**Tele Communication Customer Churn Prediction Machine Learning Application:**

Purpose and Description:

* The system leverages Supervised Machine Learning techniques to conduct classification-based predictions, specifically focusing on telecommunication customer churn prediction
* The application has a smooth, simplistic and minimalistic user interface design that allows users to upload a csv file in a specific format, choose/train their desired machine learning model and view/download the results of the prediction.

App Capabilities:

* The app has a dynamic webpage UI design
* The app is able to handle file uploads
* The app is able to produce prediction outputs for the file input and is able to allow for on-site display as well as download options
* The app allows users to train 5 models with their own dataset and see the evaluations of models
* The app offers a total of 5 different Machine Learning models for users to choose from

Limitations / Constraints / Assumptions

* The app requires pre-defined folders in the host system as routes for the app for pathing purposes
* The app limits the user to select only one model to run the predictions
* The app limits to one dataset per cycle to be uploaded and used for prediction
* The app can only handle csv files as file inputs and excel files for user downloads
* The app assumes a specific format for the CSV files, specifically the names, order and number of the columns for the csv file input (available error handling for non-CSV files)
* The app currently does not have any error handling methods for incorrect data format (column names, number of columns)

Software Requirements / Specifications:

* The app runs on python for backend design
* The app runs on python flask web framework
* The app runs on HTML-CSS as well as jinja2 templates for front-end desige
* The app requires the following Python applications / modules / packages to be installed:
  + Numpy
  + Pandas
  + Scikit-Learn + Pickle
  + Openpxl

**Software Requirements Specification (SRS)**

**1. Introduction**

1.1 Purpose

The purpose of this document is to provide a comprehensive specification for the Telecommunication Customer Churn Prediction Machine Learning Application. The application utilizes Supervised Machine Learning techniques to perform classification-based predictions, with a primary focus on telecommunication customer churn prediction.

1.2 Scope

The Telecommunication Customer Churn Prediction Machine Learning Application is designed to offer a simple and user-friendly interface that allows users to upload CSV files in a specific format, select their desired Machine Learning model, and view or download the prediction results. The application offers a total of five different Machine Learning models for users to choose from.

1.3 Definitions, Acronyms, and Abbreviations

* CSV: Comma-separated Values, a file format for data storage.
* ML: Machine Learning

1.5 Overview

The subsequent sections of this document will outline the capabilities, limitations, software requirements, and specifications for the Telecommunication Customer Churn Prediction Machine Learning Application.

**2. App Capabilities**

The Telecommunication Customer Churn Prediction Machine Learning Application possesses the following capabilities:

* Dynamic Webpage UI Design: The application provides a smooth, simplistic, and minimalistic user interface.
* File Upload Handling: Users can upload CSV files in a specific format for prediction.
* Prediction Outputs: The application produces prediction outputs for the uploaded file and allows users to view the results on-site or download them.
* Multiple Model Options: Users can select from five different Machine Learning models for their predictions.
* Training Model Options: Users can train models based on their own dataset and view the evaluation of their newly trained models

**3. Limitations / Constraints / Assumptions**

The Telecommunication Customer Churn Prediction Machine Learning Application has the following limitations, constraints, and assumptions:

* Pre-defined Folders: The application requires specific folders in the host system to facilitate pathing.
* Single Model Selection: Users can only choose one Machine Learning model for prediction.
* Single Dataset per Cycle: The application handles one dataset per prediction cycle.
* Supported File Types: The app accepts CSV files as input and allows downloading results in Excel format.
* CSV Format Assumption: The app assumes a specific format for the CSV files, including column names, order, and number.

**4. Software Requirements / Specifications**

The Telecommunication Customer Churn Prediction Machine Learning Application is built with the following software and specifications:

* Backend: Python programming language is used for backend development.
* Web Framework: The application is developed using the Python Flask web framework.
* Front-end: HTML, CSS, and Jinja2 templates are used for frontend design.
* Required Python Packages:
  + Numpy
  + Pandas
  + Scikit-Learn
  + Pickle
  + Openpyxl