**Model Optimization and Tuning Phase Template**

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| Date | 12 July 2024 |
| Team ID | SWTID1720174640 |
| Project Title | Early Prediction of Chronic Kidney Disease |
| 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 | C,penalty,solver | 0.1,l2,lbfgs |
| Support Vector Classifier(SVC) | C,gamma,kernel | 0.1,scale,linear |

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

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| **Model** | **Baseline Metric** | **Optimized Metric** |
| Logistic Regression | Accuracy : 0.975  Precision :0.6601307189542484  Recall : 0.6486364660806851  F1 score: 0.6542827657378741 | Accuracy : 0.975 |
| Support Vector Classifier(SVC) | Accuracy : 0.975  Precision: 0.6601307189542484  Recall: 0.6486364660806851  F1 score: 0.6542827657378741 | Accuracy : 0.9904 |

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

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| **Final Model** | **Reasoning** |
| Support Vector Classifier(SVC) | SVC model got much better accuracy compared to Logistic Regression model.So,we have selected SVC model. |