**CUSTOMER CHURN**

**PREDICTION PROJECT**

**Abstract :**

* **This data analytics project aims to address this challenge by developing a robust churn prediction model.**
* **Leveraging a comprehensive dataset comprising customer demographics, transaction history, and engagement metrics, we employ advanced machine learning techniques to forecast customer churn.**
* **Our methodology involves data preprocessing to handle missing values and outliers, feature engineering to extract relevant insights, and model selection to identify the most suitable algorithms for prediction.**

**Objective :**

**We will explore the data and try to answer some questions like:**

**1.What's the % of Churn Customers and customers that keep in with the active services?**

**2.Is there any patterns in Churn Customers based on the gender?**

**3.Is there any patterns/preference in Churn Customers based on the type of service provided?**

**4.What's the most profitable service types?**

**5.Which features and services are most profitable?**

**6.Many more questions that will arise during the analysis**

**Desingn and thinking:**

**1.Data collection**

**2.Data Manipulation**

**3.Data Preprocessing:**

* **Standardizing numeric attributes**

**4.Exploratory data analysis (EDA)**

**5.Machine Learning Model**

**evaluations and predictions :**

* **KNN**
* **SVC**
* **Random Forest**
* **Logistic regression**
* **Decision tree classifier**
* **AdaBoost classifier**
* **Gradient Boosting classifier**
* **Voting classifier**

**Data Collection:**

**Identify and collect relevant data sources. This could include customer demographics, transaction history, customer service interactions, and any other data that might be indicative of churn.**

**Data preprocessing:**

* **Clean the data by handling missing values, outliers, and inconsistencies.**
* **Perform exploratory data analysis (EDA) to understand data distributions and relationships.**
* **Feature engineering: Create relevant features from the data that might help in predicting churn. For example, calculate customer tenure, customer lifetime value, or aggregate transaction statistics.**

**Machine learning model:**

* **Choose appropriate machine learning algorithms for churn prediction, such as logistic regression, decision trees, random forests, gradient boosting, and neural networks.**
* **Train the selected models using the training dataset. Optimize hyperparameters and conduct cross-validation to ensure model generalization.**

**Model evaluation:**

**• Evaluate model performance using relevant metrics like accuracy, precision, recall, F1-score, and ROC AUC.**

**• Consider the business context and select metrics that align with project objectives.**

**Deployment & Documentation:**

**• Deploy the chosen model(s) into a production environment where it can be used to make real-time churn predictions.**

**• Document the entire project, including data sources, preprocessing steps, model development, and deployment procedures. This documentation is valuable for future reference and audits.**

**Conclusion :**

**In conclusion, this customer churn prediction analysis project has yielded valuable insights and tools to address the critical issue of customer attrition. Through a systematic approach to data analytics and machine learning, we have achieved the accurate churn prediction.**