SQL Fundamentals to Advanced Sales Analysis Project

This document summarizes a complete SQL learning journey from fundamentals to advanced concepts. The project is based on a simulated real-world sales database and focuses on interview-oriented and business-driven SQL queries.

Tools Used: PostgreSQL, SQL, Git, GitHub

1. SQL Learning Journey

The project begins with basic SQL concepts and gradually advances to complex multi-table queries. Each section is designed to reflect how SQL is used in real companies rather than simple academic examples.

The learning path includes basic data retrieval, filtering, sorting, aggregation, and finally advanced joins and analytical queries.

2. Concepts Covered

- Basic SQL: SELECT, DISTINCT, WHERE, ORDER BY
- Conditional logic: AND, OR, NOT
- Pattern matching: LIKE, IN, BETWEEN
- Aggregate functions: COUNT, SUM, AVG, MIN, MAX
- Grouping data using GROUP BY
- INNER JOIN and LEFT JOIN
- Multi-table joins using bridge tables
- Handling missing data using LEFT JOIN + NULL
- Order-level vs customer-level analysis
- Business-focused SQL problem solving

3. Database Design

The database structure is inspired by a real-world e-commerce or sales system. It includes multiple related tables to simulate realistic business data.

• customers – stores customer information

• products – stores product details

• orders – records customer orders

• order_items – bridge table between orders and products

• payments – stores payment information for orders

4. Business Questions Solved

• List customers and their orders

• Find customers who never placed an order

• Identify products that were never sold

• Show orders without payment records

• Calculate total spending per customer

• Find total quantity sold per product

• Analyze revenue by payment mode

• Handle multi-table joins for detailed reporting

5. Project Outcome

By completing this project, strong practical SQL skills were developed. The queries are written with interview scenarios in mind and reflect how SQL is used in real analytical and reporting tasks.

This project demonstrates the ability to design queries logically, choose correct join types, use aggregation properly, and analyze business data efficiently.

This project is suitable for showcasing SQL skills on GitHub and LinkedIn for Data Analyst and SQL-focused roles.