

# Capstone Project Telecom Churn Analysis



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# **Team Information**

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#### **Business Problem Overview**

- Customer churn prediction is extremely important for any business as it recognizes the clients who are likely to stop using their services.
- In the telecom industry, customers are able to choose from multiple service providers and actively switch from one operator to another. In this highly competitive market, the telecommunications industry experiences an average of 15-25% annual churn rate.
- For many incumbent operators, retaining high profitable customers is the number one business goal.
- To reduce customer churn, telecom companies need to predict which customers are at high risk of churn.
- In this project, we will analyze customer-level data of a leading telecom firm, to identify customers at high risk of churn and identify the main indicators of churn.



#### **Objective**

- Finding factors which influence customers to churn.
- Retain churn customers by applying strategy.
- Providing offers based on influencing factors.
- Control churn rate and improve the image in the market.



# **Data Summary**

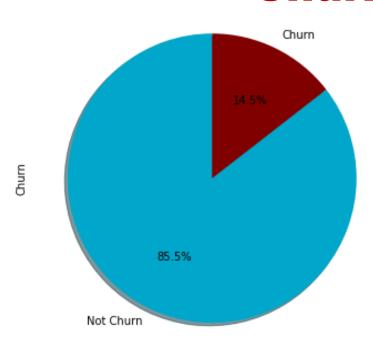
Data set: Telecom Churn dataset of Orange S.A., formerly France Télécom S.A. Shape:

- Rows 3333
- Columns 20

Important Columns: State, Area code, International plan, Voice mail plan, Churn, Customer service calls, Total eve calls, Total day calls, Total night calls, Total intl calls.( Probably all columns are important ).



#### **Churn Information**



Total Users were 3333.

2850 - Non churn (85.5%)

483 - Churn (14.5%)

# Al

- 0.4

- 0.2

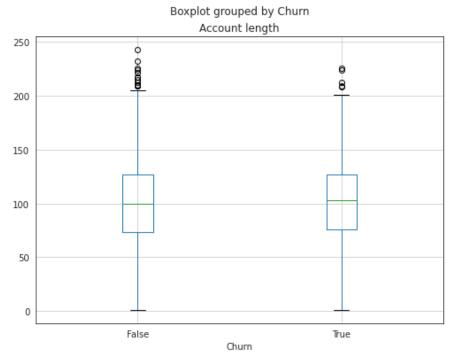
- 0.0

# **Correlation**

_		Correlation Matrix															
Account length -	1.00	-0.01	-0.00	0.01	0.04	0.01	-0.01	0.02	-0.01	-0.01	-0.01	-0.01	0.01	0.02	0.01	-0.00	0.02
Area code -	-0.01	1.00	-0.00	-0.01	-0.01	-0.01	0.00	-0.01	0.00	-0.01	0.02	-0.01	-0.02	-0.02	-0.02	0.03	0.01
Number vmail messages -	-0.00	-0.00	1.00	0.00	-0.01	0.00	0.02	-0.01	0.02	0.01	0.01	0.01	0.00	0.01	0.00	-0.01	-0.09
Total day minutes -	0.01	-0.01	0.00	1.00	0.01	1.00	0.01	0.02	0.01	0.00	0.02	0.00	-0.01	0.01	-0.01	-0.01	0.21
Total day calls -	0.04	-0.01	-0.01	0.01	1.00	0.01	-0.02	0.01	-0.02	0.02	-0.02	0.02	0.02	0.00	0.02	-0.02	0.02
Total day charge -	0.01	-0.01	0.00	1.00	0.01	1.00	0.01	0.02	0.01	0.00	0.02	0.00	-0.01	0.01	-0.01	-0.01	0.21
Total eve minutes -	-0.01	0.00	0.02	0.01	-0.02	0.01	1.00	-0.01	1.00	-0.01	0.01	-0.01	-0.01	0.00	-0.01	-0.01	0.09
Total eve calls -	0.02	-0.01	-0.01	0.02	0.01	0.02	-0.01	1.00	-0.01	-0.00	0.01	-0.00	0.01	0.02	0.01	0.00	0.01
Total eve charge -	-0.01	0.00	0.02	0.01	-0.02	0.01	1.00	-0.01	1.00	-0.01	0.01	-0.01	-0.01	0.00	-0.01	-0.01	0.09
Total night minutes -	-0.01	-0.01	0.01	0.00	0.02	0.00	-0.01	-0.00	-0.01	1.00	0.01	1.00	-0.02	-0.01	-0.02	-0.01	0.04
Total night calls -	-0.01	0.02	0.01	0.02	-0.02	0.02	0.01	0.01	0.01	0.01	1.00	0.01	-0.01	0.00	-0.01	-0.01	0.01
Total night charge -	-0.01	-0.01	0.01	0.00	0.02	0.00	-0.01	-0.00	-0.01	1.00	0.01	1.00	-0.02	-0.01	-0.02	-0.01	0.04
Total intl minutes -	0.01	-0.02	0.00	-0.01	0.02	-0.01	-0.01	0.01	-0.01	-0.02	-0.01	-0.02	1.00	0.03	1.00	-0.01	0.07
Total intl calls -	0.02	-0.02	0.01	0.01	0.00	0.01	0.00	0.02	0.00	-0.01	0.00	-0.01	0.03	1.00	0.03	-0.02	-0.05
Total intl charge -	0.01	-0.02	0.00	-0.01	0.02	-0.01	-0.01	0.01	-0.01	-0.02	-0.01	-0.02	1.00	0.03	1.00	-0.01	0.07
Customer service calls -	-0.00	0.03	-0.01	-0.01	-0.02	-0.01	-0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	1.00	0.21
Churn -	0.02	0.01	-0.09	0.21	0.02	0.21	0.09	0.01	0.09	0.04	0.01	0.04	0.07	-0.05	0.07	0.21	1.00
	Account length -	Area code -	Number vmail messages -	Total day minutes -	Total day calls -	Total day charge -	Total eve minutes -	Total eve calls -	Total eve charge -	Total night minutes -	Total night calls -	Total night charge -	Dtal intl minutes -	Total intl calls -	Total intl charge -	Customer service calls -	- Whum -



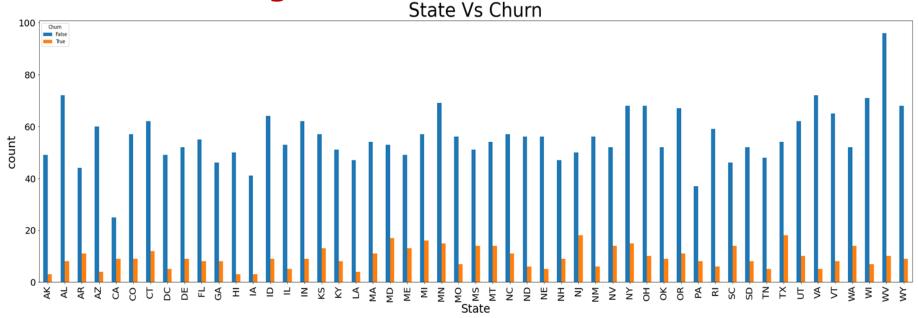
# **Analysis based on Account Length**



The mean of Account length is almost similar for both churn groups.



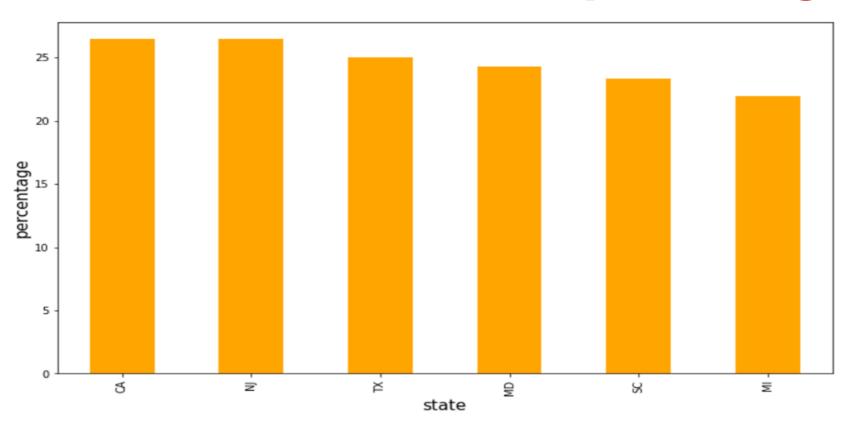
# **Analysis based on States**



There are 51 state who have different churn rate. CA, NJ,TX, MD,SC,MI are the ones who have higher churn rate more than 21.74% which is more than 50% of average churn rate.

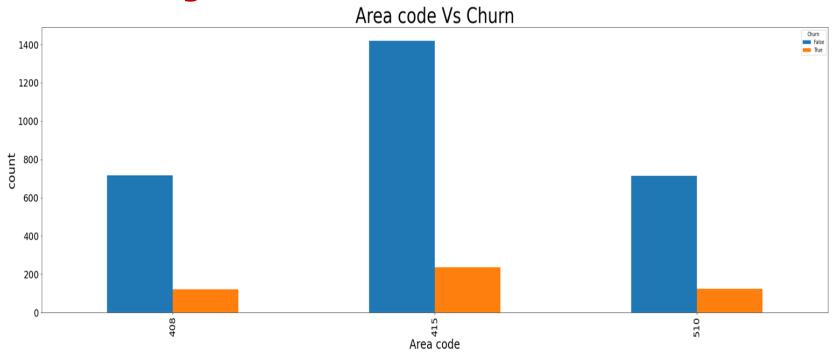


# State with most Churn percentage





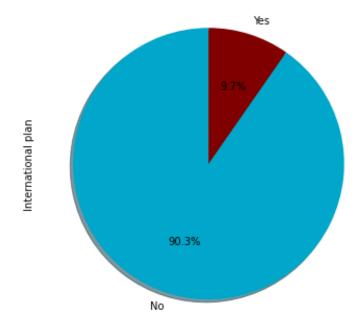
# **Analysis Based on Area Code**



All the Area codes have almost equal (.14%) percentage of Churners.



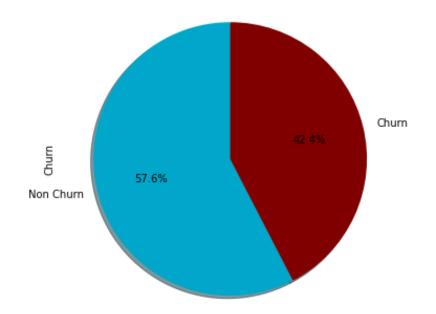
### **Analysis Based on International Plan**



Out of 3333 people only 323 have a International Plan, rest 3010 do not have International Plan



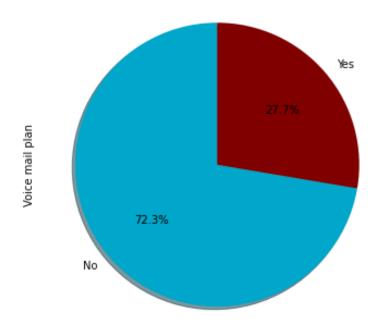
#### International Plan vs Churn



323 people having International plan about 42.4% are Churn.



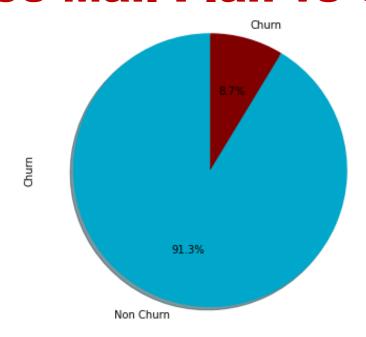
# **Analysis Based on Voice mail**



Out of 3333 people 922 having Voice mail plan, rest 2411 do not have any
Voice mail plan.



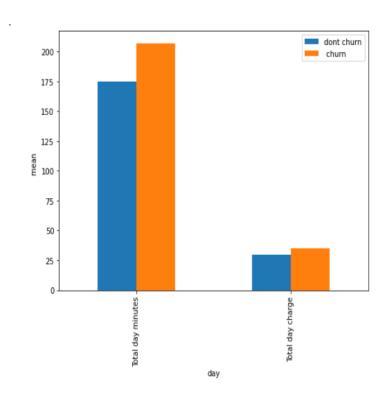
#### **Voice Mail Plan vs Churn**

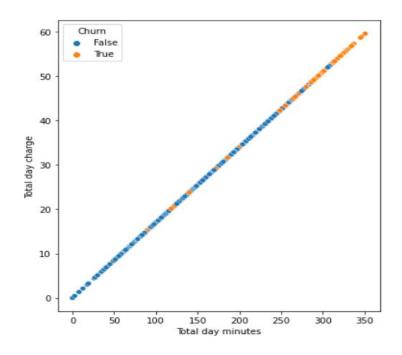


922 people having Voice mail plan about 8.7% are Churn.



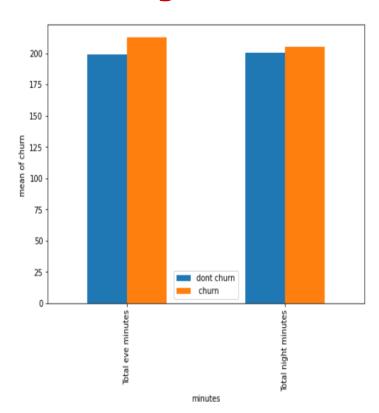
# **Analysis based on Day Calls**

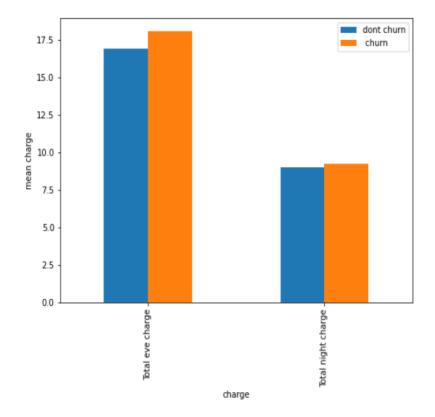






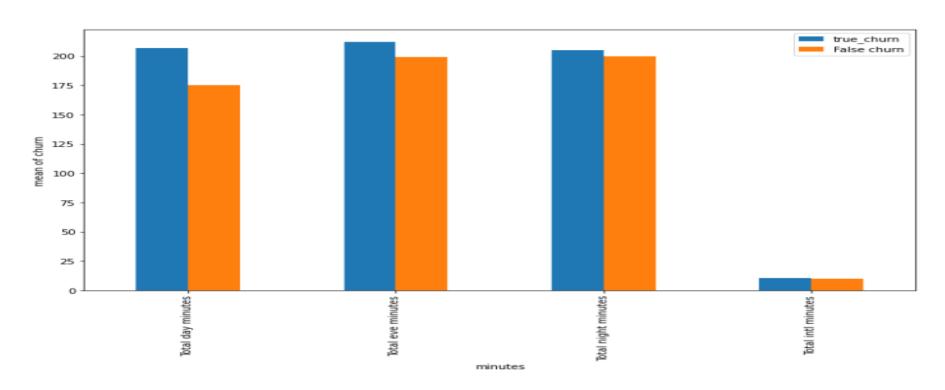
# Analysis based on eve/night calls





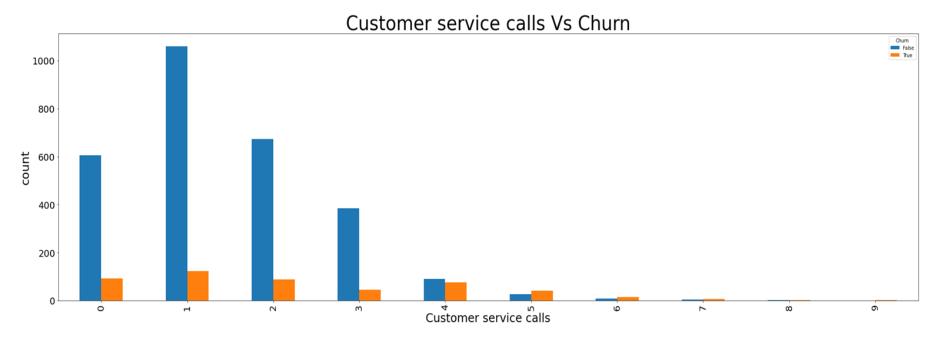


# **Analysis based on total calls**





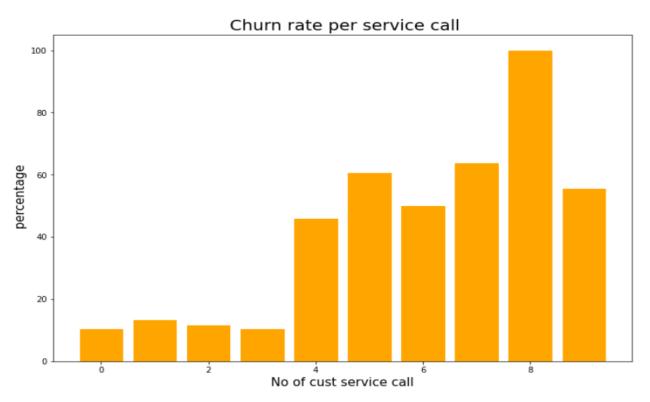
# **Analysis based on Customer Service Call**



Customers with more than 4 service calls their probability of leaving is more.



# **Churn Rate as per Service Call**





# **Challenges**

- Difficult to recognise columns like- (Account Length, Number vmail messages. Etc.) as while subset these we got lot of possibilities of true churn and have to work for each possibilities.
- Need to plot lot of Graph for different States as well as different Area codes to understand the data and handling the data.
- Need to subset for respective State having respective Area code till it reaches a dozen of customers.



#### **Solution to Reduce Customer Churn**

- Modify International Plan as the charge is same as normal one.
- Be proactive with communication.
- Ask for feedback often.
- Periodically throw Offers to retain customers.
- Look at the customers facing problem in the most churning states.
- Lean into best customers.
- Regular Server Maintenance.
- Solving Poor Network Connectivity Issue.
- Define a roadmap for new customers.
- Analyze churn when it happens.
- Stay competitive.



#### **Conclusion**

- The four charge fields are linear functions of the minute fields.
- The area code field and/or the state field are anomalous, and can be omitted.
- Customers with the International Plan tend to churn more frequently.
- Customers with four or more customer service calls churn more than four times as often as do the other customers.
- Customers with high day minutes and evening minutes tend to churn at a higher rate than do the other customers.

There is no obvious association of churn with the variables evening calls, night calls, international calls, night minutes, international minutes, account length.



# Q & A