**DS & AI Project**

**Demand Forecasting with Time Series AI Models - Predict future product demand and optimize inventory management.**

**Data:** <https://www.kaggle.com/competitions/store-sales-time-series-forecasting/data>

**Expected Outcome:**

**Accurate Sales Forecasts:**Daily Sales, Weekly Sales, Store-wise or product-wise demand

**Actionable insights through data driven features:**Seasonal pattern, Sales spike during Holidays, Product life cycles, Store performance difference

**Interactive Visitation Dashboard:**

The project will include an intuitive dashboard that presents:

* Historical sales trends
* Predicted future sales
* Impact of holidays and external events
* Confidence intervals around forecasts

Business users will be able to:

* Monitor sales forecasts dynamically
* Select specific products or stores for analysis
* Download reports for further use

This enables real-time, data-driven decision-making without requiring technical expertise.

**Reduction in Forecasting Errors**

The model's performance will be evaluated using industry-standard metrics like **RMSE**, **MAE**, and **SMAPE**.  
With advanced models like **Prophet**, **XGBoost**, and optionally **LSTM**, the solution aims to:

* Reduce error rates by at least **20–30%** compared to traditional manual forecasting
* Increase forecasting accuracy even during non-linear sales periods (e.g., holidays, product launches)