Telco Customer Churn Analysis

An Exploratory Data Analysis (EDA) Project Using Python

OVERVIEW

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Exploratory Data Analysis (EDA)

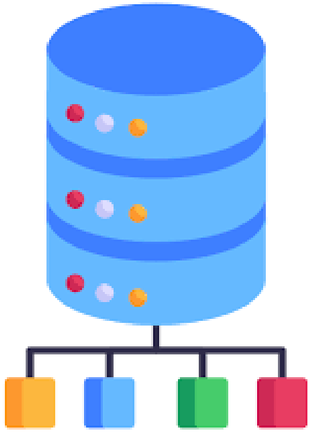
Objective

To analyze customer behavior in a telecom company and uncover key factors contributing to churn. The goal is to draw actionable insights to reduce churn and improve customer retention strategies.

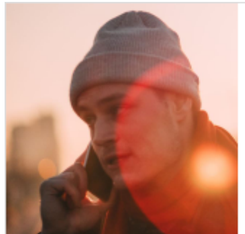
Tools Used

- Python
- Pandas, NumPy
- Matplotlib, Seaborn
- Jupyter Notebook

Dataset Overview



- Source: Telco Customer Churn dataset (public)
- Size: 7043 rows × 21 columns
- Key Features: Gender, Senior Citizen, tenure, Contract, Monthly Charges, Total Charges, Churn



Telco Customer Churn

Focused customer retention programs

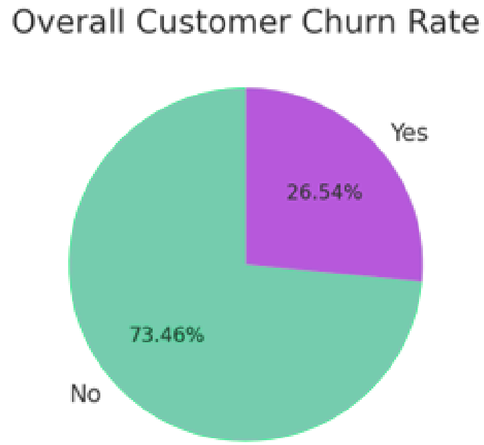
k kaggle.com

Data Preprocessing

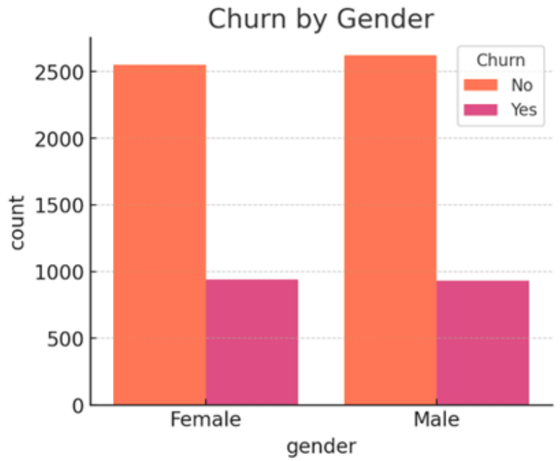
- Replaced blanks in Total Charges with 0
- Converted TotalCharges to float
- Converted SeniorCitizen from binary to categorical (Yes/No)
- Checked and removed duplicate or null records

Exploratory Data Analysis (EDA)

- **Overall Churn Rate**
  - Churned Customers: 26.5%
  - Insight: Roughly 1 in 4 customers leave — high churn.

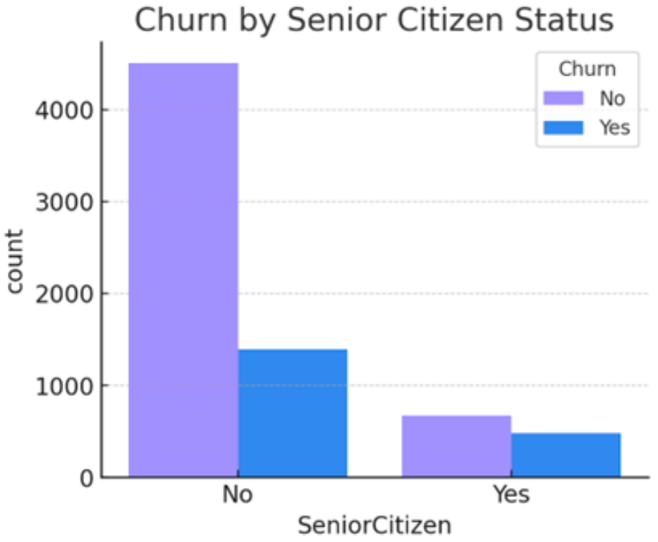


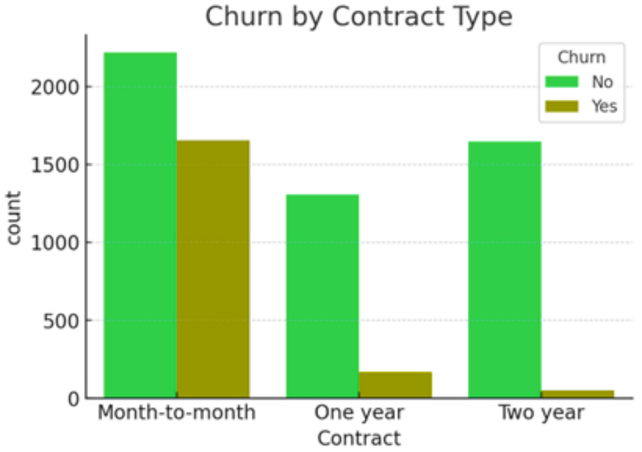
- **Churn by Gender**
  - Male: 26.2%, Female: 26.8%
  - Insight: Gender has minimal effect .



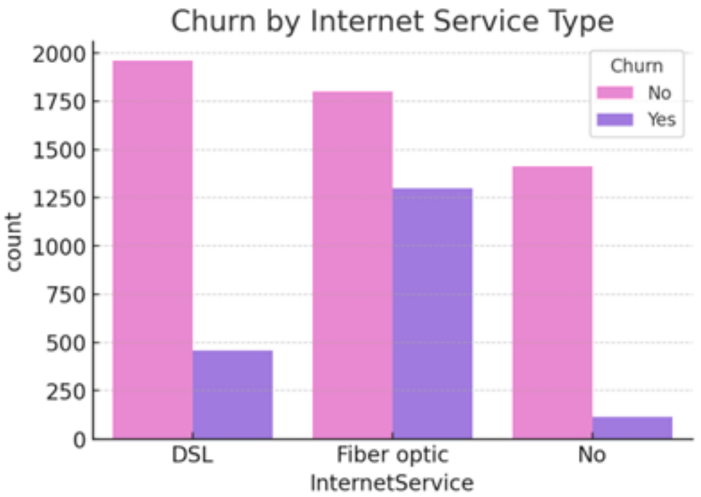
Exploratory Data Analysis (EDA)

- **Churn by Senior Citizens**
  - Senior churn: 41.7% vs. 24% for others
  - Insight: Seniors are 74% more likely to churn
- **Churn by Contract Type**
  - Monthly: 43.5%, Yearly: 11%, Two-Year: 2.9%
  - Insight: Long-term contracts reduce churn.





Exploratory Data Analysis (EDA)



- **Churn by Internet Service**
  - Fiber Optic: 41.5%, DSL: 19.7%, None: 7.5%
  - Insight: Fiber users show higher churn.
- **Tenure & Charges**
  - Lower tenure = higher churn
  - High Monthly Charges = more churn
  - Insight: Retention grows with time and pricing strategy matters.

Exploratory Data Analysis (EDA)

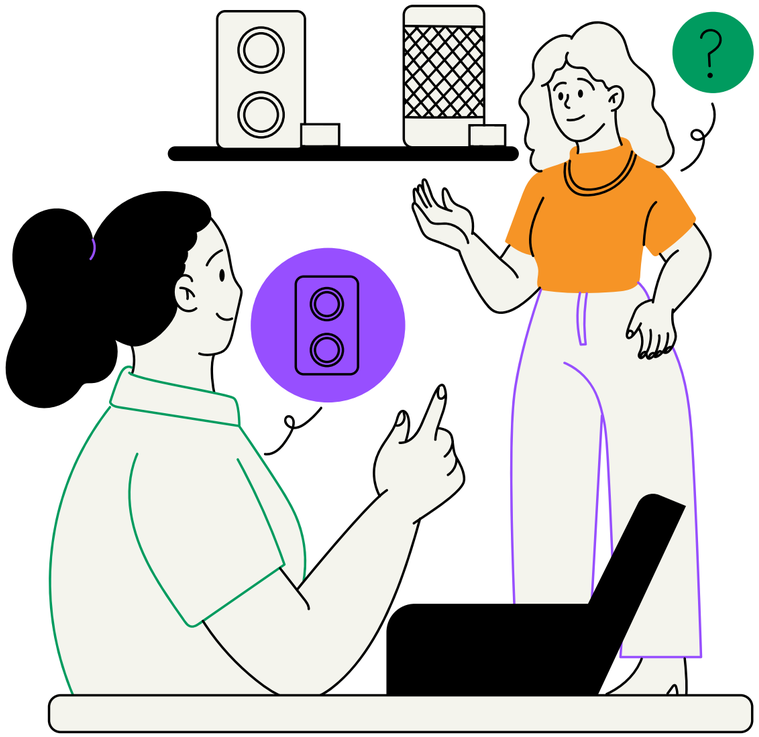
- **Value-Added Services & Churn**
    - Online Security: 49.2%
    - Tech Support: 48.4%
    - Online Backup: 44.5%
    - Device Protection: 43.9%
    - Insight: Lack of services → higher churn.

Key Insights

- Senior citizens and monthly contract users churn more.
- Fiber optic plans have higher churn — review pricing/performance.
- Missing value-added services is a churn indicator.
- Early tenure = high-risk → improve onboarding.

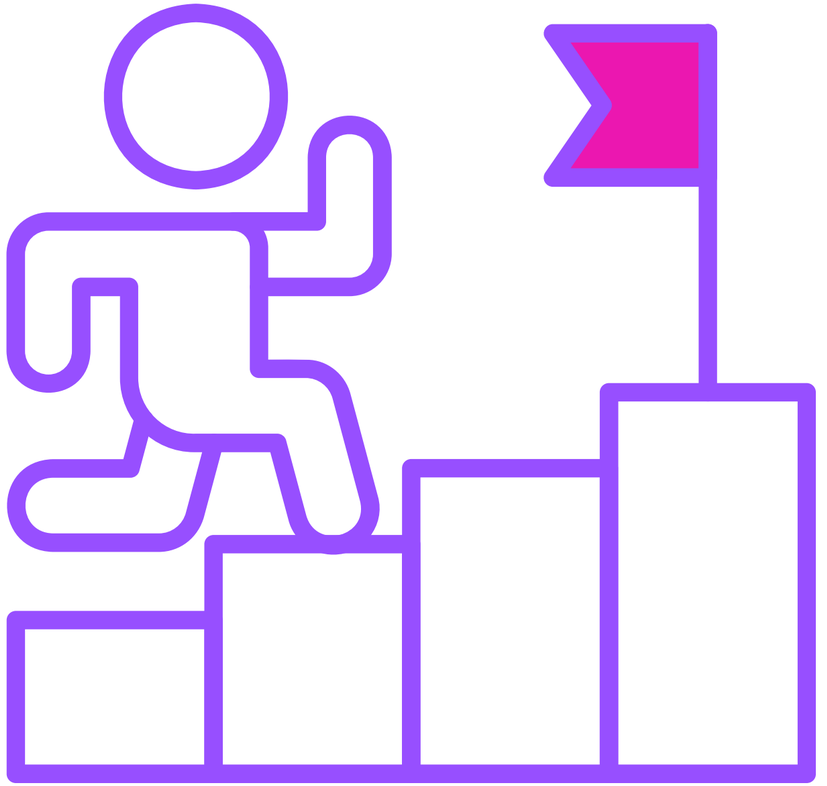
Recommendations

- Focus retention efforts on senior citizens and fiber users.
- Bundle services like security and tech support.
- Introduce tiered pricing for high-usage customers.



Conclusion

The analysis identifies actionable areas to reduce churn. A logical next step would be to build a predictive churn model using machine learning to proactively engage at-risk customers.



Thank You