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Problem description: In the pharmaceutical industry, medication adherence and persistence are critical components of quality healthcare, particularly in managing chronic conditions. However, monitoring medication persistence remains a challenge due to factors such as patient behavior, the complexity of dosing schedules, the involvement of multiple healthcare providers, and the lack of standardized methods for measuring persistence. This challenge is further compounded by the need to differentiate patients based on their adherence to prescribed treatment plans, as non-adherence can lead to increased healthcare costs, poorer health outcomes, and elevated disease prevalence. For pharmaceutical companies, understanding medication persistence is crucial as it directly impacts drug effectiveness, patient outcomes, and overall healthcare system efficiency. Physicians rely on various factors, including demographic, clinical, and behavioral characteristics, to assess and monitor medication persistence in patients. Yet, there is a need for a robust predictive system that can analyze historical patient data and accurately identify factors influencing persistence to optimize treatment strategies.

Business understanding: For pharmaceutical companies, accurately predicting medication persistence is vital for developing effective strategies to enhance patient outcomes, optimize resource allocation, and reduce healthcare costs. The goal of this project is to use historical patient data to identify patterns and indicators that impact medication persistence. By building a predictive model, we can proactively address adherence issues, improve patient care, and support healthcare professionals in decision-making. This data-driven approach will not only help in managing patient outcomes but also enable companies to tailor interventions, refine product offerings, and enhance their market positioning within the healthcare sector. The primary objective of this project is to use historical patient data to build a classification model that predicts medication persistence. This model will not only identify the key factors influencing persistence but will also serve as a standardized system for healthcare providers to assess patient behavior. The project will involve thorough data exploration, feature engineering, model development, and evaluation to ensure the predictive system is both accurate and interpretable. By addressing this problem, the project aims to facilitate a more effective approach to medication adherence, providing pharmaceutical companies and healthcare providers with a robust tool to measure persistence, inform patient interventions, and ultimately enhance health outcomes.

Project lifecycle along with deadline:
1. 9/19/2024

     a. Problem description
     b. Business understanding
     c. Project lifecycle
2. 9/26/2024
     a. Analyse collected data (EDA)
     b. Understand columns meaning and data types
     c. Identify dataset problems (e.g. NA values, null values, outliers, class imbalance, sample size, etc)
3. 10/2/2024
     a. Data preparation by cleaning, transforming, engineering features/pipelines
     b. Encoding techniques
4. 10/9/2024
     a. Deliver finalized EDA
     b. Explore model selections
     c. Develop, train, evaluate predictive model
5. 10/16/2024
     a. Validate model through different validation techniques
     b. Develop ppt presentation
6. 10/23/2024
     a. Deploy predictive model
     b. Deliver business ppt presentation
     c. Provide strategic business recommendation