

Model Development Phase Template

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| Date | 15 March 2024 |
| Team ID | 738193 |
| Project Title | Hospital Readmission Prediction Using Machine Learning |
| Maximum Marks | 6 Marks |

Model Selection Report

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

Model Selection Report:

| Model | Description | Hyperparameters | Performance Metric (e.g., Accuracy, F1 Score) |
|---------------------|--|---------------------------------|---|
| Logistic regression | In this study, we employed logistic regression, a widely-used algorithm for binary /multiclass classification tasks, to develop a predictive model for hospital readmission. | Multinomial logistic regression | Accuracy = 53 % |

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| | Logistic regression was chosen due to its interpretability and suitability for binary /multiclass outcomes | | |
| Decision tree | In our study, we employed a decision tree model for hospital readmission prediction. Decision trees were chosen for their simplicity, interpretability, and ability to capture complex relationships in the data without requiring extensive feature engineering | Criterion='entropy' | Accuracy = 45 % |
| XGBClassifier | In our research, we employed the XGBoost classifier (XGBClassifier) for hospital readmission prediction. XGBoost was chosen for its | For k_fold=5 objective='multi:softmax', max_depth=10, learning_rate=0.1, n_estimators=1000 | Accuracy = 57 % |

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| | <p>superior performance, scalability, and ability to handle complex relationships in the data. We optimized the XGBoost model through hyperparameter tuning and leveraged its feature importance analysis to identify key predictors of readmission risk. XGBoost's regularization techniques helped prevent overfitting and enhance generalization performance, making it a robust choice for predictive modeling in healthcare.</p> | | |
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