TELECOM CHURN CASE STUDY

Group Members:

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BACKGROUND

Telecom Churn Case Study

- 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.

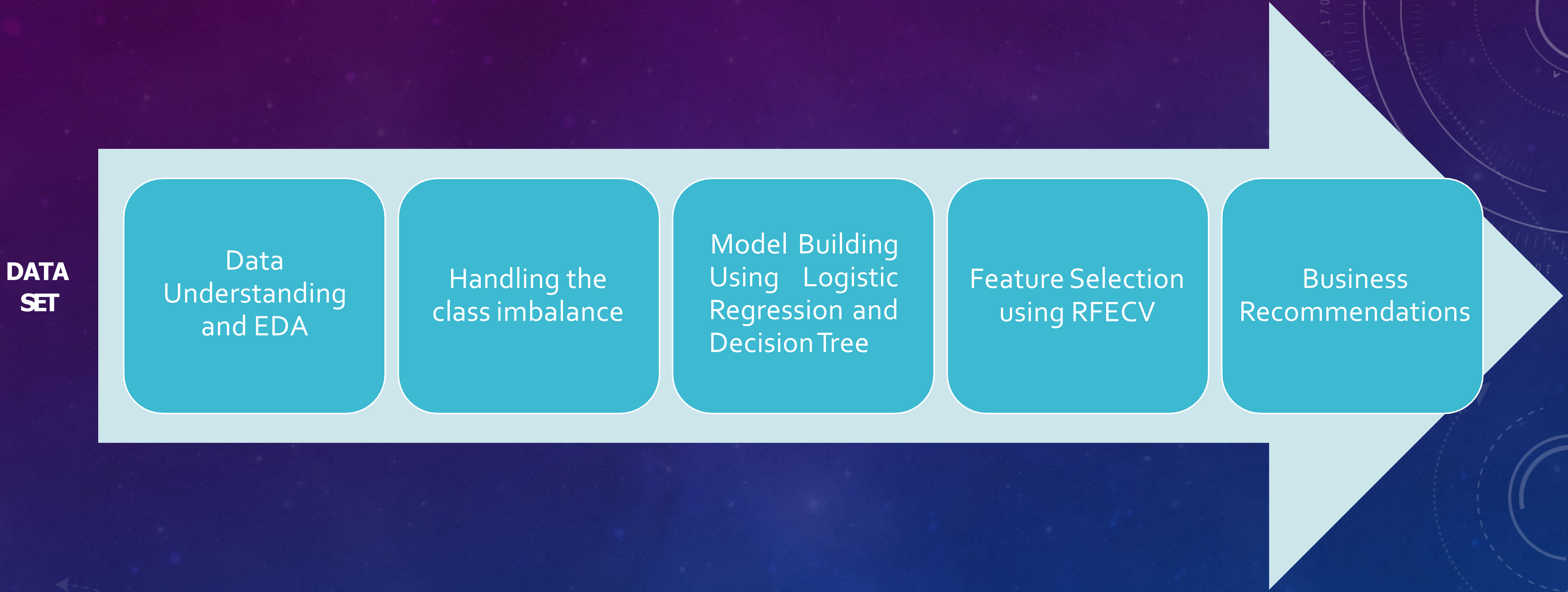
- Given the fact that it costs 5-10 times more to acquire a new customer than to retain an existing one, **customer retention** has now become even more important than customer acquisition.

BUSINESS OBJECTIVE

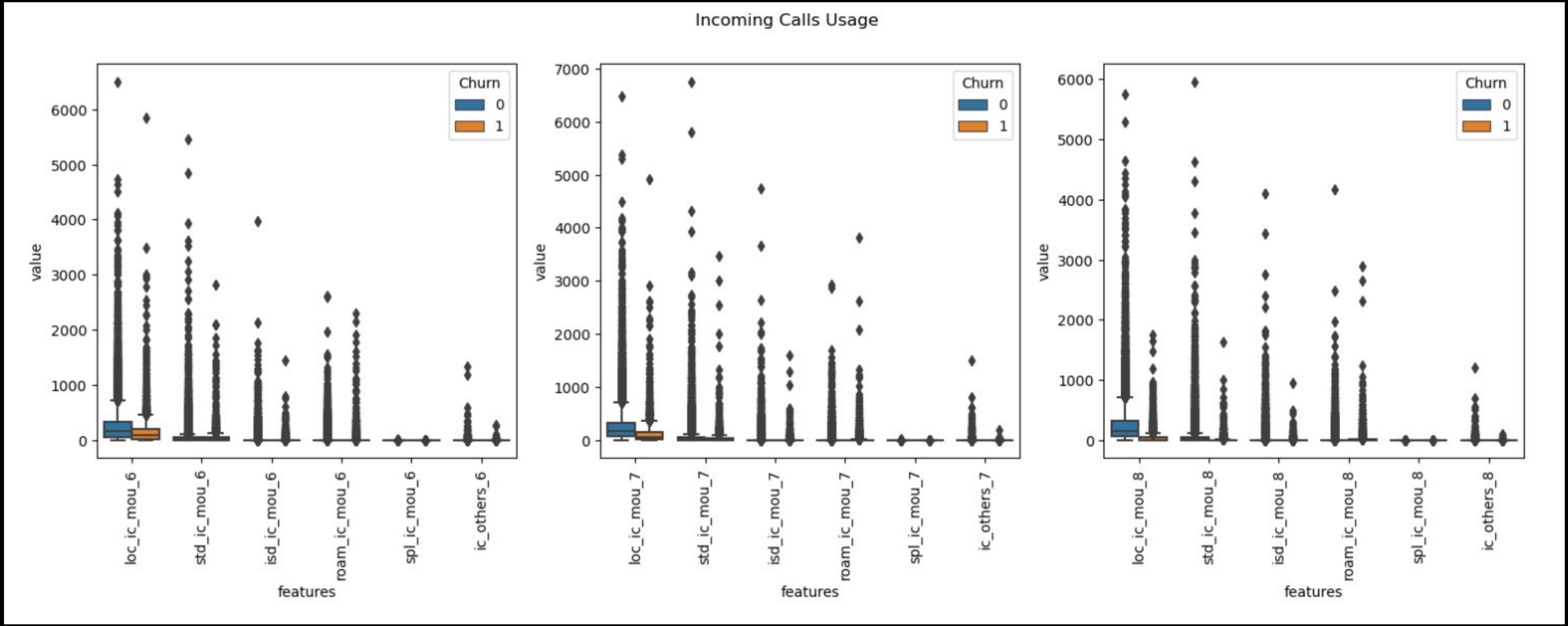
Telecom Churn Case Study

- The business objective is to predict the churn in the last (i.e. the ninth) month using the data (features) from the first three months. To do this task well, understanding the typical customer behavior during churn will be helpful.

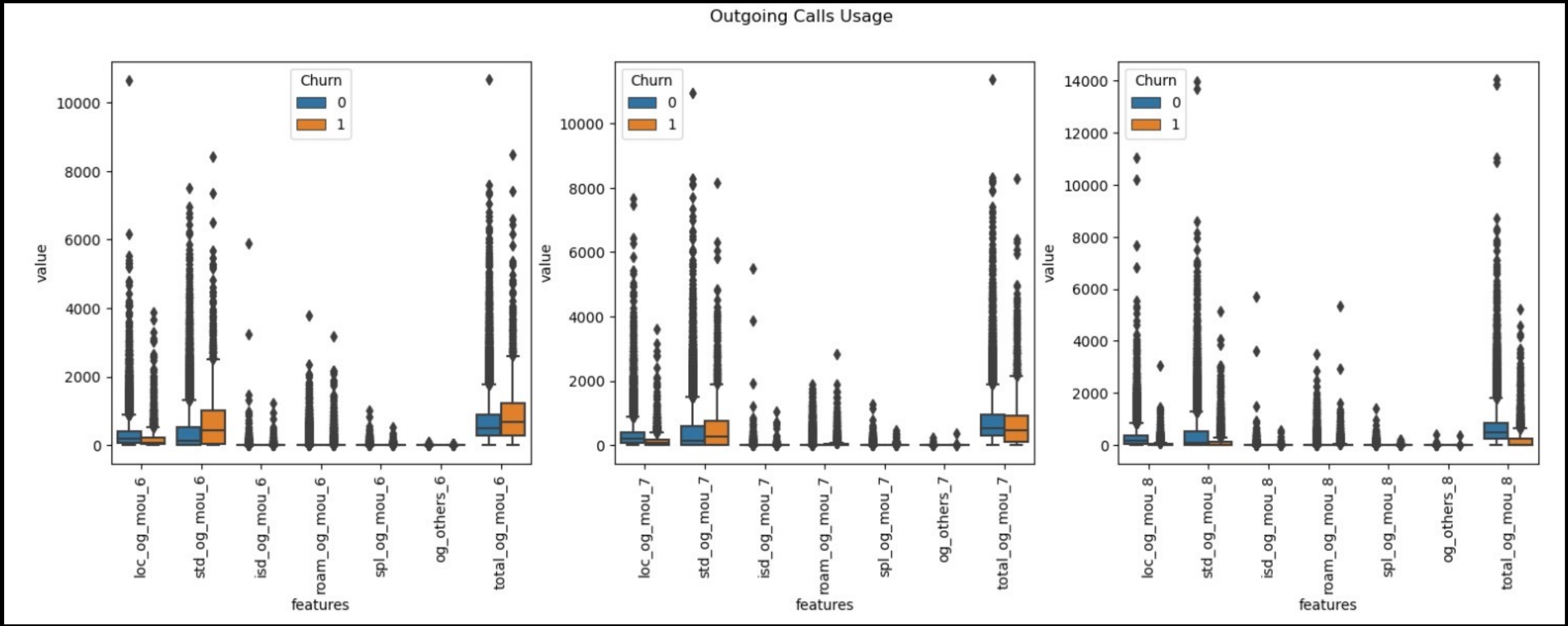
PROCESS FOR SOLVING CASE STUDY



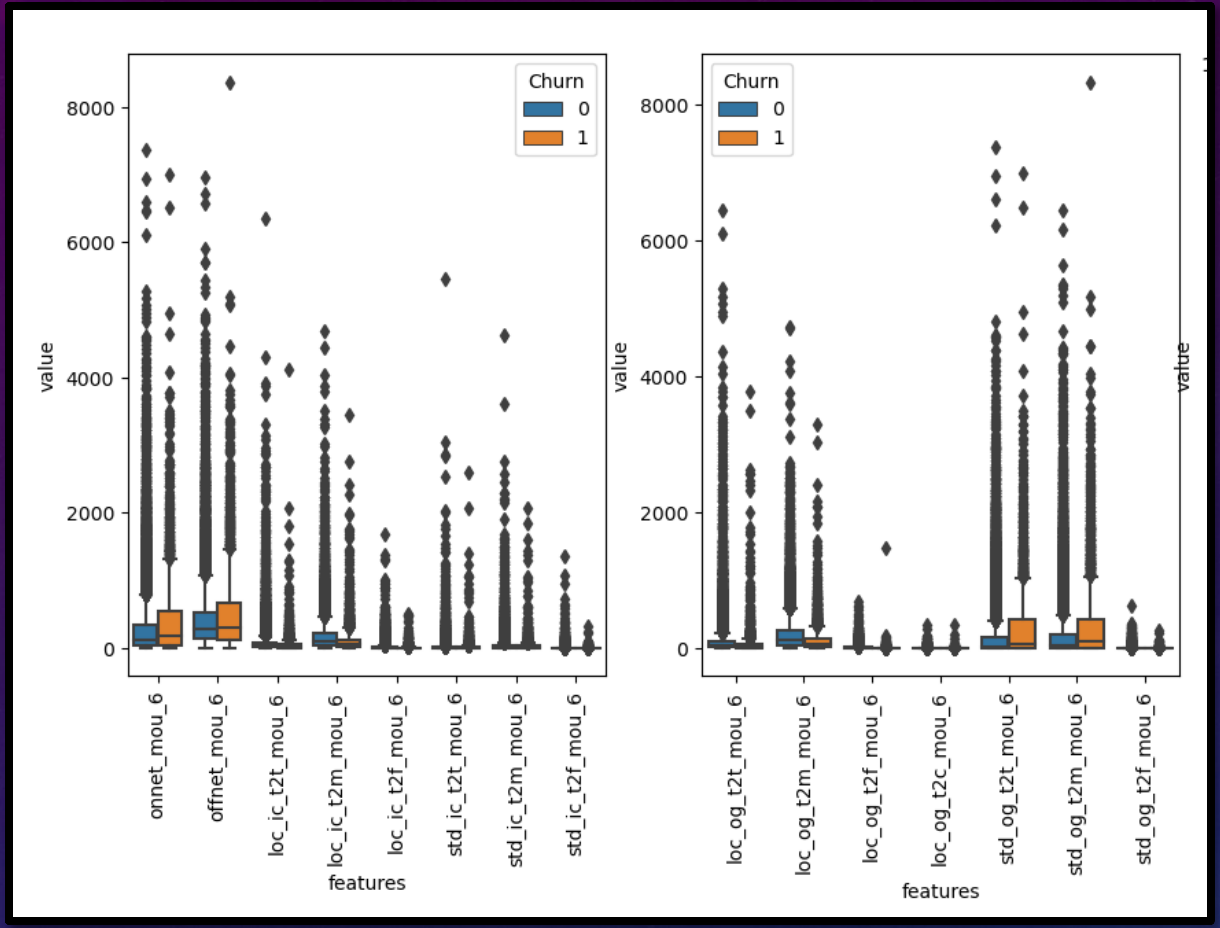
PLOTS (VISUALIZATION)

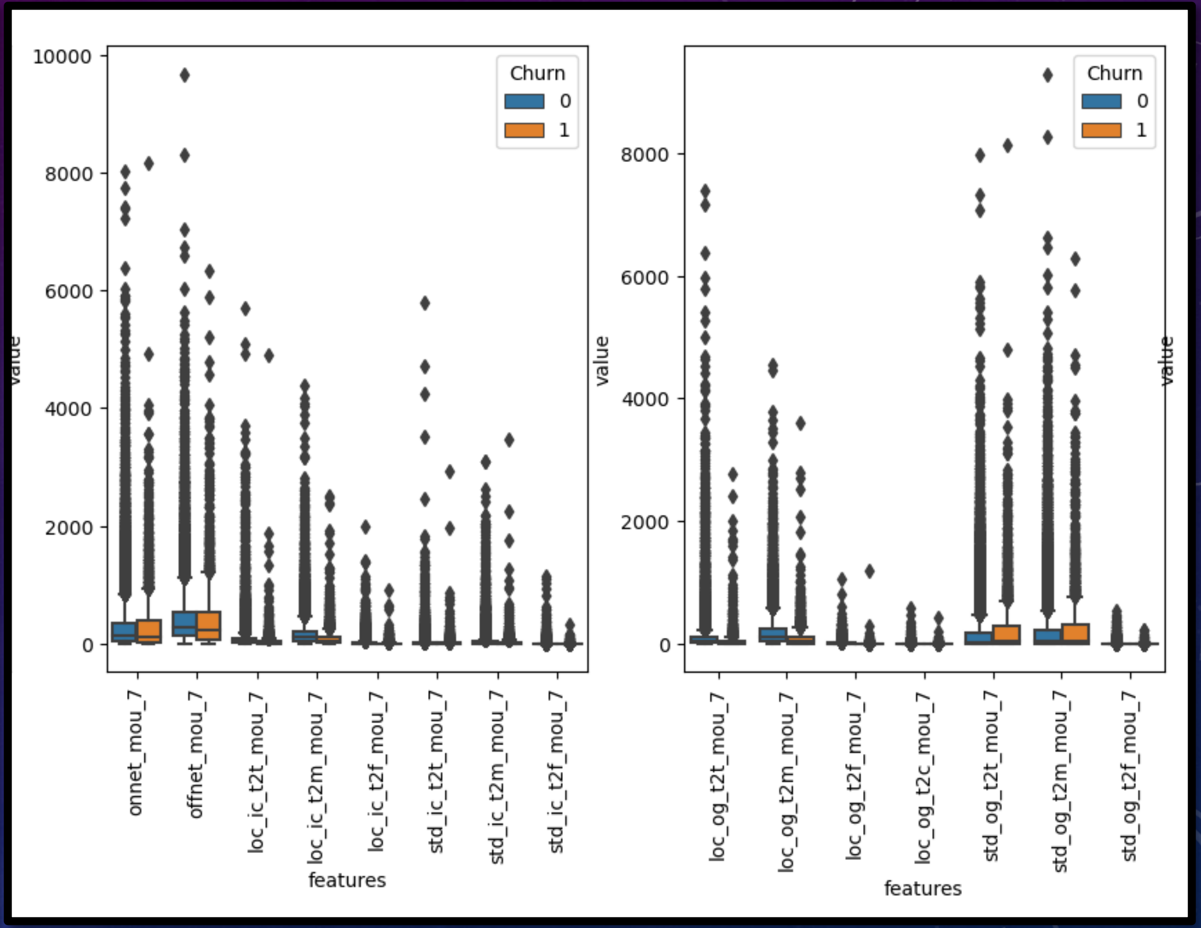


EDA box plot for the incoming call usage

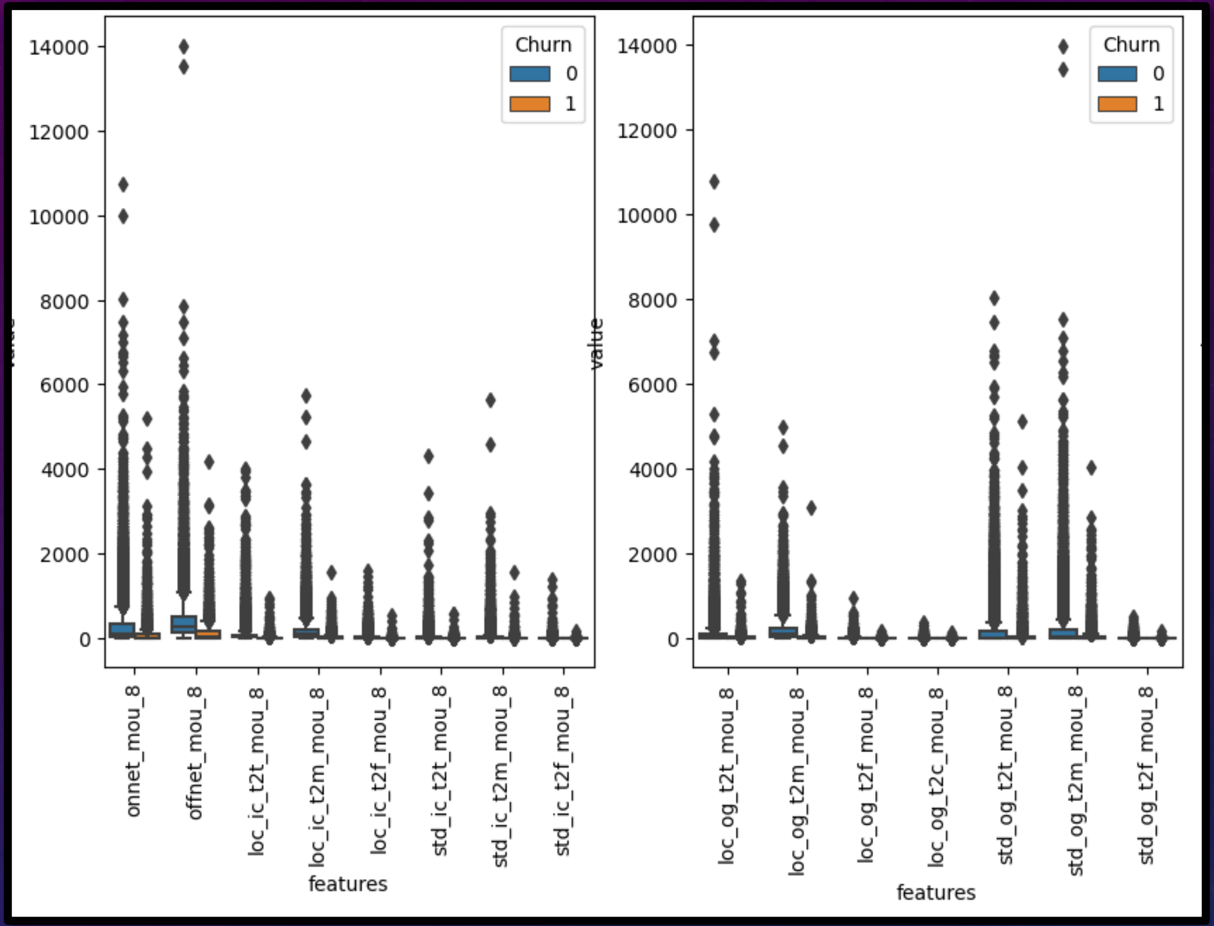


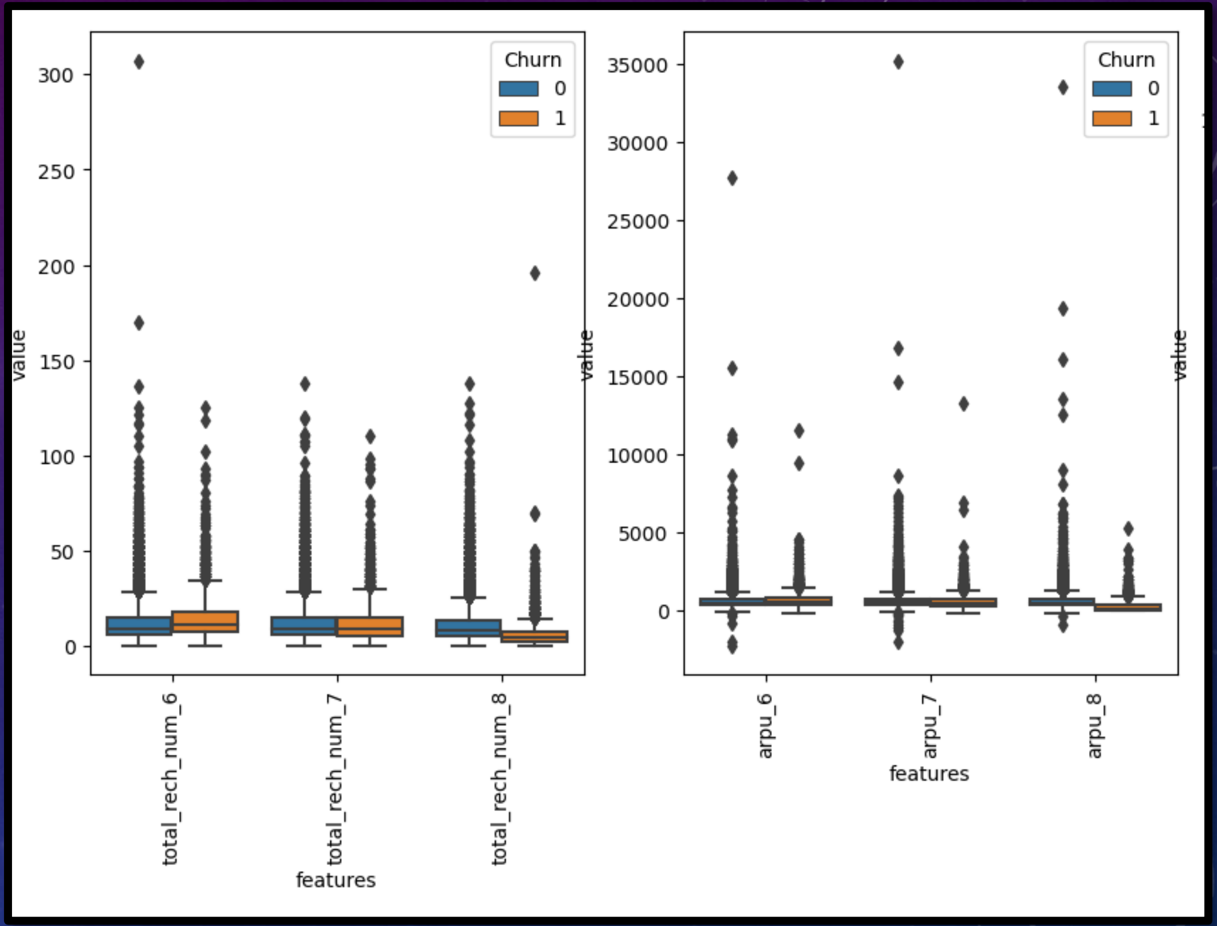
EDA box plot for the Outgoing call usage





EDA box plot for the outliers





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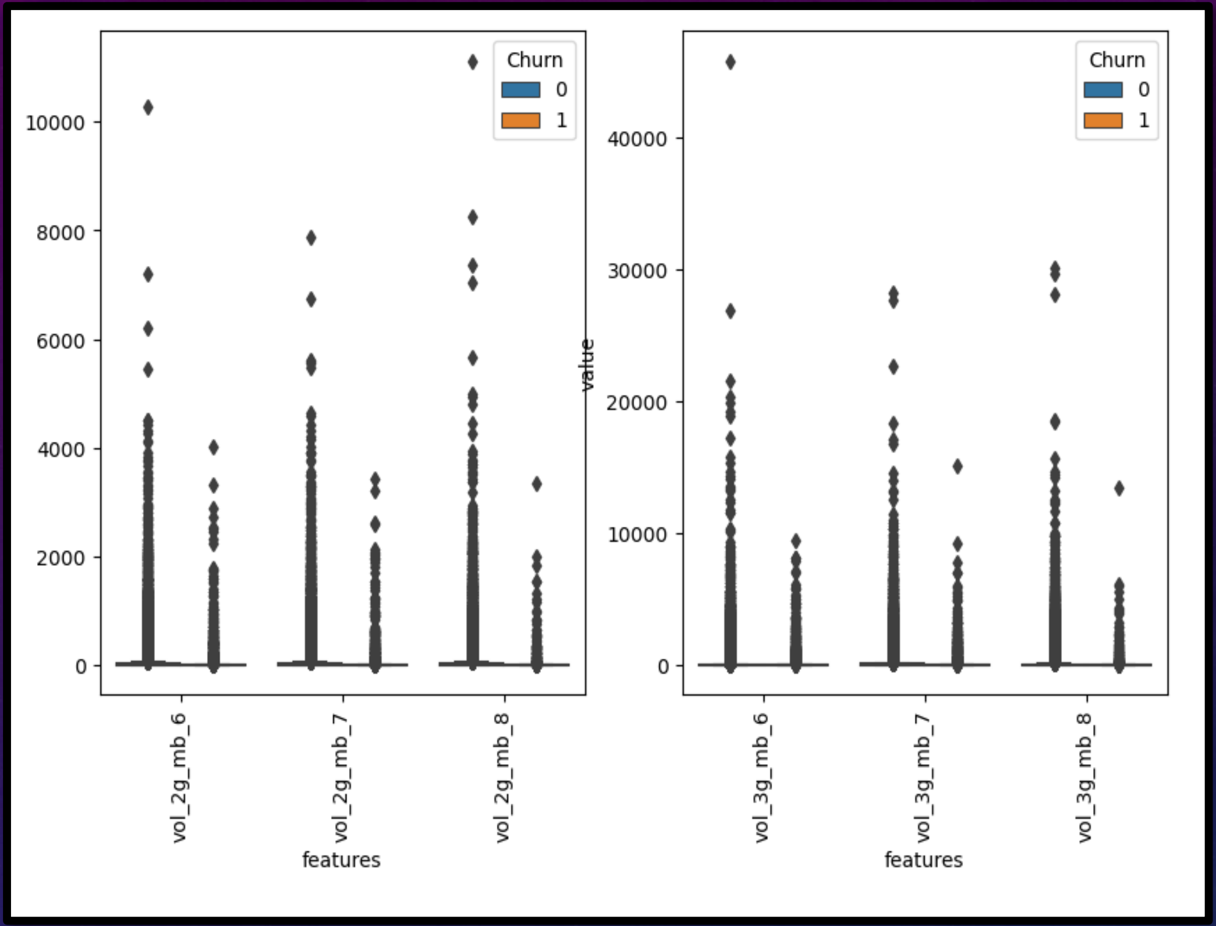

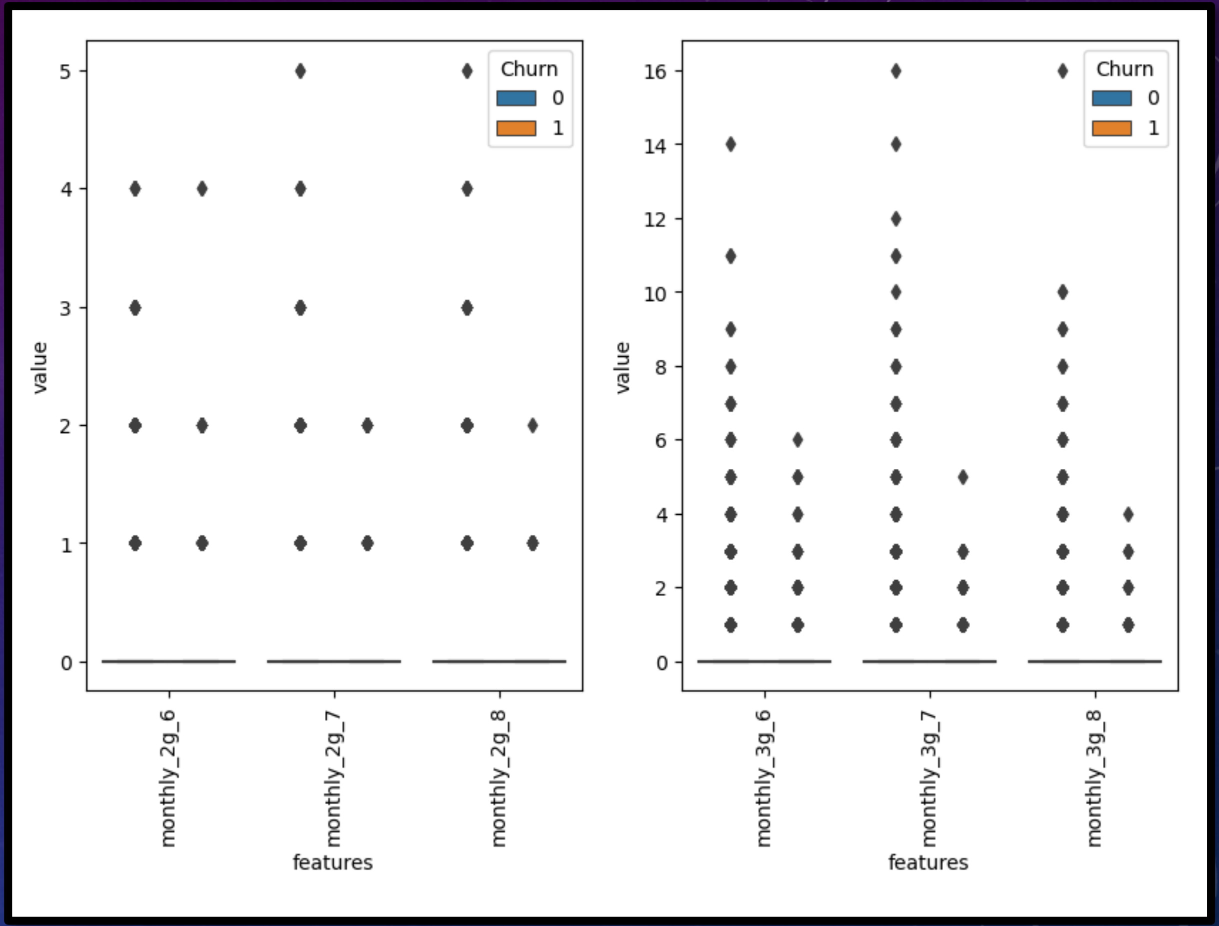

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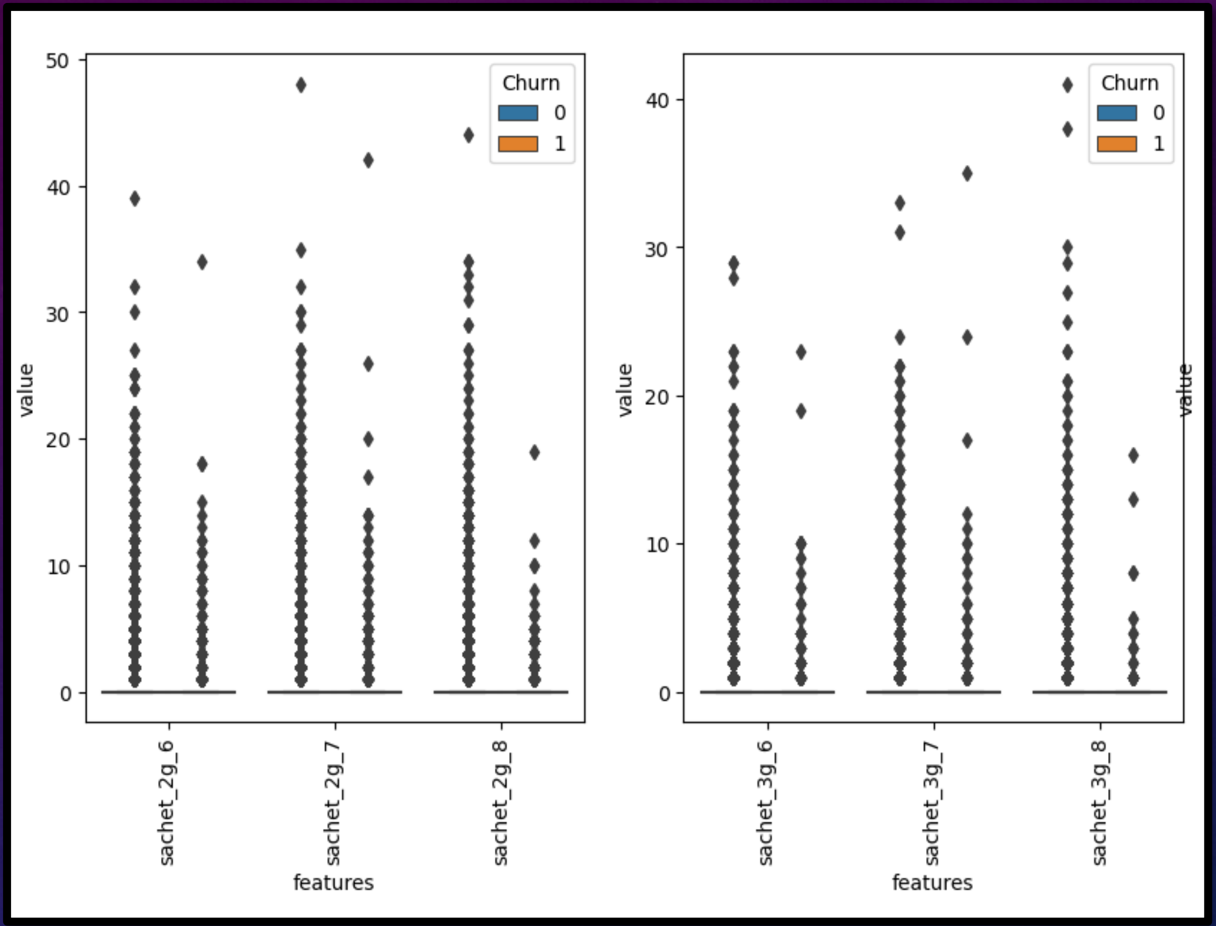
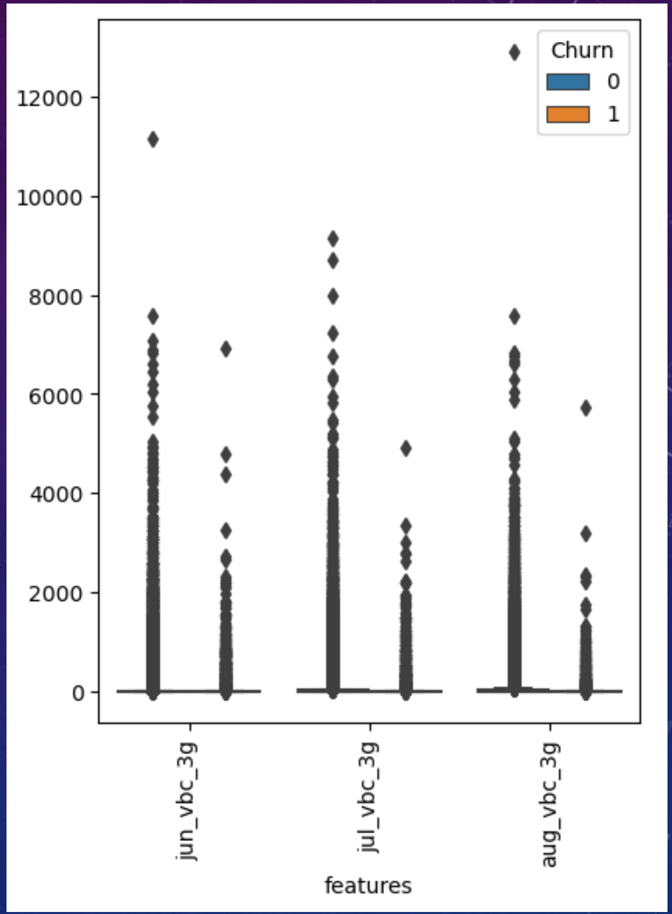
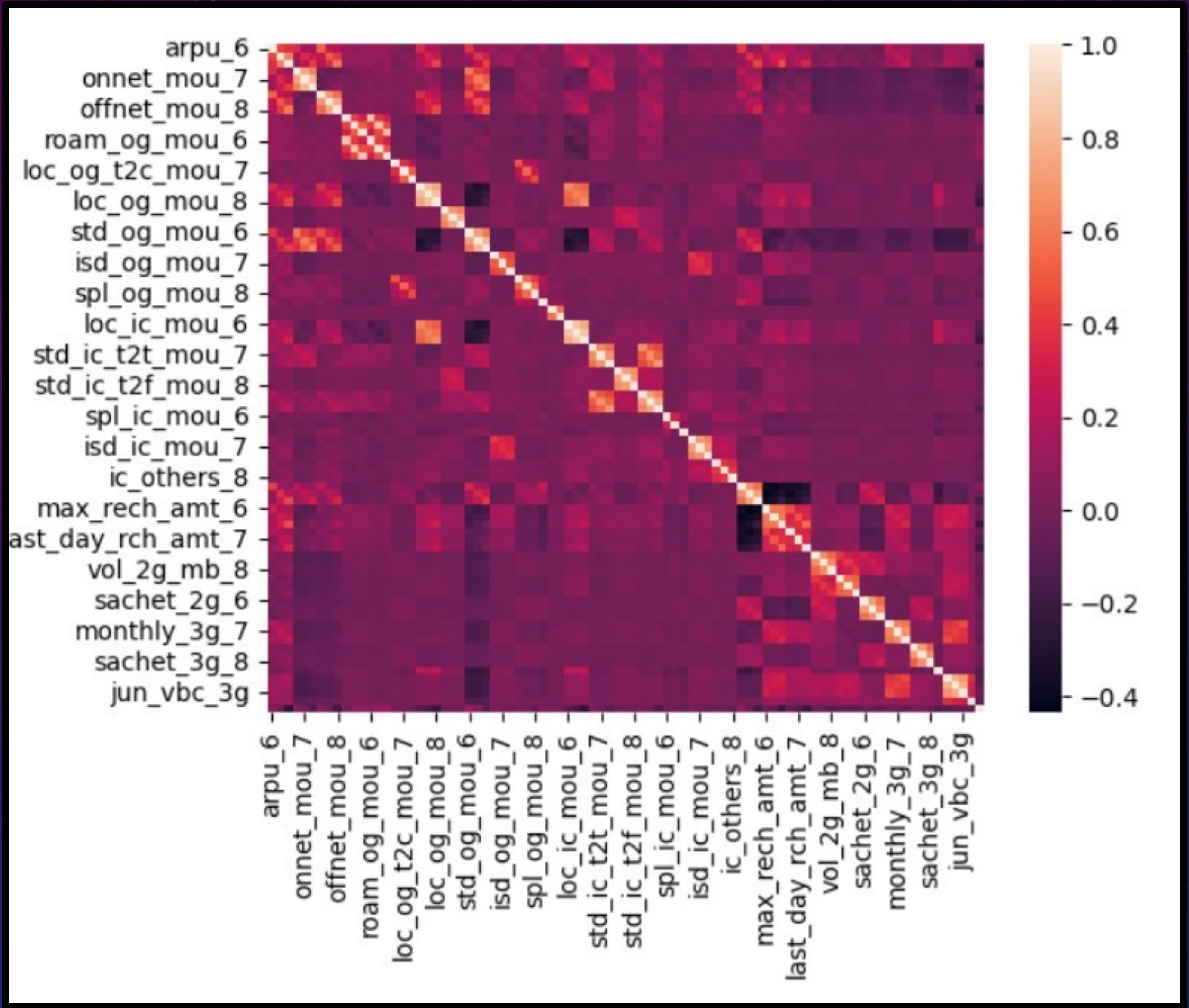
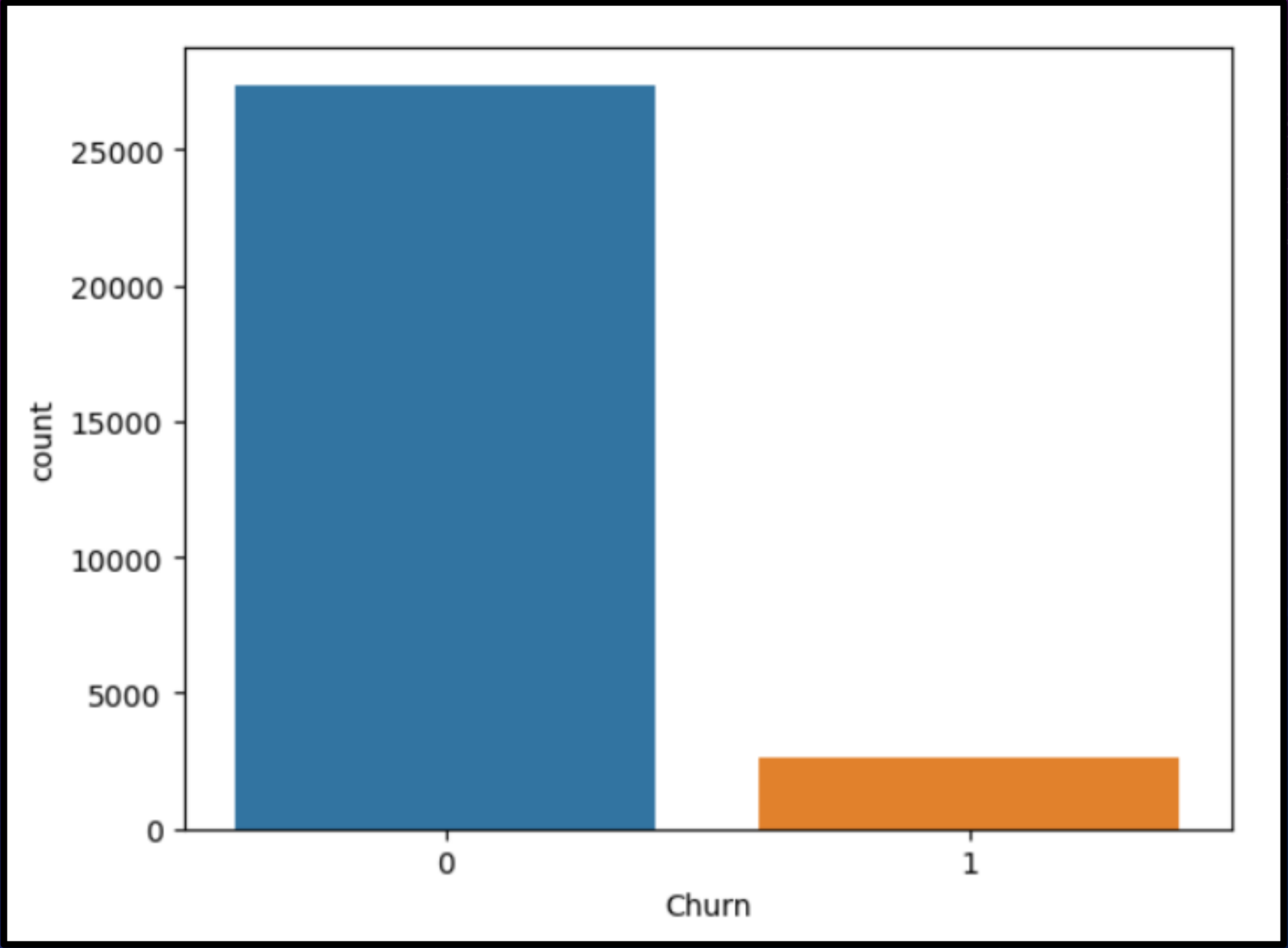




EDA box plot for the outliers



EDA plots depicting correlation (Heat Map) of all selected columns.



EDA Box plot for Class imbalance.

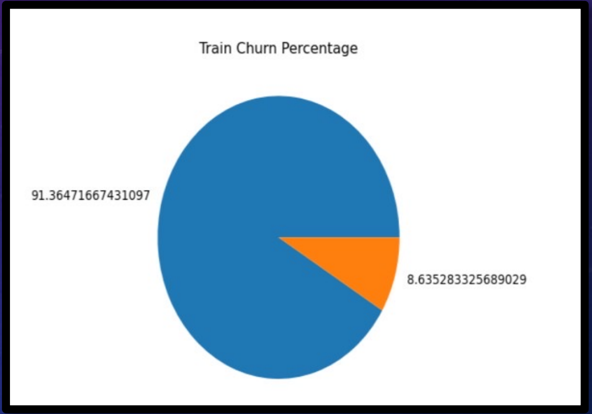
```
df2.shape
```

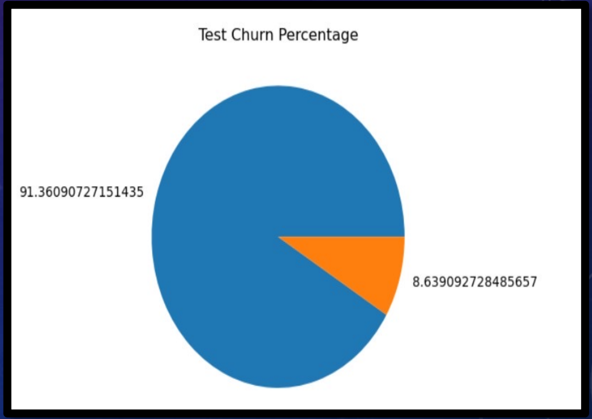
```
(29979, 87)
```

```
df_train.shape, df_test.shape
```

```
((23983, 87), (5996, 87))
```

Data Set Shape Before Splitting into Train - Test





Data Shape

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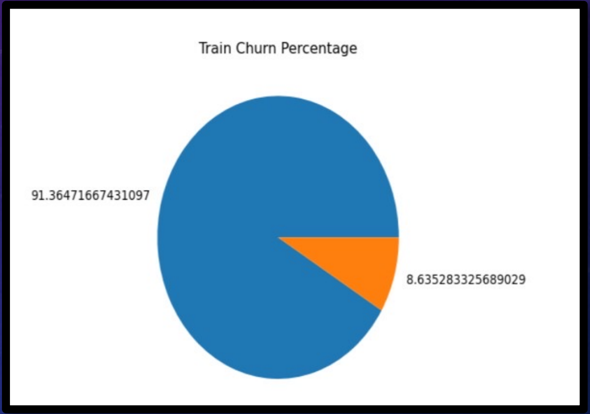
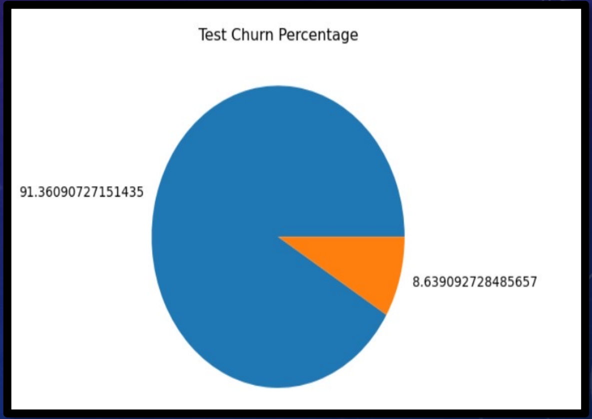
Data Set Shape Before Splitting into Train - Test





Data Shape

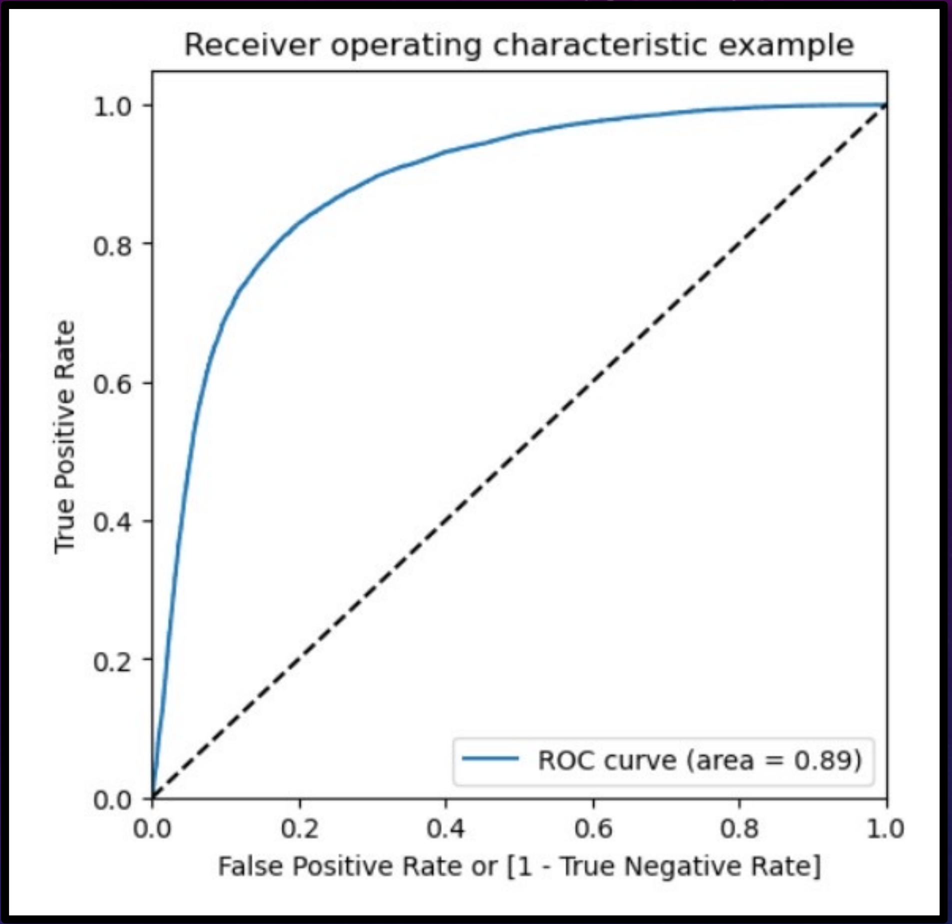
	Features	VIF
2	loc_og_mou_8	2.01
3	loc_ic_mou_7	1.64
7	last_day_rch_amt_8	1.45
6	total_rech_num_8	1.42
0	arpu_7	1.28
11	aon	1.21
4	std_ic_mou_8	1.16
9	sachet_2g_8	1.16
10	monthly_3g_8	1.14
1	roam_og_mou_8	1.09
12	sep_vbc_3g	1.09
8	monthly_2g_8	1.07
5	spl_ic_mou_8	1.03

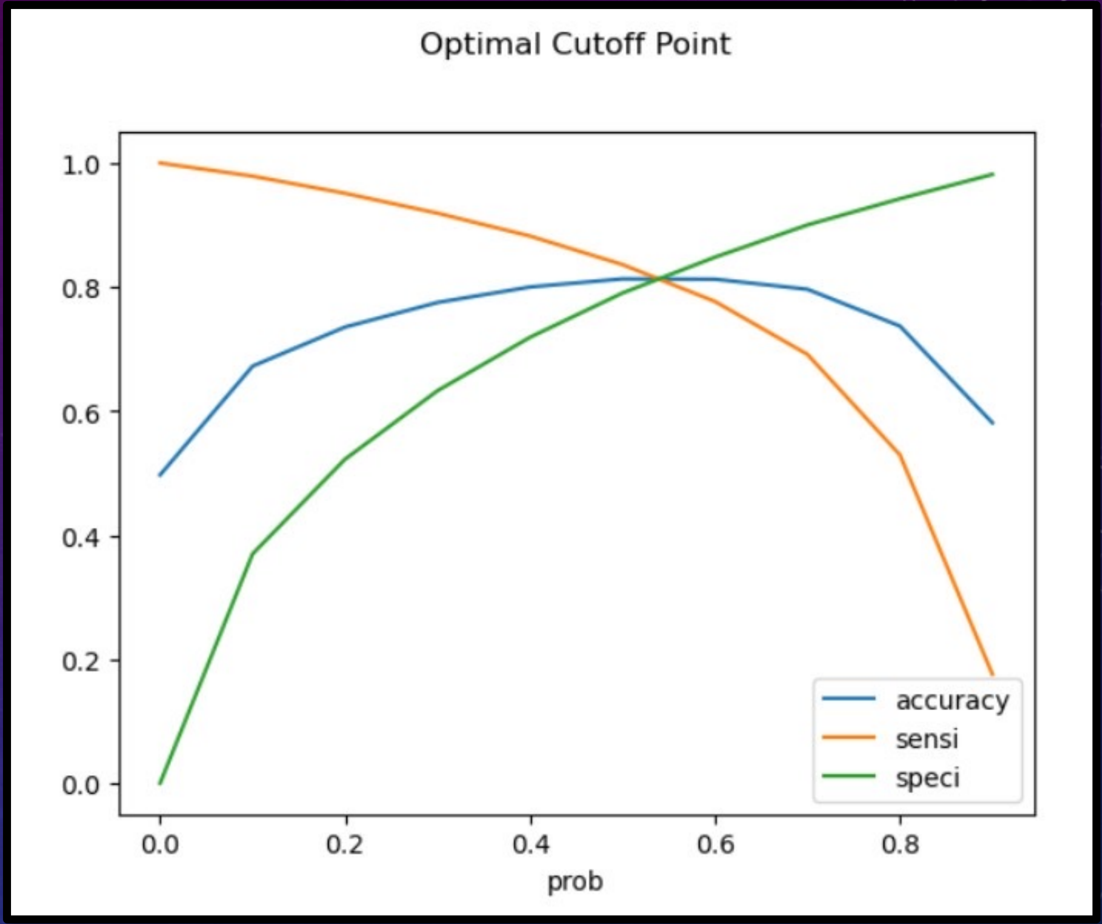
AFTER PROCESSING THE DATA FOR MODEL BUILDING USING LR, WE FOUND THE 4TH MODEL WHOSE HAVING GOOD

```
Accuracy:  0.8131255164814984
F1 score:  0.8164415683975559
Recall:  0.8361814151117679
Precision:  0.7976122296136393
ROC_AUC_SCORE:  0.8132623030286843
```

OW P- VALUE.

Model Building using Logistic Regression





Model Building using Logistic Regression

- After Processing the test data for model building using LR gives quite a good result on test data.

```
Accuracy:  0.8275517011340894
F1 score:  0.45116772823779194
Recall:  0.8204633204633205
Precision:  0.31112737920937045
ROC_AUC_SCORE:  0.8243426496438545
```

- The precision is too low but we can count on Recall which is good.

- We are preferring recall because it takes False negative Cases on count. Here we need to predict all churning customers. That's why we could not afford much False Negatives cases.

Model Building using Logistic Regression

```
Accuracy:  0.8629086057371581
F1 score:  0.4907063197026022
Recall:  0.7644787644787645
Precision:  0.3613138686131387
ROC_AUC_SCORE:  0.8183474508775714
```

- **After doing feature selection using rfecv. We took only 12 most important features. After hyper tuning our recall, accuracy, precision value slightly improved but not good enough. Hence we will try for Random Forest**

Model Building using Decision Tree

```
Accuracy:  0.9127751834556371
F1 score:  0.611152416356877З
Recall:  0.7934362934362934
Precision:  0.4969770253929867
ROC_AUC_SCORE:  0.858748084651699
```

So most important features for our final model are all from action phase.

Top 10 are listed here

1. roam_og_mou_8
2. loc_ic_mou_8
3. roam_ic_mou_8
4. arpu_8
5. loc_og_mou_8
6. last_day_rch_amt_8
7. max_rech_amt_8
8. total_rech_num_8
9. std_ic_mou_8
10. onnet_mou_8

Model Building using Random Forest

Business Recommendations

Telecom Churn Case Study

- The company after identifying customers in action phase can give offers for increasing local incoming and outgoing minutes of usage.
- Customers are more keen towards the local incoming calls over anything so, We can provide more free incoming calls and also we can reduce the outgoing calls charges for better connectivity. This can provide an advantage over other operators in the market
- The roaming charges can be made lesser by giving offers. More importantly we can provide free incoming calls on roaming.
- We can provide attractive offers and packages for the customers.

THANK YOU

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