Milestone 2: Advanced Data Analysis and Feature Engineering

Objectives

- Perform deeper analysis and enhance feature selection to improve the forecasting model's accuracy.

Tasks

1. Advanced Data Analysis

- Conduct time series analysis to identify trends, seasonality, and cyclic patterns.
- Use statistical tests (e.g., ADF test for stationarity) to ensure data suitability for time series modeling.
- Perform correlation analysis to explore the relationships between features such as sales, promotions, holidays, and weather.

2. Feature Engineering

- Create time series features like rolling averages, lag features, and seasonal components (e.g., holiday effects, month).
- Perform feature transformations such as scaling, encoding, and aggregating features (e.g., monthly sales totals).
- Introduce external factors like weather, promotions, or economic conditions to improve the forecast accuracy.

3. Data Visualization

- Develop advanced visualizations to show historical trends, forecasted demand, and factors affecting sales (e.g., promotional effects, weather impact).
- Build interactive dashboards to analyze how external factors influence demand over time.

Deliverables

- **Data Analysis Report**: A comprehensive report of statistical analyses and insights derived from feature analysis.

- **Enhanced Visualizations**: Interactive visualizations or dashboards showing demand patterns and seasonal effects.
- **Feature Engineering Summary**: Documentation of newly created features and their expected impact on the forecast model.