Customer Churn Analysis Project Report

Project Title:

Customer Churn Analysis using Python and Power BI

Objective:

The goal of this project is to analyze customer behavior and identify key factors that influence churn (the likelihood of a customer leaving).

Tools & Technologies:

Python (Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn), Jupyter Notebook, Power BI, Logistic Regression, Random Forest, Telecom dataset (CSV).

Data Overview:

Approx. 7,000 customer records with features such as Customer ID, Gender, Tenure, MonthlyCharges, Contract, PaymentMethod, and target variable: Churn.

Exploratory Data Analysis (EDA):

Analyzed churn rates by contract type, gender, tenure, internet service type, and senior citizen status.

Visualizations:

Bar plots, histograms, heatmaps, and Power BI dashboard with filters for demographics and revenue loss due to churn.

Machine Learning Models:

Used Logistic Regression and Random Forest. Preprocessing involved encoding categorical features, scaling, and handling missing data.

Evaluation Metrics:

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Achieved 80%+ accuracy. Evaluated with precision, recall, F1-score, and confusion matrix.

Key Insights:

High churn among month-to-month contracts, senior citizens, and electronic check users. Long-tenured customers are more loyal.

Business Recommendations:

Offer long-term contract incentives, improve service for senior citizens, and monitor high-paying monthly customers.

Conclusion:

Combined Python and Power BI to generate actionable insights and a predictive model to help reduce churn.