

Model Optimization and Tuning Phase Template

Date	05 June 2024
Team ID	739975
Project Title	To Predict Consumer Price Index
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	Regularization Parameter	0.1
Random forest	Number of Trees, Max Depth	100,10

Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric	Optimized Metric
Linear Regressor	2.5	2.3
Random forest	1.8	1.5

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Gradient Boosting Regressor	The Gradient Boosting Regressor was selected as the final model due to its exceptional performance in predicting the Consumer Price Index (CPI), which includes critical food resources like cereals, pulses, milk, fish, and meat. This model stood out during the evaluation phase, achieving the highest accuracy and lowest mean squared error among all tested models. It excels at capturing complex patterns and interactions within the data, which is essential for accurate CPI forecasting.