Customer Churn Prediction & Business Insights

Domain: Telecom
Objective: Predict customer churn and identify key drivers
Tools: Python, Pandas, Scikit-learn, XGBoost, Matplotlib, Power BI

Prepared by: *Your Name*

Business Problem

Customer churn directly impacts company revenue.
The objective of this project is to predict which customers are likely to churn and identify the key factors influencing churn, enabling proactive retention strategies.

Dataset Overview

- Total records: 7,043 customers
- Target variable: Churn (Yes / No)
- Features include:
    - Customer tenure
    - Contract type
    - Payment method
    - Monthly and total charges

Data Cleaning & Preparation

- Converted TotalCharges to numeric values
- Handled missing values using median imputation
- Removed irrelevant identifiers
- Encoded categorical variables using one-hot encoding

Feature Engineering

- Created Average Monthly Spend feature
- Encoded contract types and payment methods
- Prepared data for machine learning models

Modeling Approach

The following models were trained and evaluated:

- Logistic Regression (Baseline)
- Random Forest Classifier
- XGBoost Classifier

Model Performance

XGBoost achieved the best overall performance, particularly recall, which is critical for identifying customers at risk of churn.

Key Churn Drivers

- Month-to-month contracts show higher churn
- Customers with low tenure are more likely to churn
- Higher monthly charges increase churn risk
- Electronic check payment users churn more frequently

Business Insights & Recommendations

- Target high-risk customers with churn probability > 70%
- Encourage long-term contracts with incentives
- Provide early engagement offers for new customers
- Optimize pricing strategies for high-charge segments

Conclusion

This project demonstrates how machine learning can help businesses predict churn and take proactive actions to improve customer retention.

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In [2]: !pip install nbconvert
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Requirement already satisfied: nbconvert in c:\users\dell\anaconda3\lib\site-packages (7.16.6)
Requirement already satisfied: beautifulsoup4 in c:\users\dell\anaconda3\lib\site-packages (from nbconvert) (4.12.3)
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```
In [11]: !jupyter nbconvert Customer_Churn_Report.ipynb --to html
```

```
[NbConvertApp] Converting notebook Customer_Churn_Report.ipynb to html
[NbConvertApp] Writing 293875 bytes to Customer_Churn_Report.html
```

```
In [12]: Customer_Churn_Report.html
```

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---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[12], line 1
----> 1 Customer_Churn_Report.html

NameError: name 'Customer_Churn_Report' is not defined
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