Mobile Customer Churn Prediction

Project Overview

Customer Churn Prediction is a machine learning project that aims to predict whether a customer will drop or continue their subscription based on various features. The project utilizes different classification models such as Naive Bayes, Logistic Regression, Decision Tree, and Random Forest to analyze and predict customer churn.

Purpose

The primary purpose of this project is to assist businesses in identifying potential customer churn, allowing them to implement proactive strategies to retain customers. By leveraging machine learning models, we aim to provide accurate predictions that can contribute to customer retention efforts.

Project Impact

Predicting customer churn can have a significant impact on businesses, allowing them to:

- Implement targeted marketing strategies.
- Enhance customer satisfaction and loyalty.
- Optimize resource allocation by focusing on high-churn-risk customers.

Key Features

1. Data Preparation
- Cleaning and preprocessing the dataset to ensure data quality and consistency.

2. Exploratory Data Analysis (EDA)
- Analyzing the dataset through visualizations and statistical methods to gain valuable insights into the underlying patterns and trends.

3. Feature Selection
- Utilizing ANOVA F-value for feature selection, identifying the most relevant features that contribute to predicting customer churn.

4. Skewness Handling
- Applying transformations to handle skewed features, ensuring that the input data adheres to the assumptions of the machine learning models.

5. Model Building
- Implementing machine learning models, including Naive Bayes, Logistic Regression, Decision Tree, and Random Forest classifiers.

6. Model Evaluation
- Assessing the performance of the models using key metrics such as accuracy, precision, recall, and F1-score. Providing a comprehensive understanding of how well the models predict customer churn.

7. Hyperparameter Tuning
- Optimizing Random Forest parameters using GridSearchCV to enhance model performance and achieve better predictive accuracy.

Requirements

To run this project, you need the following Python libraries:

- pandas, numpy, matplotlib, seaborn, scikit-learn, scipy

- google.colab/jupiter.notebook

Install the required libraries using the following command:

```bash
pip install pandas numpy matplotlib seaborn scikit-learn scipy
```