* ***Analyzing sales data to derive insights and make recommendations.***

***Assessment: Sales Data Analysis***

**Dataset Description**

The dataset contains sales transaction data with the following columns:

* Invoice No: Unique identifier for each transaction
* Stock Code: Identifier for the product
* Description: Description of the product
* Quantity: Number of units sold
* Invoice Date: Date and time of the transaction
* Unit Price: Price per unit
* Customer ID: Unique identifier for the customer
* Country: Country where the transaction occurred

**Objectives:**

1. **Data Exploration and Cleaning:**
   * Provide a summary of the dataset (e.g., total number of transactions, total sales, average transaction value).
   * Identify and handle any missing or inconsistent data.
   * Convert the Invoice Date column to a datetime format and extract relevant time-based features (e.g., year, month, day, hour).
2. **Descriptive Analysis:**
   * Calculate the total revenue generated from sales.
   * Identify the top 10 best-selling products by revenue.
   * Determine the total number of unique customers.
3. **Sales Trends:**
   * Analyze sales trends over time (e.g., monthly or weekly sales trends).
   * Identify any seasonal patterns in sales.
4. **Customer Analysis:**
   * Analyze customer purchasing behavior (e.g., average number of transactions per customer, average spend per customer).
   * Identify the most valuable customers (e.g., top 10% of customers by total spend).
5. **Geographical Analysis:**
   * Analyze sales performance by country.
   * Identify any countries with significant sales growth or decline.
6. **Recommendations:**
   * Based on your analysis, provide three actionable recommendations for improving sales performance.
7. **Machine Learning (optional):**
   * Develop a predictive model to determine the likelihood of a customer making a purchase in the next month or any other Data Science use case you can derive from this

***Deliverables:***

1. **Report:**
   * A comprehensive report summarizing your findings, analysis, and recommendations.
   * Include visualizations (e.g., charts, graphs) to support your analysis.
2. **Code:**
   * Provide the code used for your analysis (e.g., Jupyter notebook, R script, or any other tool you used).

***Guidelines:***

* Use descriptive statistics to summarize the data.
* Use appropriate visualizations to highlight key insights.
* Provide clear and concise recommendations.

***Evaluation Criteria (Thought Process and Analytical Skills):***

* **Logical Approach**: Demonstrates a logical and structured approach to problem-solving.
* **Critical Thinking**: Shows the ability to think critically about the data, identify key issues, and apply appropriate methods to address them.
* **Innovative Solutions**: Provides innovative and creative solutions to the problems presented in the dataset.
* **Justification of Choices**: Clearly explains and justifies the choices made during the analysis, from data cleaning methods to model selection and evaluation.