Assignment: Data Transformation

Objective:

Perform data transformation tasks on a dataset containing sales data. This includes data encoding, creating derived columns, and performing data aggregation.

Instructions:

1. Dataset: Use dataset named **customer_sales_data.csv** with the following columns:
    - Sales_ID (Integer)
    - Product_Category (Categorical: Electronics, Clothing, Home Appliances, etc.)
    - Region (Categorical: North, South, East, West)
    - Sales_Amount (Float)
    - Quantity_Sold (Integer)
    - Sales_Date (Date format: YYYY-MM-DD)
    - Customer_Age (Integer)
    - Customer_Gender (Categorical: Male, Female)
2. Tasks:

    a. Load the dataset using Pandas.

    b. Data Encoding:
        - Perform one-hot encoding on Product_Category and Region columns.
        - Perform label encoding on Customer_Gender where Male = 1, and Female = 2.

    c. Create New Derived Columns:
        - Create a new column Sales_Profit by assuming a constant profit margin of 25% on the Sales_Amount.
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    d. Group and Aggregate Data:
        - Use groupby to calculate the total sales and average quantity sold for each product category.
        - Use pivot_table to display total sales for each region with columns for different product categories.
3. Submission:
    - Submit the Python script (.ipynb or .py) and PDF of the output (containing the transformed data, statistical summaries, and visualizations).