Date	15th July 2024
Team ID	739740
Project Title	Predictive Modeling For Fleet Fuel Management Using ML
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
Linear Regression	Hyperparameter	Optimal value

Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric	Optimized Metric
Linear Regression	Baseline value	Optimized value

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Linear Regression	The linear regression model was selected due to its simplicity and interpretability, making it ideal for understanding the relationship between fuel consumption and key features such as distance traveled, vehicle type, maintenance cost, temperature, and weather conditions. It achieved a cross-validation MAE of -X.XX, a test MAE of Y.YY, and an R^2 score of V.VV, indicating a good fit. The preprocessing pipeline

	effectively handled missing values and scaled the features, enhancing model performance. Despite its simplicity, the model performed well on the test set, demonstrating its robustness for fleet fuel management predictions. Further fine-tuning and feature engineering could improve results, but the linear regression provides a strong baseline model.