What is Customer Churn?

Customer churn is defined as when customers or subscribers discontinue doing business with a firm or service.

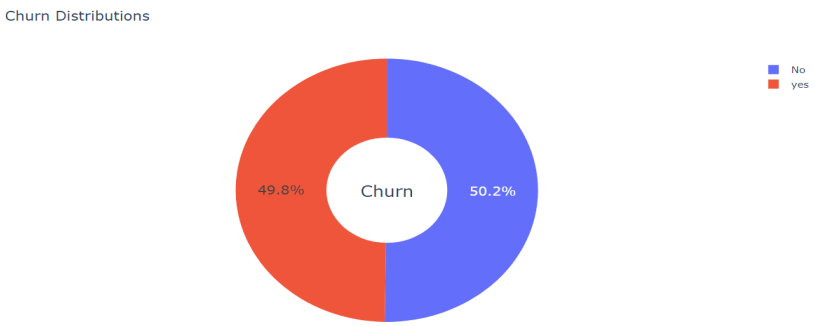
Individualized customer retention is tough because most firms have a large number of customers and can't afford to devote much time to each of them. The costs would be too great, outweighing the additional revenue. However, if a corporation could forecast which customers are likely to leave ahead of time, it could focus customer retention efforts only on these "high risk" clients. The ultimate goal is to expand its coverage area and retrieve more customers' loyalty. The core to succeed in this market lies in the customer itself.

Customer churn is a critical metric because it is much less expensive to retain existing customers than it is to acquire new customers.

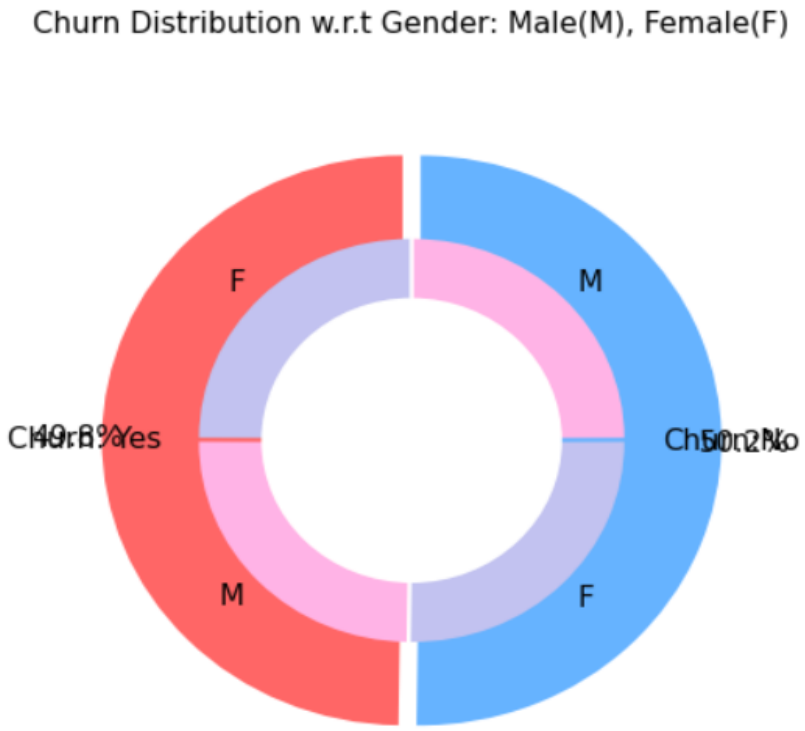
To detect early signs of potential churn, one must first develop a holistic view of the customers and their interactions across numerous channels. As a result, by addressing churn, these businesses may not only preserve their market position, but also grow and thrive. More customers they have in their network, the lower the cost of initiation and the larger the profit. As a result, the company's key focus for success is reducing client attrition and implementing effective retention strategy.

Few glimpses of EDA :

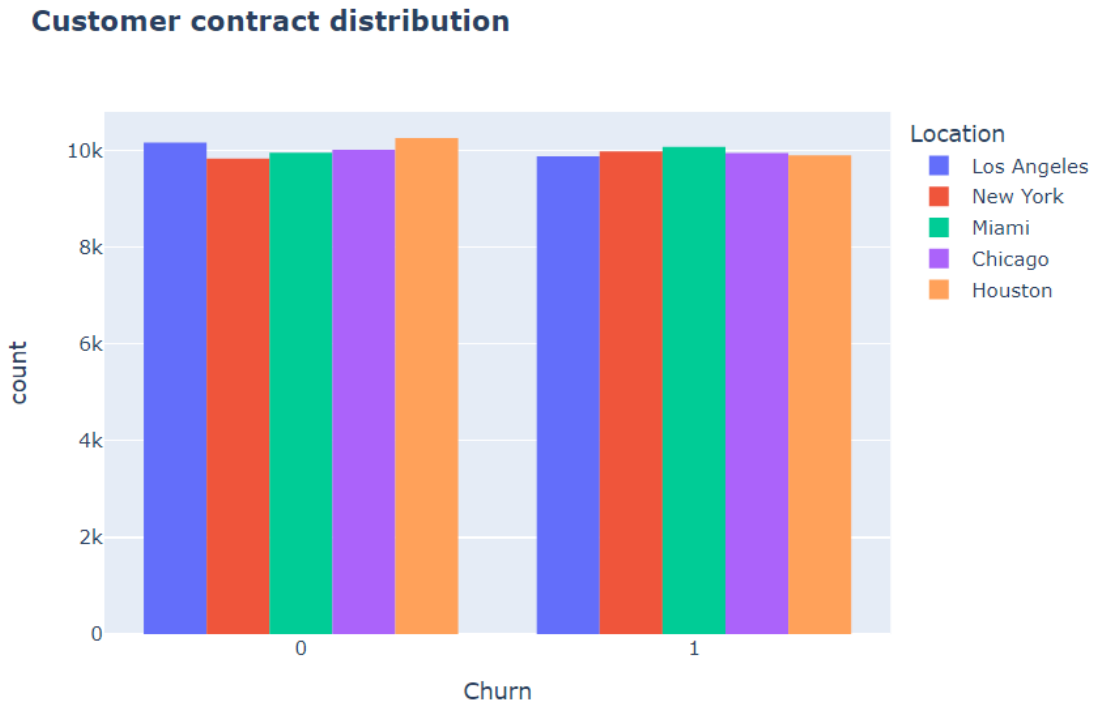
1. Churn distribution



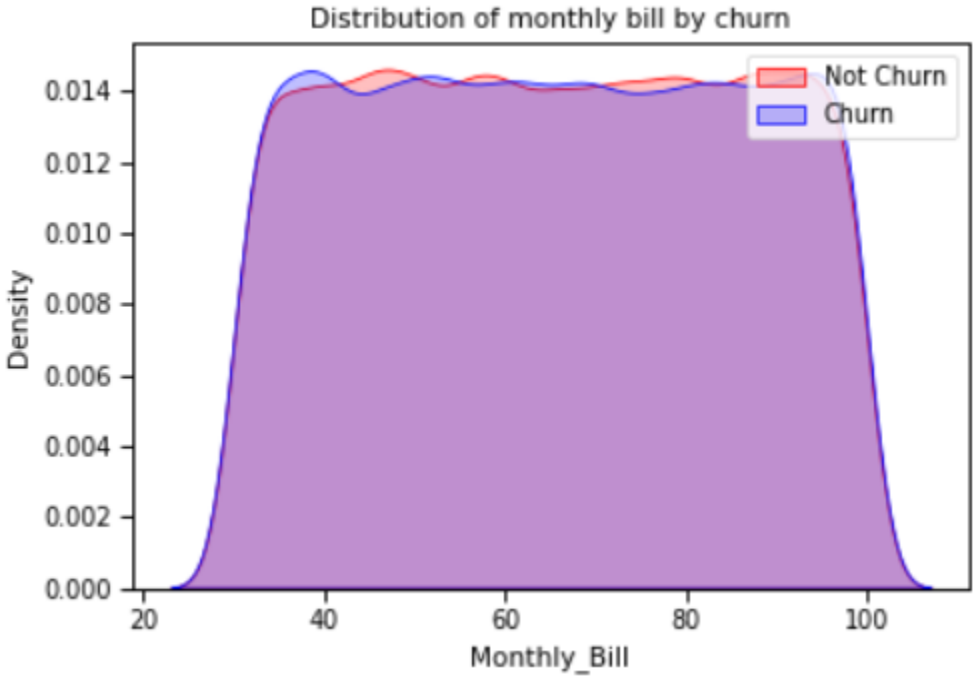
2. Churn distribution wrt Gender



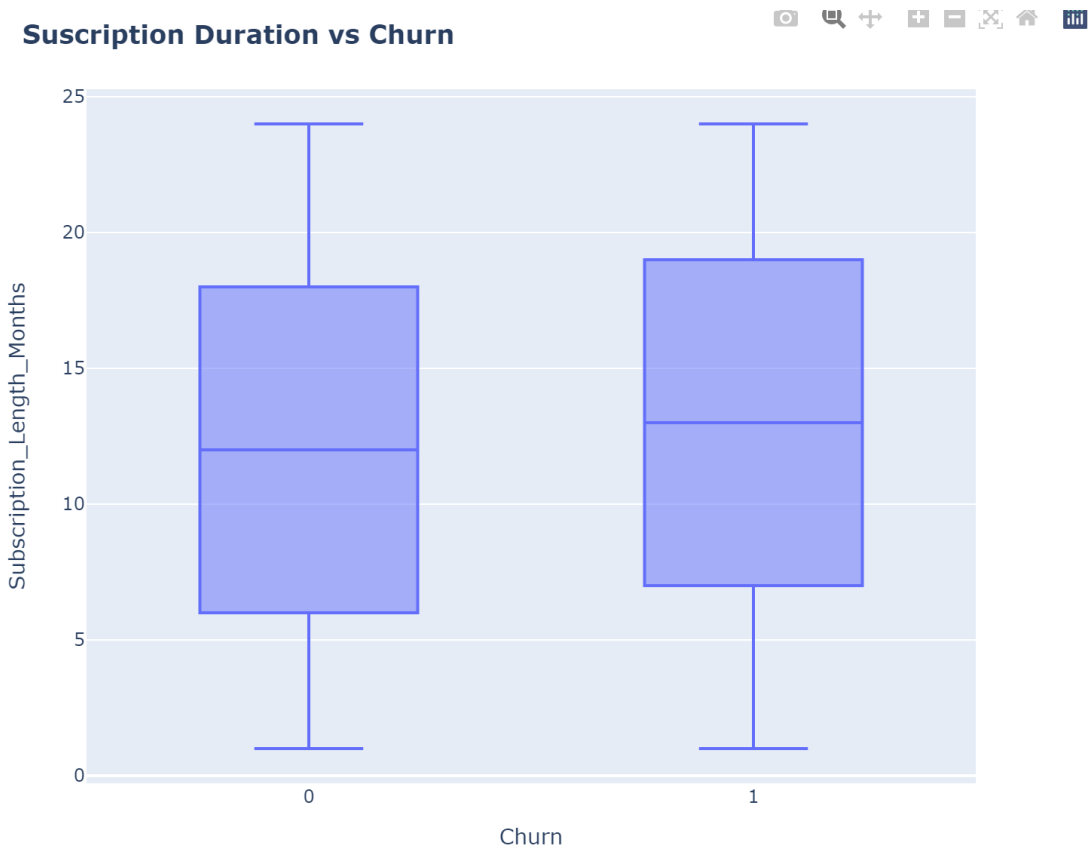
3. Location of customer wrt to Churn



4. Distribution wrt to Monthly Bill



5. Wrt to subscription duration



Feature Engineering :

1. One Hot Encoding : One-hot encoding is a technique used in machine learning and data preprocessing to represent categorical data as binary vectors. It is particularly useful when working with machine learning algorithms that require numerical input, such as neural networks or decision trees, as it allows you to convert categorical data into a format that these algorithms can understand.
2. Standardization : Standardization, also known as feature scaling or z-score normalization, is a data preprocessing technique used in machine learning and statistics to rescale the features (variables) of a dataset so that they have a mean of 0 and a standard deviation of 1.
3. Binning : Binning is a data preprocessing technique used in statistics and data analysis to group a set of continuous or numerical data values into a smaller number of "bins" or intervals. This process helps simplify the data, reduce noise, and make it easier to visualize and analyze patterns within the data.

Model Building :

Various models were trained and tested on the preprocessed dataset.

1) Logistic Regression
2) Decision Trees
3) Random Forest
4) Ensemble Techniques - Gradient Boosting, XGboost
5) KNN
6) Neural Networks

Model Optimization :

1) Implemented Grid Search CV technique for hyper-parameter tuning of model Grid Search Cross-Validation (Grid Search CV) is a hyperparameter tuning technique used in machine learning to systematically search for the best combination of hyperparameters for a given model
2) Optimal number of K in KNN