



TELECOM CHURN PREDICTION

INTRODUCTION

- Churn prediction is one of the most popular Big Data use cases in business. It consists of detecting customers who are likely to cancel a subscription to a service.
- Churn is a problem for telecom
- companies because it is more expensive to acquire a new customer than to keep your existing one from leaving.
- Wireless companies today mean
- voluntary churn by a monthly figure

PROJECT OBJECTIVE

- To predict Customer Churn.
- Highlighting the main variables/factors influencing Customer Churn.
- Use various ML algorithms to build prediction models, evaluate the accuracy and performance of these models.
- Finding out the best model for our business case & providing executive summary.
- products, better delivery methods, lower prices, building satisfactory customer relationships, better marketing and, above all, successful customer communications.

DATASET DESCRIPTION

- Source dataset is in csv format.
- Dataset contains 7043 rows and 14 columns
- > There is no missing values for the provided input dataset.
- Churn is the variable which notifies whether
- a particular customer is churned or not. And
- we will be developing our models to predict

METHODOLOGIES

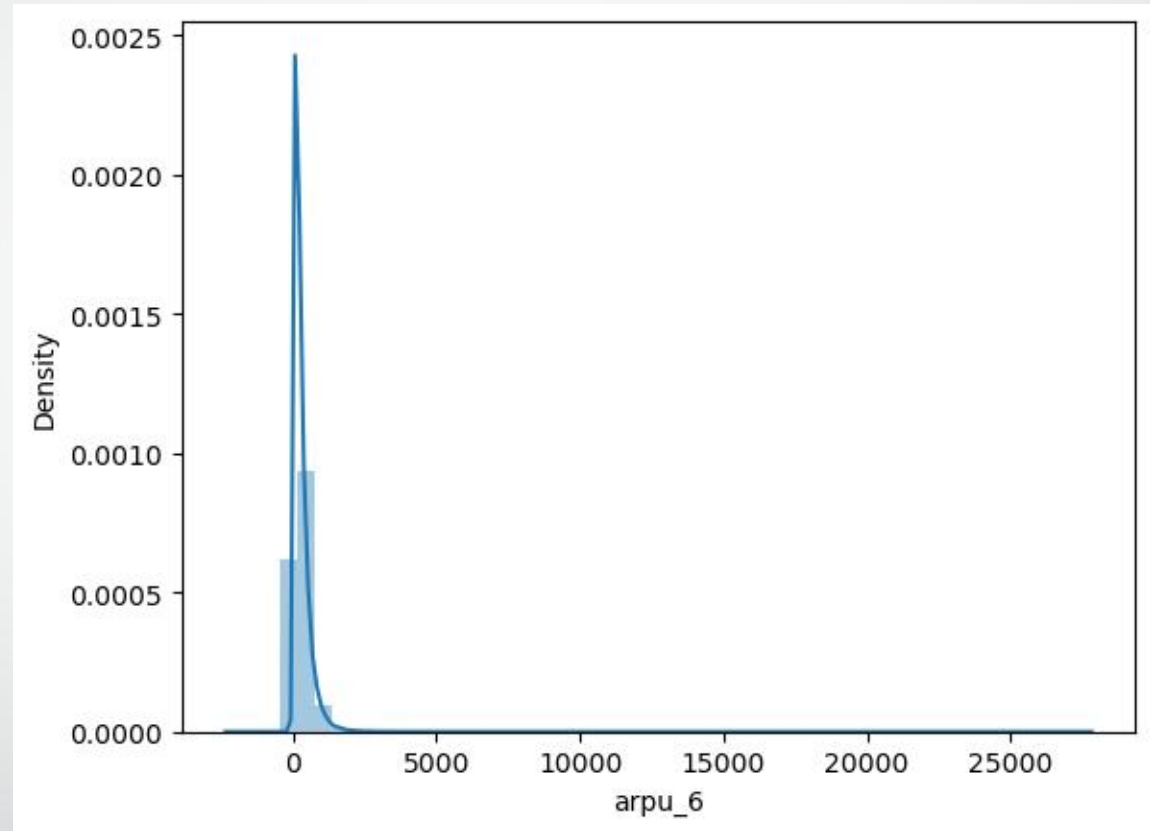
- EDA(Exploratory Data Analysis): The dataset consists of 12 variables in all. A few are continuous, rest are categorical. The control variable was customer.
- Model building which includes defining the purpose of model, determine the model boundary, build the model, create an interface and export the model.
- Evaluating machine learning algorithm is an essential part of project.

EXPLORATORY DATA ANALYSIS

- Data visualization using seaborn and matplotlib > Exploratory data analysis (EDA) is an approach to analyze data sets & to summarize their main characteristics, often with visual methods.
- A Statistical model can be used or not, but primarily EDA is for seeing what the data can tell us beyond the formal modelling or hypothesis.

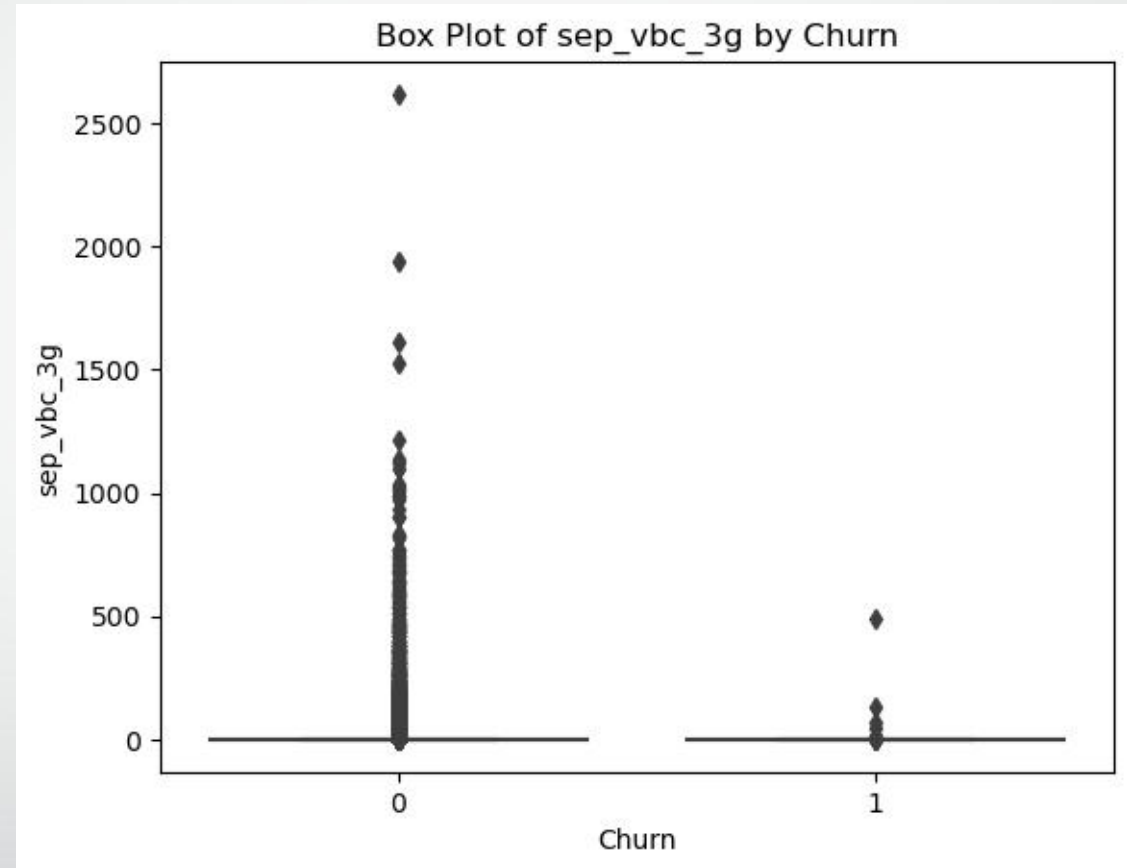
Results and Insights

Offer attractive ISD incoming call plans: Since customers receiving more ISD incoming calls in July tend to have higher value or engagement, consider offering attractive ISD incoming call plans, competitive international calling rates, or promotions. This will cater to the needs of customers with international connections and encourage them to stay.



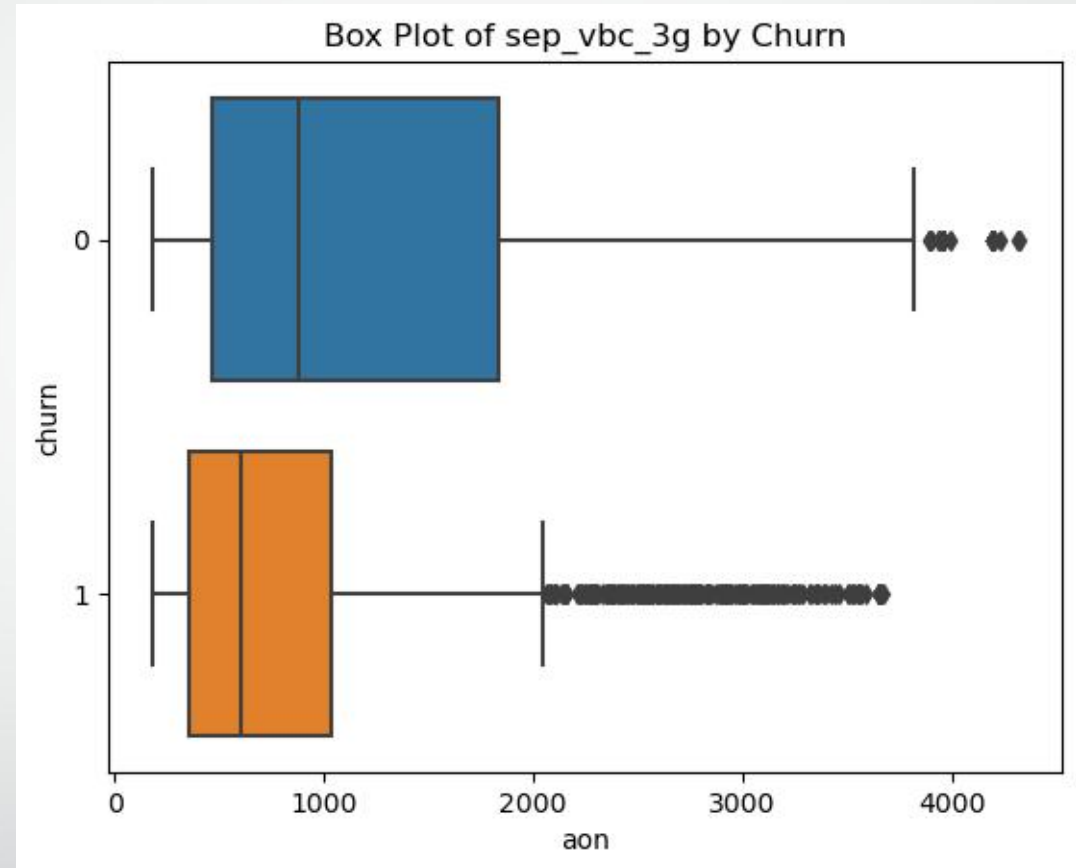
Boxplot

Enhance local outgoing call offerings to other operator mobiles: Implement strategies to improve the attractiveness of your local outgoing call offerings to customers using other operator mobiles in July. This could include competitive pricing, value-added services, or targeted marketing campaigns to retain high-value customers.



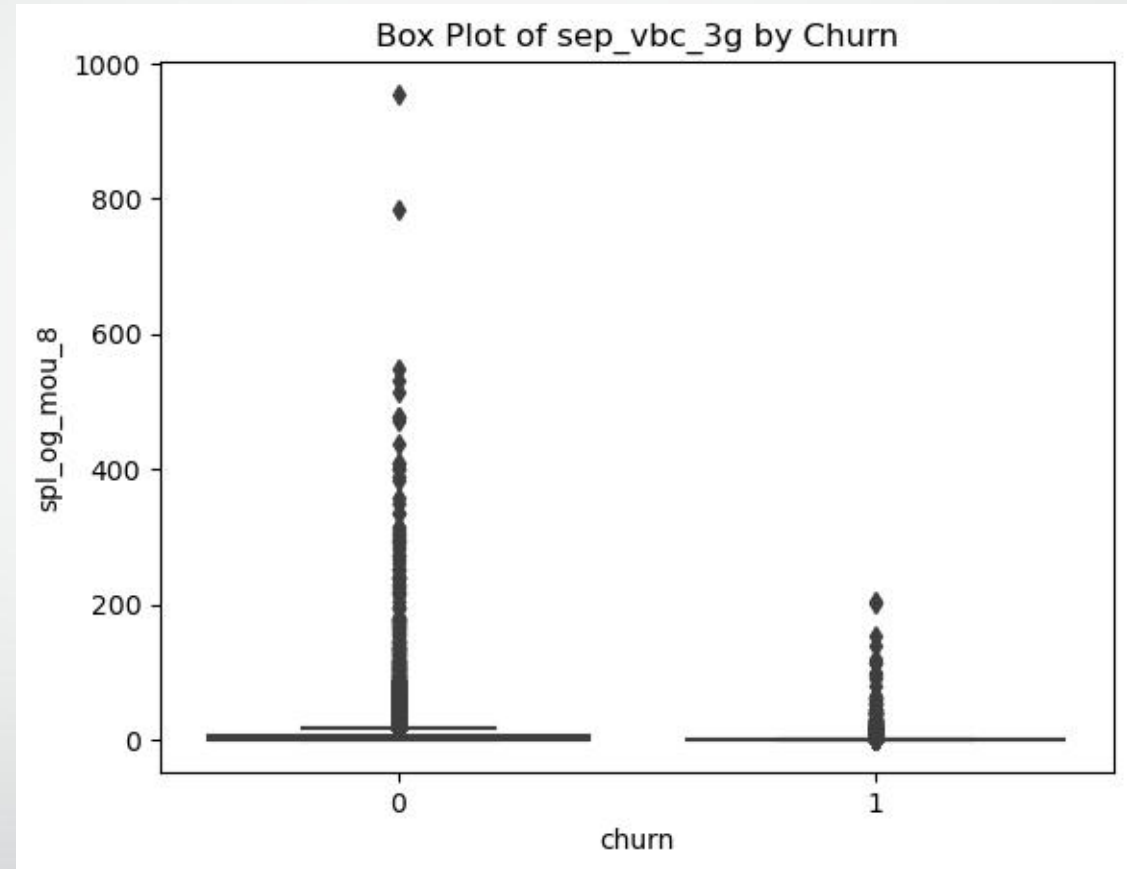
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Customize special outgoing call packages: Evaluate the nature and purpose of special outgoing calls and identify ways to enhance their value or relevance for customers. Introduce customized special call packages, exclusive features, or discounts to encourage high-value customers to make more of these special outgoing calls.



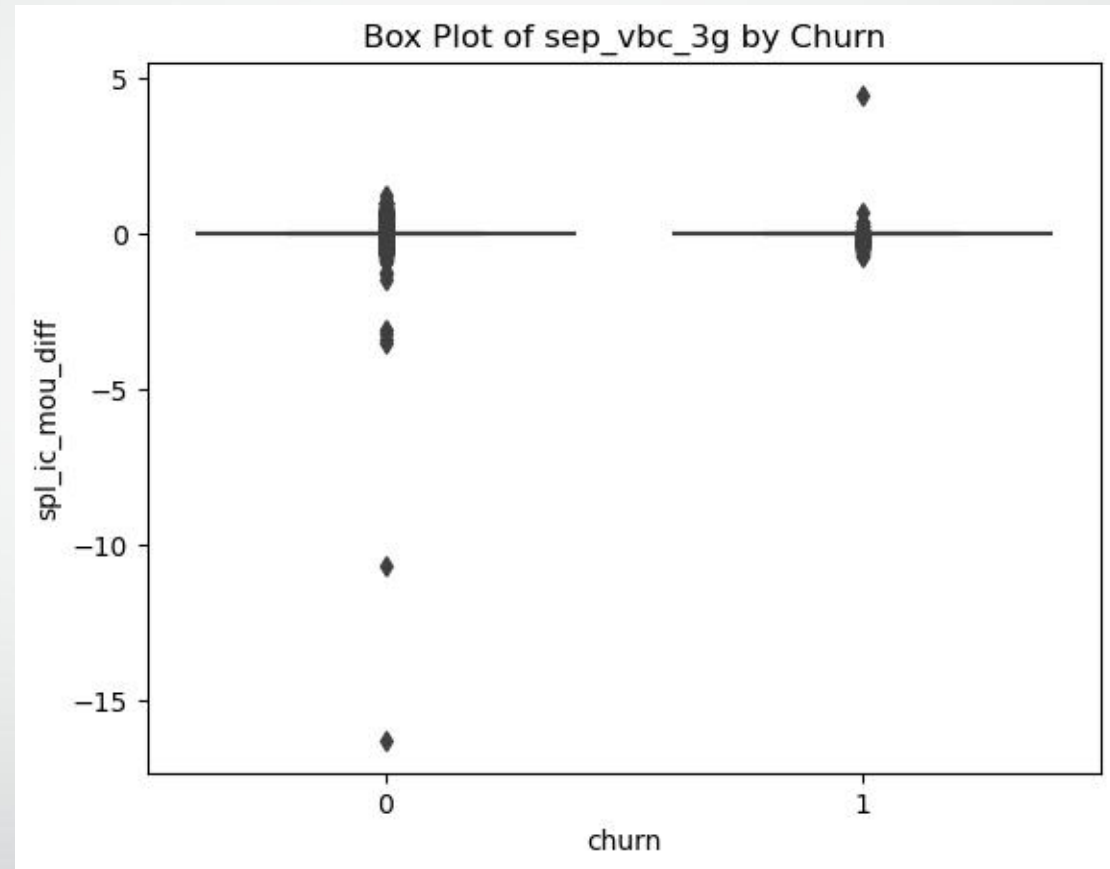
Boxplot

Promote higher-speed data services: Analyze the trend of customers opting for 2G sachet recharges in July, which suggests lower value or engagement. Promote higher-speed data services and encourage customers to upgrade to more advanced data plans to retain highvalue customers who require faster data speeds.



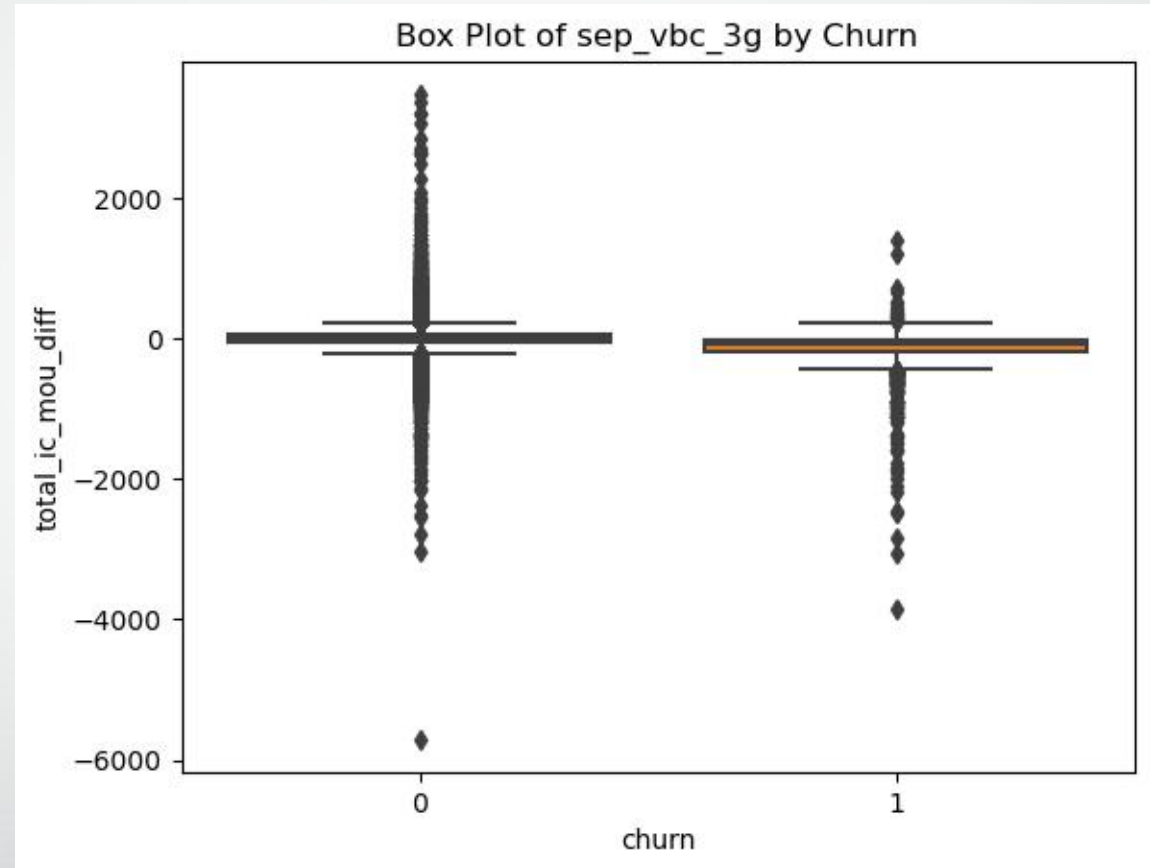
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Provide exceptional customer service: Regardless of the specific insights, delivering exceptional customer service is crucial for retaining high-value customers. Focus on personalized interactions, prompt issue resolution, and proactive communication to build strong relationships and loyalty



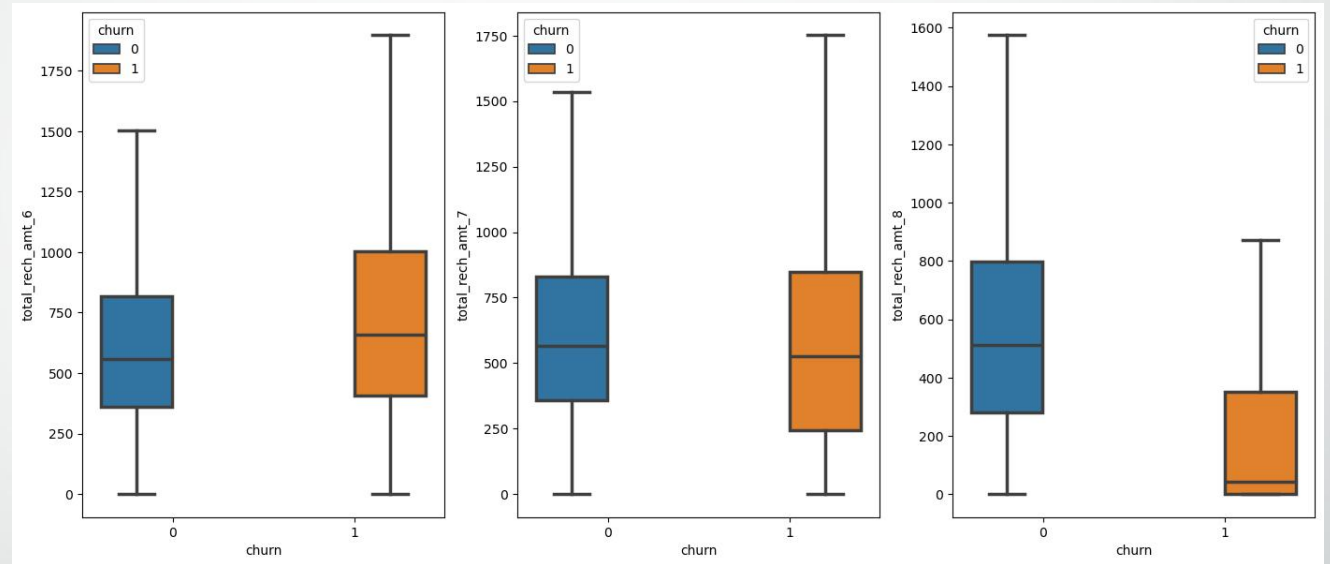
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Provide special roaming offers: Since customers making more outgoing calls while roaming in July tend to be more valuable, consider providing special roaming offers, affordable international calling rates, or tailored packages. This strategy will cater to the needs of customers who frequently travel and help retain them.



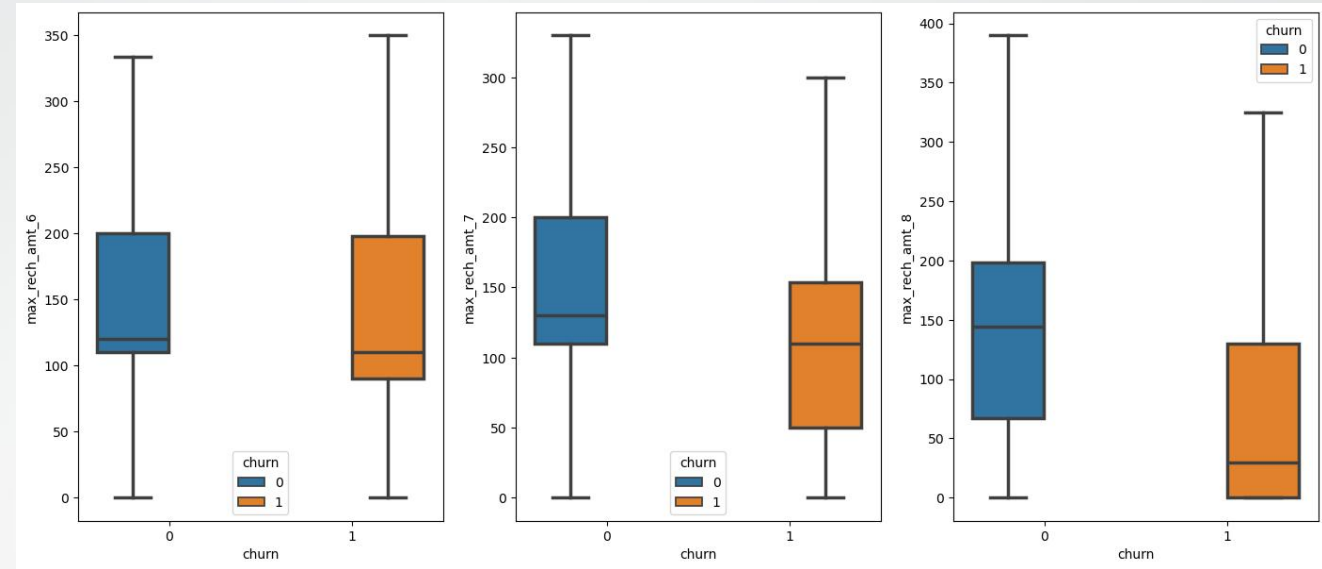
Boxplot

Offer personalized STD calling plans: Leverage the insight that customers making more STD outgoing calls in August tend to have higher value or engagement. Create targeted STD calling plans or special promotions during this period to encourage customer engagement and reduce churn.

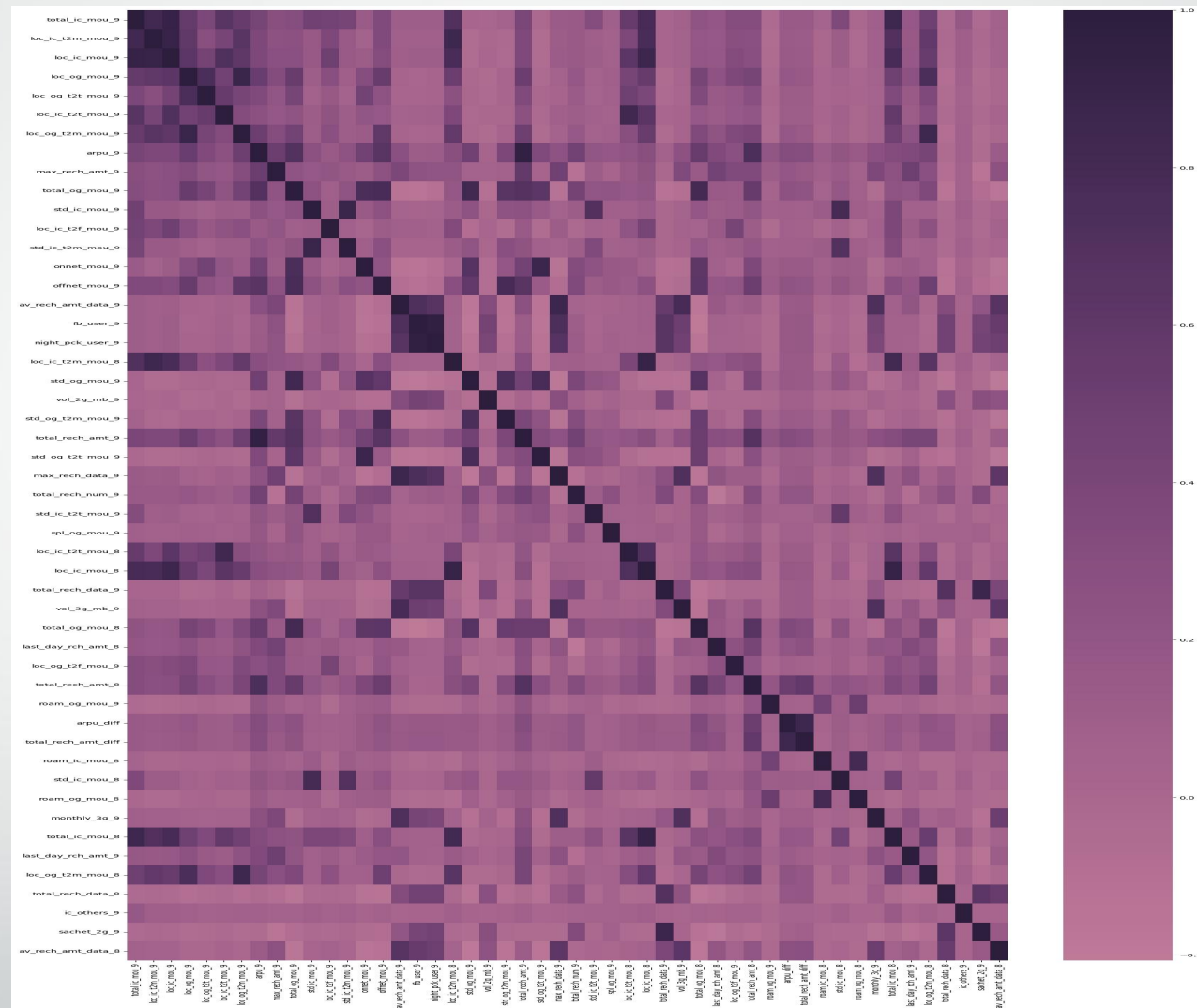


Boxplot

Enhance STD incoming call experience: Focus on enhancing the customer experience for STD incoming calls, as customers receiving more STD incoming calls in July tend to have higher value or engagement. Provide better call quality, reliable connections, and attractive STD incoming call packages to retain these high-value customers.



Heatmap



Logistics Regression

```
step = [('scaler', StandardScaler()), ("logistic",  
LogisticRegression(class_weight={0:0.1, 1:0.9}))]
```

Compiling them

```
logistic = Pipeline(step)
```

Hyperparameter

```
param = {'logistic__C': [0.1, 0.5, 1, 2, 3, 4, 5, 10], 'logistic__penalty': ['l1', 'l2']}
```

Folds

```
fold = StratifiedKFold(n_splits = 5, shuffle = True, random_state = 4)
```

Create the gridsearch

```
model = GridSearchCV(estimator = logistic, cv = fold, param_grid = param, scoring  
= 'roc_auc', n_jobs = -1, verbose = 1)
```

```
model.fit(X_train, y_train)
```




Model

GridSearchCV
estimator: Pipeline

StandardScaler

LogisticRegression



Metrics Evaluation

Confusion Matrix **5795 1086**
120 488

Sensitivity : 0.8

Specificity : 0.84

ROC : 0.88

Steps to Reduce Churn

- 1) Offer Discounts: Provide usage-based discounts to retain customers.
- 2) Add Data Benefits: Give extra internet services with recharges.
- 3) Customer Engagement: Talk to customers to understand and meet their needs.
- 4) Lower Data Costs: Reduce tariffs to stay competitive.
- 5) Improve 2G Coverage: Enhance network reliability where 3G isn't available.
- 6) Expand 3G Network: Bring 3G services to underserved areas.

Conclusion

Churn prediction is a vital process for telecom companies to identify and retain their most valuable customers. By using data analytics and machine learning techniques, telecom companies can analyze customer behavior, preferences, and needs, and segment them into different groups based on their churn risk. This enables telecom companies to design and implement personalized and targeted retention strategies, such as offering incentives, improving service quality, enhancing customer satisfaction, and increasing customer loyalty. We have provided quite a few insights and advice which can help telecom company to retain high value customers and have better profits Churn prediction can help telecom companies reduce customer attrition, increase revenue, and gain a competitive edge in the market.