



# Customer Churn Analysis



## Project Objective

The objective of this project is to analyze customer churn patterns and identify key factors that drive customer retention or loss. By understanding these patterns, the business can develop effective strategies to improve customer loyalty, reduce churn, and enhance profitability.

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## Approach & Methodology

### 1. Data Cleaning

- Replaced missing or blank values in `TotalCharges`.
- Converted data types for consistency.
- Removed duplicate records.
- Recoded binary fields (e.g., `SeniorCitizen`) into readable categories.

### 2. Exploratory Data Analysis (EDA)

- Distribution analysis of customer demographics and services.
- Visualization of churn vs. gender, senior citizen status, contract type, payment method, etc.
- Correlation analysis between numerical variables (tenure, monthly charges, total charges).

### 3. Visualization

- Count plots and pie charts to show churn proportions.
  - Stacked bar charts to compare churn across demographics and services.
  - Heatmaps to show correlation strength.
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## Key Insights

- **Overall Churn Rate:** ~26.5% of customers have churned.
  - **Demographics:**
    - Gender has little effect on churn.
    - Senior citizens show a **higher churn rate** compared to younger customers.
  - **Customer Tenure:**
    - New customers (<12 months) churn significantly more, while long-tenured customers are more stable.
  - **Contract Type:**
    - **Month-to-month customers churn the most.**
    - **Two-year contracts show the lowest churn rate** → long-term contracts improve retention.
  - **Payment Method:**
    - Customers paying via **electronic check have the highest churn rate.**
    - Automatic payments (credit card/ bank transfer) show lower churn.
  - **Monthly Charges:**
    - Customers with **higher monthly charges are more likely to churn**, suggesting price sensitivity.
  - **Services:**
    - Customers without value-added services (online security, tech support) churn at higher rates.
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## Business Recommendations

- **Retention Programs for New Customers:** Strengthen onboarding in the first year to build loyalty.

- **Encourage Long-Term Contracts:** Offer discounts or incentives for 1–2 year contracts.
  - **Senior Citizen Support:** Improve customer service and targeted offers for older customers.
  - **Reduce Payment Friction:** Encourage auto-payments to lower churn associated with electronic checks.
  - **Price Sensitivity Handling:** Bundle services or offer flexible plans for high-charge customers.
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## **Business Impact**

Implementing these strategies can:

- Reduce churn rate by retaining vulnerable customer segments.
- Increase revenue through longer customer lifetimes.
- Enhance customer satisfaction and strengthen brand loyalty.