Comprehensive Summary of Telco Customer Data Analysis

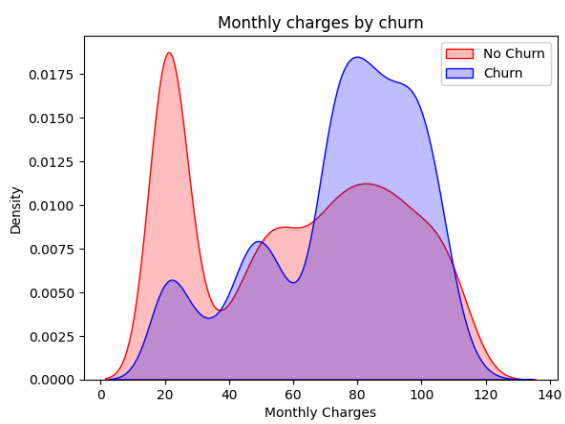
The analysis provides an in-depth examination of Telco customer data, aiming to reveal key patterns related to customer demographics, service types, and churn behavior. The findings are essential for identifying high-risk customers and potential areas for customer retention improvements.

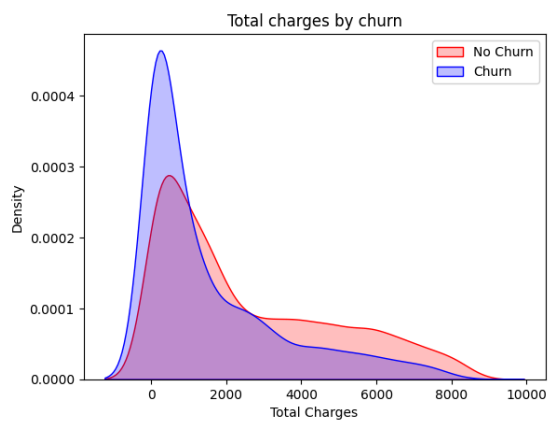
1. Data Composition and Key Variables

- **Total Customers**: The dataset includes data on 7,0043 customers.
- **Key Attributes**: Attributes span across demographic data (gender, age), subscription types (phone, internet service), contract information, tenure (in months), monthly charges, total charges, and churn status.
- **Missing Values**: Some missing data were identified, specifically in the `TotalCharges` column, likely due to new customers who haven't accrued charges.

2. Churn Analysis

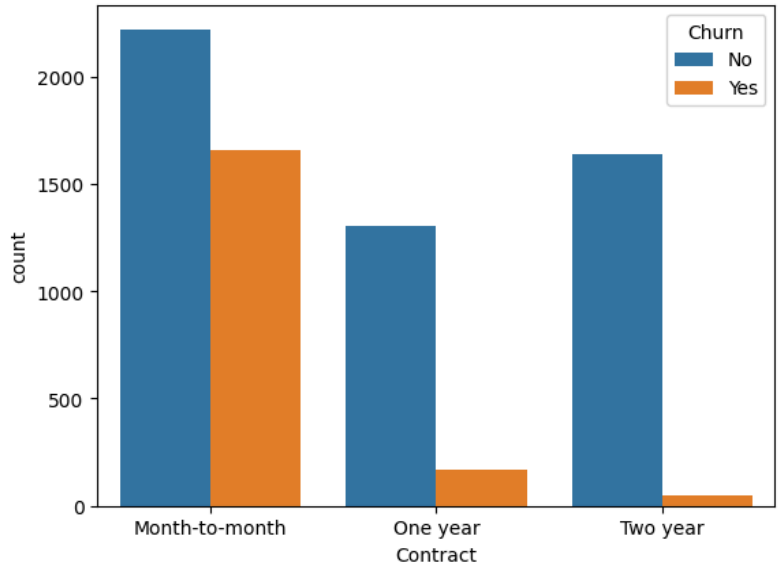
- **Overall Churn Rate**: 26.53% of customers have churned. This high churn rate underscores the need for effective customer retention strategies.





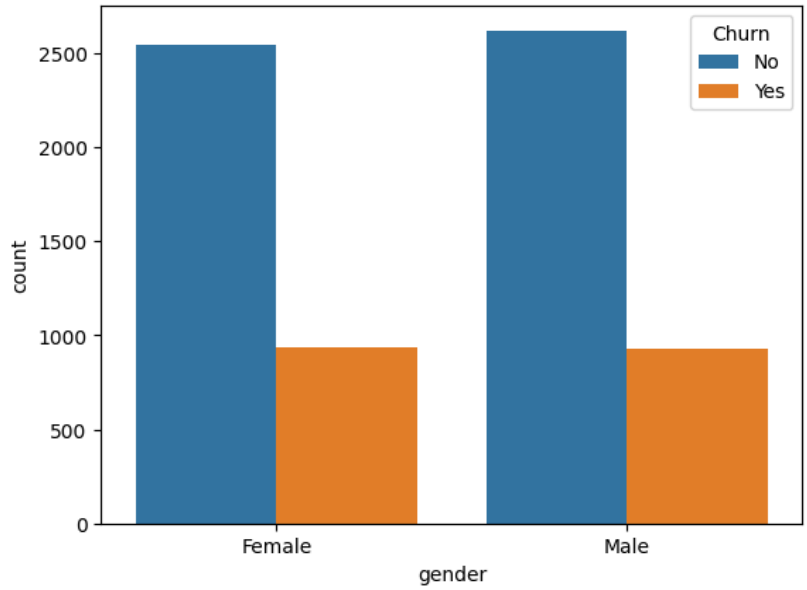
- **Monthly Charges and Churn**:
  - A box plot of monthly charges by churn status reveals that the median monthly charge for churned customers is approximately $80, while for non-churned customers, it is closer to $60. This indicates a positive correlation between higher charges and churn.
- **Total Charges Distribution**:
  - A distribution plot indicates that total charges for churned customers tend to be lower overall, suggesting they are likely newer customers who have churned early in their lifecycle.

3. Contract Type and Churn Correlation



- **Churn by Contract Type**:
  - A bar chart shows that customers on month-to-month contracts account for over 85% of churned customers, while churn is significantly lower for those with one-year or two-year contracts. Specifically:
    - **Month-to-Month Contracts**: Churn rate of ~42%
    - **One-Year Contracts**: Churn rate of ~11%
    - **Two-Year Contracts**: Churn rate of ~3%
- **Implications**: Offering incentives for customers to switch from month-to-month contracts to longer terms could reduce churn significantly.

4. Demographics and Churn Patterns



- **Gender**: There is no significant difference in churn between male and female customers, as the churn rate is nearly identical across genders.
- **Senior Citizens**: Senior citizens have a churn rate of ~42%, almost double the rate of non-senior citizens. This suggests a potential need for tailored services or support for older customers.
- **Dependents**: Customers with dependents show a lower churn rate (~15%) compared to those without dependents, who have a churn rate closer to ~30%.

5. Internet Service and Churn

- **Internet Service Types**:
    - Customers with fiber optic internet show a high churn rate of ~41%, while those with DSL have a churn rate of around ~13%.
    - Customers without internet service have the lowest churn rate, suggesting that internet service type influences churn significantly.
- **Implications**: Fiber optic service, although popular, may have issues related to cost or quality that drive churn, indicating a need for further investigation into service satisfaction.

6. Payment Methods and Churn

- **Payment Method Distribution**:
    - Electronic checks have the highest churn rate at ~45%, while automatic payments (credit card, bank transfer) have lower churn rates around ~20%.
- **Monthly vs. Automatic Payments**:
    - The reliance on electronic checks, often associated with more effort and manual management, may contribute to higher churn, suggesting that encouraging automatic payments could help in retention.

7. Tenure and Churn

- **Tenure Distribution**:
    - Customers with a tenure of less than 12 months exhibit a churn rate exceeding 50%, while churn rate decreases substantially for customers with tenure longer than two years.
    - A line chart of churn rate versus tenure shows an inverse relationship, where longer tenure correlates with a reduced likelihood of churn.
- **Customer Lifecycle Focus**: This indicates a critical window within the first year to engage and retain customers, potentially through personalized onboarding, loyalty programs, or targeted discounts.

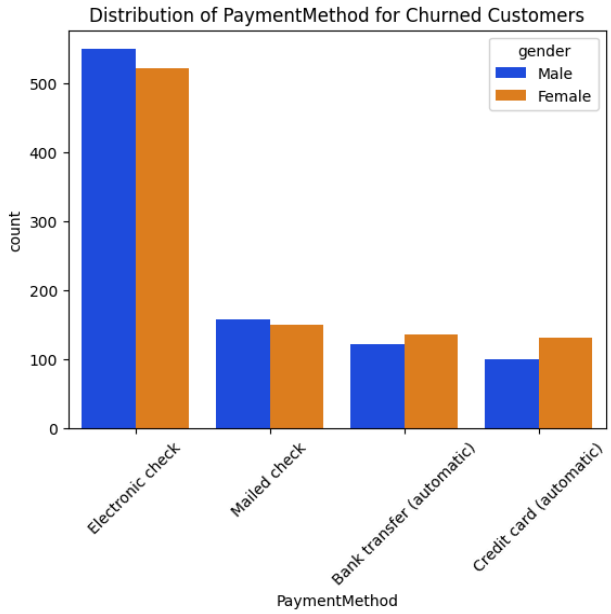
8. Chart Data Summary

- **Churn by Monthly Charges**: Median monthly charges are higher for churned customers, emphasizing the impact of cost on churn.

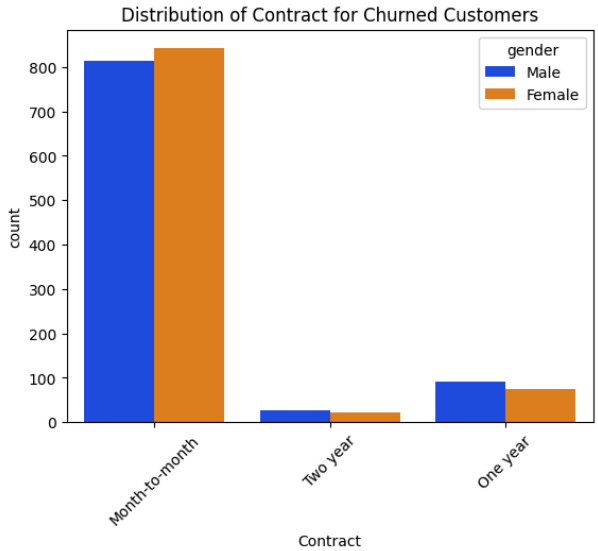
- **Churn by Contract Type**: The higher churn rate in month-to-month contracts suggests that increasing contract length could mitigate churn.
- **Tenure and Churn Trend**: The steep decline in churn rate with increased tenure supports a strategy focused on retaining newer customers.

9. Distribution of Churned Customers over gender

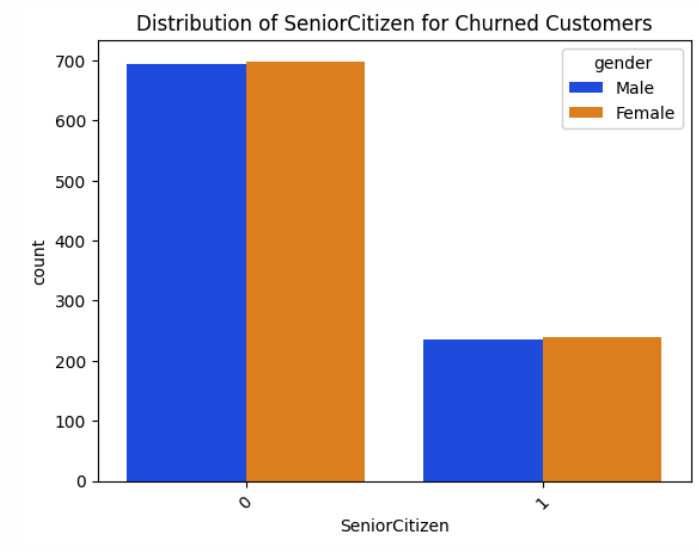
- **PaymentMethod :**



- **Contract :**



- **SeniorCitizen**



10. Business Recommendations

- **Retention Focus**: Retention efforts should target month-to-month customers, senior citizens, and those with fiber optic internet, as these groups exhibit the highest churn.
- **Pricing Strategy**: Introducing pricing options that lower the cost for month-to-month customers or creating retention offers for high-charge customers could reduce churn.
- **Early Engagement**: Implementing customer engagement strategies for those in their first 12 months can increase tenure and reduce churn.
- **Payment Method Adjustment**: Encouraging automatic payments over manual ones may also contribute to reduced churn.