**E-Commerce Sales Analytics Project**

**Role:** Data Analyst | **Database:** PostgreSQL | **Techniques Used:** Joins, Aggregates, CTEs, Window Functions,   
**Dataset:** 5 interrelated tables - Customers, Orders, Order\_Items, Products, Payments  
**Goal:** Solve real-world business problems using SQL

**Project Overview (Simple & Clear Language)**

This project represents a comprehensive analysis of a fictional

e-commerce business using only SQL. The goal was to answer practical business questions that companies deal with every day—like who the best customers are, which products sell most, and how revenue is changing over time.

Using five related datasets—**customers**, **orders**, **order\_items**, **products**, and **payments**—I built 40+ queries to derive insights. I used advanced SQL concepts like **window functions**, **CTEs**, **date/time analysis**, **joins**, **aggregations**, and **ranking functions**. These queries simulate real analytics used by e-commerce companies to improve their marketing, inventory, finance, and customer experience.

**Technical Highlights**

* **Joins:** Connected customers with orders, orders with items, and payments
* **Aggregates:** SUM, AVG, COUNT for totals, averages, and trends
* **Date Handling:** Used TO\_DATE() and CURRENT\_DATE - INTERVAL to filter by time
* **Window Functions:** ROW\_NUMBER(), RANK(), LAG() for ranking and comparisons
* **CTEs (Common Table Expressions):** Made complex queries cleaner and more readable
* **CASE WHEN:** For customer segmentation

**Key Insights and Problems Solved (in Simple Terms)**

**Sales & Revenue**

* Tracked daily and monthly sales trends
* Found the best-performing months based on deliveries
* Measured revenue growth over the last 12 months

**Customer Behavior**

* Listed top 10 loyal customers based on how often they buy
* Detected churned customers (those who haven’t ordered in the last month)
* Categorized customers into Gold, Silver, Bronze based on total spend
* Found customers from a specific location like California

**Product Analysis**

* Found the most popular product in each category
* Listed products that have never been sold (zero sales)
* Identified low-rated products with low stock
* Found products that were sold every single month (consistent performance)

**Payments & Orders**

* Spotted successful payments where no amount was paid (possible fraud/anomaly)
* Listed partially paid orders (where customer paid less than they were supposed to)
* Analyzed orders that were canceled and who canceled the most
* Measured average delivery time in days

**Trends & Growth**

* Calculated month-over-month growth in number of orders
* Found top 3 selling product categories for each month
* Checked how many items are usually bought per order
* Discovered which customers are loyal to a particular brand

**Geographic Insights**

* Calculated **product sales by customer state**
* Listed customers from specific regions like California