Model Development Phase Template

Date	18 July 2024
Team ID	739829
Project Title	Unveiling Airbnb price patterns machine learning for forecasting
Maximum Marks	6 Marks

Model Selection Report

We employed Gradient Boosting Regression for forecasting Airbnb prices due to its robust performance with complex datasets and ability to handle non-linear relationships. Through cross-validation, it outperformed other models like Random Forest and Linear Regression, achieving lower Mean Absolute Error (MAE) and better R-squared values. This choice ensures accurate predictions by capturing intricate pricing dynamics in Airbnb listings.

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)

Random Forest	Random Forest Regression utilizes multiple decision trees to predict Airbnb prices, offering robustness and the ability to capture complex interactions among various factors like location, property features, and guest reviews.	-	-
Linear regressor	Linear Regression models for Airbnb price forecasting use a straightforward approach to establish a direct relationship between input features (e.g., location, property size) and price, making it suitable for interpreting the impact of individual predictors on rental rates.	-	-

Catboost regression	CatBoost Regressor for Airbnb price forecasting utilizes gradient boosting with optimized handling of categorical variables, enhancing prediction accuracy by automatically managing feature interactions and reducing overfitting.	-	-
Polynomial regression	Polynomial Regression for Airbnb price forecasting captures non-linear relationships between features (e.g., location, property size) and prices, accommodating more complex patterns in rental rate variations.	-	-

XGboost regression	XGBoost Regressor for Airbnb price forecasting employs optimized gradient boosting techniques to enhance prediction accuracy by sequentially improving weak learners, effectively capturing intricate relationships among features like location, property attributes, and guest reviews.	-	-

 Gradient Boosting	Gradient boosting with trees; optimizes predictive performance, handles complex relationships, and is suitable for accurate loan approval predictions.	-	-