



TELECOM CHURN ANALYSIS

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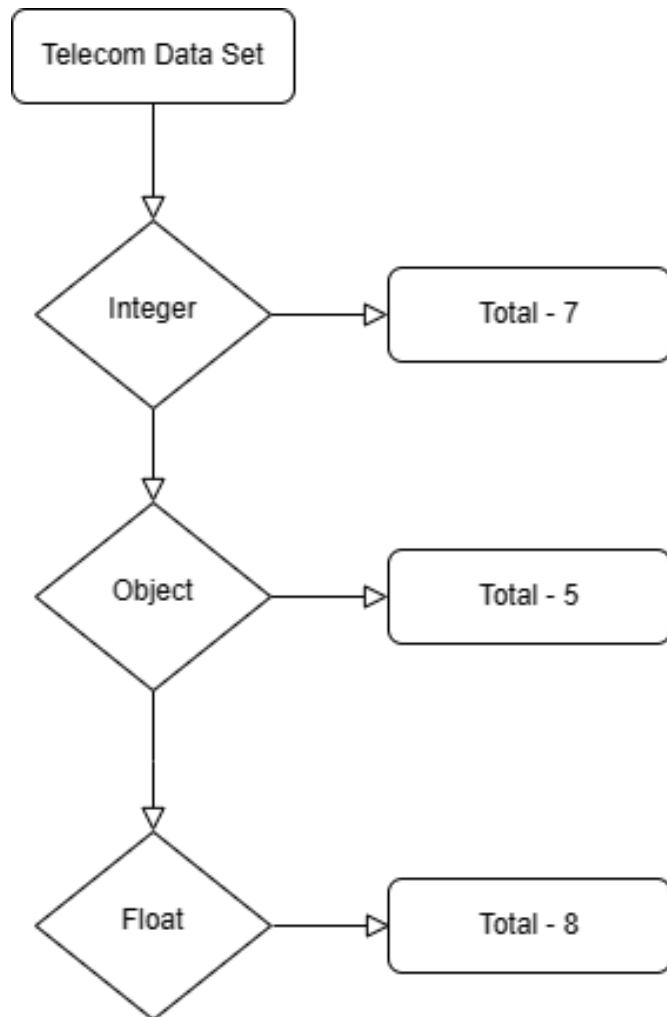
1. Objective
2. Summary of data
3. Exploratory Data Analysis
4. Recommendation
5. Conclusion

Objective

Maximize: Company's profit by retaining customer.

Minimize: Customer churn by identifying the key cause of the problem.

Business Constraint: Provide offers and discount and improve the service quality without compromising with profit.



SUMMARY OF DATA

1. Here the decision variable is the 'churn' column – 'y'
2. Rest all the others lies In the feature space 'X'

Model Building

1. Outlier Detection
2. Feature Engineering
3. Data Set Balancing
4. Model Building Utilizing Various Models

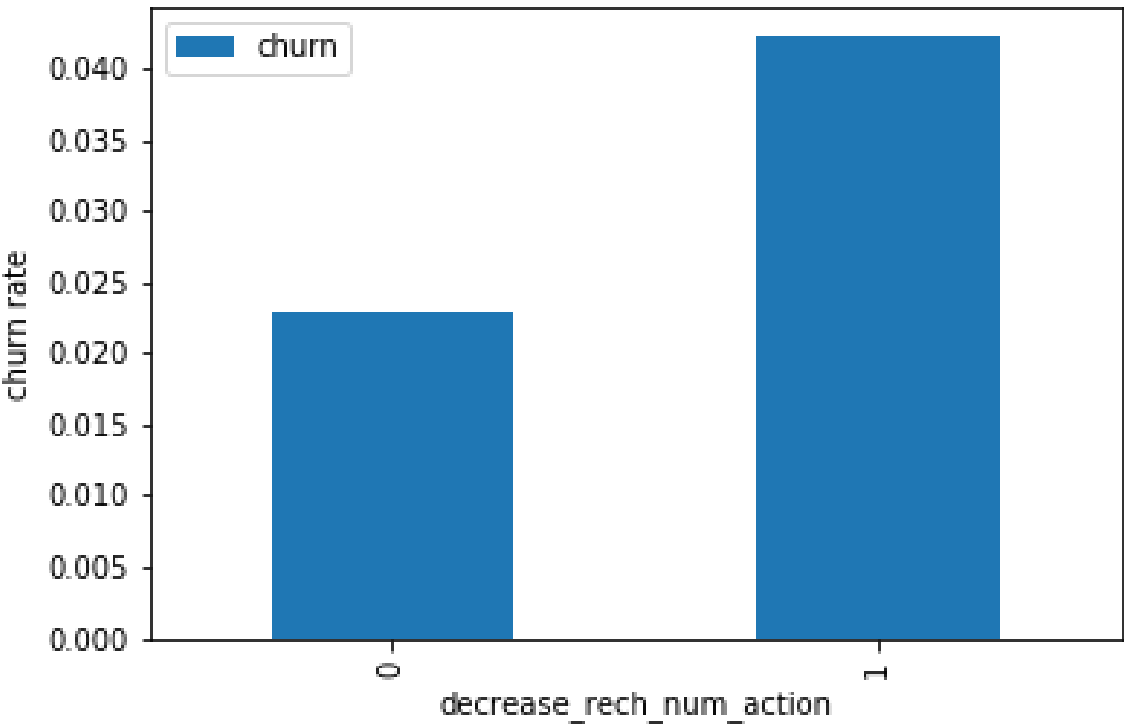
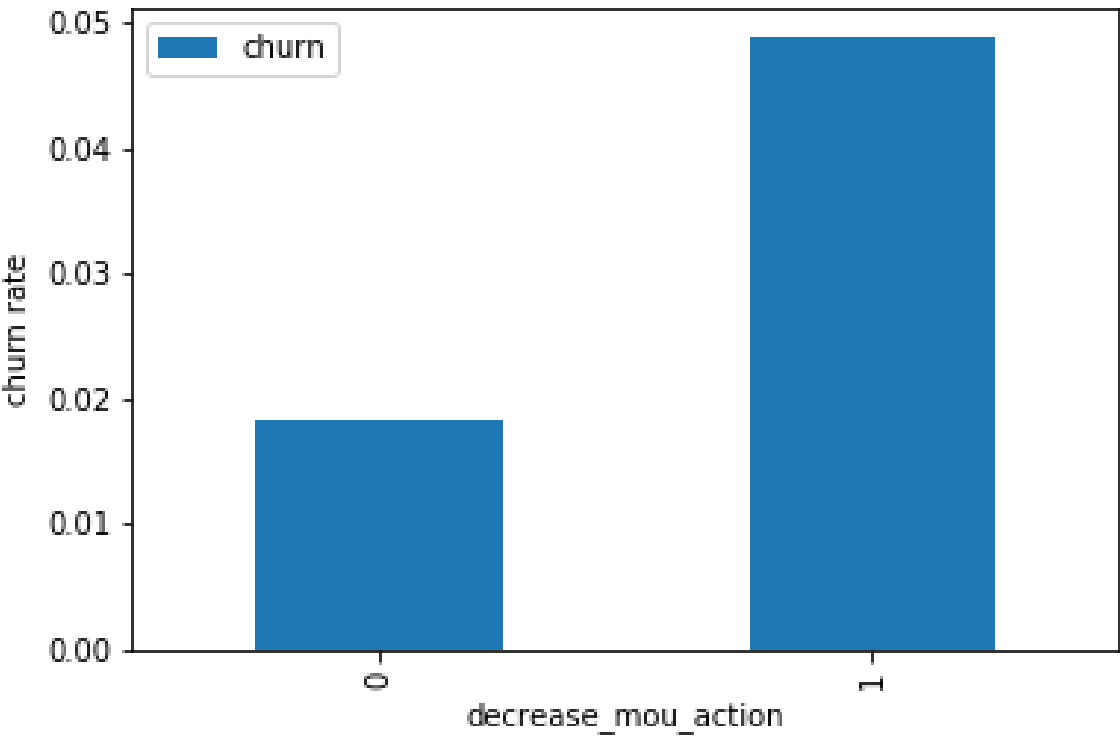
Exploratory Data Analysis

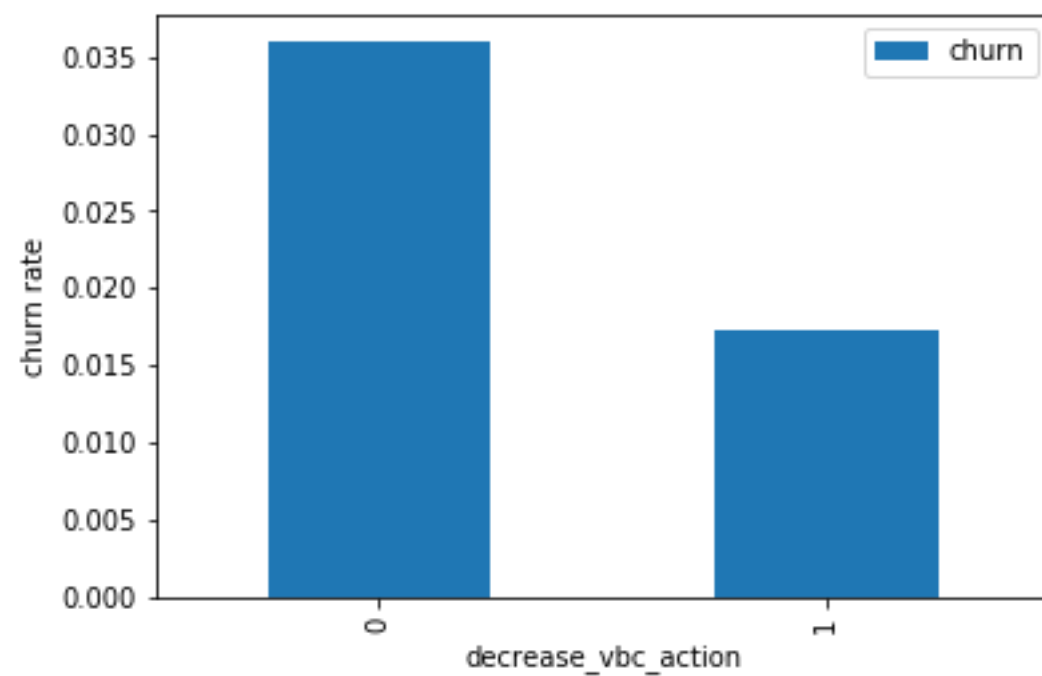
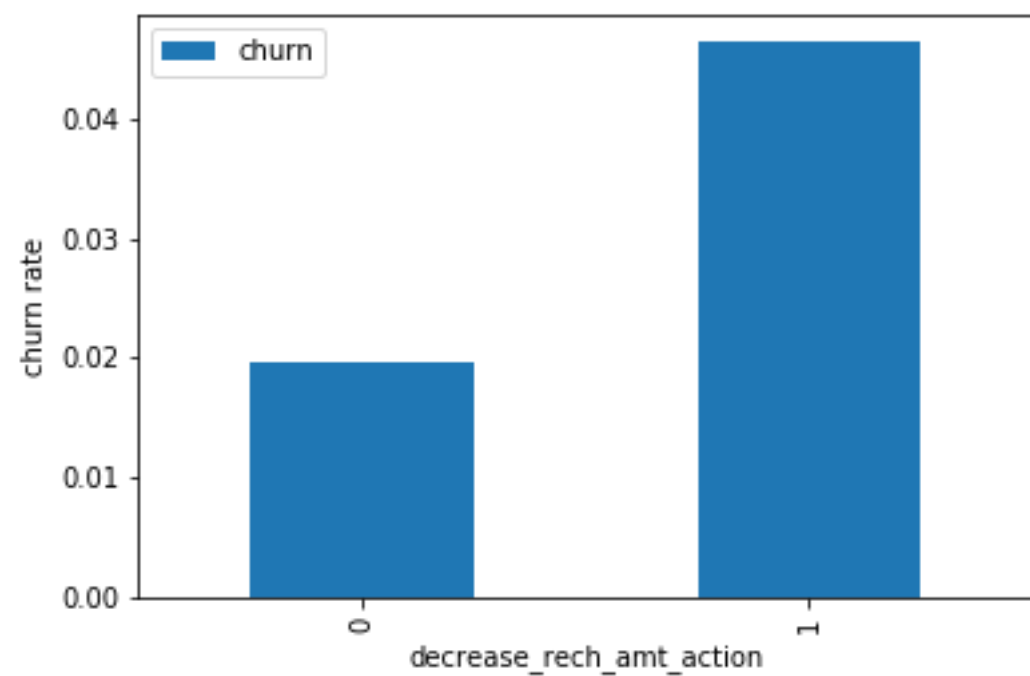
1. The number of customers without international plans totals 4,527, while those with international plans amounts to 473.

2. This observation highlights that customers with international plans exhibit a higher churn rate of 42%.

3. In essence, it appears that a substantial number of individuals who have subscribed to international plans are experiencing a significant churn rate, which may be attributed to connectivity issues or high call charges.

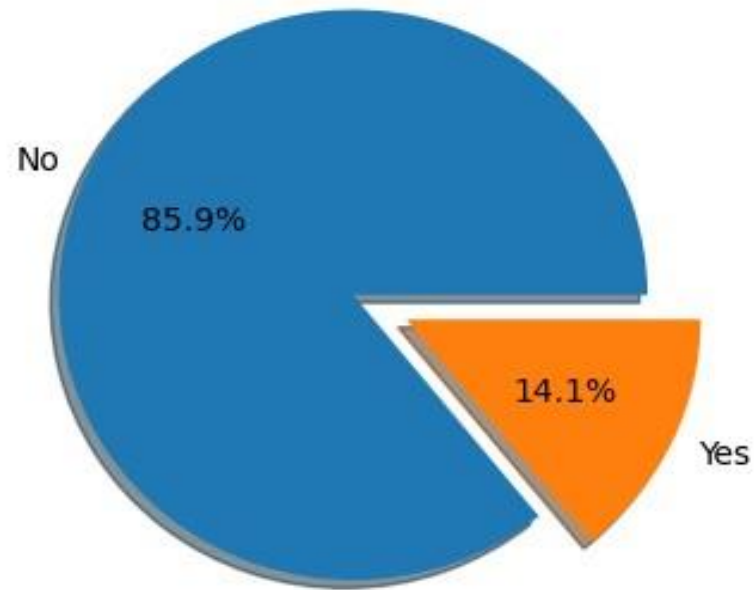
Churn rate on the basis whether the customer decreased her/his MOU in action month





Exploratory Data Analysis

Pie chart for churn

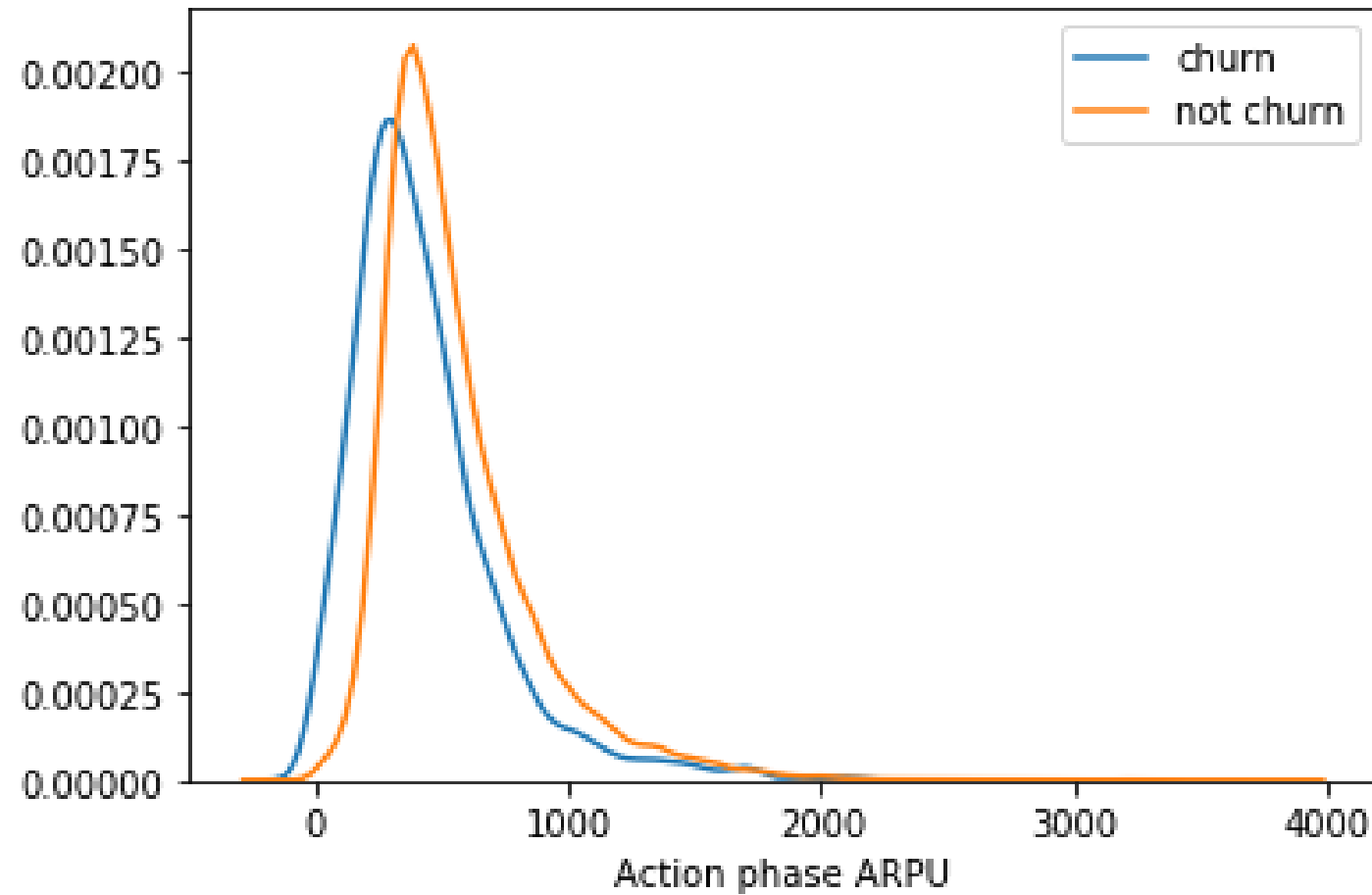


Total number of customers in data set - 5000

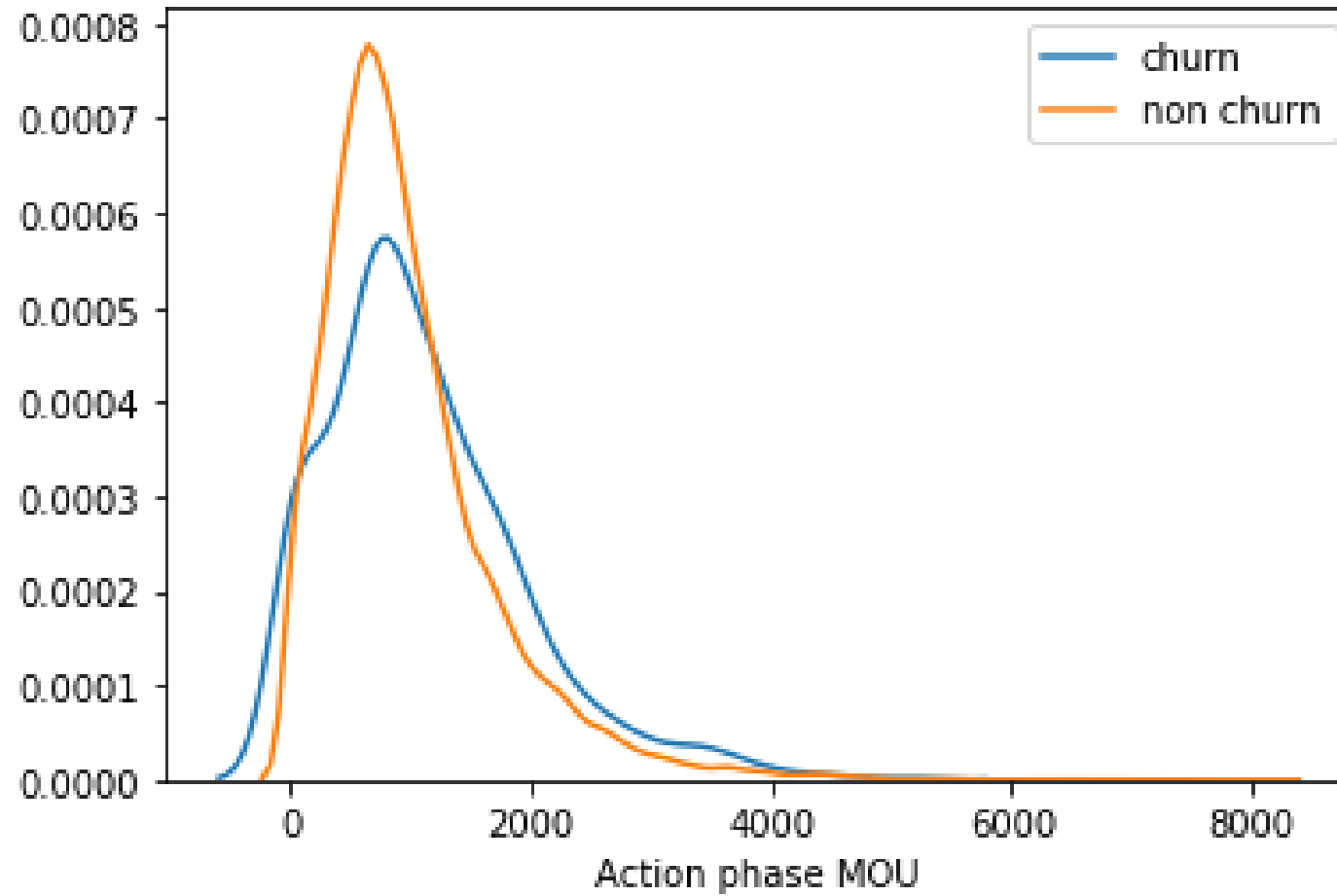
Total number of customers churn - 707

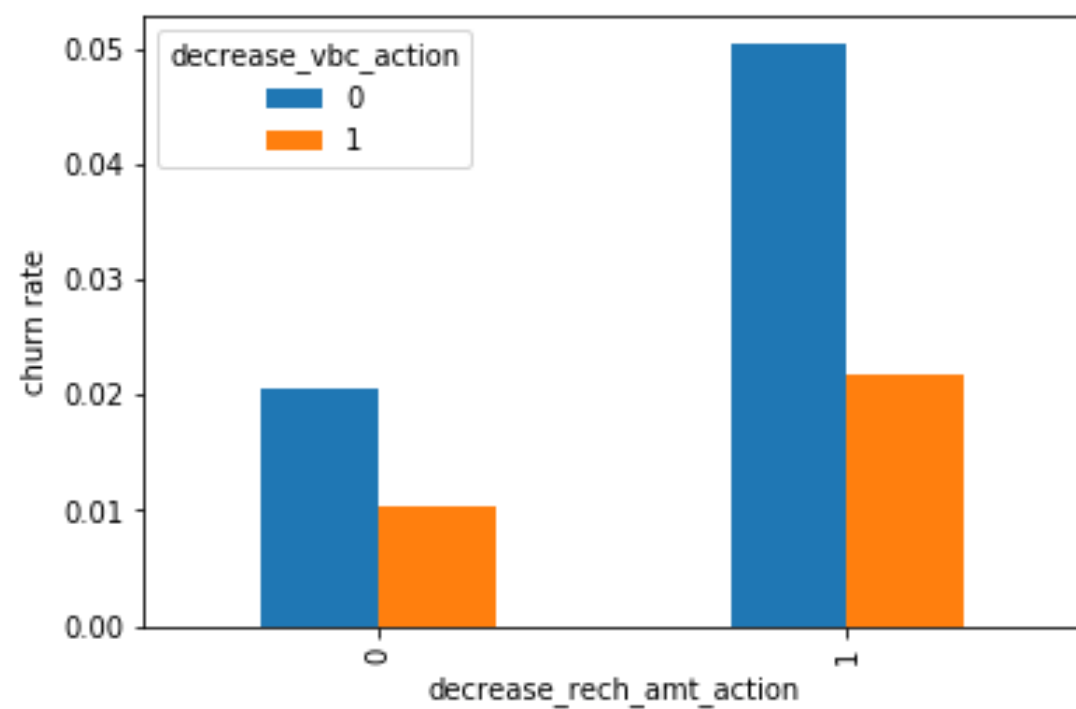
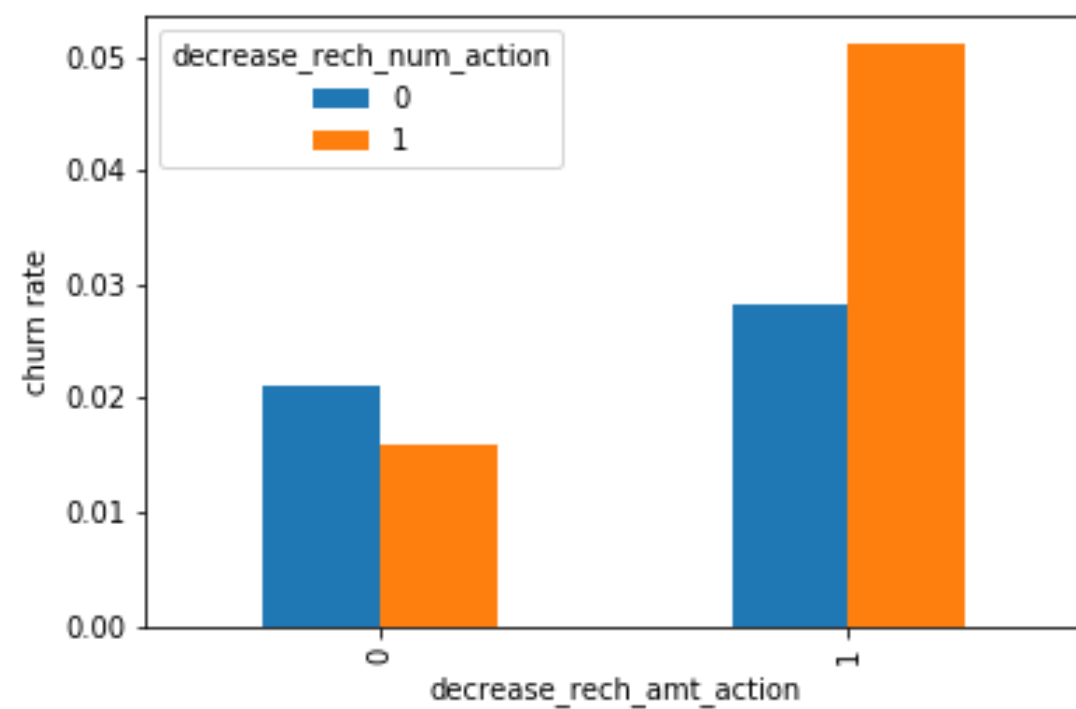
Total number of un-churn customers - 4293

Distribution plot

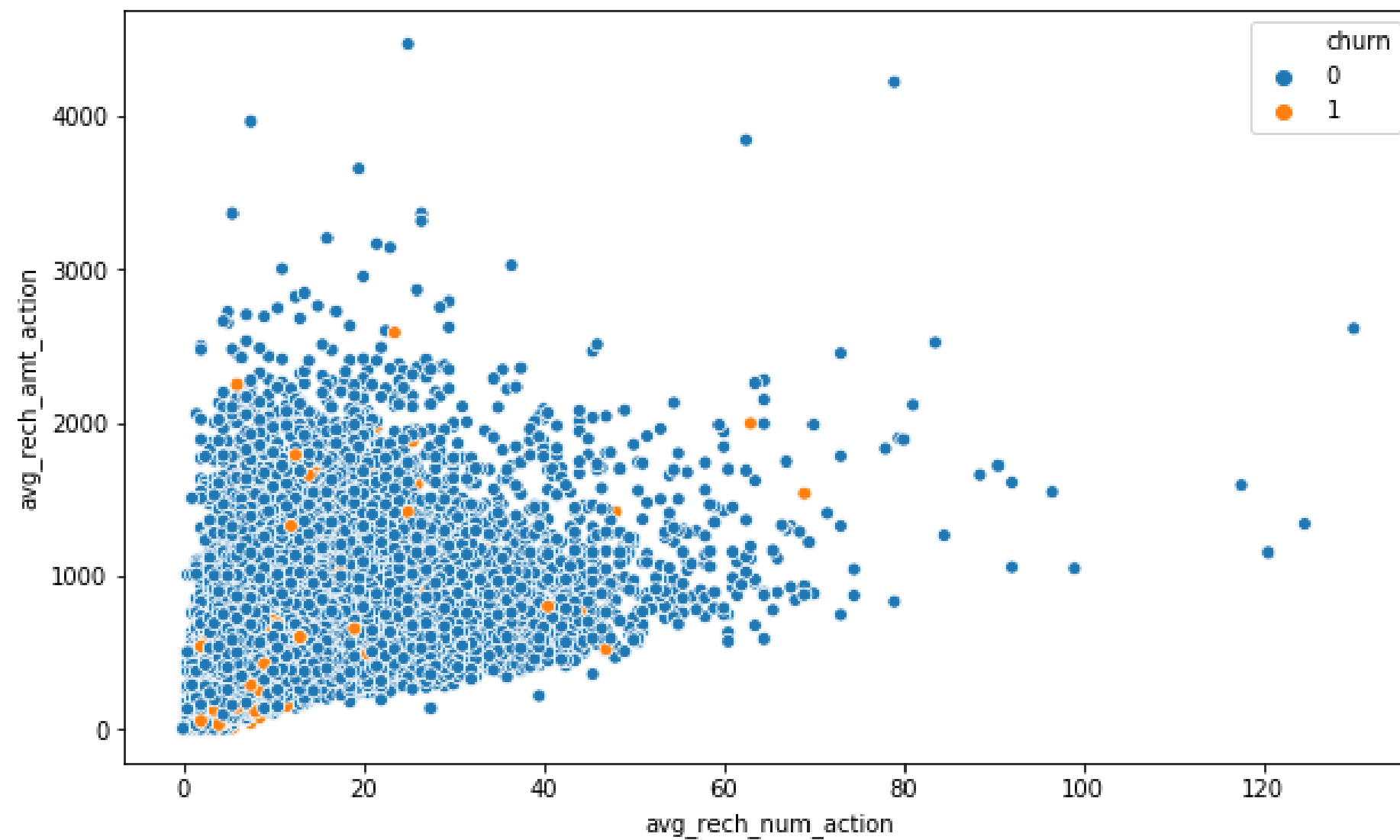


Distribution plot

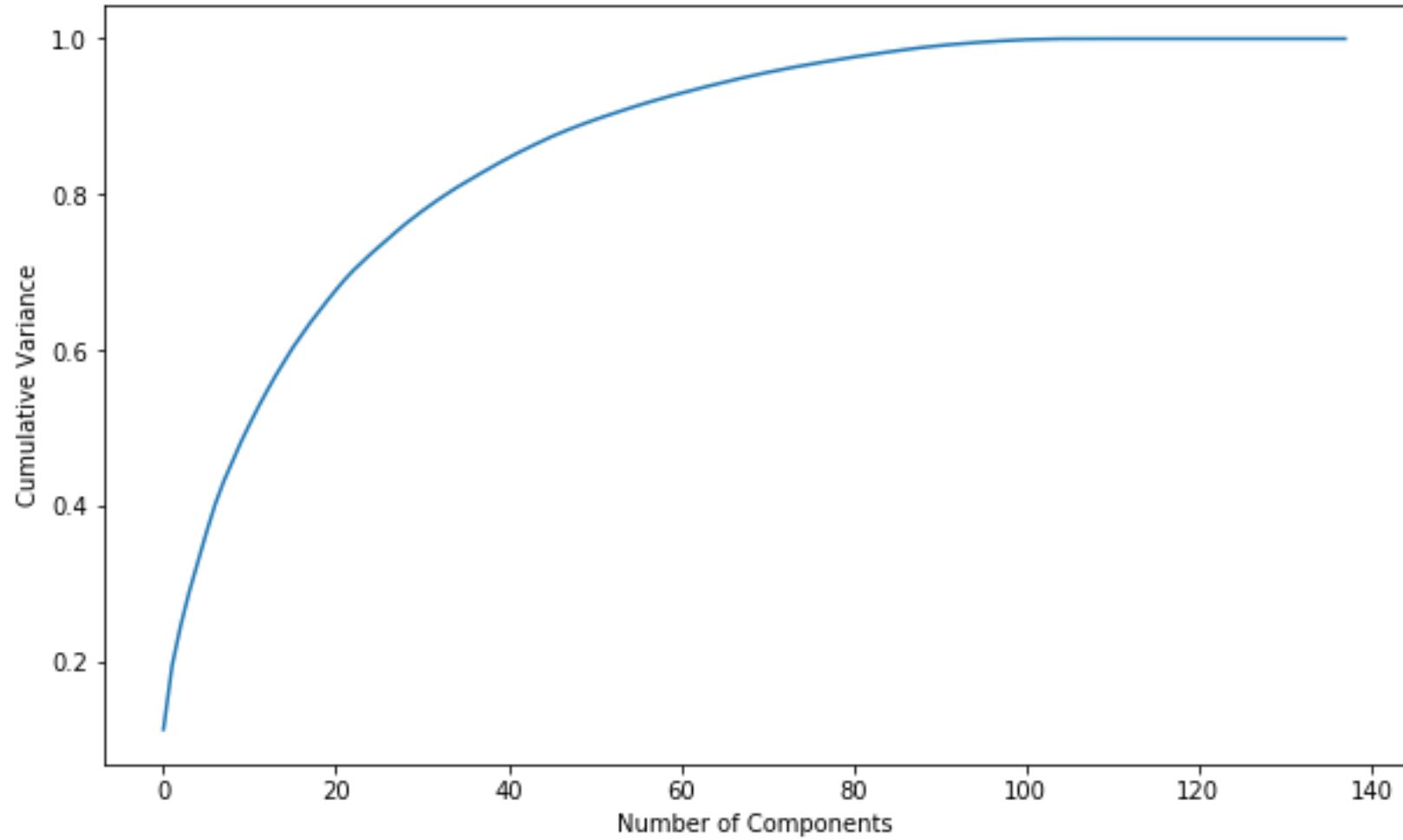




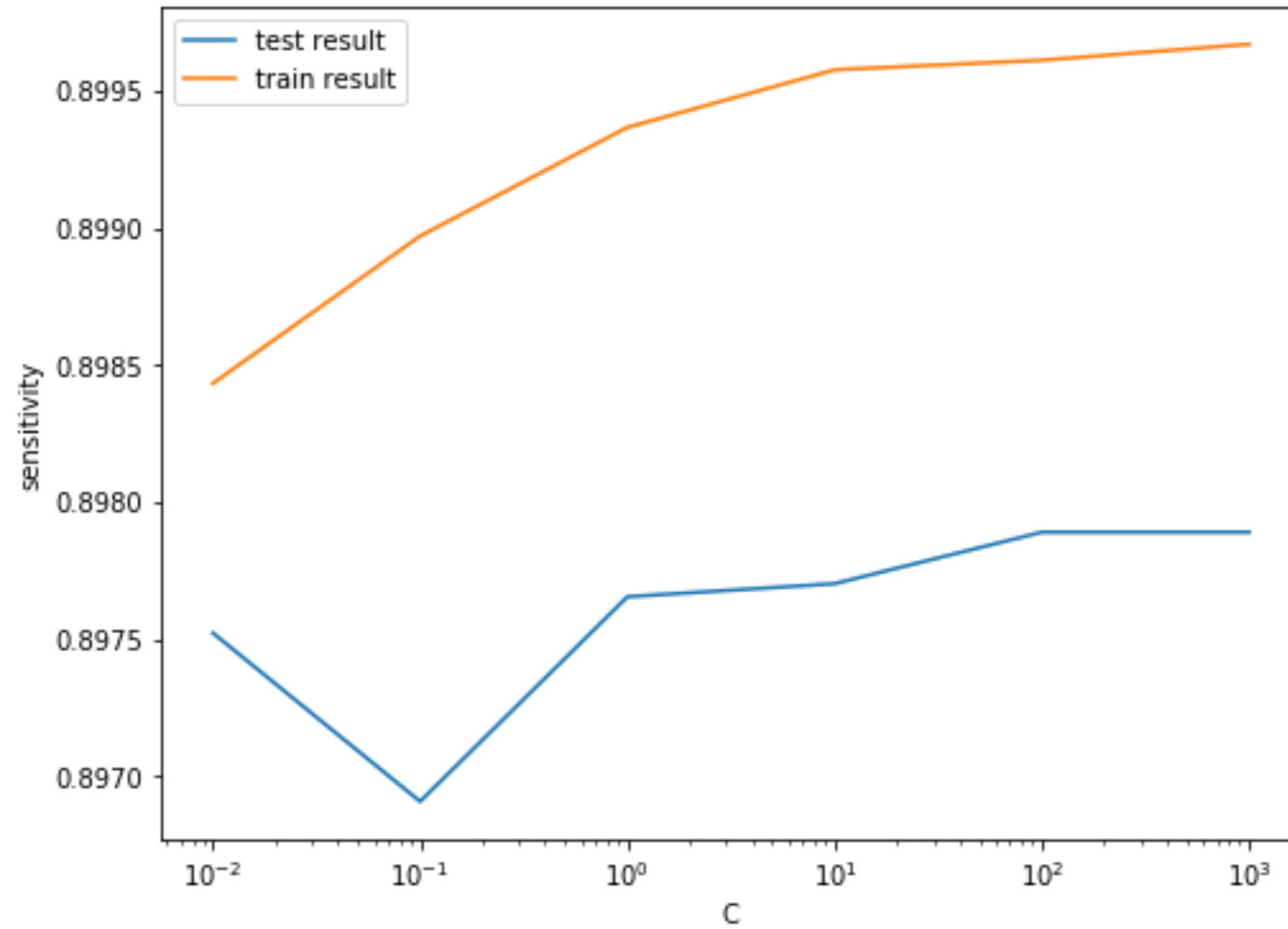
EDA



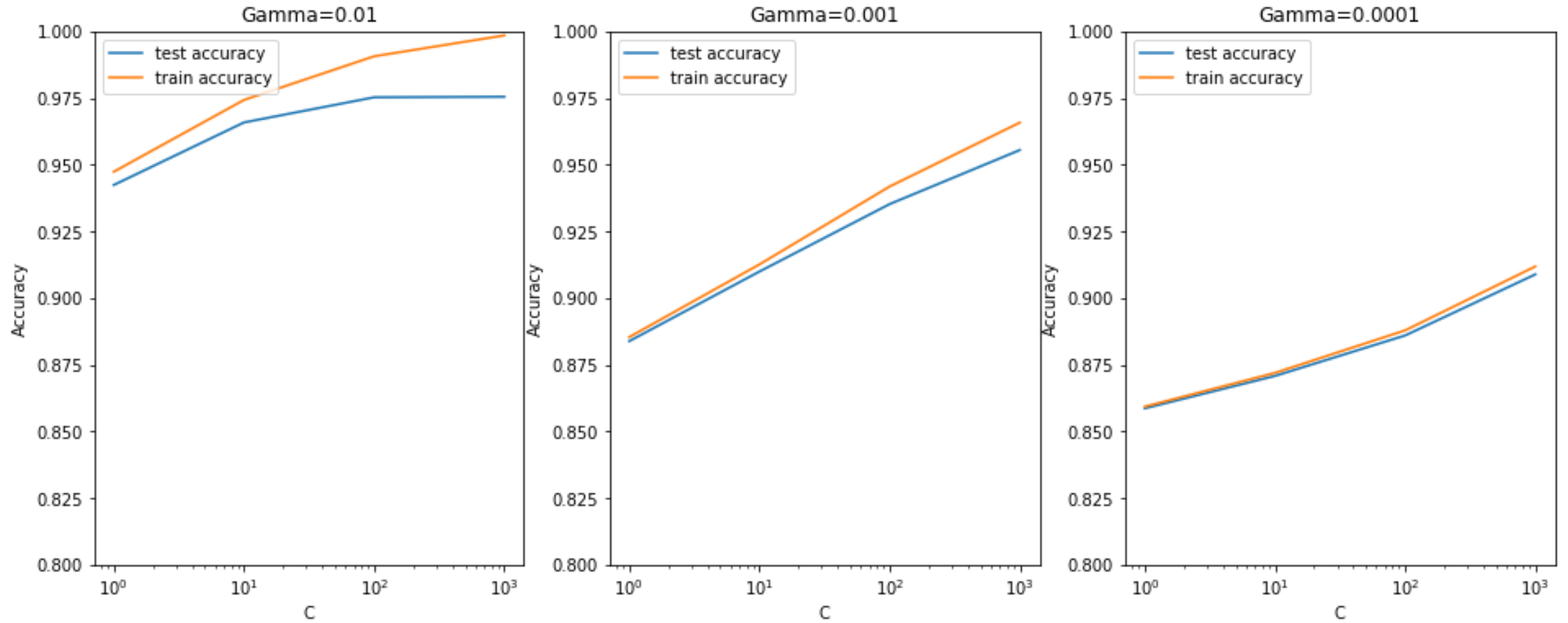
Cumulative variance of the PCs



Plot of C versus train and validation scores



Converting C to numeric type for plotting on x-axis

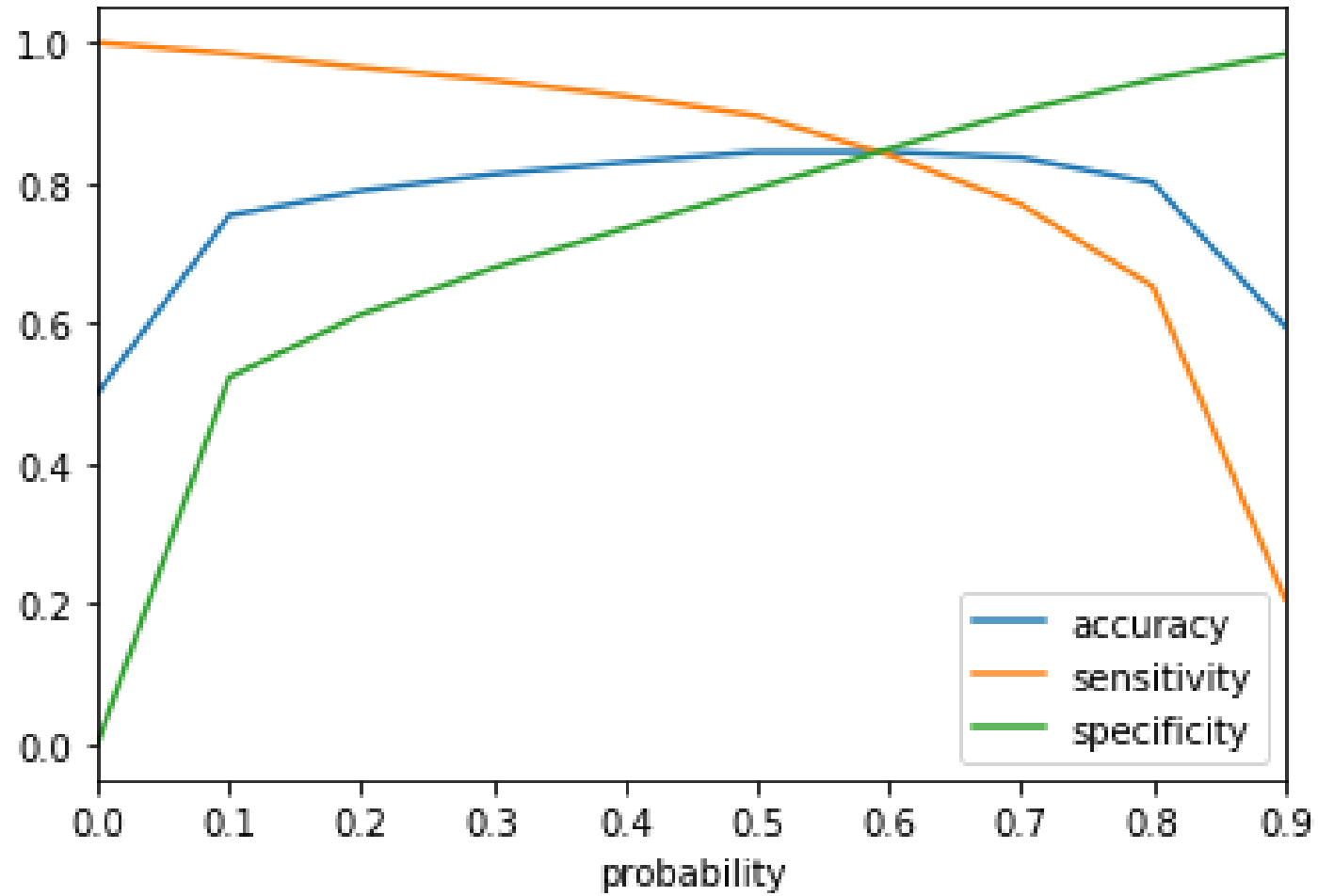


Generalized Linear Model Regression Results

Dep. Variable:	churn	No. Observations:	42850
Model:	GLM	Df Residuals:	42836
Model Family:	Binomial	Df Model:	13
Link Function:	logit	Scale:	1.0000
Method:	IRLS	Log-Likelihood:	-15720.
Date:	Sat, 16 May 2020	Deviance:	31440.
Time:	18:07:30	Pearson chi2:	3.92e+06
No. Iterations:	11		
Covariance Type:	nonrobust		

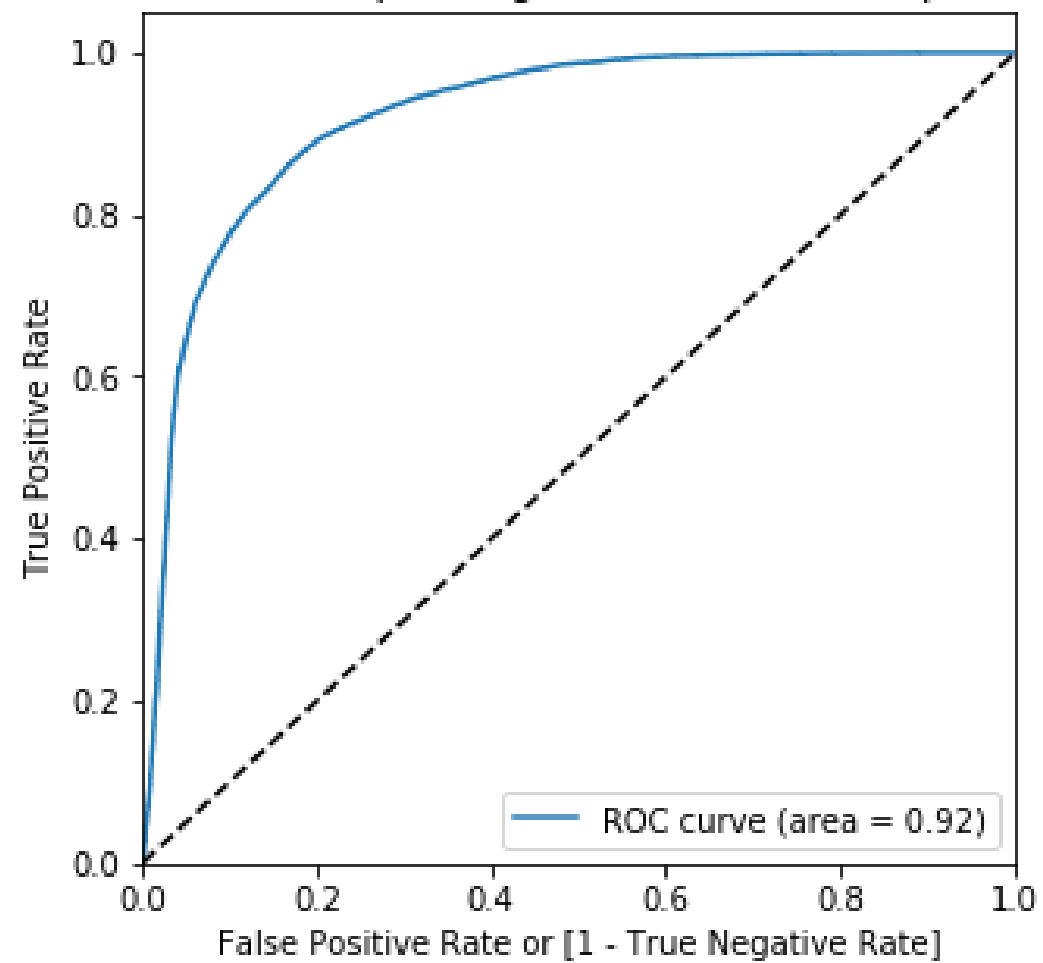
	coef	std err	z	P> z	[0.025	0.975]
const	-1.2058	0.032	-37.536	0.000	-1.269	-1.143
offnet_mou_7	0.3665	0.022	16.456	0.000	0.323	0.410
roam_og_mou_8	0.7135	0.024	29.260	0.000	0.666	0.761
std_og_t2m_mou_8	-0.2474	0.022	-11.238	0.000	-0.291	-0.204
isd_og_mou_8	-1.3811	0.212	-6.511	0.000	-1.797	-0.965
og_others_7	-2.4711	0.872	-2.834	0.005	-4.180	-0.762
loc_ic_t2f_mou_8	-0.7102	0.075	-9.532	0.000	-0.856	-0.564
loc_ic_mou_8	-3.3287	0.057	-58.130	0.000	-3.441	-3.216
std_ic_t2f_mou_8	-0.9503	0.078	-12.181	0.000	-1.103	-0.797
ic_others_8	-1.5131	0.129	-11.771	0.000	-1.765	-1.261
total_rech_num_8	-0.5060	0.018	-28.808	0.000	-0.540	-0.472
monthly_2g_8	-0.9279	0.044	-21.027	0.000	-1.014	-0.841
monthly_3g_8	-1.0943	0.046	-23.615	0.000	-1.185	-1.004
decrease_vbc_action	-1.3293	0.072	-18.478	0.000	-1.470	-1.188

Plot shows accuracy, sensitivity and specificity for different probabilities

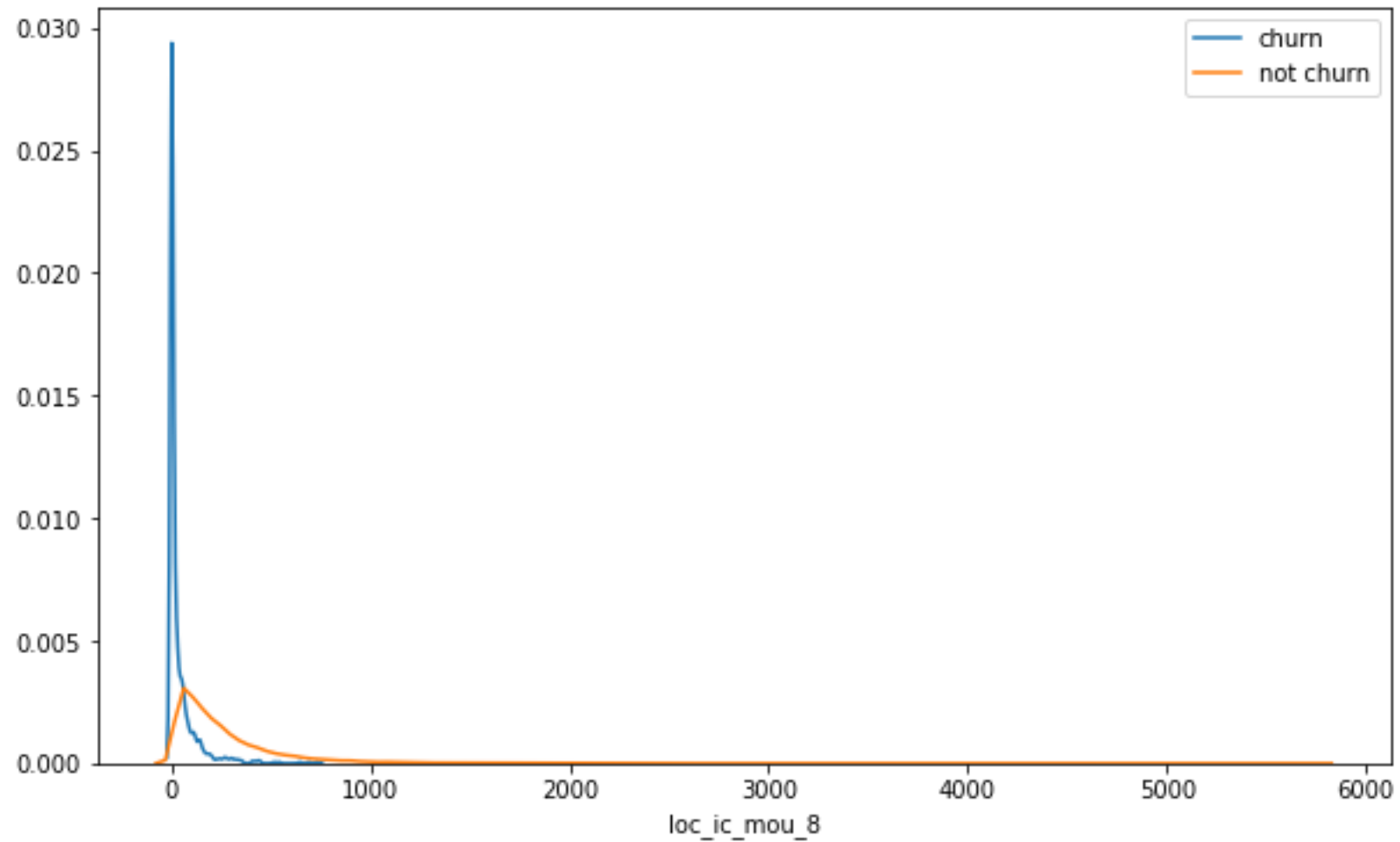


ROC Curve

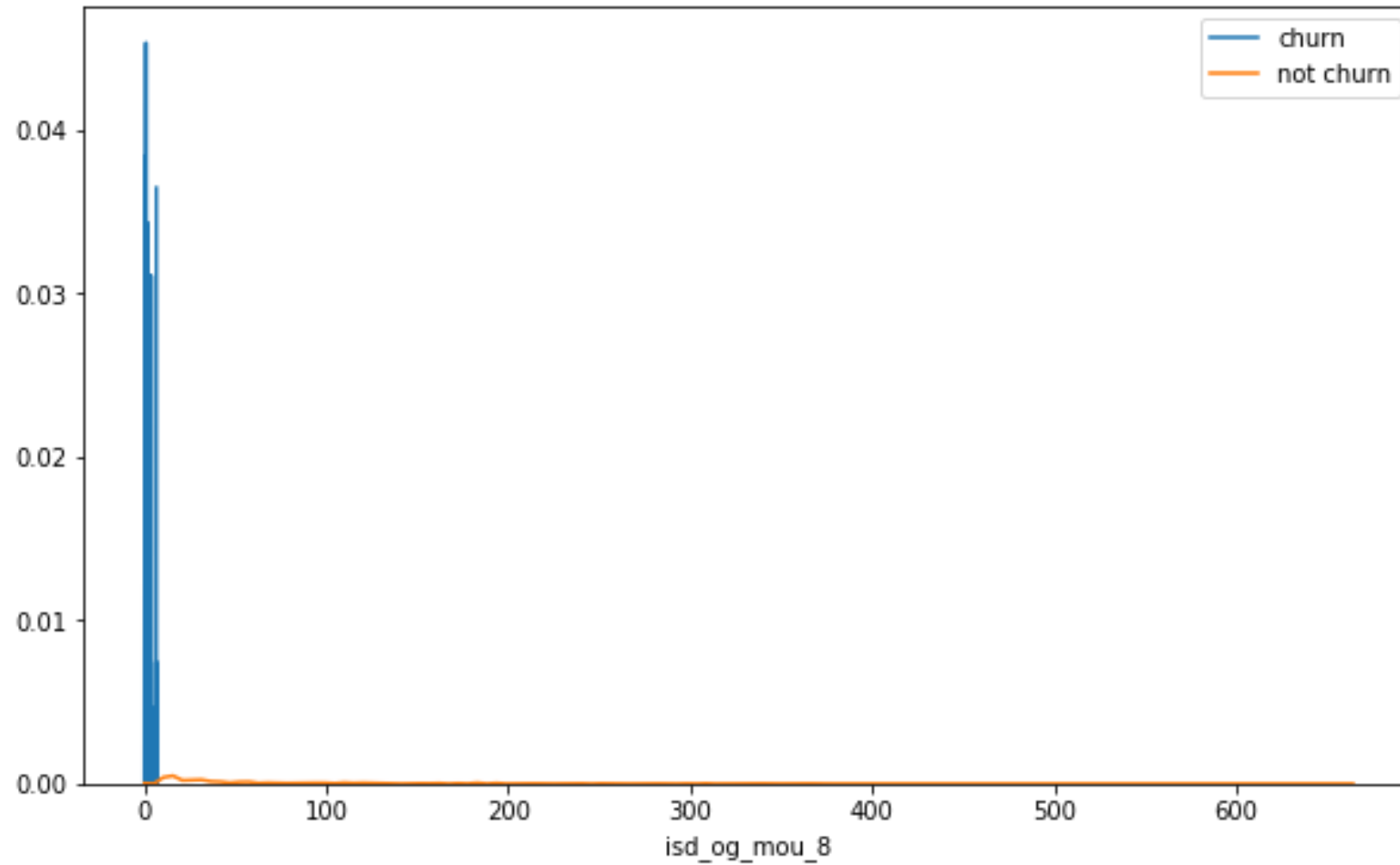
Receiver operating characteristic example



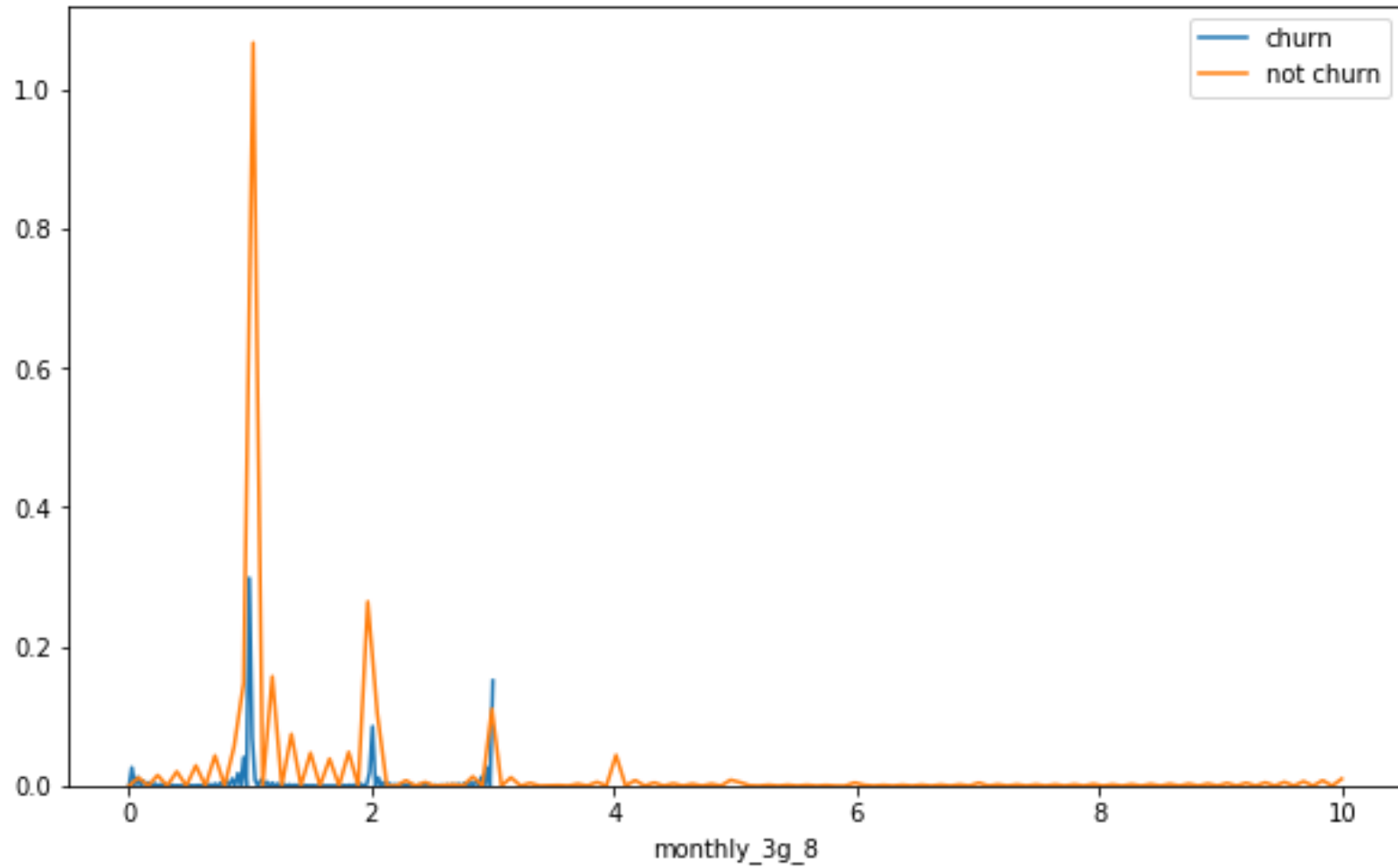
Plotting loc_ic_mou_8 predictor for churn and not churn customers



Plotting `isd_og_mou_8` predictor for churn and not churn customers



Plotting monthly_3g_8 predictor for churn and not churn customers



Recommendation

- 1.Enhance network coverage in areas with low connectivity.
- 2.Offer discount plans to international plan customers.
- 3.Enhance the quality of voicemail services and gather customer feedback.
- 4.Provide discounts to customers who use more minutes.
- 5.Enhance the call center's service quality and regularly gather customer feedback to address their issues promptly.

Conclusion

1. Churn analysis reveals that a significant portion of churned customers had subscribed to international plan services. This suggests that a substantial number of customers who opted for international plans are churning, possibly due to concerns related to connectivity issues or high call charges.
2. In the case of voicemail, when the number of voice messages exceeds 20, it leads to churn. This indicates a correlation between voicemail quality and customer attrition.
3. Customers with high day call minutes also tend to incur higher call charges, making them more likely to churn.