Model Optimization and Tuning Phase Report

Date	18 June 2024
Team ID	739990
Project Title	Auto Insurance Fraud Detection
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

Optimizing and tuning a model for smart home temperature control involves several critical steps to ensure its efficiency and accuracy. First, focus on data preparation, which includes cleaning the data to remove inconsistencies, missing values, and outliers. Feature engineering is essential in this phase, where you identify and create relevant features such as indoor temperature, outdoor temperature, humidity levels, time of day, seasonality, occupancy status, and weather forecasts.

Hyperparameter Tuning Documentation (6 Marks):

Model	Tuned Hyperparameters	Optimal Values
Decision Tree	-	-
Random Forest	-	-

Logistic Regression		
KNN	-	-
Navie Bayes	-	-
Support Vector Machine		

Performance Metrics Comparison Report (2 Marks):

Model	Optimized Metric

| Decision Tree | - |

Random Forest	-
Logistic Regression	
KNN	-

Navie Bayes	
Support Vector Machine	-

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Decision Tree	A decision tree is an effective model for auto insurance fraud detection due to its simplicity and interpretability. It classifies claims by recursively splitting data based on features like claim amount and policyholder age, creating a clear decision path. Handling both numerical and categorical data without requiring scaling, decision trees are versatile. They can, however, overfit the training data, so pruning is necessary. Evaluating the model with metrics like precision f-1 score etc, ensures its reliability. Decision trees offer a robust starting point for detecting fraudulent claims in auto insurance.

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