Model Optimization and Tuning Phase Template

Date	15 March 2024
Team ID	738306
Project Title	Employee performance prediction with 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 model	Quarter Department day	0 1/0 0
Random forest model	Quarter Department day	0 1/0 0
Xgboost model	Quarter Department	0 1/0

	day	0

Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric	Optimized Metric
Model 1	team targeted_productivity smv wip over_time incentive idle_time idle_men no_of_style_change no_of_workers actual_productivity	Quarter Department day
Model 2	team targeted_productivity smv	Quarter Department day

	wip over_time incentive idle_time idle_men no_of_style_change no_of_workers actual_productivity	

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random forest model	Based on the provided metrics, the Random Forest Regressor appears to be the best-performing model. It demonstrates the lowest Mean Squared Error (MSE) on the testing data, indicating superior prediction accuracy. Additionally, it exhibits high R-squared (R2) scores on both training and testing data, suggesting a robust fit to the data and capturing more variance compared to the other models. Therefore, for this specific task, the Random Forest Regressor is recommended for further exploration and deployment.
