Customer Churn Analysis Dashboard

Data-Driven Retention Strategy through Python, SQL, and Power BI

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1. Executive Summary

This project aims to analyze customer churn patterns within a telecom company using Python, SQL, and Power BI. By identifying factors influencing churn, the analysis provides data-driven recommendations to improve retention and reduce customer loss.

Key Highlights:

- • Overall churn rate: 26.6%
- • Fiber optic users show 41.9% churn
- • Month-to-month contracts drive majority of churn

2. Project Objectives

• Identify key drivers of customer churn

• Quantify churn by contract, payment method, and tenure

• Build a Power BI dashboard for interactive analysis

• Provide actionable business recommendations

3. Tools and Technologies

Tool / Technology	Purpose
Python (Pandas, Seaborn, Matplotlib)	Data cleaning and exploratory data analysis
SQL	Data validation and extraction
Power BI	Dashboard design and visualization
DAX	Custom measures, KPIs, and tooltips
Jupyter Notebook	Code documentation and reproducibility
GitHub	Version control and project sharing

4. Dataset Overview

Source: https://www.kaggle.com/datasets/blastchar/telco-customer-churn

Rows / Columns: 7043 × 21

Target Variable: churn

Column	Description	Example
customerID	Unique customer identifier	7590-VHVEG
gender	Customer gender (Male/Female)	Female
tenure	Number of months the customer stayed	24
contract	Type of subscription contract	Month-to-month
paymentmethod	Payment channel used	Electronic check
churn	Whether customer left or not	Yes / No

5. Data Pre-Processing & Exploratory Data Analysis

Performed data cleaning (handling nulls, encoding categorical variables, outlier detection) and conducted exploratory data analysis to identify relationships between churn and customer attributes.

Key visualizations included:

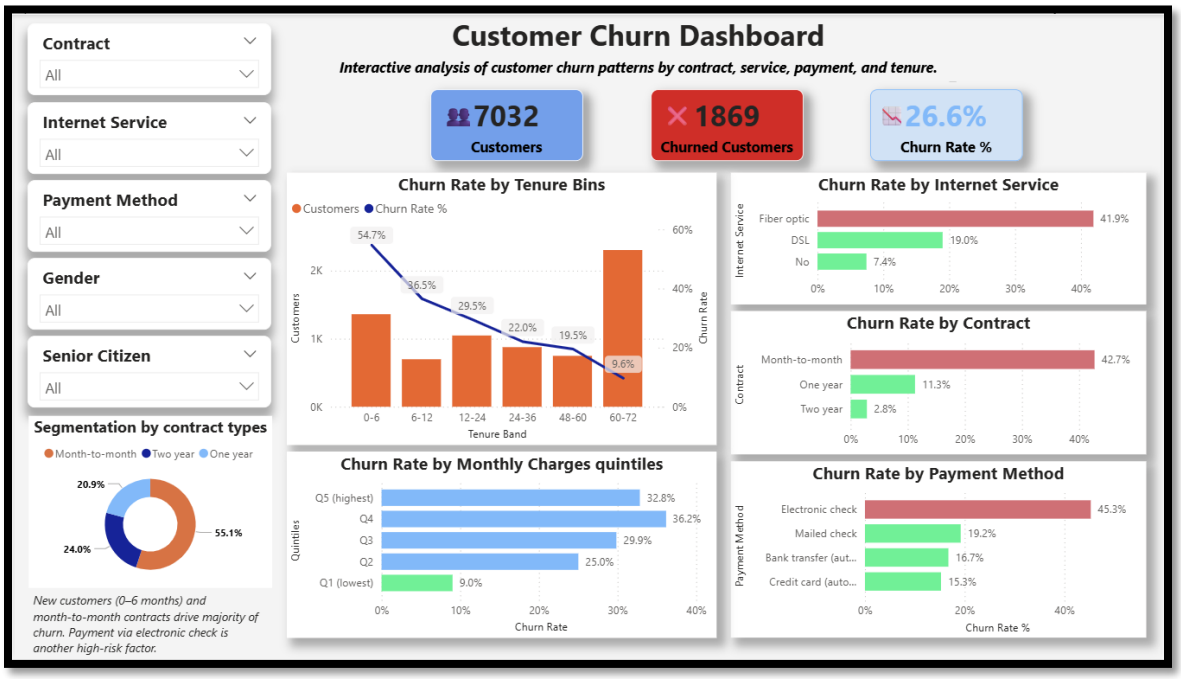
- • Churn Rate by Tenure Band
- • Churn Rate by Contract Type
- • Churn Rate by Internet Service
- • Churn Rate by Payment Method

6. Insights Summary

- • Month-to-month customers show the highest churn (42.7%).
- • Electronic check users churn at 45.3%, higher than other payment types.
- • Fiber optic customers churn more (41.9%) than DSL (19%).
- • Longer tenure (>48 months) reduces churn to below 10%.
- • Higher monthly charges correlate with higher churn in upper quintiles.

7. Power BI Dashboard Overview

The Power BI dashboard integrates multiple KPIs and visuals, including churn rate trends, contract-based insights, and interactive tooltips powered by DAX measures.



8. Business Recommendations

Area	Recommendation
Contract	Promote long-term contracts with loyalty discounts.
Payment	Encourage auto-pay and credit card usage.
Internet	Improve service quality for fiber optic users.
Retention	Target new customers (<12 months) with personalized offers.

9. Key Learnings & Next Steps

The project strengthened understanding of churn dynamics and Power BI interactivity. Next steps include predictive churn modeling using machine learning techniques.

11. Contact Information

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