Project Report: Telecom Customer Churn Analysis

Executive Summary

This project aims to identify factors causing Telecom customer churn and predict churn using historical data. By analyzing customer behavior, we provide actionable insights to help reduce churn and increase retention.

Objective

The client is facing high customer churn and wants to understand the root causes.
Goal: Analyze the data to identify churn patterns and create a predictive model.

Dataset Overview

- Source: Kaggle
- Features: Customer ID, Gender, Age, Tenure, MonthlyCharges, Churn (Yes/No), etc.
- Type: Tabular (CSV)

Tools & Technologies Used

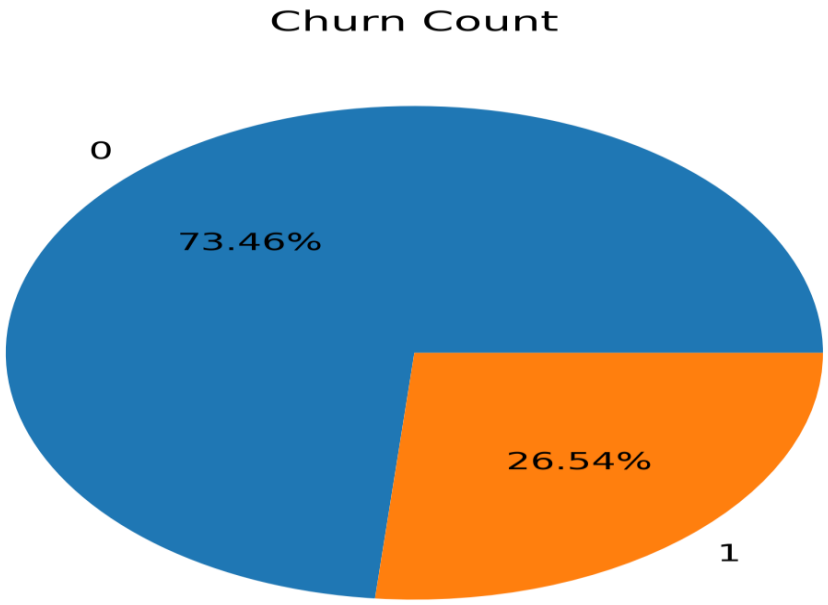
- Python (Pandas, Matplotlib, Seaborn, Scikit-learn)
- Power BI (for dashboards)

Data Preprocessing

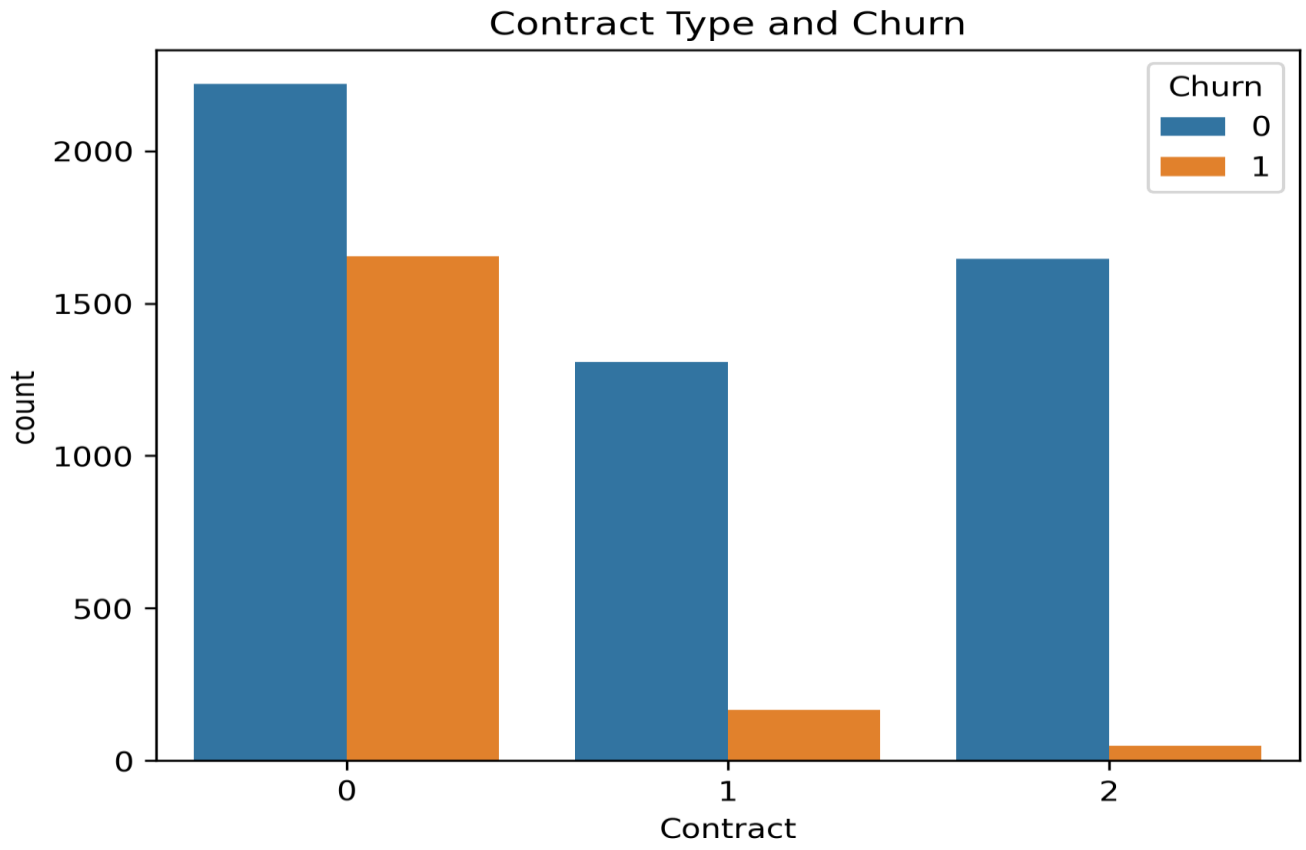
- Handled missing values using median imputation.
- Converted categorical variables using one-hot encoding.
- Removed outliers based on z-score.
- Normalized numerical features.

Exploratory Data Analysis (EDA)

- 26% customers churned.
- Senior citizens and month-to-month contracts show higher churn.
- Higher monthly charges correlate with churn.



above pie shows us among total customer 26 percent is churnd that means they stoped use of the company services and below figure shows us contract of month to month is more than other contracts . if monthly subscription is more churned than other contract of customer so it need most focus segment to reduce churn



Model Building

- Used Logistic Regression and Random Forest.
- Train-test split: 80–20
- Best model: Random Forest with 83% accuracy and 0.81 F1-score.

Dashboard

Power BI dashboard includes:

- Total active vs churned customers
- Churn rate by contract type
- Monthly revenue trends
- Filters for gender, seniority, internet service

Insights & Recommendations

- Customers on monthly contracts are 3x more likely to churn. Offer them long-term discounts.
- High churn in senior citizens → improve support accessibility.
- Target customers with charges >$70 for retention efforts.

Conclusion

The project successfully identified key churn drivers and built a predictive model. Visual dashboards enable business users to monitor churn in real-time.