**Case Study: Monthly Sales Forecasting for a manufacturer**

**Background:** A large German manufacturer in Heidelberg in the area of offset printing has been collecting monthly sales data for the past 9 years for equipment and service parts. The management team is keen to improve its financial forecasting for future sales for both product categories.

**Objective:** Develop a time series forecasting model that can predict the monthly sales for the next 12 months (Fiscal year 2025) using historical sales data (*attached*). The candidate is free to choose any appropriate method for the forecasting task.

**Data:** The dataset (*attached*) includes:

* Date (Monthly)
* Total Sales (in Euros)
* Sales by Category (Equipment, Service Parts)

The candidate can include further external data (*attached*):

* Print Production Volume in Germany

**Tasks:**

1. **Data Preparation:**
   * Perform exploratory data analysis (EDA) to understand the structure and patterns in the data.
   * Handle missing values and outliers if any.
2. **Model Selection and Training:**
   * Choose an appropriate time series forecasting method (e.g., Facebook Prophet, SARIMAX).
   * Train the model
3. **Model Evaluation:**
   * Evaluate the model's performance using appropriate metrics (e.g., MAE, RMSE).
   * Validate the model
   * Visualize the forecasted results
4. **Present your results and your procedure:**
   * Discuss the model selection process and justify the choice of the forecasting method.
   * Present the forecasted sales for the next 12 months (Fiscal Year 2025).

Good luck!