, numpy, matplotlib, seaborn
Development Environment	IDE	Jupyter Notebook, pycharm
Data		
Data	Source, size, format	Kaggle dataset, 614, csv UCI dataset, 690, csv