

# Customer Churn Analysis

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# Introduction

Interested in churn rate, retention rate

Does churn rate depend on tenure of the customers?

so increasing the value of your existing customers is a great way to drive growth.

## Exploratory Data Analysis

The data set contains 7043 observations and 33 features. Each observation corresponds to a different customer, whereas the features relate to demographic information of the customers, such as gender, age, and location, as well as the types of services purchased and their cost. Figure 1 shows that Telco customers are located in California and clustered around big cities such as Los Angeles, San Francisco, and San Jose. There also doesn't seem to be any apparent relationship between churn rate and customer location.

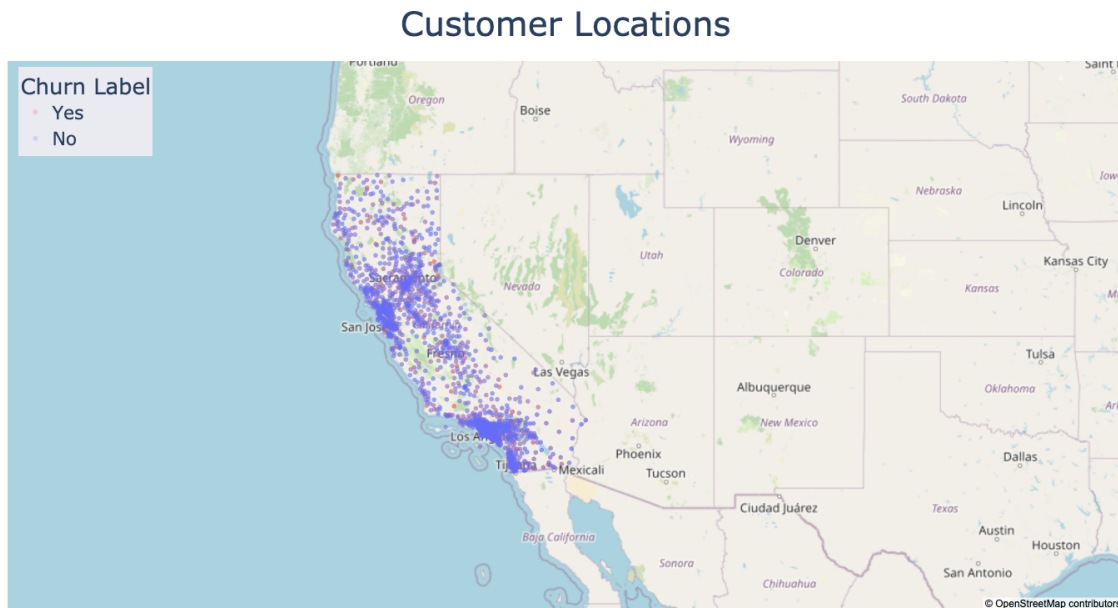


Figure 1: Customers are located in California and clustered around large metropolitans. There does not appear to be a relationship between churn rate and customer location.

The current churn rate is around 25%. In other words, approximately 1 out of 4 customers ended up cancelling their business with the company (Figure 2), which is quite high. One way of gauging the incurred loss due to churned customers is by estimating their overall value to the company. The customer lifetime value (CLTV) estimates a customer's value and is calculated using corporate formulas and existing data. The higher the value, the more valuable the customer. High value customers should be monitored for churn since they are the most profitable and it costs less to keep existing customers than it does to acquire new ones.

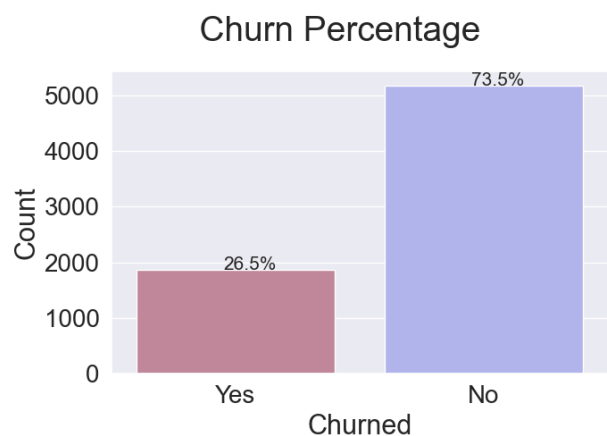


Figure 2: The current churn rate is around 25%.

Figure 3 displays how the CLTV is distributed among churned and non-churned customers. It also takes into account total number of months that the customer has been with the company. On average, churned customers have a lower life-time value to the company. Furthermore, long-term customers have a higher value and are less likely to churn.

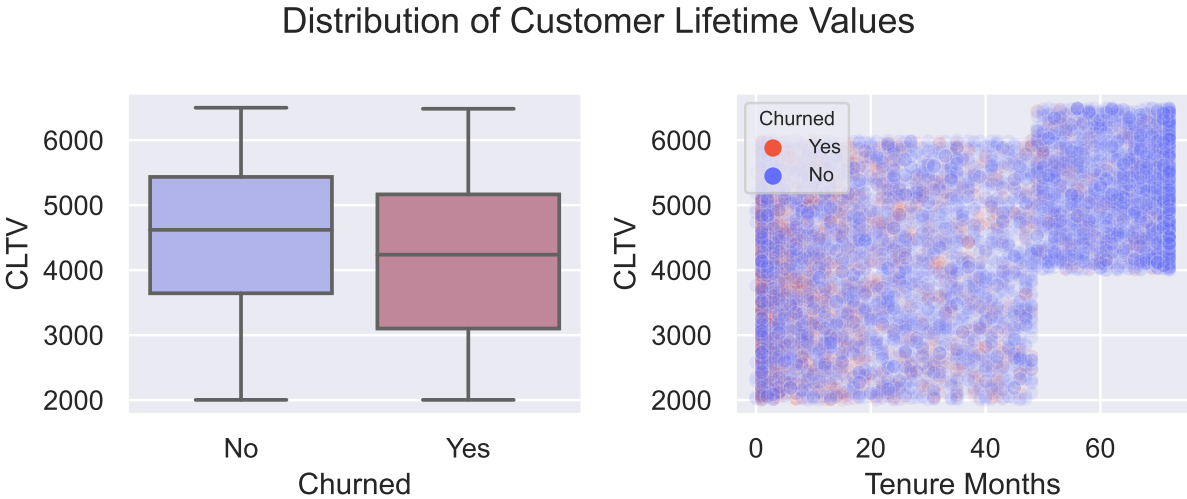


Figure 3: On average, the estimated CLTV is lower in churned customers. Long-term customers have a higher value and are less likely to churn.

The data set also contains information on the total monthly charges for each customer. This can be used to calculate the total revenue that is lost due to churned customers. Overall, churned customers constitute around \$140,000 in lost revenue, which translates to 30% of total revenue. Figure 4 summarizes the distribution of monthly charges across churned and non-churned customers and indicates that higher monthly charges seem to correlate with higher churn rates.

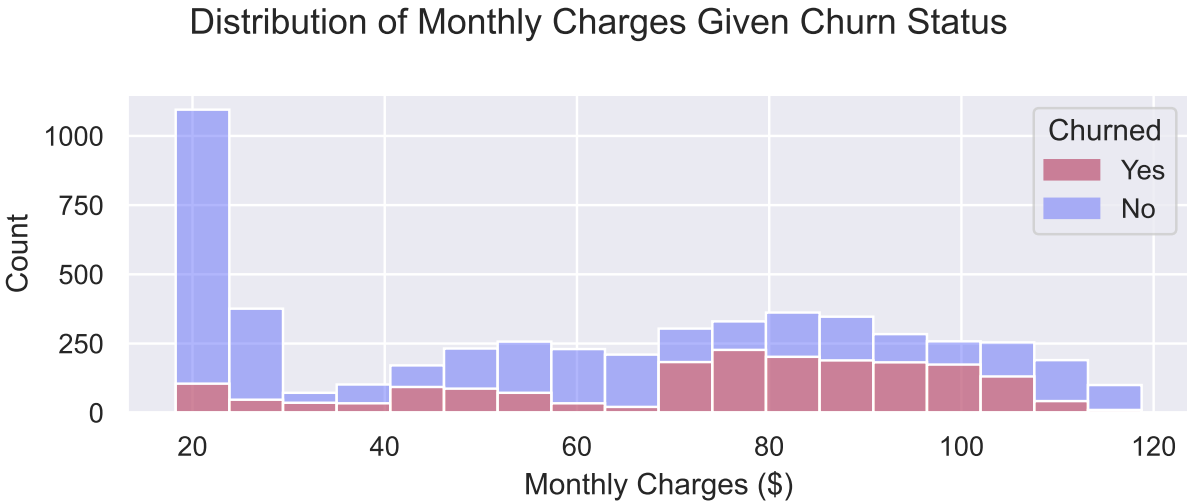


Figure 4: Higher monthly charges are correlated with higher churn rates

Total monthly charges are calculated based on different services that a customer is subscribed to. These services involve phone service, internet service, multiple lines, online security, online backup, device protection, and tech support. Figure 5 summarizes the popularity of these services by displaying the number of customers subscribed to them, as well as the churn rate within each service. The majority of customers are subscribed to phone and internet services, whereas tech support and online security are the least popular services. Furthermore, customers that are subscribed to less popular services seem to be less likely to churn.

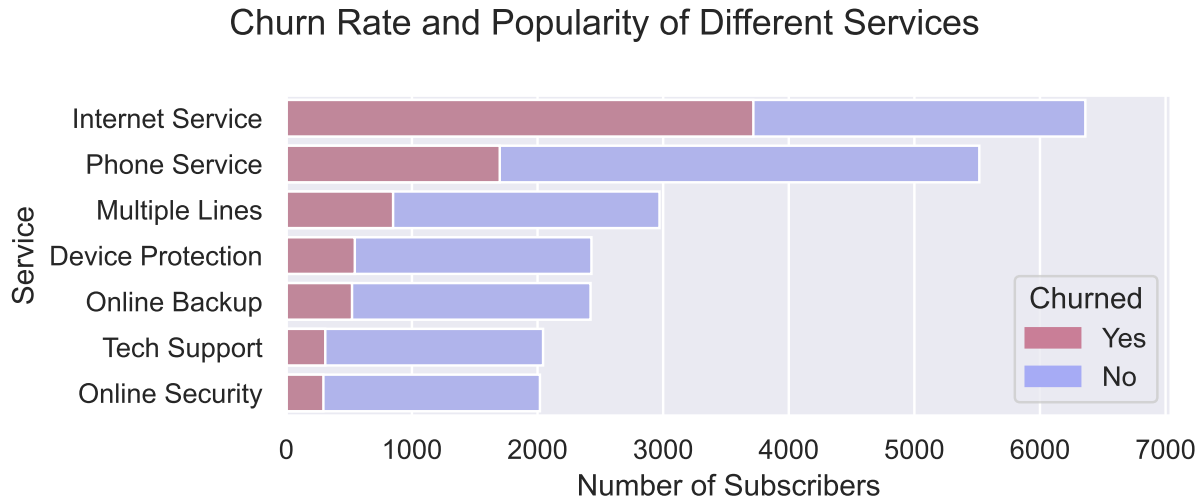


Figure 5: The majority of customers are subscribed to phone and internet services. Tech support and online security are the least popular services. Churn rate decreases with popularity.

Customers can choose between three different types of contracts: month-to-month, one year, and two year. In addition, they have the option to opt in to paperless billing choose between different payment methods. Churn rates among different payment related variables are displayed in Figure 6.

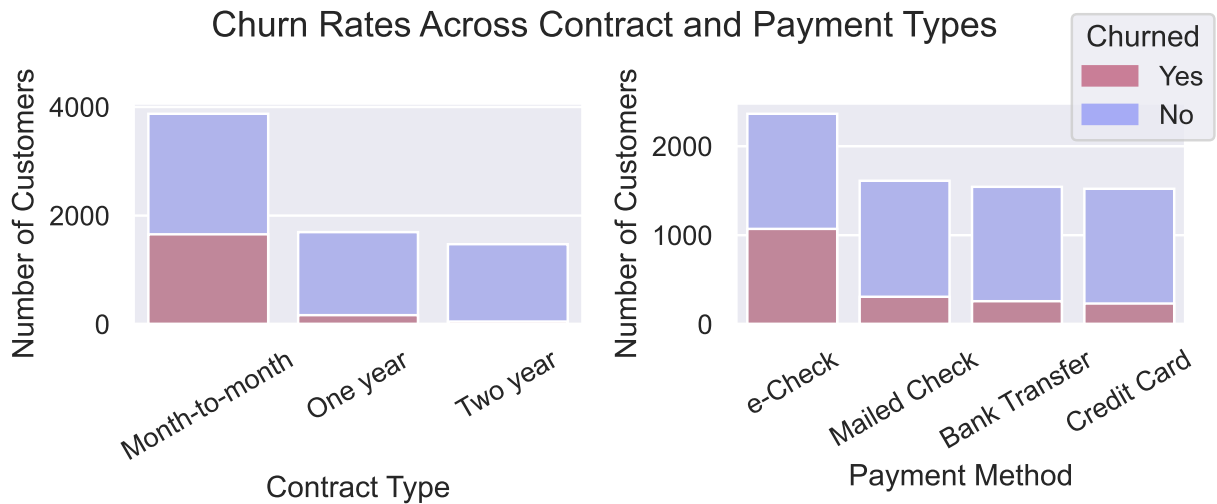


Figure 6: Long-term contracts have very low churn rates, but are also less popular. Paying with electronic check is the most common and has the highest churn rate.

Month-to-month contracts are the most popular option and are associated with the highest churn rates. On the other hand, long-term contracts are less popular but have a very low churn rate. Most customers pay

via electronic check, which has a higher churn rate than other payment methods.

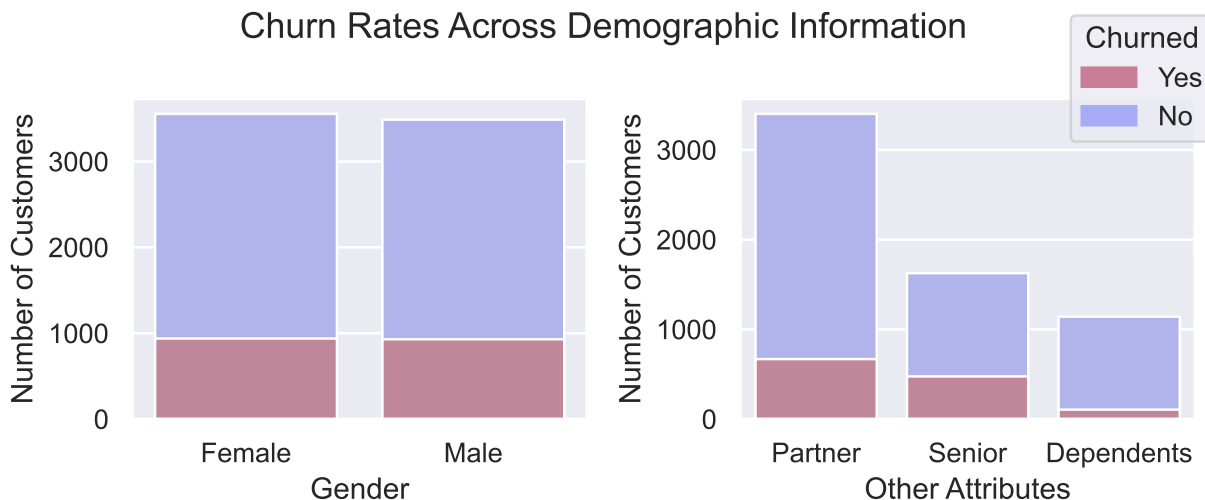


Figure 7: Churn rates do not differ between genders. Customers with dependents have a comparatively low churn rate.

There are a roughly equal number of male and female customers. The churn rate does not differ significantly between the two genders. Furthermore, customers with dependents have a relatively low churn rate.

A simple way of gaining insight into why customers are churning is by asking them directly. Telco records the responses to a survey that asks customers who are cancelling their services about the specific reason for leaving.

Figure 8 visualizes the most common words from these customer surveys by generating a word cloud, where a larger font size corresponds to a higher frequency of the word. Overall, the most common churn reason can be attributed to competitors. Other words that stand out, such as support and attitude, suggest that negative customer support experiences are another frequent churn reason.



Figure 8: Most customers churn due to competitors and negative customer support experiences.

**Modeling**

**Results**

**Conclusion**