

SQL Music Store Analysis



PostgreSQL



Advanced SQL



Business
Intelligence

SQL-driven exploratory analysis of a digital music store using PostgreSQL

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Project Overview



This project analyzes a complete digital music store database encompassing customers, artists, albums, tracks, and sales transactions. Using PostgreSQL, I performed comprehensive exploratory data analysis to extract actionable business insights.

The analysis demonstrates proficiency in advanced SQL techniques including complex joins, aggregations, window functions, and CTEs. Through 12 real-world business questions, this portfolio-ready project showcases practical data analytics skills that directly translate to business value.

Dataset Overview

Integrated Tables

Complete music store operations data

Customer & Sales

Transaction history and customer profiles



Artists & Albums

Metadata, catalog management, attribution

Normalized Schema

PostgreSQL relational optimized relationships

Database Schema



Core Entities

CUSTOMER

Customer profiles, contact information, and geographic location data

INVOICE & INVOICE_LINE

Sales transactions with totals, dates, and detailed line-item purchases

TRACK, ARTIST & ALBUM

Complete music catalog with song metadata, duration, genre, and artist attribution

Supporting Tables

GENRE, MEDIA_TYPE, and PLAYLIST provide organizational structure

QUESTIONS 1-4

Business Analysis: Operational Insights

Q1: Senior Leadership

Identified the senior-most employee by analyzing job title hierarchy to understand organizational structure and reporting chains.

Q2: Market Distribution

Analyzed invoice counts by country to identify key markets and concentrate marketing resources in high-volume regions.

Q3: Peak Revenue Transactions

Discovered top 3 invoice values to understand high-value purchase patterns and premium customer behavior.

Q4: Festival Location Planning

Determined which city has the best customers by total spending to optimize promotional music festival placement.

QUESTIONS 5-8

Business Analysis: Customer & Content

Q5: VIP Customer Identification

Identified the best customer by total spending to enable targeted retention strategies and personalized engagement.

Q6: Rock Music Segment

Extracted all Rock music listeners with email and name for genre-specific marketing campaigns and promotions.

Q7: Artist Collaboration Targets

Ranked top 10 rock bands by track count to identify prolific artists for potential exclusive partnerships.

Q8: Extended Content Discovery

Found tracks longer than average song length to curate specialized playlists for listeners seeking extended listening experiences.

Business Analysis: Revenue & Trends

Q9: Genre Revenue Analysis

Analyzed genres by total revenue and units sold to understand which musical categories drive the most business value.

Q11: Emerging Genre Trends

Identified top genres with year-over-year growth to spot emerging trends and allocate resources to high-potential categories.

Q10: Artist Profitability

Calculated artist revenue by genre to identify the most profitable artist-genre combinations for strategic catalog expansion.

Q12: Cumulative Revenue Growth

Calculated cumulative revenue over time to visualize business growth trajectory and identify peak performance periods for strategic planning.

Key Takeaways

Real-world Data Analysis

Demonstrated practical skills in extracting, transforming, and interpreting data from a complex music store database.

Actionable Business Intelligence

Translated raw data into strategic insights, identifying key markets, customer behavior, and revenue trends.

Advanced SQL Mastery

Proficiently applied advanced SQL techniques including complex joins, subqueries, CTEs, and window functions.

Drives Strategic Decisions

Provided data-driven recommendations for marketing, content strategy, and operational efficiency.

Foundation for Growth

Built a strong foundation for tackling more complex data science and advanced analytics challenges.

Project Goals Achieved



Analyzed 10 Tables

Successfully navigated and integrated data from 10 interconnected database tables.



Answered 12 Questions

Provided data-driven answers to 12 complex business questions with SQL.



Advanced SQL Proficiency

Demonstrated mastery of advanced SQL techniques and functionalities.



Actionable Insights

Extracted practical, data-driven business insights for strategic planning.



Portfolio-Ready Analysis

Developed a comprehensive, professional, and presentation-ready data analysis.

Tools & Technologies Used



PostgreSQL

Powerful open-source relational database management system for storing and managing music store data.



Data Visualization

Tools for creating clear and impactful visual representations of findings for stakeholder communication.



Advanced SQL

Employed complex queries, joins, aggregations, window functions, and CTEs for in-depth data extraction and manipulation.



Data Analysis

Used various analytical methods to uncover trends, patterns, and insights from the music sales and customer data.



Git & GitHub

Utilized for version control, collaboration, and showcasing the project's codebase and documentation.

Advanced SQL Techniques

Complex JOINS

Leveraging **INNER**, **LEFT**, **RIGHT**, and **FULL OUTER JOINs** to efficiently combine data across multiple relational tables.

Window Functions

Applying **ROW_NUMBER()**, **RANK()**, and **DENSE_RANK()** for intricate analytical queries, enabling calculations across specific partitions of data.

Aggregation Functions

Employing **SUM()**, **COUNT()**, **AVG()** in conjunction with **GROUP BY** and **HAVING** to summarize and filter grouped data effectively.

Common Table Expressions (CTEs)

Utilizing **WITH** clauses to modularize complex queries, improving readability and facilitating recursive operations.

Subqueries & Nested Queries

Constructing queries within queries to perform conditional filtering and derive data based on intermediate results.

Key Business Insights



High-Value Content

Rock and Metal genres, alongside specific top artists, consistently drive the highest revenue and track sales, indicating strong demand in these segments.



Customer Segmentation

Identified VIP customers through spending patterns, revealing a preference for longer tracks and specific artists, crucial for targeted retention strategies.



Strategic Market Focus

Analysis of invoice counts highlighted key geographic markets and top-spending cities, optimizing resource allocation for marketing and festival planning.



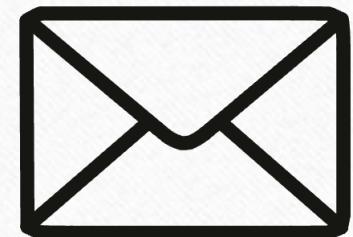
Growth Trajectories

Significant revenue growth observed in Q4, confirming seasonal peaks, and an overall upward trend in cumulative revenue underscores business expansion.



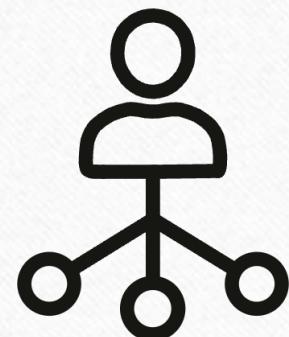
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Thank you!