ELEVATE LABS DATA ANALYST INTERN ON 17th APRIL 2025

🛒 Sales Data Analysis Project with SQL Server in Jupyter Notebook

📌 Project Overview

This project involves end-to-end data analysis using a real-world sales dataset loaded into Microsoft SQL Server and queried through a Jupyter Notebook using Python and pyodbc.
The goal is to extract meaningful business insights from structured sales data using SQL queries, and optionally visualize results using Python libraries like matplotlib or seaborn.

📁 Dataset

The dataset used: sales_data_sample.csv
It includes transactional-level details such as:
Customer information
Order details
Product data
Geographic information
Sales & revenue
Date and time attributes

🧰 Tools & Technologies

Python (Jupyter Notebook)
Pandas
PyODBC (for SQL Server connection)
Microsoft SQL Server (Relational Database)
SQL (T-SQL) for data querying and aggregation
(Optional) matplotlib, seaborn for data visualization

📦 Project Steps

Data Import
Load CSV into Microsoft SQL Server
Use BULK INSERT or SQL Server Import Wizard
Jupyter Setup
Establish a SQL Server connection with pyodbc
Query the database directly from the notebook
SQL Queries
View sample records
Aggregate metrics (sales, orders, revenue)
Analyze customer behavior
Detect top products, deal sizes, trends
Time-based and region-based analysis
(Optional) Visualize insights with Python charts

🧠 Key Insights & Sample Queries

Top 10 best-selling products by quantity
Monthly and quarterly sales trends

Revenue by country and city
High MSRP items with low sales
Customers with the highest order frequency
Order distribution by status and deal size
Example query:

```
SELECT
    PRODUCTCODE,
    SUM(SALES) AS Total_Sales
FROM sales_data_sample
GROUP BY PRODUCTCODE
ORDER BY Total_Sales DESC;
```

📊 Possible Extensions

Interactive dashboard with Power BI or Tableau
Time-series forecasting with Python (ARIMA, Prophet)
Advanced analytics: customer segmentation, RFM analysis
Integrate with web apps (Flask/Django + SQL Server)

✅ What You'll Learn

How to connect Jupyter Notebook to SQL Server
Writing and executing T-SQL queries
Analyzing structured business data
Using Python as a data pipeline & visualization tool
Communicating insights clearly through code

📂 Folder Structure

bash

```
├── sales_data_sample.csv
├── sales_analysis.ipynb      # Jupyter notebook with all SQL queries
└──── README.md               # Project documentation
```

💡 Final Thoughts

This project bridges SQL querying and Python scripting, a powerful combo for data analysts working with relational databases. Whether you're preparing for interviews, building a portfolio, or solving real business problems — this is a great foundational exercise.

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