Model Optimization and Tuning Phase Template

Date	15 March 2024
Team ID	740089
Project Title	Acoustic fire extinguishing prediction
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining machine learning models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Hyperparameter Tuning Documentation (6 Marks):

Model	Tuned Hyperparameters	Optimal Values
KNN	-	-
SVM	-	-
Naïve Bayes	-	-
Logistic Regression	-	-
Decision tree	-	-
Random forest	-	-

Gradient Boosting	-	-

Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric	Optimized Metric
KNN	-	-
SVM	-	-
Naïve Bayes	-	-
Logistic Regression	-	-
Decision tree	-	-
Random forest	-	-
Gradient Boosting	-	-

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random Forest	Random Forest is selected because it is robust, handles overfitting well, works with various data types, requires minimal tuning, and provides feature importance insights. for time series data, LSTM (Long Short-Term Memory) networks, a type of RNN, could also be highly effective.