CS2500 Data Science and Engineering Challenge

Project Description

Deadlines : Project Proposal - April 4, 2022
Web-based Interactive Dashboard - June 5, 2022

Overview

Customer churn is the loss of customers by a business for different reasons such as poor service and better price somewhere else. It is one of the most critical and challenging problems for telecommunication companies, credit card companies, cable service providers, etc. Since acquiring new customers costs more than retaining existing ones, analyzing customer churn and finding ways to reduce it are vital for businesses.

CEO of Chatterbox Telco Pvt Ltd in the Banana Republic, Mr. William wants to analyze the customer churn in his company and decides to bring a data science engineer on board. Suppose he hired you for this job. You were provided with a dataset that contains the package type and usage details of a customer and whether they left Chatterbox or not. In particular, the dataset consists of 19 predictor variables and one target variable. Table 1 shows the description of each variable.

Variable Name	**Description**
customer_id	Customer identification number
account_length	Number of months the customer has been with the current telco provider
location_code	Customer location code
international_plan	If the customer has international plan or not
voice_mail_plan	If the customer has voice mail plan or not
number_vm_messages	Number of voice-mail messages
total_day_min	Total minutes of day calls
total_day_calls	Total minutes of day calls

total_day_charge	Total charge of day calls
total_eve_min	Total minutes of evening calls
total_eve_calls	Total number of evening calls
total_eve_charge	Total charge of evening calls
total_night_minutes	Total minutes of night calls
total_night_calls	Total number of night calls
total_night_charge	Total charge of night calls
total_intl_minutes	Total minutes of international calls
total_intl_calls	Total number of international calls
total_intl_charge	Total charge of international calls
customer_service_calls	Number of calls to customer service
Churn	If the customer left or not (target variable)

Your Tasks

Mr. Williams asks you to analyze the given dataset and develop a web-based interactive dashboard that would provide valuable insights for him to make decisions., Mr. William needs you to submit a project proposal before starting the project.

1. Project Proposal

Your project proposal should be **no longer than 4 pages** and should contain the following.

1. Problem definition
    a. Problem
    b. Motivation
    c. Objectives
2. Proposed solution (step-by-step)
    Identify a set of possible technologies to implement the dashboard. Select an appropriate technology, with justification. Clearly explain the procedure to implement the dashboard with the selected technology
3. Proposed features of the dashboard
    Clearly describe the features you are planning to offer via your proposed dashboard and why you think those features are helpful and vital.
4. Project timeline

2. Web-based Interactive Dashboard Demo

Develop a web-based interactive dashboard using technologies such as PowerBI, Grafana, ChartJS or D3 to help Mr. William to make decisions regarding customer retention. Use the knowledge you obtained from Introduction to Data Science (CS3120) and Introduction to Machine Learning (CS3110) to decide what elements to be included in the dashboard. The dashboard should show various insights into the provided dataset and allow the user to obtain the prediction for a new customer.