Feature Engineering Documentation – Customer Churn Prediction

Introduction

Feature engineering enhances the predictive power of machine learning models by creating meaningful features from raw data.

Customer Lifetime Value

Calculated as MonthlyCharges multiplied by Tenure. This feature estimates total revenue generated by a customer.

Average Monthly Spend

Derived by dividing MonthlyCharges by Tenure to capture spending behavior over time.

High-Value Customer Indicator

A binary feature identifying customers with lifetime value above the median, useful for targeted retention strategies.

Long-Term Customer Flag

Indicates customers with tenure greater than 12 months, who are typically less likely to churn.

Payment Efficiency

Represents the ratio of monthly charges to lifetime value, highlighting payment behavior anomalies.

Feature Selection Rationale

Correlation analysis and statistical tests were used to retain only the most impactful features.

Business Impact

Engineered features improve churn prediction accuracy and provide actionable insights for customer retention.

Conclusion

The engineered features enhance both model performance and interpretability.