Capstone Project
EDA - Telecom Churn Analysis

By - Dishant Toraskar

CONTENT

Business Acumen

The telecommunication sector is made up of companies that make communication possible on a global scale, whether it is through the phone or the Internet.

Orange S.A. is one such French multinational telecommunication corporation(11th largest in the world) which have provided us with its cleaned customer data. We have to perform exploratory data analysis on a data provided to us and come up with a ways to decrease the churn rate of the customer.

Customer churn in the telecom industry poses one of the most significant risks to loss of revenue. Annual churn rates for telecommunications companies average between 10 percent and 67 percent.

We have to ensure that our customer continue to utilize our service and for that we have to retain them. Since, the cost of acquiring new customer is 25 times higher than the cost of retaining them.

Business Acumen

Business Problem - To Explore and analyze the cleaned customer data provided by Orange S.A., to discover key factors responsible for customer churn and suggest ways to ensure customer retention.

Business Metrics - Decrease % of customer churn rate (or increase the % of customer retention).

What is Churn Rate?

Rate at which customers stop doing business with an entity. We can also call it as the percentage of customers choosing to discontinue the service.

What is Retention?

Customer retention refers to a company's or product's ability to retain customers over time. If a company or product has low customer retention, it means that customers stop buying or using a product or service.

Data Summary

Before diving into analysis and visualization, let us first understand about the data we're going to deal with.

Data Provided - Telecom Churn.csv
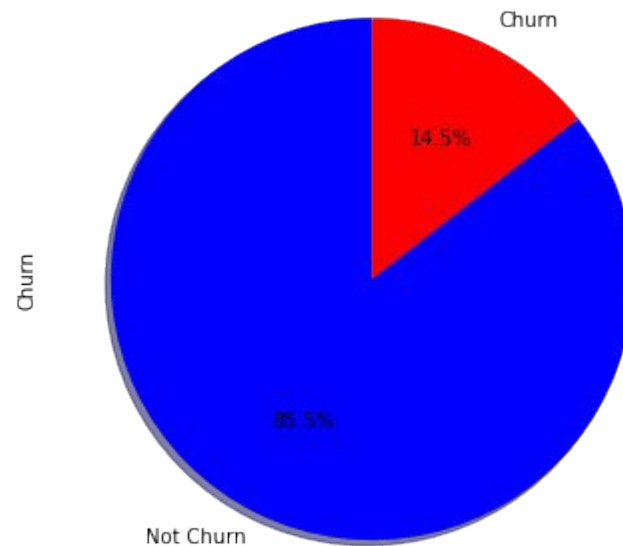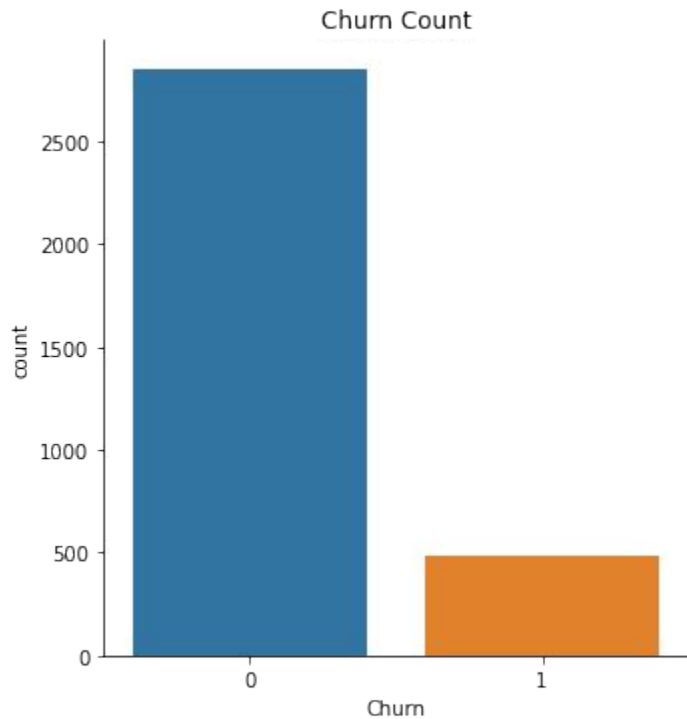
Data Shape - 3333 Rows and 20 Columns

Data Info - 1 Target Variable(Churn), 19 Features(15 Numerical & 4 Categorical) & No Null Values Present.

Churn can have 2 values True or False (I have replaced it with 0 for false and 1 for True respectively to perform analysis)
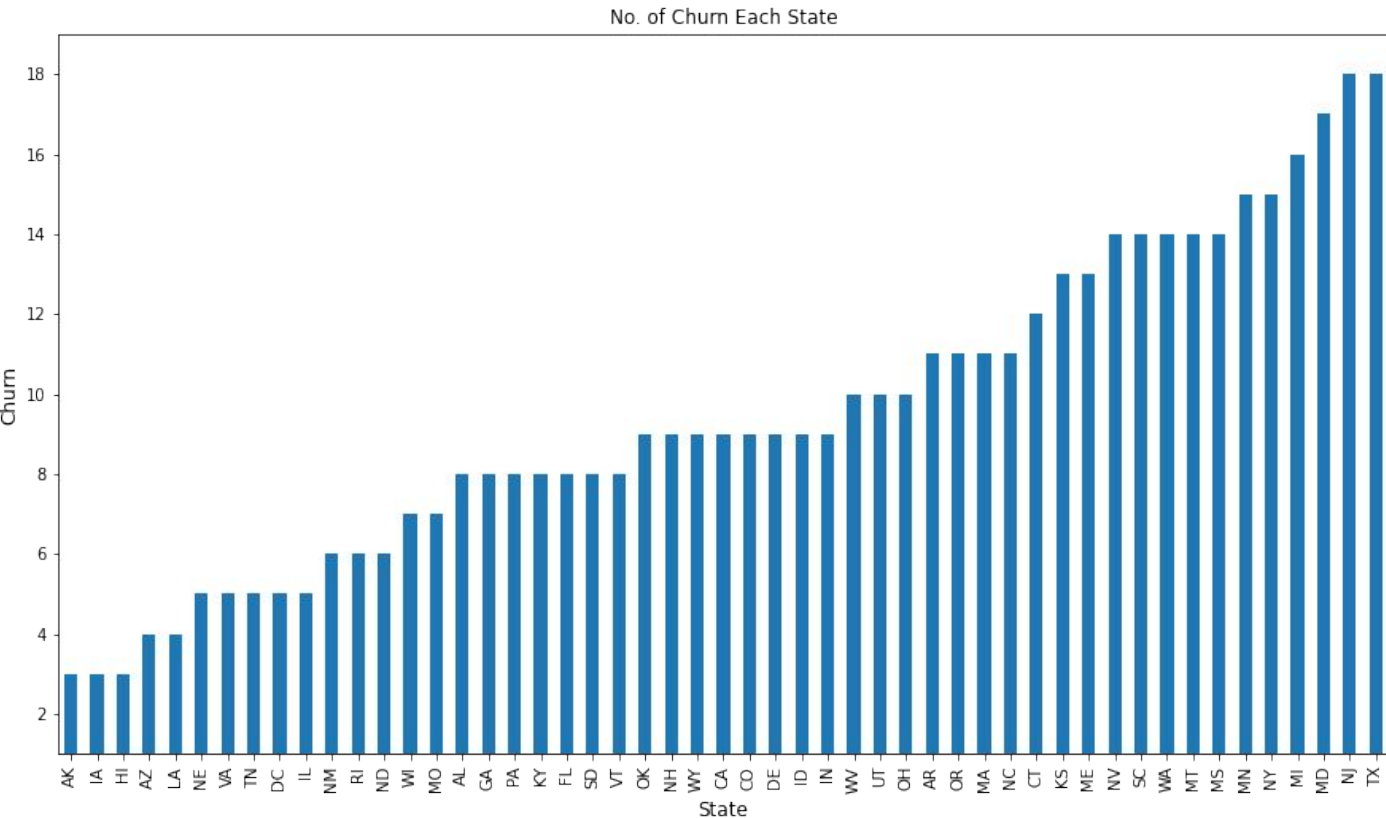
Dataframes - tele_df, state_data, international_plan, voice_mail_plan.

AI

Relationship Analysis

Churn Analysis

No. of Churn w.r.t. Each State


No. of Churn Each State

We can see that TX State have a higher number of churn where as AK is the lowest. But this might not be the same case when we consider Churn percent rate as there might be different number of customers from different State. E.g., TX may have 100s of customers whereas AK have only 10.

Churn Rate w.r.t. Each State

AI

Churn Rate w.r.t Each State
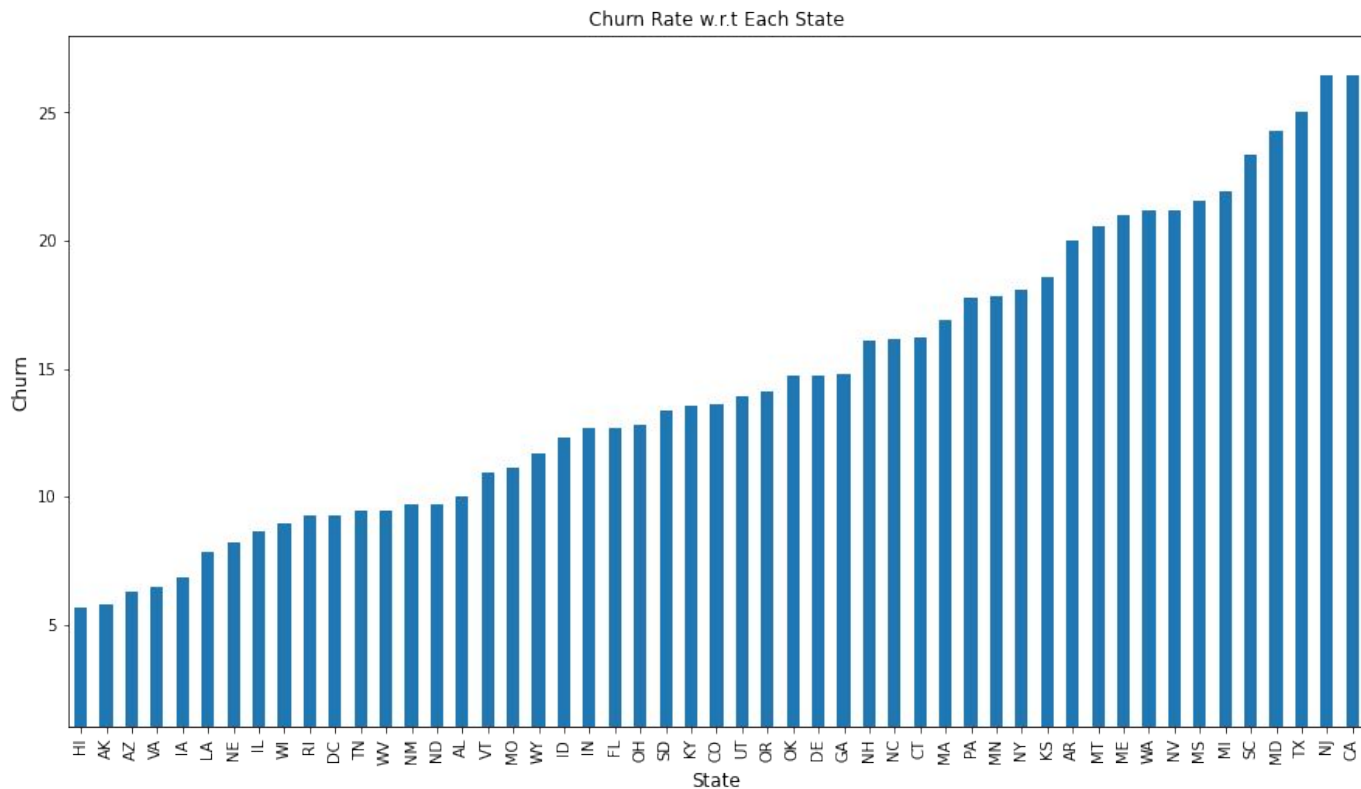
Here we can see that CA is the state with highest number of churn rate & HI as the lowest. So there's difference in number of customer churn per state and rate of customer churn per state.
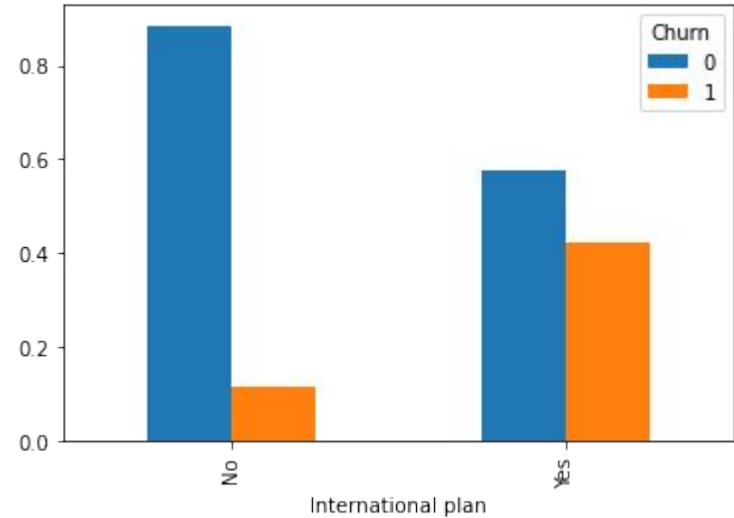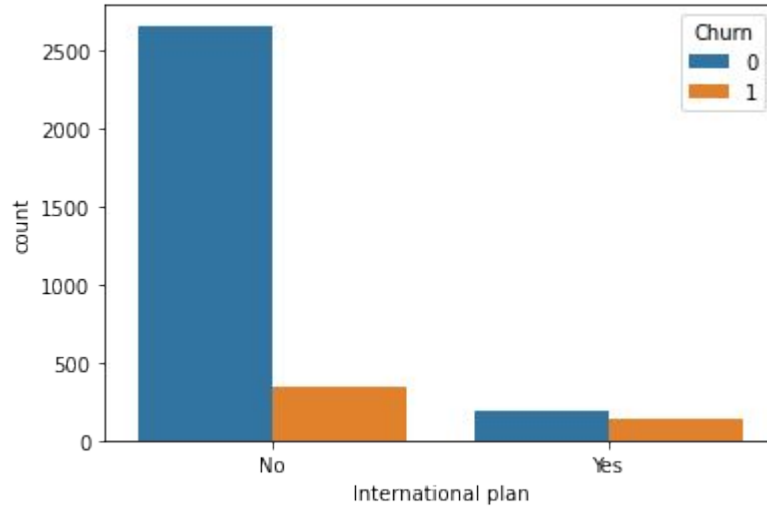
Churn w.r.t. Voicemail Plan
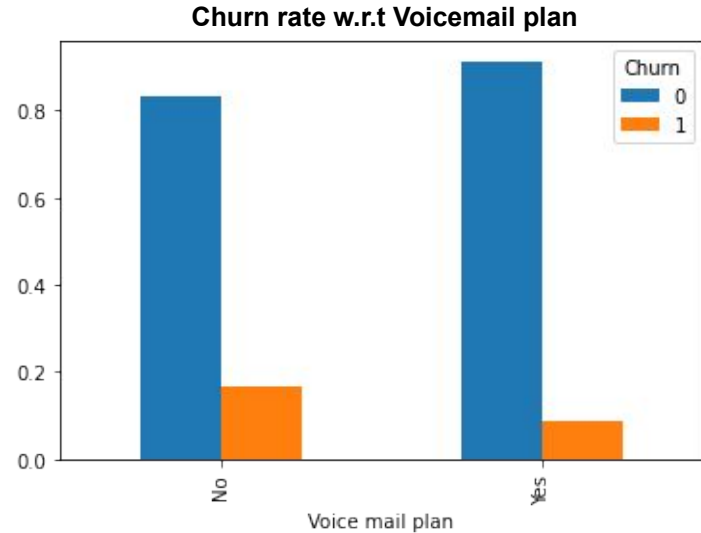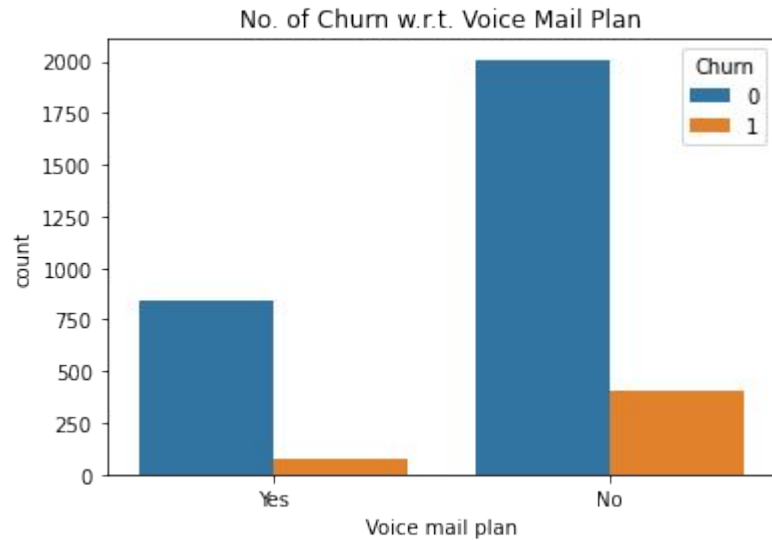
Here we can see that most no. of customer who don't have voicemail plan are more likely to quit then those who have voicemail plan.
Churn rate for those customer with -
i. Voicemail plan : ~8%
ii. No Voicemail plan : ~16%

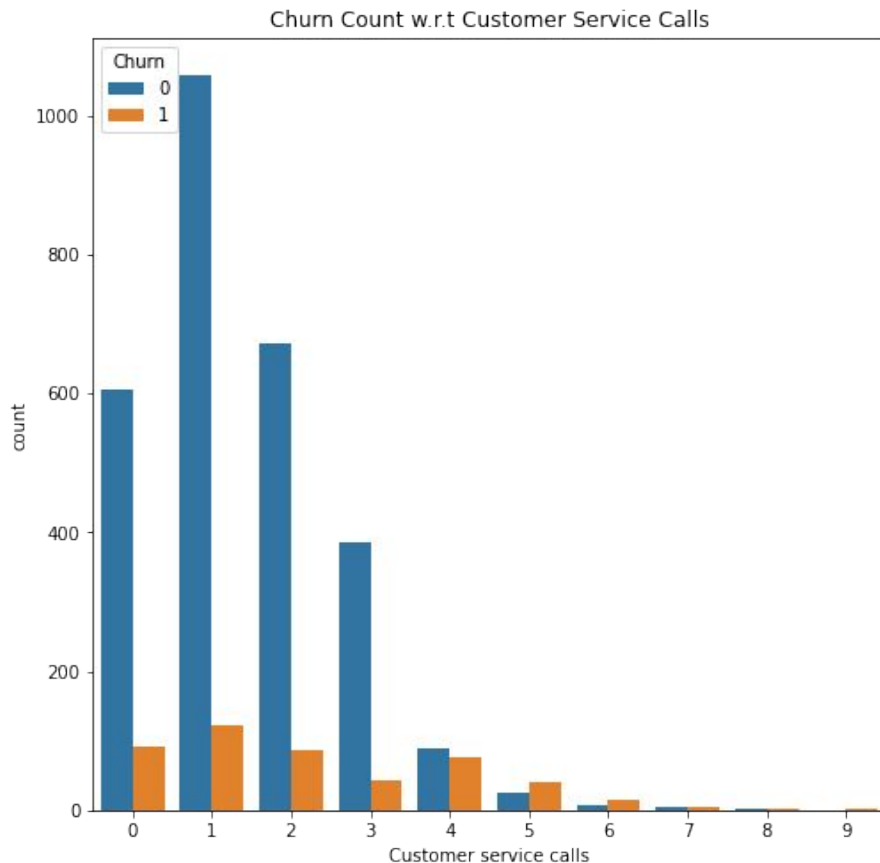# Churn w.r.t. International Plan

Here we can observe that those who have international plan are more likely to go churn.
Churn rate for -
 International plan customer's : ~42%
 Non-International plan customer's : ~11%

Churn w.r.t. Customer Service Calls

AI

Churn Count w.r.t Customer Service Calls

Here we can observe that Churn Rate increases w.r.t. increase in the number of customer services calls. The lower the customer service calls, lower are the chances of customer going churn.

Customer Service Calls(State) w.r.t Churn(State)

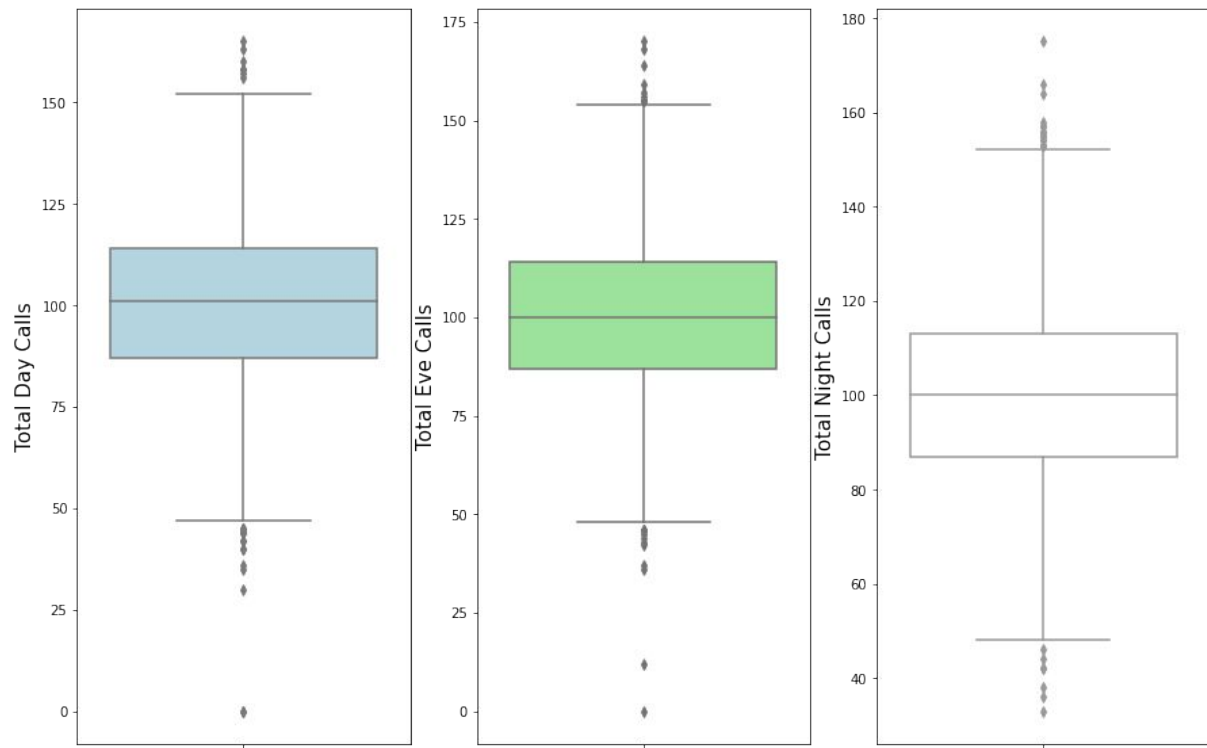Total Customer Serivce Calls(State) w.r.t. Total Churn(State)
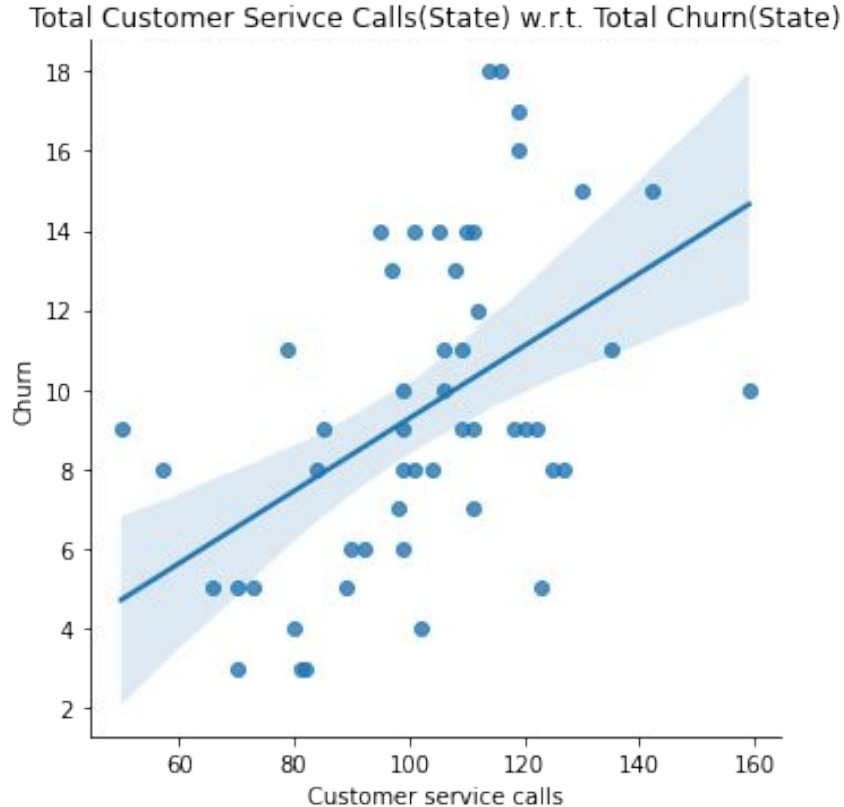
We can observe that as number of customer service calls increases then the number of churn increases. So if any state have higher customer service calls then the churn probability is higher.

Area Code w.r.t Churn Rate
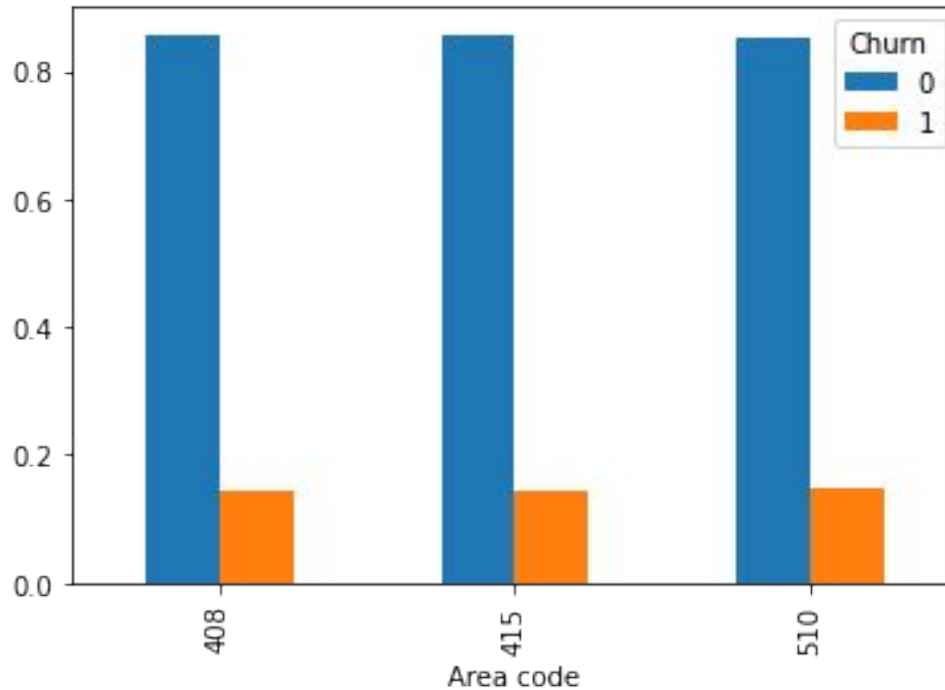
We can observe that all Area Code
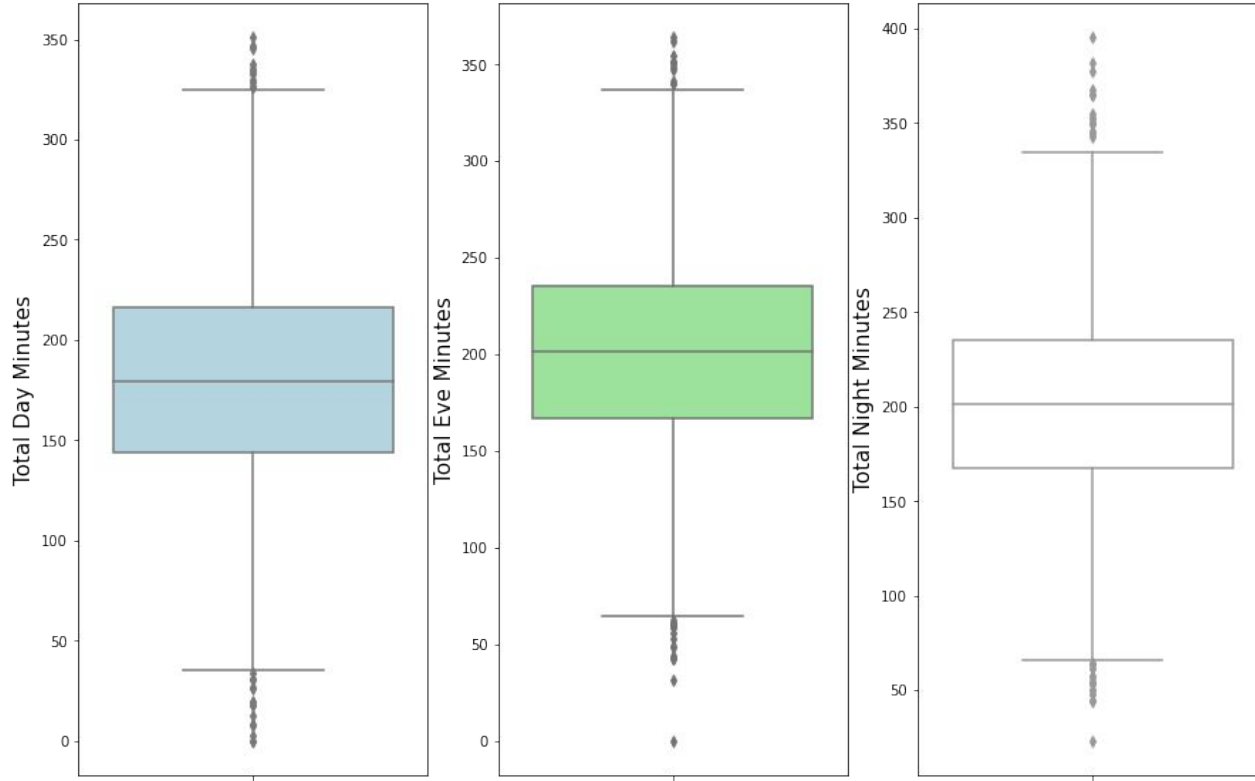have same percentage of Churn.

Total Calls(Day, Eve & Night)

Here we can see that most number of calls are made during days, then during evening and least number of calls are made in the night

Total Minutes(Day, Eve & Night)

Here we can observe that our customers tend to call for longer minutes during evening then during day time and least calling minutes is during night.

Total Charge(Day, Eve & Night)
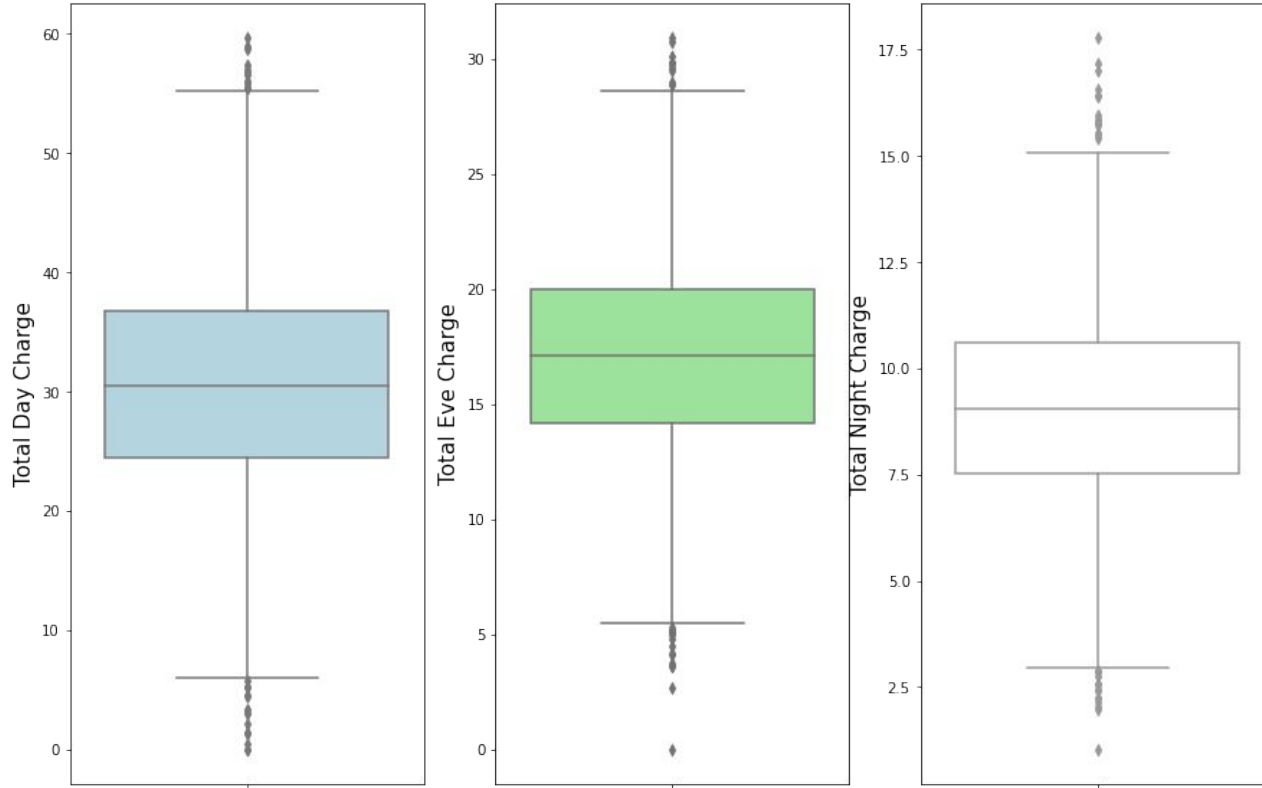
Here we can observe that the most number of call charge is incurred during evening calls followed by day calls and least during the night.

Relationship Between Total Minutes & Churn
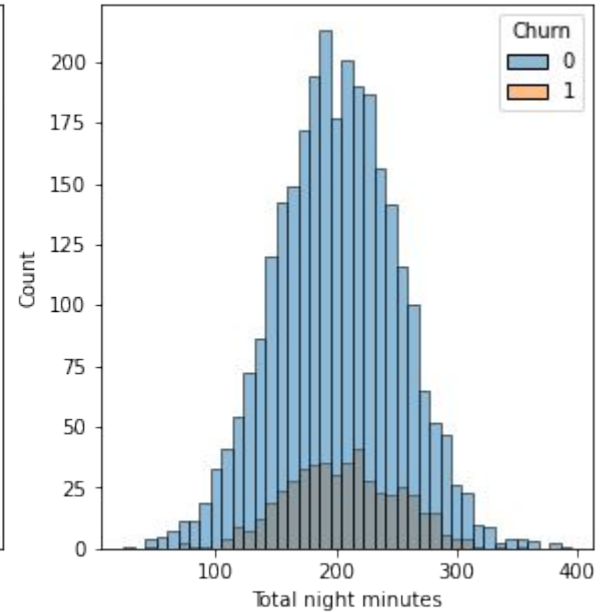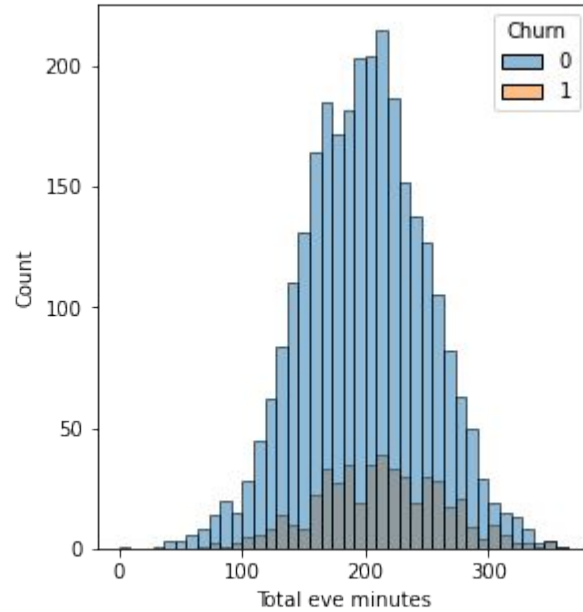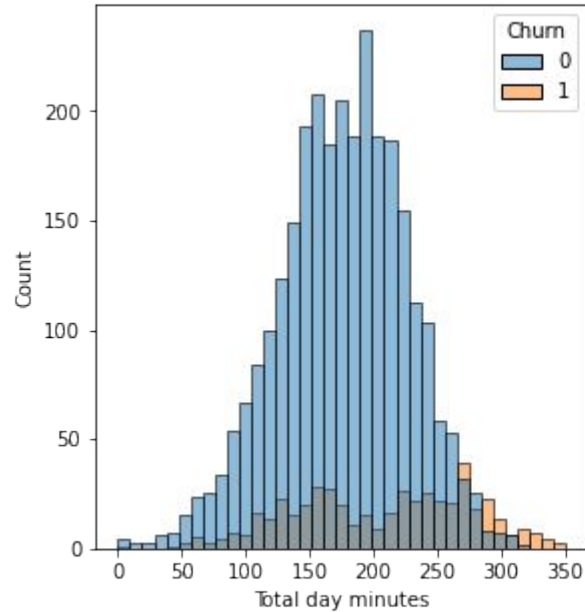
We can observe that those customers who spends more minutes on call during day are more likely to go churn then those during evening and night time.

Day Calls Summary (Charge, Minutes & Calls)
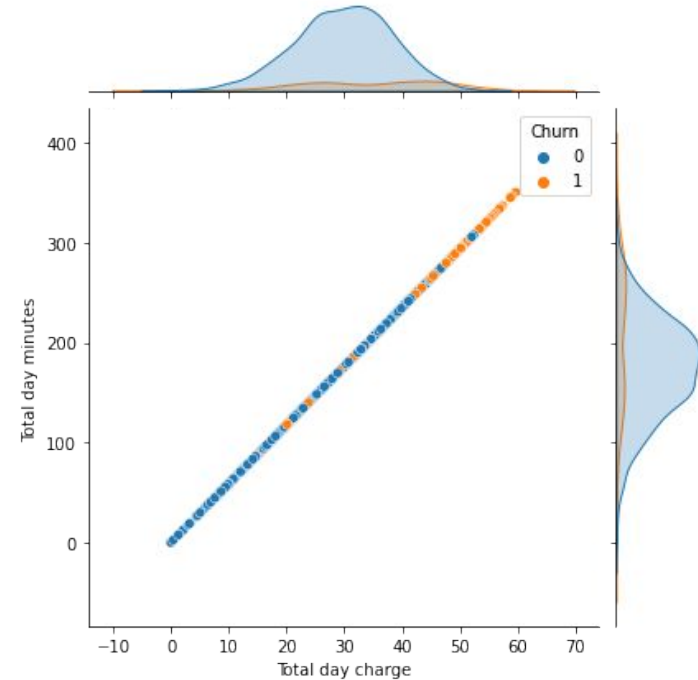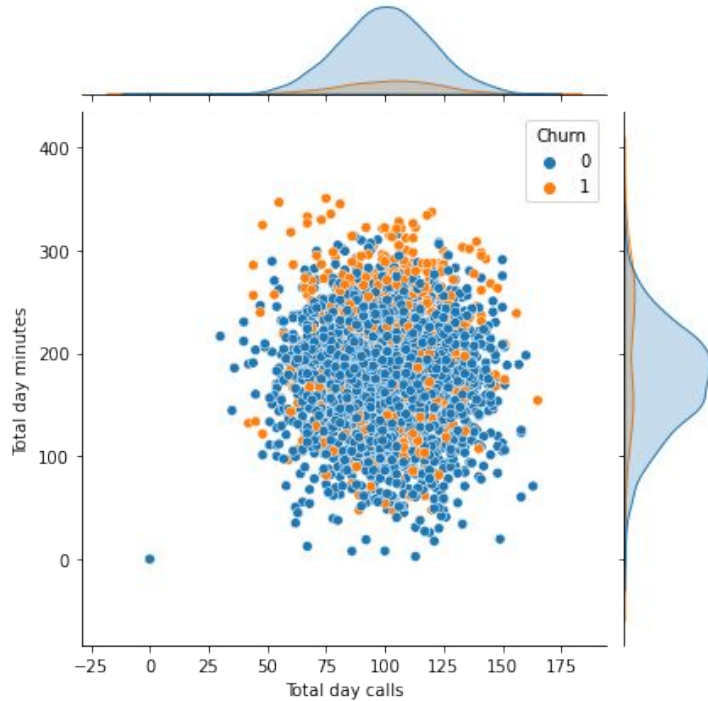
There's linear relationship between total day minutes and total day charge. And also as we saw earlier, if customers spends more time on calls then they are more likely to go churn. There's no relationship between total day minutes w.r.t total day calls.

Total International Calls w.r.t. Churn
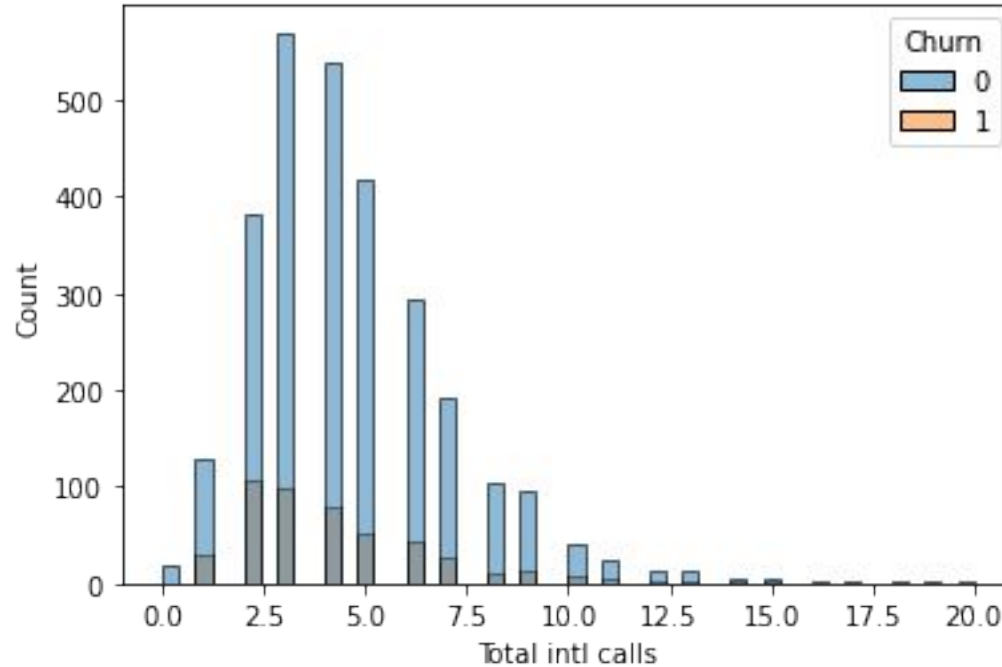
Here we can observe that most number of international calls by each customer is made between 2 to 7 times. And also most customer's make approximately 2 to 7 international calls and also the chance of them going churn is linearly correlated.

Total Intl Minutes & Charge
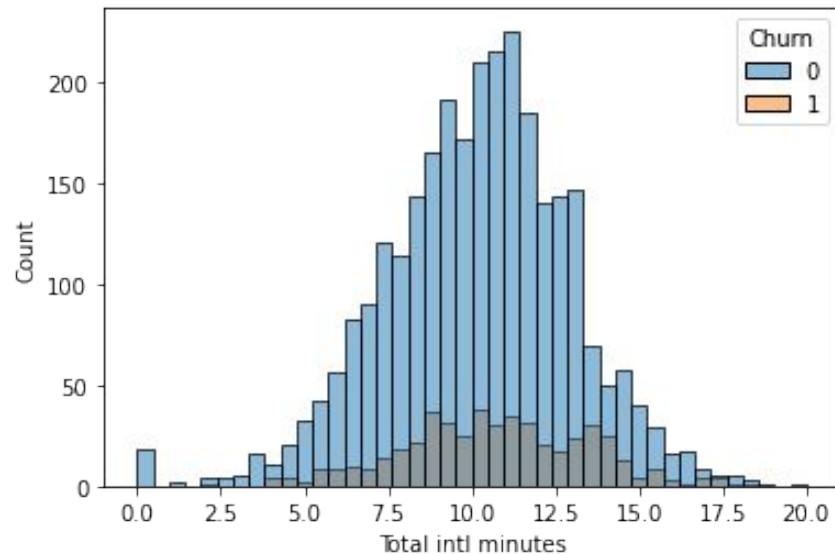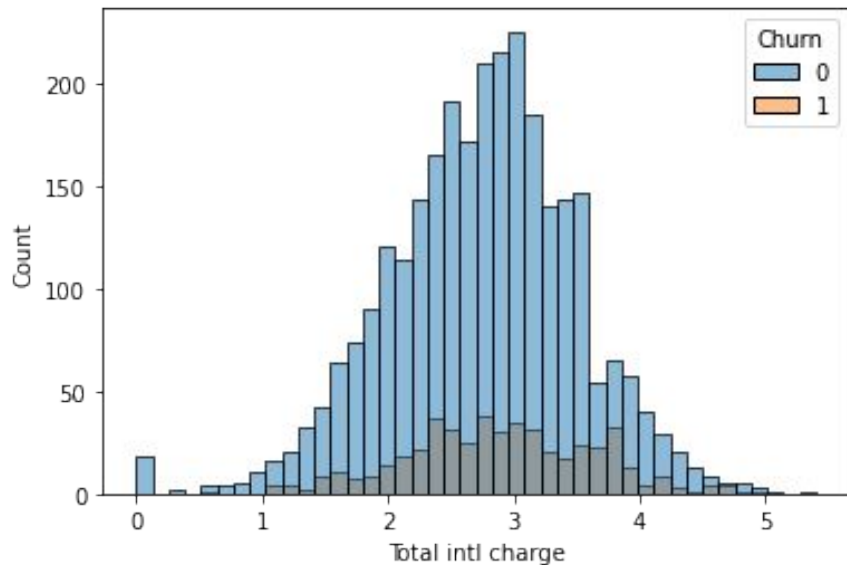
Most of our customer incur intl charge between 2.5 up 3.5. And also we can observe that those who incurred intl charge of more than 3.5 have high chances of going churn.
Also for total intl minutes, we can see that most minutes our customer spend on intl calls is between 8 to 13 minutes. Those who spend more than 13 minutes have higher chances of going churn.

Total Intl Minutes & Charge
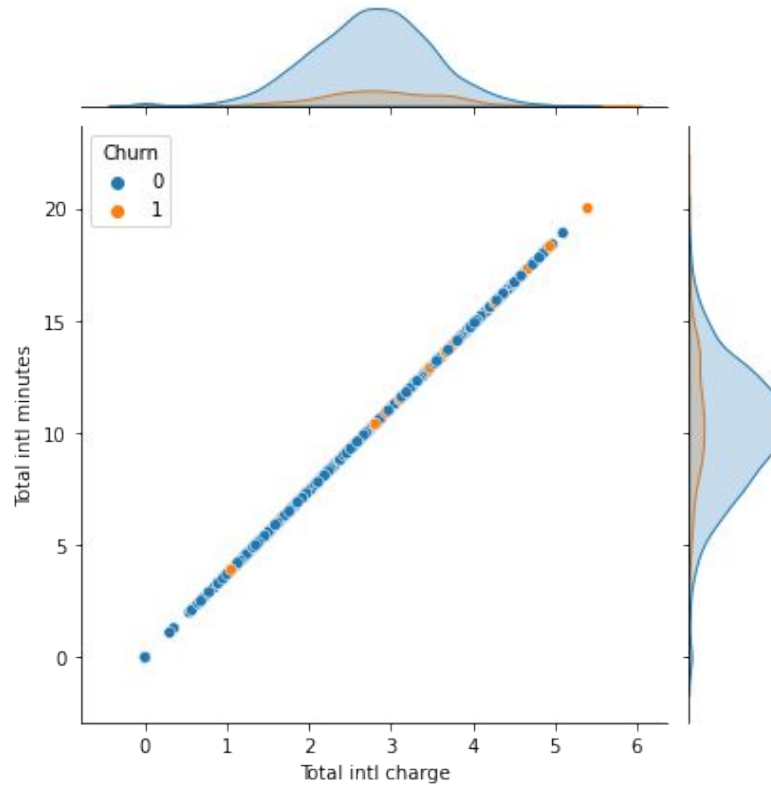
There's linear relationship between total international minutes and charge.

Correlation Heatmap

From the above heatmap we can observe that-

1. Correlation w.r.t Churn -
    - Total day minutes to Churn at 0.21
    - Total day charge to Churn at 0.21
    - Customer service calls to Churn is 0.21
    - Total minutes to churn is 0.2
2. Correlation w.r.t each other -
    - Total day charge to Total day minutes at 1
    - Total evening charge to total eve minutes at 1
    - Total night charge to total night minutes at 1
    - Total day minutes & day charge to total minutes is 0.61
    - Total eve minutes, charge & night minutes,charge to total minutes is 0.56

Inferences

- Most of our customer's does not opt for **International plan** and those who opt are more likely to go churn.
- Around **16%** of our customers are more likely to be go churn who have not opted for **Voicemail plan** & **8%** will go churn for those who have opted for a plan.
- Customers who call **Customer service** for **4** or more times are more likely to go churn then those who call **3** times or less than that.
- TX State have a highest number of customer churn where as AK is the State with lowest number of customer churn.
- **Area code** does not have any direct relationship with customer churn, as churn rate is same for each and every **Area code**
- Customers who spends more time during the day on calls are more likely to go Churn.
- Most of our customers prefer to calls more during the day time but speak for less time. Those who call during night time are the one who spends more time on calls.

- Those customers who don't have **international plan** have **more calls overseas** as compared to those who have international plan.
- **NZ State** has a **highest percentage of Churn rate**.
- Those who have **international calls between 2 - 5 hive higher chances of churn** then compared to other's.
- Those who incur a **cost of international calls of more than 2,** are more likely to go **churn**.
- Those who have **intl minutes of more than 8** have **higher chances of going churn**.
- There's l**inear relationship** between **total international charge** and **total international minutes**.
- Even if it's **day, evening or night calls** we can see there's **linear relationship** between **charges & minutes**.
- **Total day calls have high correlation** to **charges and minutes** w.r.t. **churn**. **Total day calls & minutes to churn** have correlation of **0.21**.

Key Factors Responsible For Churn

AI

1. Customers who have **international plan** will most probably go **churn** which may be cause of **higher cost for international plan**.
2. Customers who **calls during day and have higher calling minutes** will go **churn**.
3. Customers who **calls customer service** more **frequently** are likely to go **churn**. So it's our responsibility to troubleshoot the problem face by them as soon as & efficiently possible.
4. Customers who **don't have voicemail plan** are more likely to go **churn**.
5. Customers if they **incur international charge** of **more than 8** are more likely to go **churn**.
6. Other factors may include **poor connectivity issues**.

Recommendations For Retention of Customer

1. We must try to **introduce a new scheme** for **international plan**. By which our **customers will be benefited** more than what they are getting now. Also we can **decrease the cost** of our **international plan** as we can see those customers who incur **international charge of more than 8** are more likely to go **churn**.

2. We can **introduce a beneficial service** for those **who calls more number of time**. Like **unlimited calling** for **limited days**.

3. Also we can **cut down the cost** for those customers **who tends to have longer talk-time**.

4. **Improvement in customer services** can be done so that **churn w.r.t more number of customer service** calls doesn't get increased.

5. We can **introduce a State based plan** for states **where we have higher rate of customer churn**.

6. We can **try to improve** if there's **any connectivity issue**.

Conclusion

- Average churn rate of telecom companies is between 10% & 67% Annually.
- Orange S.A. have customer churn of 14.5%.
- TX have the highest number of customer churn and CA have the highest rate of customer churn.
- Customers who don't have voicemail plan are more likely to go churn then those who have.
- Customers who have international plan are more likely to go churn.
- Customers who calls customer care for 4 or more times are more likely to go churn.
- Higher the customer service calls in state higher the churn rate.
- Customers who spends more minutes on calls during day time are more likely to go churn.
- We can decrease the customer churn and improve their retention rate by improving customer care, decreasing the cost for international plan, availing more benefits for customers who spends more time on calls, improving connectivity issues, etc.

THANK YOU