**Model Optimization and Tuning Phase Template**

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| Date | 15 March 2024 |
| Team ID | 739724 |
| Project Title | Rhythmic Revenue: Unveiling The Future Of Music Sales With Machine Learning |
| 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):**

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| --- | --- | --- |
| **Model** | **Tuned Hyperparameters** | **Optimal Values** |
| Decision tree | - | - |
| Random forest regression | - | - |
| Linear Regression | - | - |
| KNN | - | - |
| XGBoost Regressor | - | - |

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

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| --- | --- | --- |
| **Model** | **Baseline Metric** | **Optimized Metric** |
| Decision tree | - | - |
| Random forest regression | - | - |
| Linear Regression | - | - |
| KNN | - | - |
| XGBoost Regressor | - | - |

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

|  |  |
| --- | --- |
| **Final Model** | **Reasoning** |
| XGBoost Regressor | The XGBoost Regressor was selected as the final model due to its proven ability to handle intricate relationships in data. Its robust performance in predicting music sales trends, coupled with its scalability for processing large datasets, makes it an ideal choice. XGBoost's combination of accuracy and interpretability equips stakeholders with valuable insights to optimize revenue strategies effectively in the dynamic music industry. |