**Model Optimization and Tuning Phase Template**

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| Date | 10 July 2024 |
| Team ID | SWTID1720013031 |
| Project Title | Prediction and Analysis of Liver Patient Data Using 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** |
| Logistic  Regression |  |  |
| K neighbors  Classifier |  |  |
| RandomForest  Classifier |  |  |
| SVC |  |  |

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

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| --- | --- | --- |
| **Model** | **Baseline Metric** | **Optimized Metric** |
| Logistic  Regression |  |  |
| K neighbors  Classifier |  |  |
| RandomForest  Classifier |  |  |
| SVC |  |  |

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

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| --- | --- |
| **Final Model** | **Reasoning** |
| SVC | SVC is selected as for its **Effective in High-Dimensional Spaces**, Robust to Overfitting handle both linear and non-linear classification problems by employing kernel functions, making it a versatile and powerful tool for a wide range of applications |