

Task 1: Data Loading, Cleaning, and Exploratory Data Analysis (EDA)

Data Loading and Inspection:

The first step I took was loading the datasets into Python using Pandas. I used the `read_csv()` function to load the data and inspected its structure with `head()`, `info()`, and `describe()` functions. These functions helped me review the columns, data types, and identify any missing or incorrect values. The datasets contained key columns like CustomerID, ProductID, Sales, Region, and Category, which were essential for further analysis.

Data Cleaning:

After understanding the dataset, the next step was cleaning the data. I addressed missing values using `dropna()` for rows with critical missing information and `fillna()` to impute missing values with the mean or median for less important columns. I also removed duplicates using `drop_duplicates()` to ensure each record was unique. I checked the data types to ensure correctness, converting Date columns to datetime using `pd.to_datetime()` for accurate handling in time-based analysis.

Exploratory Data Analysis (EDA):

Once the data was clean, I performed EDA to uncover trends and patterns. First, I analyzed sales by region using bar charts to understand which regions had the highest sales. I also examined top-selling products and categories to identify popular items and profitable categories. This helped me focus on inventory and product strategy. Finally, I identified customers with the highest transactions, which gave me insights into high-value customers, crucial for targeted marketing and loyalty programs.

Business Insights:

From the EDA, I derived the following business insights:

Regional Sales: Some regions perform better, suggesting opportunities for targeted marketing.

Top Products: Identifying top-selling products helps optimize inventory management.

High-Value Customers: Recognizing key customers allows for personalized offers.

Category Performance: Some categories perform better, guiding product focus.

Sales Trends: Seasonal peaks highlight opportunities for timely promotions.

Conclusion:

This task provided valuable insights that can guide marketing strategies, inventory management, and customer retention efforts. It helps me make informed decisions and drive business growth.