Title: Data Preprocessing and Forecasting for Client's Business

Role: Data Scientist Associate

Goal: To preprocess the client's data, collaborate on external data identification, perform visualizations, and develop an accurate forecasting model with a Mean Absolute Percentage Error (MAPE) of 40% or lower.

Methodology:

1. Data Preprocessing and Collaboration:
   * Worked closely with the client to understand their data and business requirements.
   * Collaborated with the client to identify the best external data sources to enhance the forecasting model's accuracy.
   * Collected data from multiple sources, including client-provided data and external data.
2. Data Cleaning and Organization:
   * Cleaned the collected data by removing duplicates, inconsistencies, and inaccuracies.
   * Dealt with missing values using appropriate imputation techniques.
   * Smoothed the data by applying appropriate transformation techniques to reduce noise.
3. Visualization of Trends and Seasonality:
   * Utilized data visualization tools to showcase trends and seasonality in the preprocessed dataset.
   * Identified patterns and insights that could be leveraged for improving the forecasting model.
4. Mono-input Forecasting:
   * Developed initial forecasting models using mono-input data for monthly and quarterly predictions.
5. Correlation Study and Feature Importance:
   * Conducted a correlation study to identify relevant features and their importance in the forecasting model.
   * Utilized the findings to refine the model and improve accuracy.
6. Multi-input Forecasting and Model Iterations:
   * Performed multiple iterations of multi-input forecasting using Long Short-Term Memory (LSTM), Facebook's Prophet, and Temporal Fusion Transformer (TFT) models.
   * Continuously refined and optimized the models based on their performance and insights from the correlation study and feature importance analysis.

Results:

After several iterations and refinements, we successfully developed a forecasting model that achieved a MAPE of 40%, meeting the client's satisfaction. The combination of data preprocessing, visualization, and advanced forecasting techniques, along with close collaboration with the client, resulted in an accurate model that could be utilized for informed decision-making and planning.