Customer Churn Prediction Project

Task 1: Initial Data Analysis

Objective: Analyze basic patterns in customer churn data.

Instructions:

1. Load the customer_churn_data.csv and display first 5 rows

2. Calculate basic statistics for numerical features

3. Analyze churn rate across different contract types

4. List 3 key observations about churn patterns

Expected Outcome: Statistical summary and initial insights about churn patterns.

Task 2: Feature Relationship Analysis

Objective: Visualize how different features relate to churn.

Instructions:

1. Create boxplots comparing churned vs non-churned customers

2. Plot average churn rates by contract length

3. Generate correlation heatmap for numerical features

4. Write interpretations for each visualization

Expected Outcome: Three visualizations with written analysis.

Task 3: Feature Engineering

Objective: Create new features for churn analysis.

Instructions:

1. Calculate average monthly usage (total_usage_gb/tenure_months)

2. Create customer_value_score combining monthly_charges and tenure

3. Develop risk_score based on payment_delay and service_calls

Expected Outcome: Enhanced dataset with engineered features.

Task 4: Basic Model Development

Objective: Create initial logistic regression model.

Instructions:

1. Prepare features (scaling, encoding)

2. Split data 80/20 train/test

3. Train logistic regression model

4. Calculate accuracy, precision, recall

Expected Outcome: Basic predictive model with performance metrics.

Task 5: Model Comparison

Objective: Compare different classification models.

Instructions:

1. Train Random Forest and XGBoost models

2. Perform 5-fold cross-validation

3. Compare model performances using ROC curves

4. Analyze feature importance

Expected Outcome: Model comparison and recommendation.