Introduction

Hello everyone! I'm Raffy Alcazar, a Data Analyst. This is my first project using Power BI. This project is about **Churn Analysis.** For subscription-based businesses, reducing customer churn is a top priority. In this Power BI case study, we'll investigate a dataset from an example telecom company called Databel and analyze their churn rates. Analyzing churn doesn't just mean knowing what the churn rate is: it's also about figuring out why customers are churning at the rate they are, and how to reduce churn. We'll answer these questions by creating measures and calculated columns, while simultaneously creating eye-catching report pages.

My dataset came from DataCamp. DataCamp is an online learning platform that focuses on teaching students the comprehensive skills they need to become successful data scientists. Let's start!

Metadata

You may view the dataset here: https://tinyurl.com/2s3nz7va

1. Understanding the metadata
A. Customer Status

Customer ID	The unique ID that identifies a customer
Churn Label	Contains "Yes" or "No" to indicate if a customer churned
Churn Reason	The particular reason why the customer ended the contract
Churn Category	Groups multiple churn reasons together for analysis purposes

B. Demographics

Gender	The gender of the customer, indicated by "Male", "Female" or "Prefer not to say"
Under 30	Indicates if the customer is under 30 with "Yes" or "No"
Senior	Indicates if the customer is 65 or above with "Yes" or "No"
Other	The age of the customer

C. Contract information

Contract Type	Contains "Month-to-Month", "One Year" or "Two Year"
Payment Method	Preferred payment method of the customer indicated with "Credit Card", "Direct Debit" or "Paper Check"
State	The code of the state where the customer lives
Phone Number	Phone number of the customer
Group	Indicates if the customer is part of a group contract. A group contract offers advantages and is generally cheaper. Contains "Yes" or "No"
Number of Customers in a group	Number of customers part of the group

D. Subscription types and Charges

Account length (in months)	The number of months the customer has been with Databel
Local Calls	Amount of local (within the US) calls from the customer
Intl Calls	Amount of international (outside the US) calls from the customer

Intl Mins	The number of minutes spent calling internationally. Intl Active: Indicates if the customer called internationally with a "Yes" or "No"
Intl Plan	Indicates if the customer has a premium plan to call internationally for free with "Yes" or "No. This premium is reflected in the amount of the monthly charge
Extra International Charges	Indicates if the customer has a premium plan to call internationally for free with "Yes" or "No. This premium is reflected in the amount of the monthly charge
Customer Service Calls	The number of calls made to customer service
Avg Monthly GB Download	Contains the average monthly download volume in gigabytes
Unlimited Data Plan	Indicates if the customer has free unlimited download capacity with "Yes" or "No". This premium is reflected in the amount of the monthly charge
Extra Data Charges	Contains the extra charges for data downloads for customers who are not on an unlimited plan
Monthly Charges	Average of all Monthly Charges to the customer
Total Charges	Sum of all monthly charges

Question

1. In this dataset, what is the churn rate?
2. What is the trend of churn rate based on Account Length? And what is the average month that customer will churn?
3. What is the churn rate based on Demographics, Contract Type/Contract Category, Number of Customers in a group, Unlimited Data Plan, and Intl Plan.
4. What is the reason why customers are churning out?
5. What are the different types of payment methods? What is their count on this data and what is their churn rate?
6. What are the average total charges based on age group and what is their churn rate? Investigate why.
7. What is the churn rate across the state?

Data Cleaning

1. Understanding the data structure
    a. Continuous
        i. Column names: Age, Number of customers in a group, Account length (in month), Local Calls, Intl Calls, Intl Mins, Extra International Charges, Customer Service Calls, Avg Monthly GB Download, Extra Data Charges, Monthly Charges, and Total Charges.
    b. Categorical
        i. Column names: Customer ID, Churn Label, Churn Reason, Churn Category, Gender, Under 30, Senior, Age, Contract Type, Payment Method, State, Phone Number, Group, Intl Plan, Intl Active, and Unlimited Data Plan

2. Identifying missing data
    The dataset has no missing data. The dataset is already clean. But changed some of the data types.

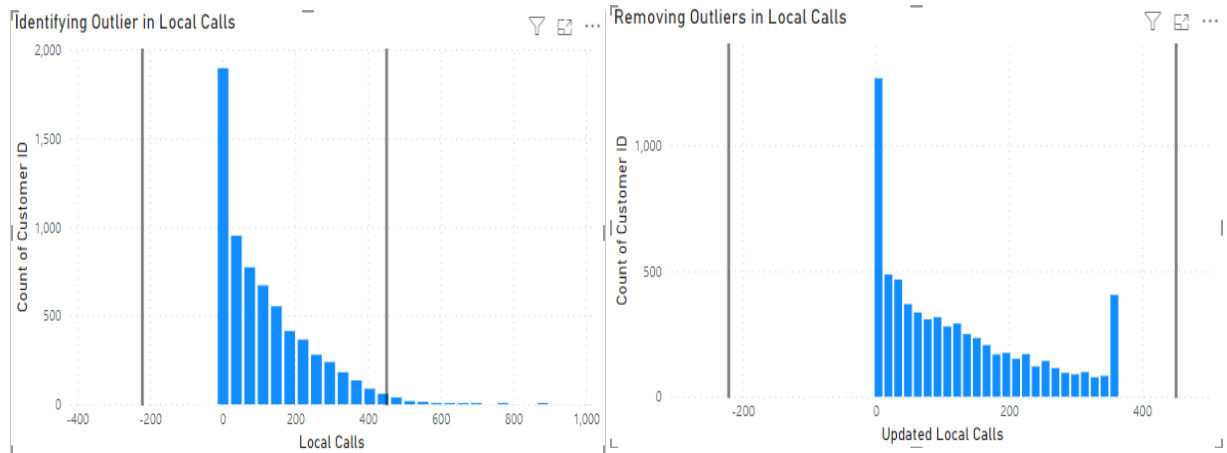3. Identifying outliers – To perform the identifying outliers, I used the following formula:

Lower and Upper Threshold = 25th and 75th Percentile ± 1.5 * IQR.

To replace some of the values who exceed the lower and upper threshold I use the IF() statement of Power BI and then used the following formula:
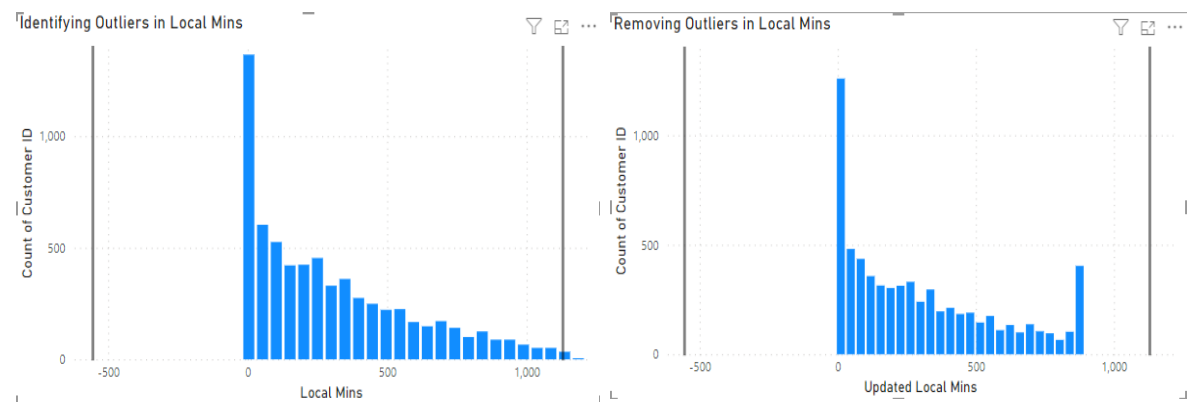
IF value < 5th Percentile THEN value = 5th Percentile

IF value > 95th Percentile THEN value = 95th Percentile
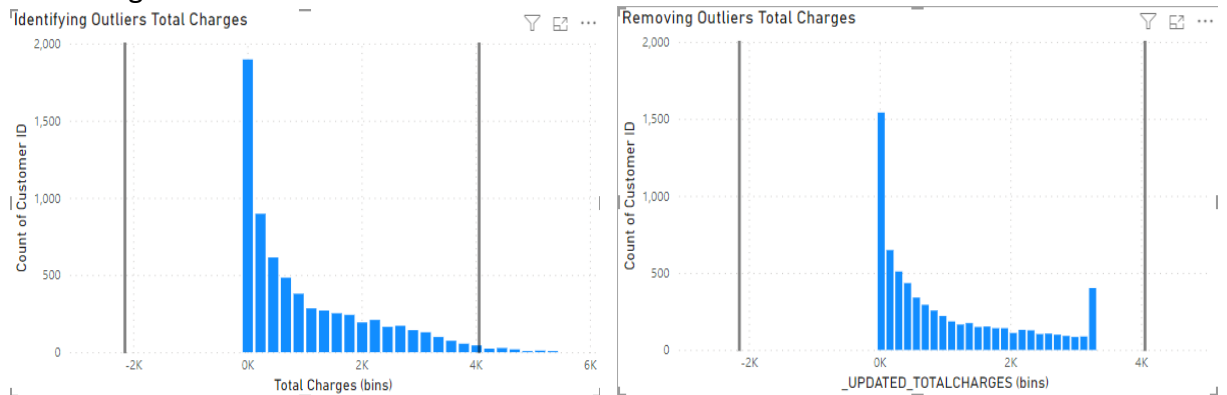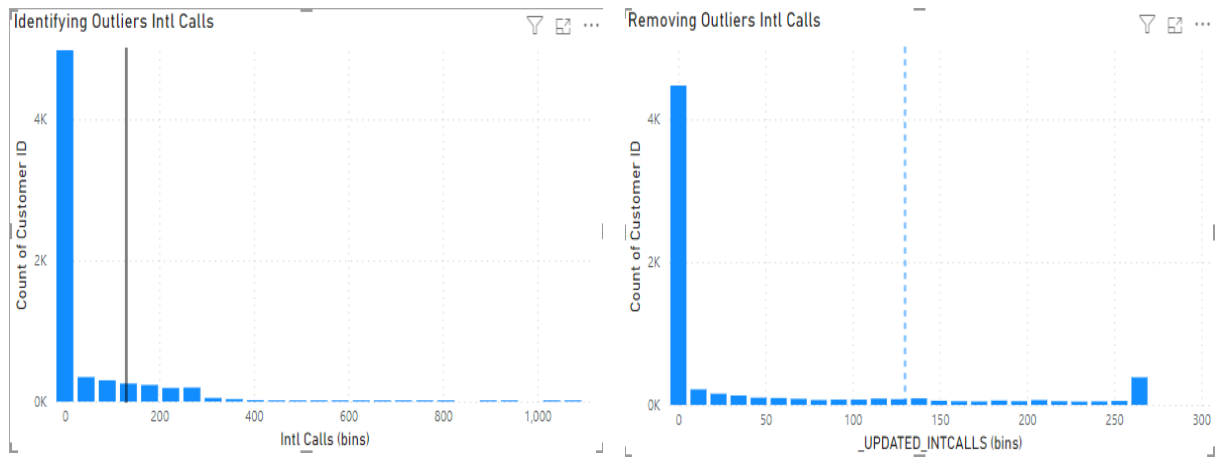
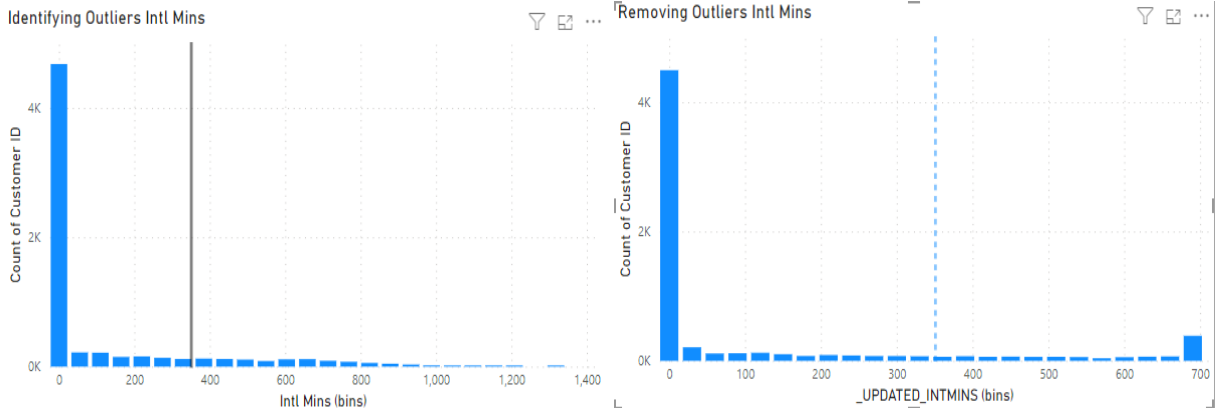   a. Local Calls Column

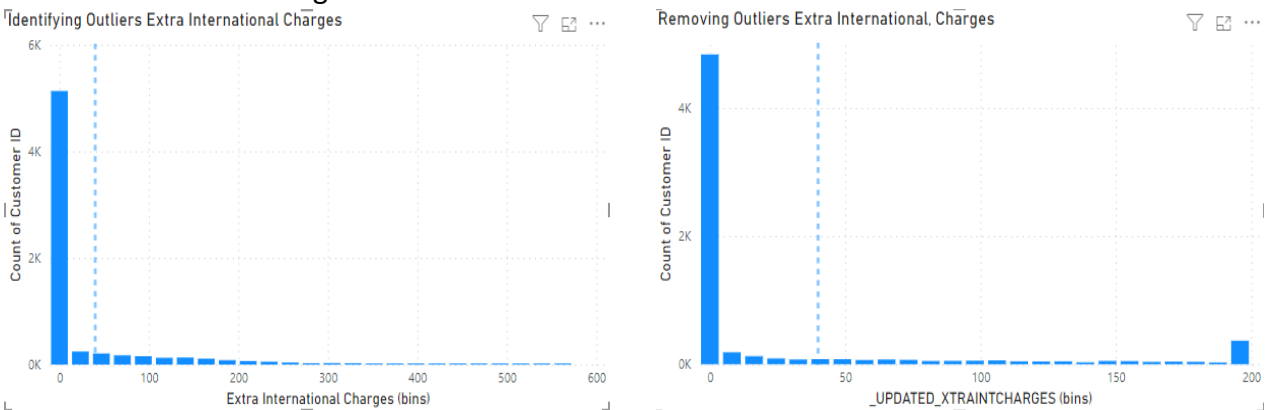   b. Local Mins Column

    c. Total Charges Column

    d. Intl Calls Column

Identifying Outliers Intl Calls / Removing Outliers Intl Calls

e. Intl Mins Column

Identifying Outliers Intl Mins / Removing Outliers Intl Mins

f. Extra International Charges Column

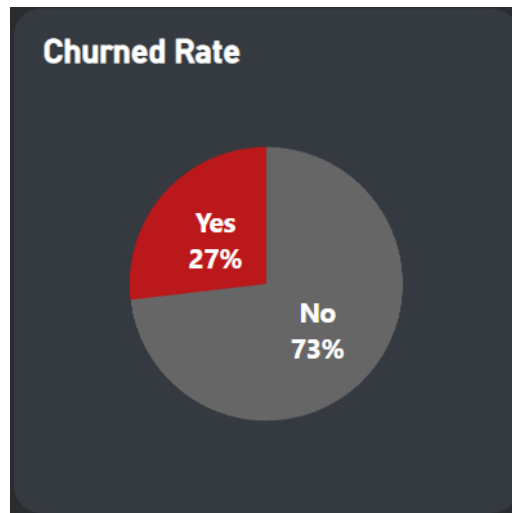Identifying Outliers Extra International Charges / Removing Outliers Extra International, Charges

Analysis and Answering Questions

1. In this dataset, what is the churn rate?
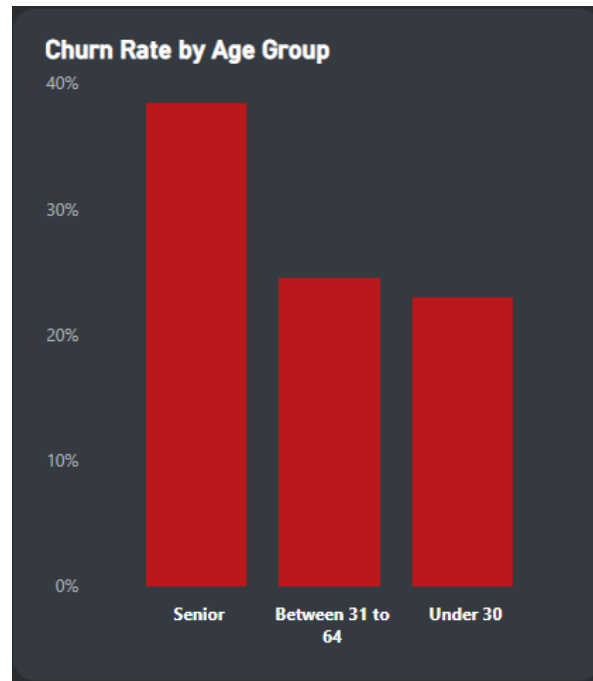   Based on the graph, the **churn rate is 27%.**

2. What is the trend of churn rate in Account Length? And what is the average month that customer will churn?
   Based on the graph, we have **a downward trend**, **the longer the customer continues their plan the lower the churn rate**. The **average month that a customer will churn** is **18 months**.
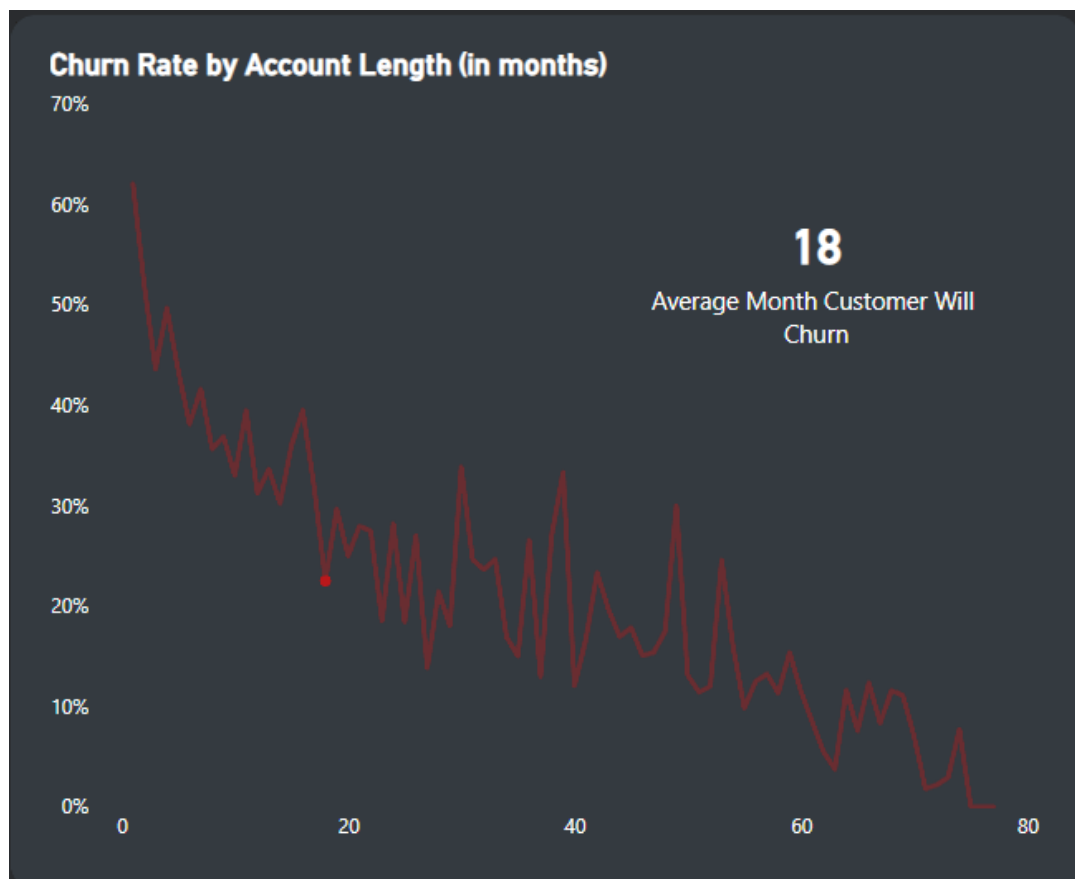
3. What is the churn rate based on Demographics, Contract Type/Contract Category, Number of Customers in a group, Unlimited Data Plan, and Intl Plan.
   a. Demographics – **Senior** age group has the **highest churn rate** and above the average churn rate (27%). While **Other and Under 30** age group churn rates are **likely close**.

   b. Contract Type / Contract Category – Based on the data, **Monthly Contract** category churn rates are **high and above the average churn rate**, while **Yearly Contract** is **below the average** churn rate.
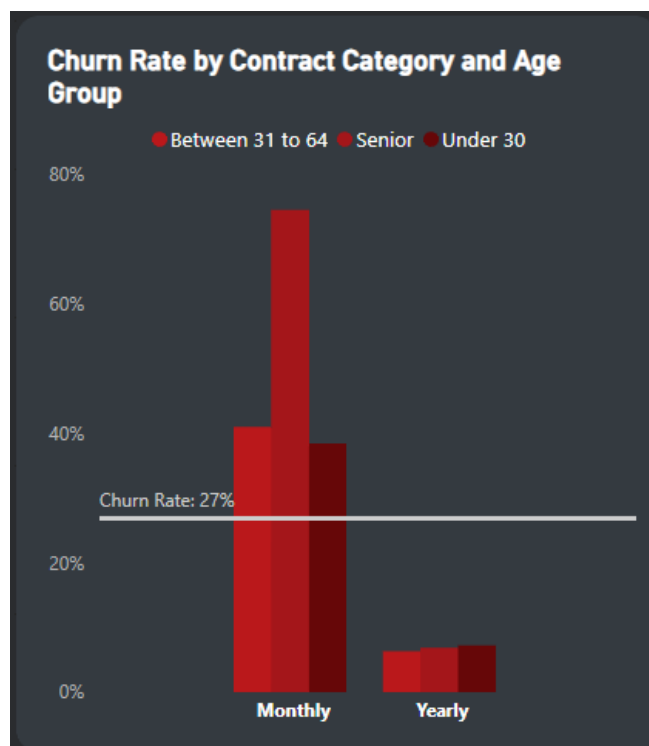
c. Number of Customer in a group – As we can see at the graph, customers who are not in the Group Contract have the highest churn rate.

Average of Monthly Charge and Churn Rate by Number of Customers in Group
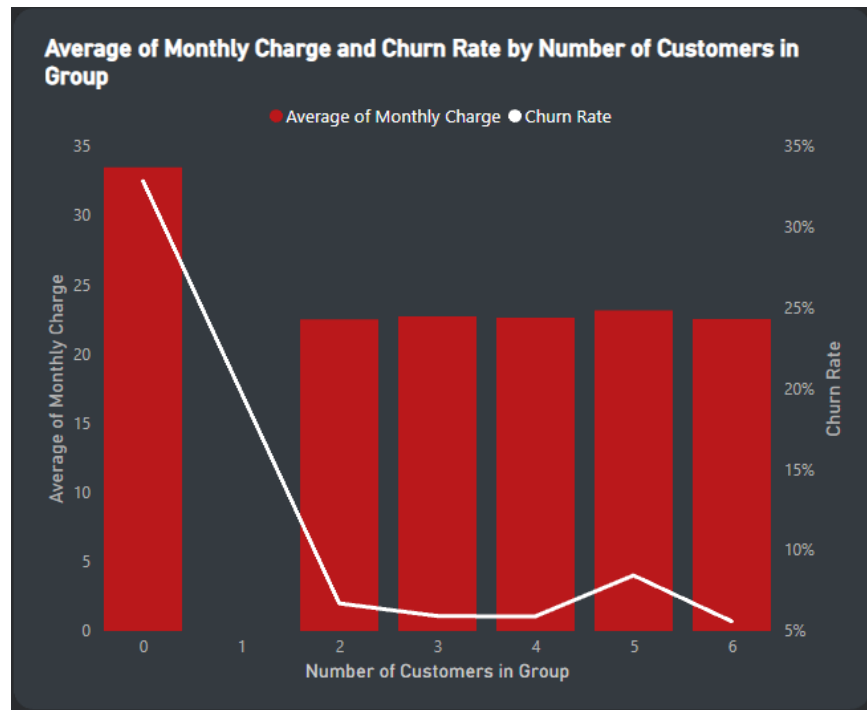
d. Unlimited Plan – As we can see from the graph, customers who are not in the **Unlimited Data Plan have a relatively high churn rate compared** to those customers who consumed data above 5 GB.

Churn Rate by Unlimited Data Plan and Grouped Consumption
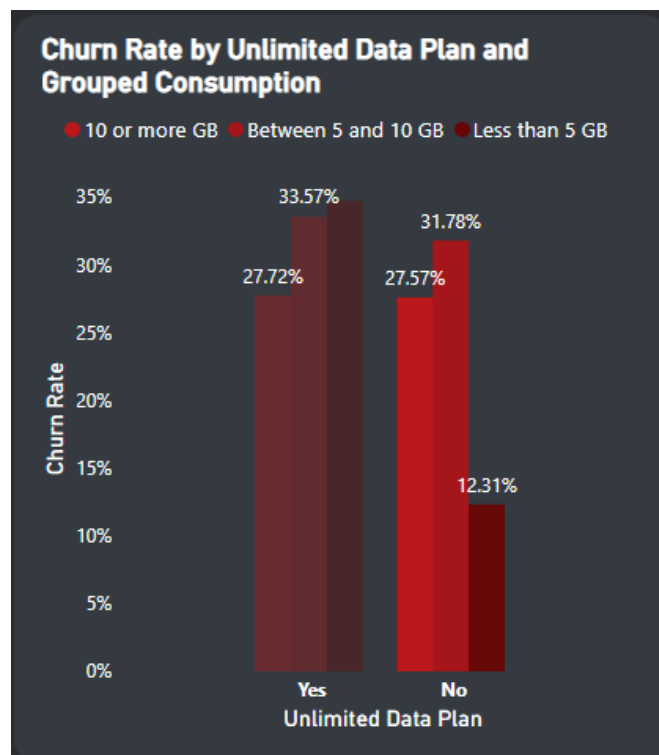
e. Intl Plan (International Plan) – Customers who are in **International Plan** (customers who can call international) and they are **not active** have **higher churn rate**. While customers who are **not in International Plan** but **active caller outside of their states** have also **higher churn rate**.

Number of Customer and Churn Rate by International Plan and Intl Active
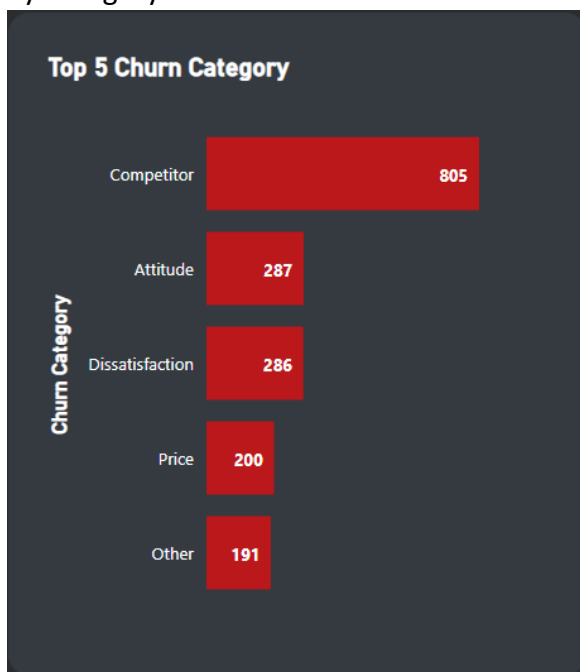
● Yes ● No ● Churn Rate
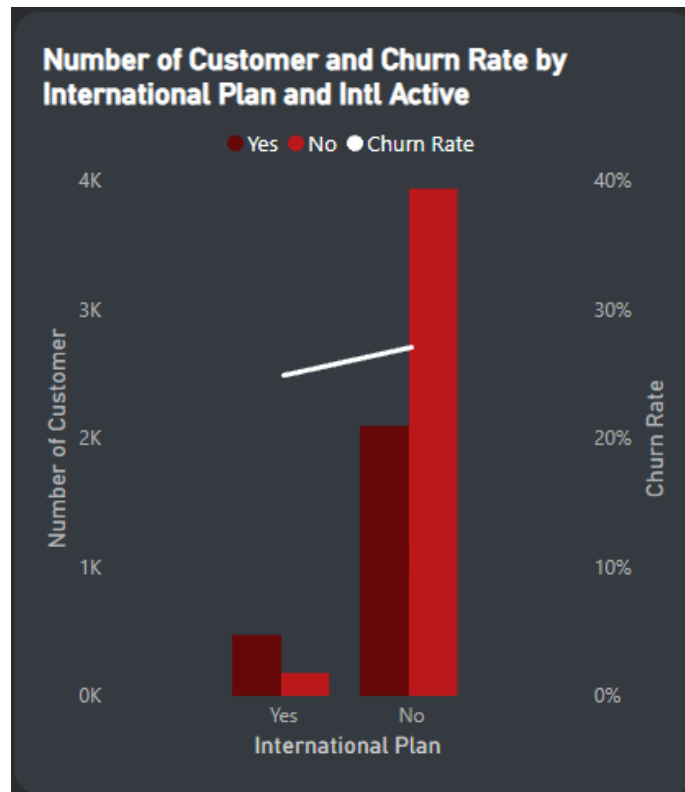
4. What are the reasons why customer churn? These are the reasons why customers churn.

By Category
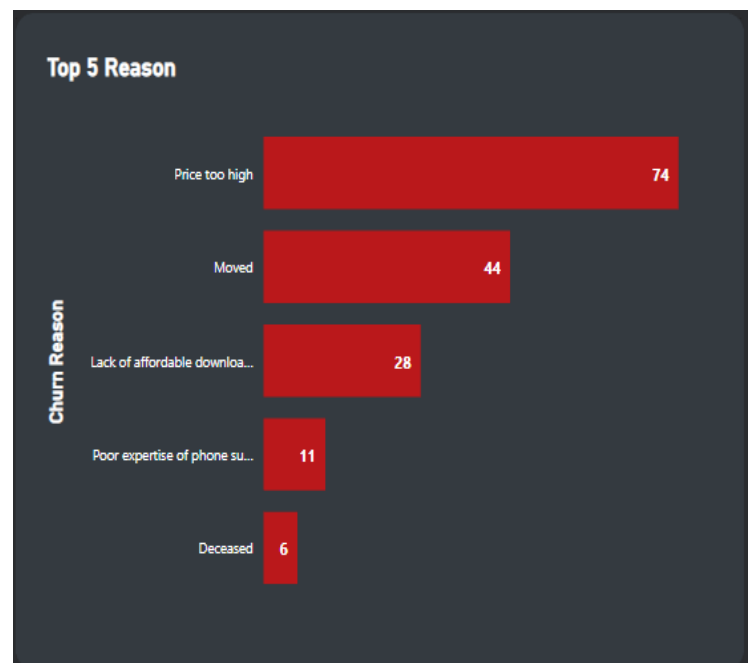
Top 5 Churn Category

Churn Category	
Competitor	805
Attitude	287
Dissatisfaction	286
Price	200
Other	191

By Reason

Top 5 Reason

Churn Reason	
Price too high	74
Moved	44
Lack of affordable downloa…	28
Poor expertise of phone su…	11
Deceased	6

5. What are the different types of payment methods? What is their count on this data and what is their churn rate?
According to our data, Direct Debit has the highest usage rate as a payment method and places 2nd in churn rate. Although Paper Check has the lowest usage rate as a payment method, it still ranks 1st in churn rate.

Number of Customer by Payment Method

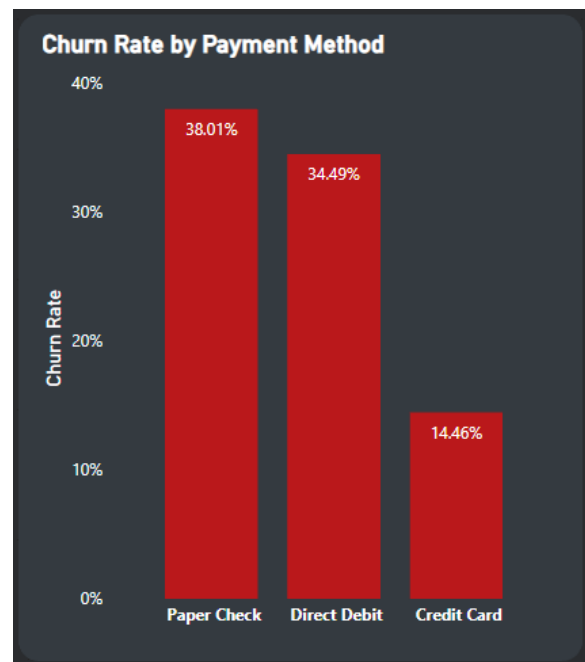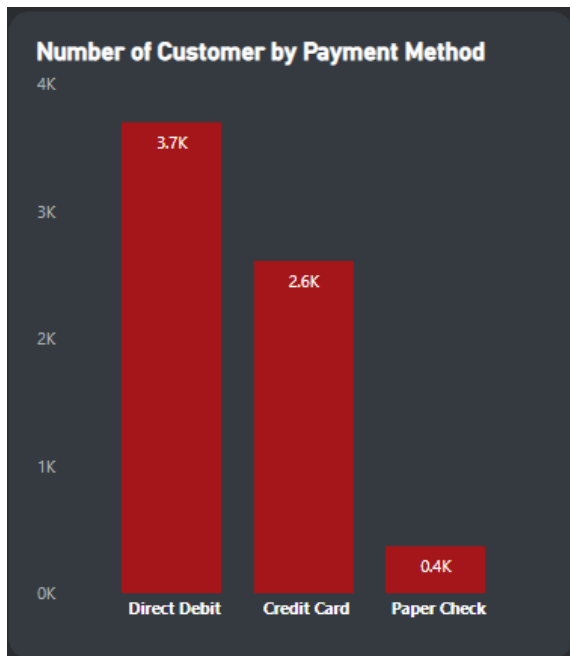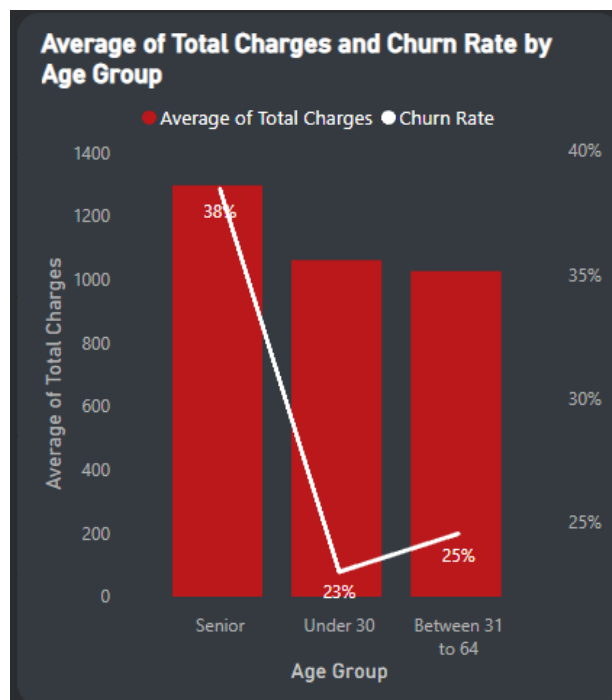| Payment Method	Number of Customers
Direct Debit	3.7K
Credit Card	2.6K
Paper Check	0.4K

Churn Rate by Payment Method

Payment Method	Churn Rate
Paper Check	38.01%
Direct Debit	34.49%
Credit Card	14.46%

6. What are the average total charges based on age group and what is their churn rate?
According to our graph, Senior age group has the highest average total charges and has the highest churn rate. While the under 30 and between 31 to 64 age group are close together when it comes to average total charges and churn rates. Let's investigate why this is happening.

Average of Total Charges and Churn Rate by Age Group

● Average of Total Charges ● Churn Rate

Age Group	Churn Rate
Senior	38%
Under 30	23%
Between 31 to 64	25%

7.1.   According to the first graph, we have a high number of customers who have International Plan in age group Between 31 to 64, while Under 30 has the lowest number of customers. But according to the graph, we have a high number of customers who are International Active even though they don't have International Plan contract. The 2nd graph tells us that we have a high average extra international charges for those who don't have plan/contract in International Plan
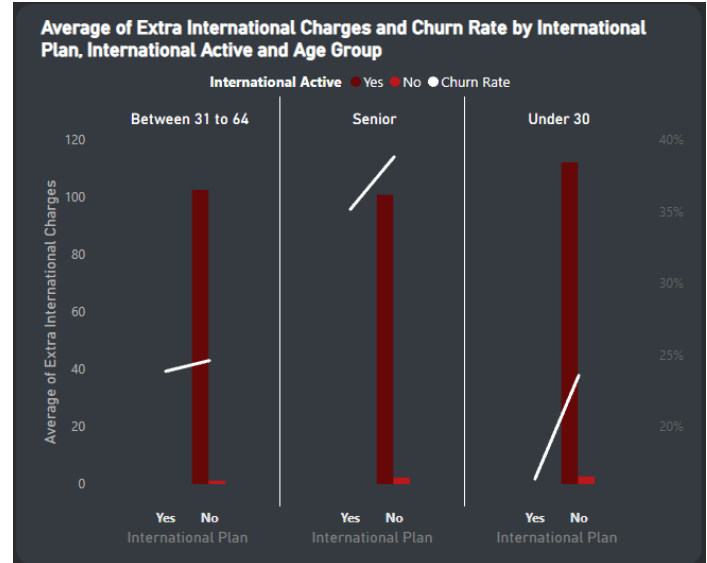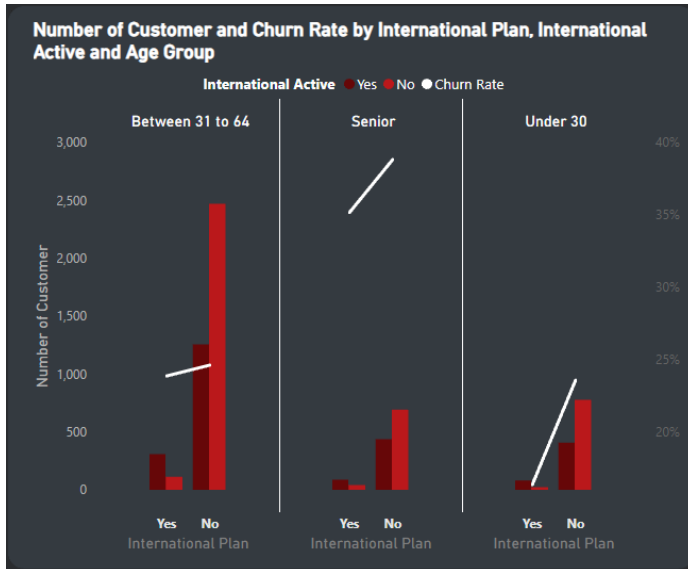
7.2.   As we see here, we have high number of customers in Between 31 to 64 and the lowest is Under 30. Even though we have a lower number of customers who are in Unlimited Data Plan in Senior group we have higher churn rate in this group.
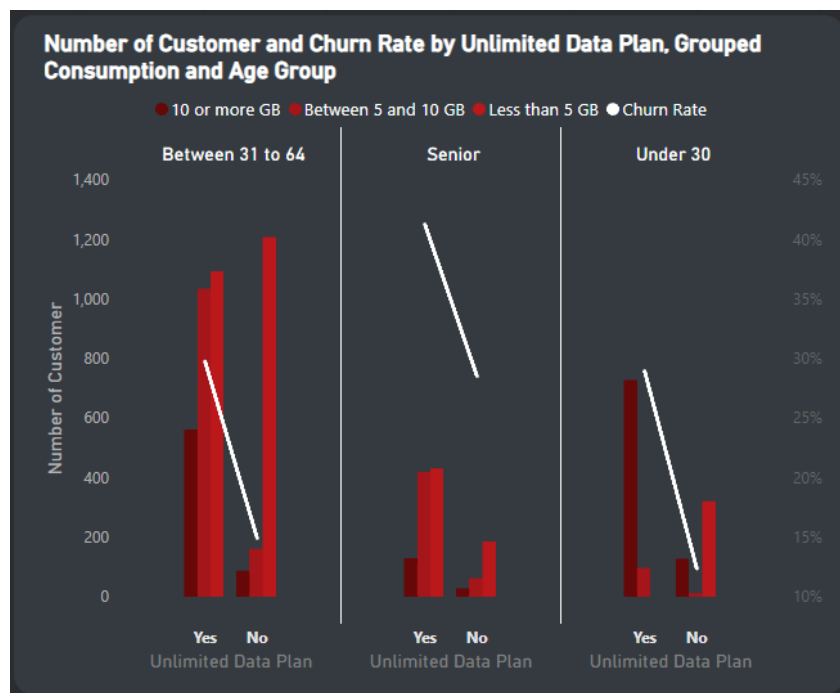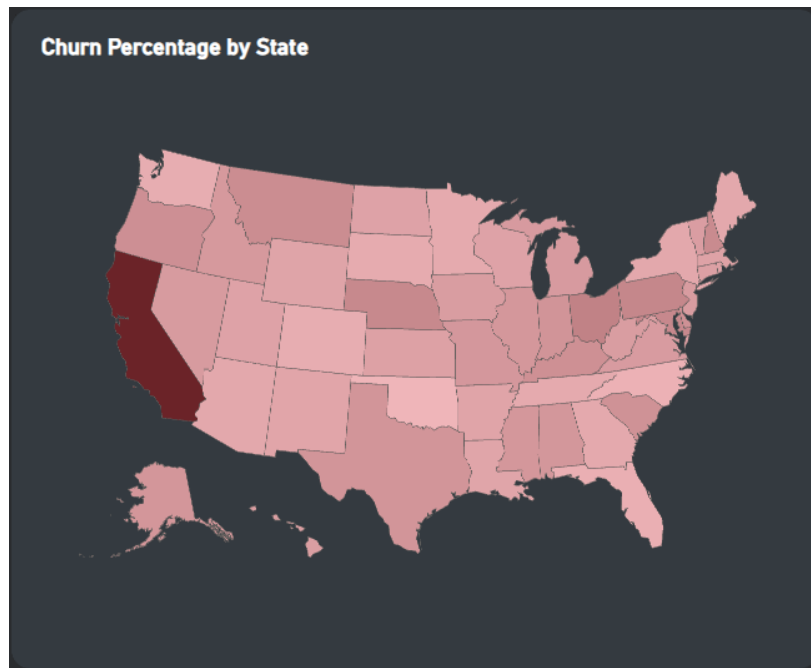
8. What is the churn rate across the state?

Based on the data, California (CA) has the highest churn rate (63.24%) while District of Columbia has the lowest churn rate (19.44%) across the state.

Churn Percentage by State

Conclusion

Here are the conclusions why Databel company have a high churn rate:

- In this data, we have a **27% churn rate.**
- The average month customer will churn is **18 months.**
- The highest churn rate based on age group is **Senior** followed by age group Between 31 to 64.
- Between Monthly and Yearly contract, Monthly contract tend to have a higher churn rate.
- Databel customers who don't have Group Plan/Contract have a high average monthly charge as well as churn rates.
- Databel customers who don't have Unlimited Data Plan also have a high usage rate in data consumption.
- Databel customers have a high number of customers who are not on the International Plan but an active caller in other countries.
- These are the top 5 reasons why customers churn based on category: **Competitor, Attitude, Dissatisfaction, Price and Other.**
- The top customer payment method is Direct Debit but also ranks 2nd in highest churn rate (34%), followed by Paper Check (38%), but Paper Check is the lowest Payment Method.
- When it comes to Average Total Charges, Senior age group has the highest average and highest churn rate. Followed by Under 30 and Between 31 to 64.
- The number of customers who are International Active but don't have International Plan/Contract have a higher churn rate and higher extra charges. Also, Senior group have a higher churn rate.
- Age group Senior and Under 30 have a low data consumption even though they have Unlimited Plan. Also, Senior had the highest churn rate.

- California (CA) has the highest churn rate (63.24%) while District of Columbia has the lowest churn rate (19.44%) across the state.

Recommendation

Based on the results of the data, these are the recommendations:

- Consider creating a Group Plan/Contract for customers who are currently not on a contract. This will help to reduce their high average monthly charges and lower their churn rate.
- Address the top 5 reasons for customer churn by improving the company's competitiveness, addressing customer attitudes, addressing dissatisfaction, offering competitive pricing, and addressing other customer concerns.
- Provide better customer service and support to the Senior age group, which has the highest churn rate and the highest average total charges. This could include offering discounts, incentives, and personalized support for this age group.
- Offer an Unlimited Data Plan for customers who are not currently on an Unlimited Plan. This will help to retain customers who have high data usage rates.
- Address the high churn rate in California by providing better customer service, support, and incentives to customers in this state. This could help to reduce the overall churn rate and retain more customers.
- Offer discounts or incentives for customers who choose yearly contracts over monthly contracts. This will help to reduce the churn rate among monthly contract customers.
- Address the low data consumption rates among the Senior and Under 30 age groups, even though they have Unlimited Plans. This could include offering additional features or benefits to these age groups to encourage them to use more data.
- Create an International Plan for customers who are actively calling other countries but not currently on an International Plan. This will help to retain customers who have high international calling needs.
- Consider promoting alternative payment methods to Paper Check and Direct Debit, which have high churn rates. This could include credit or debit card payments, mobile payment apps, or other electronic payment options.
- Provide better education and training to customers who have International Active status but are not on an International Plan/Contract. This could help to reduce their churn rate and extra charges.

Dashboard

Datbael - Churn Analysis

Churn Rate by State

6687
Number of Customer

26.86%
Churn Rate

1796
Number of Churned

Contract Category Percentage
Yearly 49% / Monthly 51%

Unlimited Data Plan Percentage
No 33% / Yes 67%

32
Average of Account Length (in months)

6123
Total Customer Service Call

0.92
Average of Customer Service Calls

Churn Rate
Yes 27% / No 73%

International Plan Percentage
Yes 10% / No 90%

Average of Monthly Charge and Churn Rate by Number of Customers in Group

● Average of Monthly Charge ● Churn Rate

Churn Rate by Account Length (in months)

Top 5 Churn Category

Category	Value
Competitor	805
Attitude	287
Dissatisfaction	286
Price	200
Other	191