**Online Retail Case Study Project**

**Dataset on**

[**https://archive.ics.uci.edu/ml/machine-learning-databases/00352/Online%20Retail.xlsx**](https://archive.ics.uci.edu/ml/machine-learning-databases/00352/Online%20Retail.xlsx)

**Part 1: Data Cleaning and Preparation**

1. **How do you load the dataset into a Pandas DataFrame?**
2. **How many missing values are there in each column?**
3. **What would be the best approach to handle these missing values?**
4. **How do you convert the InvoiceDate column to a datetime format?**
5. **Why is it important to convert this column to datetime?**
6. **How can you extract additional features such as Month, Day, and Hour from the InvoiceDate column?**
7. **How do you identify and remove rows with erroneous data, such as negative quantities or incorrect order dates?**
8. **How can you extract city and country information from the Country column?**

**Part 2: Exploratory Data Analysis (EDA)**

1. **What are the top 10 products by sales volume?**
2. **Which product generated the most revenue?**
3. **What is the distribution of orders by month?**
4. **What is the best time of day to advertise products?**
5. **Which product category is the most popular?**
6. **Which product category generates the most revenue?**
7. **Which countries have the highest sales volume?**
8. **Are there any patterns in sales distribution by country?**

**Part 3: Data Visualization**

1. **How can you visualize the sales trend over the year?**
2. **How can you create a bar chart to compare sales across different product categories?**
3. **How can you visualize the sales distribution by country?**
4. **How can you plot the relationship between product price and quantity sold?**
5. How can you use a heatmap to explore correlations between different features?

**Part 4: Advanced Analysis**

1. **Which product combinations are most often sold together?**
2. **How can you use a simple linear regression model to predict future sales?**
3. **How accurate is your model in predicting future sales?**
4. **How can you segment customers based on their purchasing behavior?**
5. **What are the characteristics of each customer segment based on total spending and purchase frequency?**

**Part 5: Reporting and Recommendations**

1. **How can you summarize your findings in a report?**
2. **What actionable recommendations can you provide based on your analysis?**
3. **How can your insights help improve business decisions and strategies?**