CUSTOMER CHURN PREDICTION USING CLASSIFICATION ALGORITHMS AND SURVIVAL ANALYSIS

Customer Churn Prediction Using Classification Algorithms and Survival Analysis

- **Overview:** Project aims to predict customer churn using classification algorithms (decision trees, logistic regression) and survival analysis. Focuses on improving customer retention and business profitability.

Related Work

- **Machine Learning Techniques:** Logistic regression and decision trees are commonly used for churn prediction. Ensemble methods and survival analysis have shown effectiveness in improving predictive accuracy.

- **Notable Studies:** Verbeke et al. (2012): High performance using decision trees with ensemble methods. Neslin et al. (2006): Logistic regression integrated with behavioral data. Buckinx & Van den Poel (2005): Survival analysis adapted for churn prediction.

Proposed Methodology

- **Data Collection:** Utilizing customer interaction logs, transaction history, and demographic data. Data will be sourced from company databases or publicly available datasets (e.g., IBM Watson Telco Customer Churn).
- **Model Development:** Application of decision trees, logistic regression, and survival analysis (Kaplan-Meier, Cox Proportional Hazards). Focus on high accuracy and robust predictions.

Implementation and Evaluation

- **Implementation:** Models will be implemented using Python libraries such as Scikit-learn, Lifelines, and Pandas. A dashboard will be created for visualizing churn predictions and customer metrics.
- **Evaluation:** Performance metrics: accuracy, precision, recall, F1-score, AUC-ROC for classification models; C-index for survival analysis. K-fold cross-validation will be used for model robustness.

Expected Outcomes

- **Customer Retention:** The model will enable proactive interventions to reduce churn, enhancing customer loyalty and business profitability.
- **Actionable Insights:** Identifying key predictors of churn will allow for targeted marketing strategies and personalized customer engagement.

Conclusion and Future Work

- **Project Conclusion:** The project will provide a comprehensive analysis of customer churn, identifying the most significant predictors and offering practical recommendations for businesses.
- **Future Work:** Exploring advanced techniques like deep learning and incorporating additional data sources (e.g., social media activity) to further improve predictive accuracy.