

Telco Customer Churn Analysis

This presentation explores the Telco Customer Churn dataset, which contains 7,043 customer records from a telecommunications company. The dataset includes demographics, account details, service usage, charges, and churn status. Our goal is to understand why customers churn, identify high-risk segments, and support retention strategies.

We will cover data loading, preprocessing, exploratory data analysis, and key insights on churn drivers such as demographics, tenure, services, charges, contract types, payment methods, and customer support.

by Nagasudha S 

Data Loading and Preprocessing

Data Overview

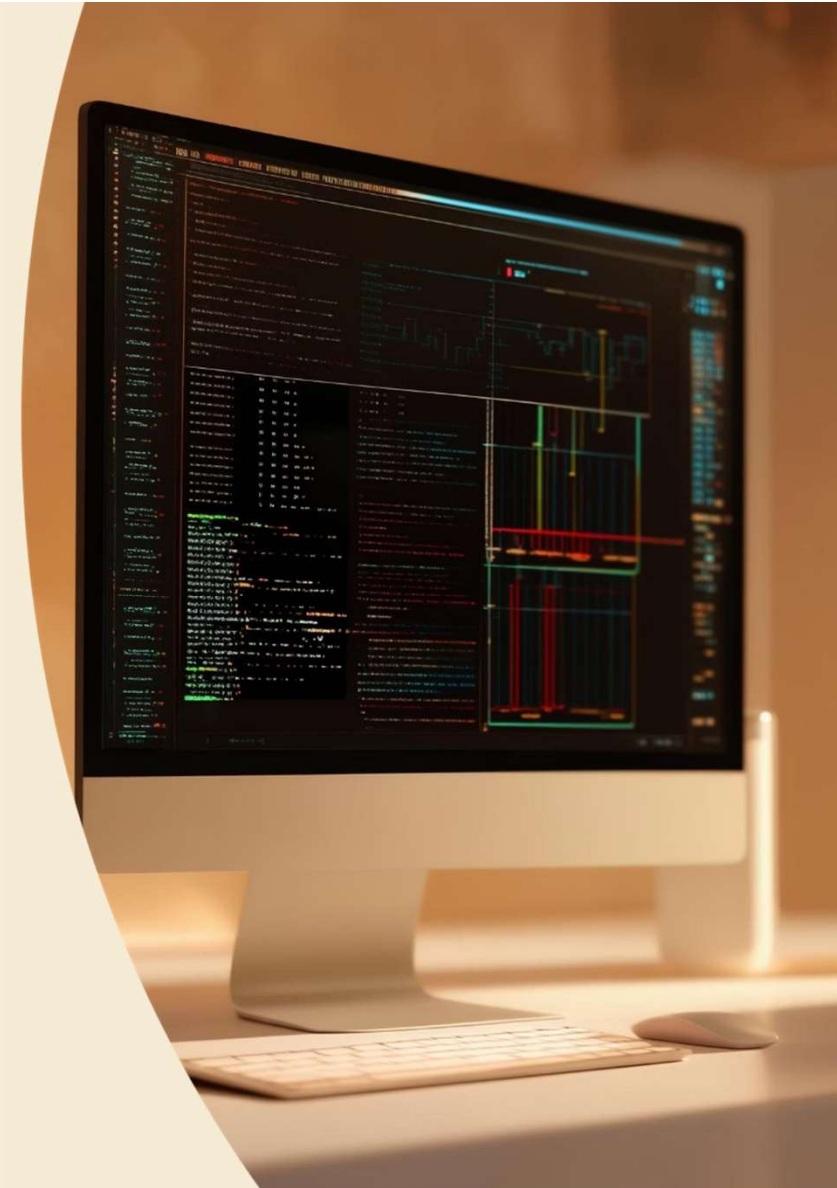
The dataset has 7,043 entries and 21 columns, including categorical and numerical data. No missing or duplicate values were found.

Data Cleaning

TotalCharges was converted from text to numeric to enable analysis. Outliers were checked in numerical columns using boxplots.

Libraries Used

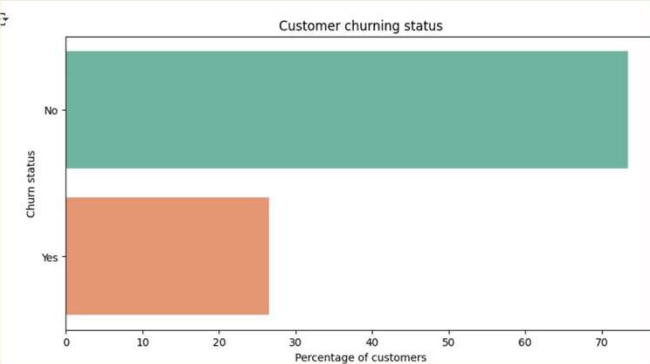
Python libraries such as pandas, numpy, matplotlib, seaborn, and warnings were imported for data manipulation, visualization, and clean output.



Overall Churn Rate and Demographics

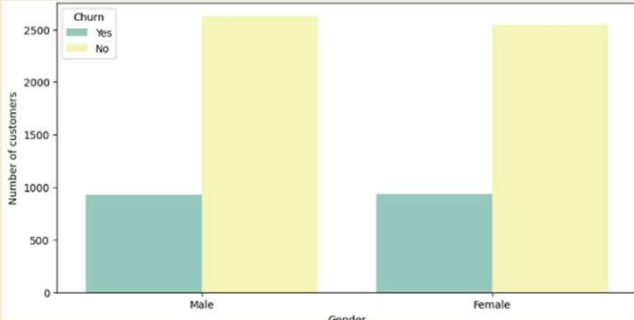
Churn Rate

26.5% of customers have churned, while 73.5% have been retained. This highlights the importance of understanding churn drivers.



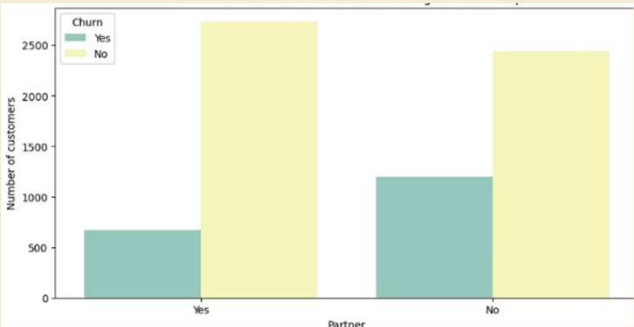
Gender Impact

Churn is nearly equal among males and females, indicating gender does not significantly influence churn.



Senior Citizen & Partner Status

Churn is evenly distributed between senior and non-senior citizens. Customers without partners show higher churn, suggesting partnership status may contribute when combined with other factors.



Tenure and Churn Relationship

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Tenure Categories

Customers are grouped as New (0-12 months), Early (13-24), Established (25-48), and Loyal (49-70).

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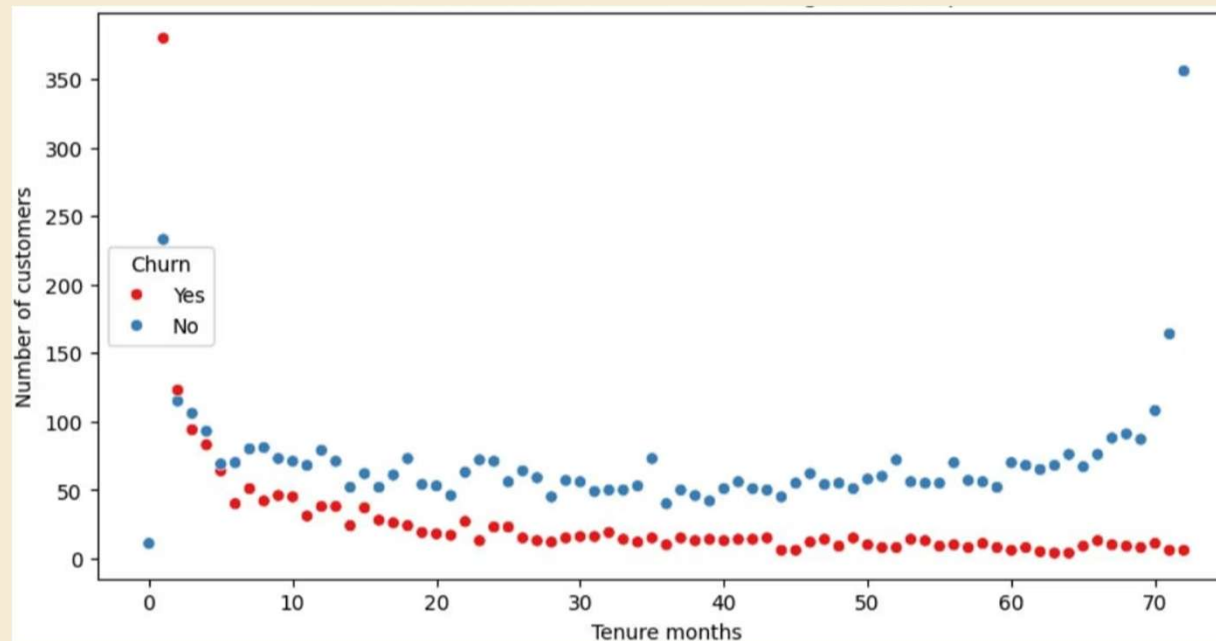
Statistical Test

Chi-Square test shows a strong relationship between tenure and churn (p-value ≈ 0), rejecting independence.

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Insights

Half of new customers churn, while loyal customers have low churn. Early engagement is critical to reduce churn.



Service Usage Among Churned Customers

Phone Service

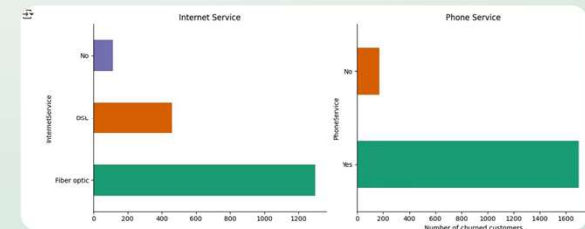
Most churned customers (1699) use phone service, indicating it is common among churners.

Internet Service

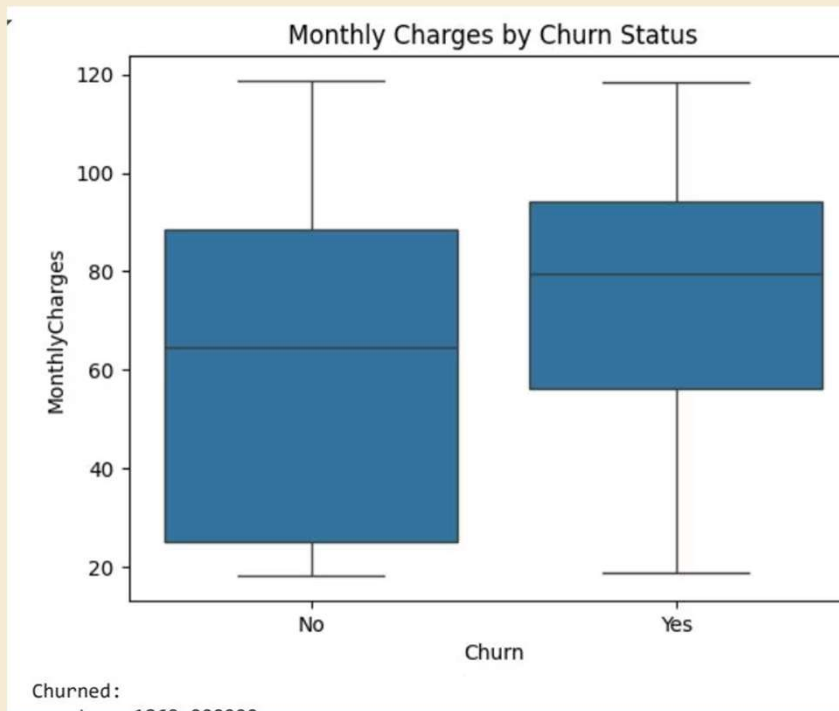
Fiber optic users have the highest churn (1297), followed by DSL (459). Churn also occurs without internet service.

Service Combination

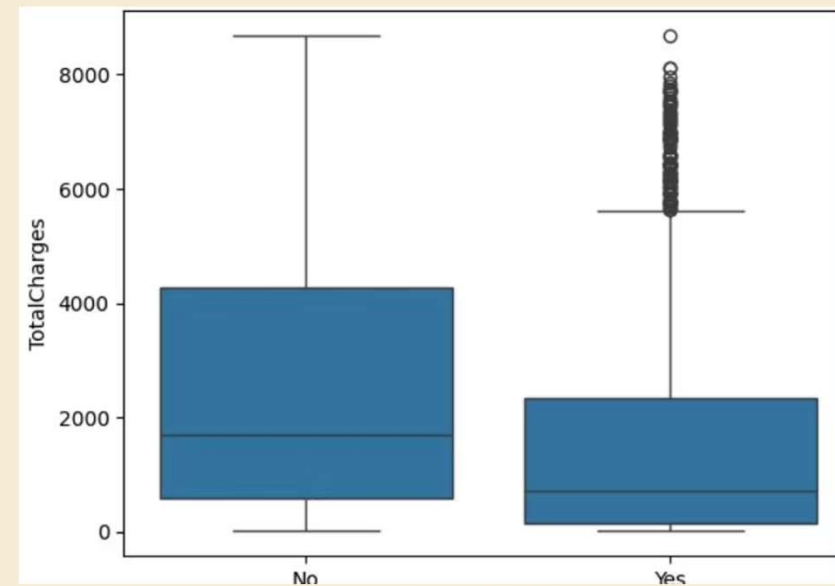
Churn is highest among customers with both phone service and fiber optic internet, suggesting dissatisfaction or cost issues.



Charges and Churn Analysis



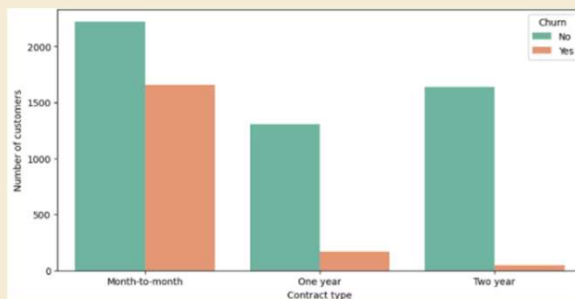
Churned customers pay higher monthly charges on average (\$74.44) than retained customers (\$61.31). Higher charges may increase churn risk.



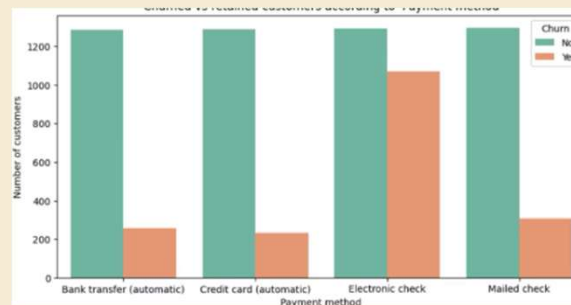
Churned customers have lower total charges (\$1,531.80) than retained (\$2,555.34), reflecting shorter tenure and early departure.

Two-sample t-tests confirm significant differences in monthly and total charges between churned and retained groups (p-value < 0.05).

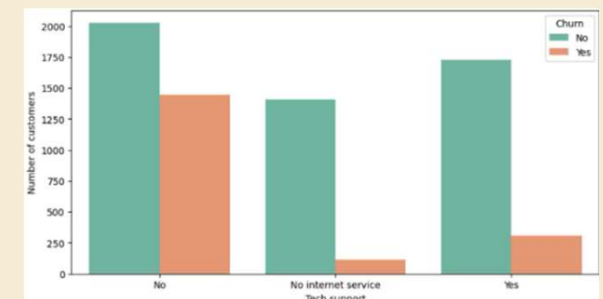
Contract, Payment Method, and Support Impact



Month-to-month contracts have the highest churn, nearly equal to retained customers. Longer contracts show much lower churn.



Electronic check payment users have the highest churn (over 45%). Automatic payments via bank transfer or credit card show better retention.



Customers without tech support have significantly higher churn. Providing tech support correlates with better retention.

Add-On Services and Key Churn Drivers

Add-On Services

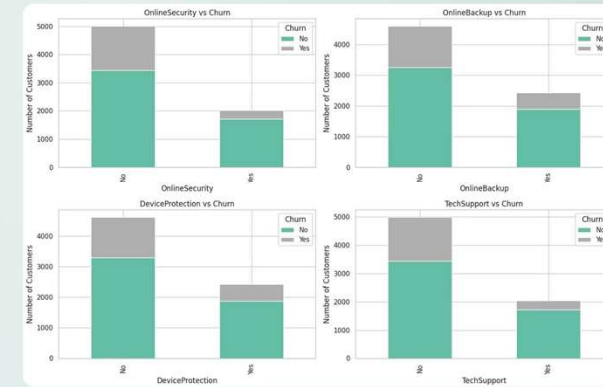
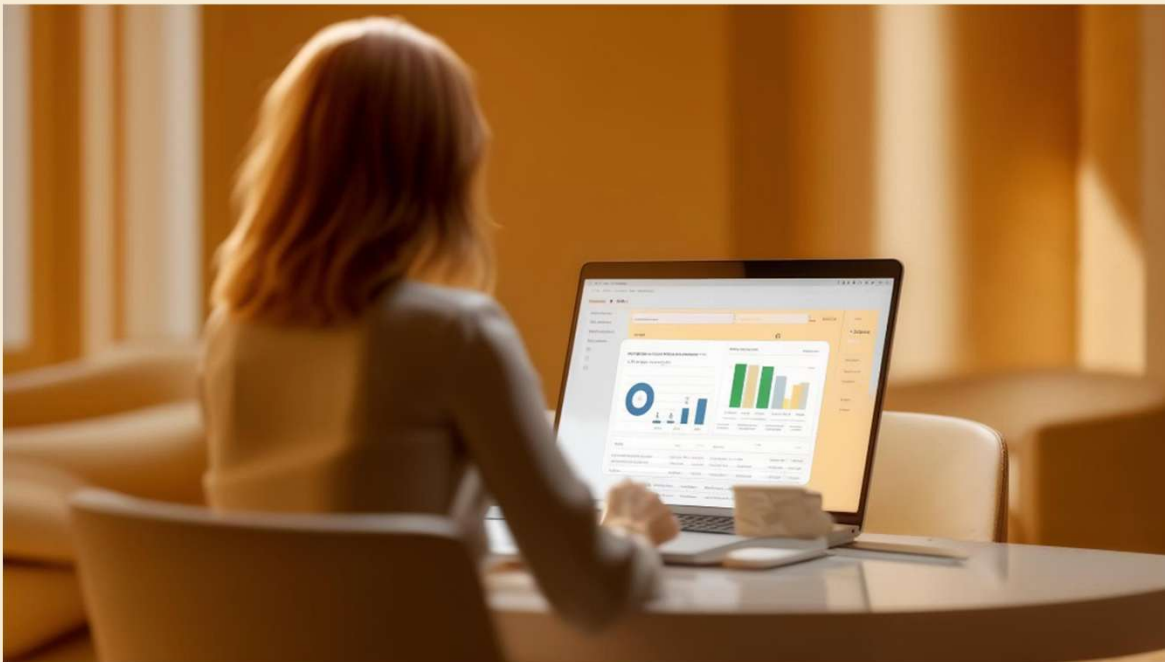
Churn is higher among customers lacking online security, backup, device protection, or tech support.

Feature Correlation

Strongest positive correlations with churn include new tenure, fiber optic internet, electronic check payments, and monthly charges.

Retention Focus

Improving early tenure experience, contract terms, payment options, and support services can reduce churn and increase loyalty.





Thank You

We appreciate your time. Your insights are invaluable for our next steps.

Key Insights

We identified critical customer churn drivers.

Next Steps

Implement targeted retention strategies now.

Collaboration

Let's partner to boost customer loyalty.