

**Model Optimization and Tuning Phase Template**

Date	09 July 2024
Team ID	740138
Project Title	Identification Of Methodology Used In Real Estate Property Valuation
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
Decision tree	-	-
Random forest regression	-	-
Linear Regression	-	-
Adaboost Regression	-	-
XGBoost Regressor	-	-
Multilinear Regression		

**Performance Metrics Comparison Report (2 Marks):**

Model	Baseline Metric	Optimized Metric
Decision tree	-	-
XGB regression	-	-
Linear Regression	-	-
Ada boost	-	-
Multilinear Regression	-	-

**Final Model Selection Justification (2 Marks):**

Final Model	Reasoning
Random forest regressor	<p>Based on the evaluation, the <b>Random Forest Regression</b> model is selected for predicting real estate property values due to its highest accuracy of 0.7883. This model effectively balances bias and variance, providing robust and reliable predictions.</p> <ul style="list-style-type: none"> <li>• <b>Accuracy:</b> Random Forest Regression has the highest accuracy among all models tested.</li> <li>• <b>Robustness:</b> It reduces overfitting by averaging multiple decision trees.</li> <li>• <b>Handling Non-Linearity:</b> It captures complex relationships between features and the target variable.</li> </ul>