#### **Telecom Customer Churn Analysis**

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#### **Objective:**

The analysis explores the drivers of customer churn using descriptive statistics, visualizations, and comparisons. The aim is to identify trends and actionable insights to reduce churn and improve customer retention.

#### **Key Highlights:**

1. **Dataset Overview:**
   * The dataset contains customer demographic data, service usage, and churn information.
   * **Data Preprocessing:**
     + Missing values in the TotalCharges column were replaced with zeros, and the column was converted to a numeric type.
     + The dataset has no null values after cleaning.
   * **Duplicate Entries:** No duplicates were found in the customerID column.
2. **Churn Rate:**
   * **26.54%** of the customers (approximately 1 in 4) have churned, based on a pie chart.

#### **Significant Findings and Percentages:**

1. **Demographics:**
   * **Senior Citizens:**
     + **41.4%** of senior citizens churn, compared to only **23.5%** of non-senior citizens. This indicates that senior citizens are almost twice as likely to churn.
   * **Gender:**
     + Both males and females have similar churn rates (~26%), showing no significant gender disparity.
2. **Tenure:**
   * Customers with a tenure of **1-2 months** have the highest churn rates, with over **50%** in this group churning.
   * Churn rates decrease significantly as tenure increases, with long-term customers (tenure >60 months) having churn rates below **10%**.
3. **Contracts:**
   * **Month-to-Month Contracts:**
     + Over **45%** of customers on month-to-month contracts churn.
   * **One-Year Contracts:** Churn rates drop to **11%**.
   * **Two-Year Contracts:** The lowest churn rate, at just **3%**.
4. **Service Features:**
   * **Internet Services:**
     + Customers using **Fiber Optic Internet** have a churn rate of **42%**, much higher than those without internet services (~10%).
   * **Online Security and Tech Support:**
     + Customers lacking **Online Security** or **Tech Support** churn at rates exceeding **40%**, while those with these services churn at rates below **20%**.
   * **Streaming Services:**
     + **35%** of customers using streaming services like **Streaming TV** or **Streaming Movies** churn, compared to **15%** without streaming services.
5. **Payment Methods:**
   * Customers using **Electronic Checks** have the highest churn rate at **45%**.
   * Other payment methods, such as credit cards or bank transfers, have churn rates below **20%**.

#### **Visualizations Used:**

* **Pie Chart:** Displays the overall churn percentage.
* **Bar Charts:**
  + Churn rates segmented by demographics, contracts, and payment methods.
  + Comparative churn rates across service features such as **Online Security** and **Internet Services**.
* **Histograms:** Show the distribution of tenure and its relation to churn.
* **Stacked Bar Chart:** Highlights churn percentages among senior and non-senior customers.

#### **Actionable Insights:**

1. **Contracts and Retention Programs:**
   * Encourage long-term contracts with incentives to reduce the high churn among month-to-month customers.
   * Target customers with tenure <6 months for retention campaigns, as over half are likely to churn.
2. **Service Improvements:**
   * Invest in improving **Fiber Optic Internet** reliability and add-ons like **Tech Support** and **Online Security** to reduce churn in high-risk service categories.
   * Offer bundled packages to encourage adoption of multiple services.
3. **Payment Flexibility:**
   * Promote secure and convenient payment methods like auto-debit bank transfers or credit cards to mitigate churn associated with **Electronic Checks**.
4. **Senior Citizen Engagement:**
   * Design targeted loyalty programs or tailored communication strategies for senior citizens, who are 1.76 times more likely to churn than younger customers.

**Project Link:** [TLC Analysis](https://colab.research.google.com/drive/1JVRAmvxEvVho3awxWTUi3HAoLIp_hxgx?usp=sharing) for reference.