

AI-Powered Assistant for Churn Prediction

OVERVIEW

We have been tasked by a client to develop a Proof of Concept (PoC) that showcases a model capable of predicting customer churn rates. The requirement is for the marketing team to interact with the model through an LLM-powered chatbot using natural language.

Objectives:

1. Develop a churn classification model to demonstrate our expertise in constructing classical machine learning models.
2. Create a pipeline for chat interactions with the classification model, allowing the marketing team to input queries and receive understandable results and deploy it as an API.

SPECIFICATIONS:

1. **Diagram:** Create a diagram illustrating the different components and how to approach this request, showing your objectives and goals.
2. **Dataset:** Use the attached dataset to demonstrate building the classification model.
3. **Pipeline:** Build a pipeline to handle the chat with the marketing team, gather the model inputs through a conversation, and return the output.
4. **LLM Integration:** Ensure that the LLM-powered chatbot:
 - a. Is based on open-source models (to meet the client's requirements about not using closed-source models and third-party LLMs).
 - b. Translates marketing questions into structured data for the ML model.
 - c. Presents results in a clear and understandable format.
5. **Documentation:** Provide comprehensive documentation explaining your approach, including:
 - a. Technical and business motivations.
 - b. How the solution meets the client's requirements.
6. **Tools and Libraries:** Use any tools or libraries, provided the solution remains simple and meets the client's requirements.

Dataset Overview:

The data set consists of 21 Variables and 7043 Observations.

CustomerId : Customer Id

Gender : Gender

Senior_Citizen : Whether the customer is a senior citizen (1, 0)

Is_Married : Indicating if the customer is married or not

Dependents : Indicating if the customer has children or not

tenure : Number of months since the customer joined the company

Phone_Service : Indicating if the customer has phone or not

Dual: Indicating if the customer is a dual customer or not

Internet_Service : Customer's internet service provider (DSL, Fiber optic, No)

Online_Security : Indicating if the customer has online security or not

Online_Backup : Indicating if the customer has online backup or not

Device_Protection : Indicating if the customer has device protection or not

Tech_Support : Indicating if the customer receives technical support or not

Streaming_TV : Whether the customer has streaming TV (Yes, No, no Internet service) (The customer has a third-party indicates whether the provider uses the Internet service to broadcast television programs)

Streaming_Movies : Whether the customer has streaming movies (Yes, No, No Internet service) (Customer has a third-party Indicates whether the customer is using the Internet service to stream movies from the provider)

Contract : Duration of the customer's contract (Month to month, One year, Two years)

Paperless_Billing : Whether the customer has a paperless bill (Yes, No)

Payment_Method : Customer's payment method (Electronic check, Postal check, Bank transfer (automatic), Credit card (automatic))

Monthly_Charges : Amount charged to the customer monthly

Total_Charges : Total amount charged to the customer

Churn : Whether the customer is using or not (Yes or No) - Customers who left in the last month or quarter.

DELIVERABLES

1. Churn Classification Model:

- a. Code implementing the model.
- b. A clear explanation of the model choice, feature engineering, and training process.

2. API and Chatbot Pipeline:

- a. An API to handle the conversation with the marketing team.
- b. Chatbot pipeline code that interacts with the churn model.
- c. Clear documentation on how the marketing team can use the chatbot.

3. Diagram:

- A diagram showing the architecture and flow of data between components.

4. Documentation:

- a. A detailed report explaining the technical and business motivations for your approach.
- b. How the solution aligns with the client's requirements.