2026

Hotel Bookings Analytics Solution

End-to-End Snowflake Hotel Booking Analytics Project Using Medallion Architecture

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Contents

Executive Summary

High-Level Overview of the Project

This project focused on developing an end-to-end Hotel Booking Analytics solution using Snowflake and SnowSight to transform raw hotel booking data into meaningful business insights. The solution leveraged the Medallion Architecture approach (Bronze, Silver, and Gold layers) to ingest, cleanse, standardize, and model hotel booking data for reporting and analytics purposes. The final dashboard provided stakeholders with interactive visualizations and KPI monitoring to support operational and strategic decision-making.

Business Problem Being Solved

The hotel organization faced challenges with inconsistent and unstructured booking data, limiting its ability to accurately monitor business performance. Management lacked visibility into key operational metrics such as monthly revenue trends, booking activity, customer booking behavior, and city-level revenue performance. Manual reporting processes and poor data quality reduced confidence in reporting accuracy and delayed decision-making.

Expected Business Value

The implementation of a centralized analytics solution provides management with accurate, timely, and business-ready reporting capabilities. By improving data quality and automating analytical reporting, the organization gains:

- Increased visibility into hotel performance trends
- Faster and more informed decision-making
- Improved operational reporting accuracy
- Better understanding of revenue-driving locations and booking patterns
- Reduced time spent on manual data preparation and reporting

The solution also establishes a scalable cloud-based analytics framework that can support future reporting enhancements and additional business intelligence initiatives.

Business Requirements - Hotel Analytics

Background

The hotel has raw, inconsistent booking data and lacks clear view of monthly revenue, booking tends, and city-level performance. Management needs quick, accurate insights for decision-making.

Objectives

- Clean and standardize booking data
- Show monthly revenue and monthly bookings
- Identify top revenue-generating cities
- Analyze bookings by type and status
- Display key KPIs (like total revenue, total bookings)

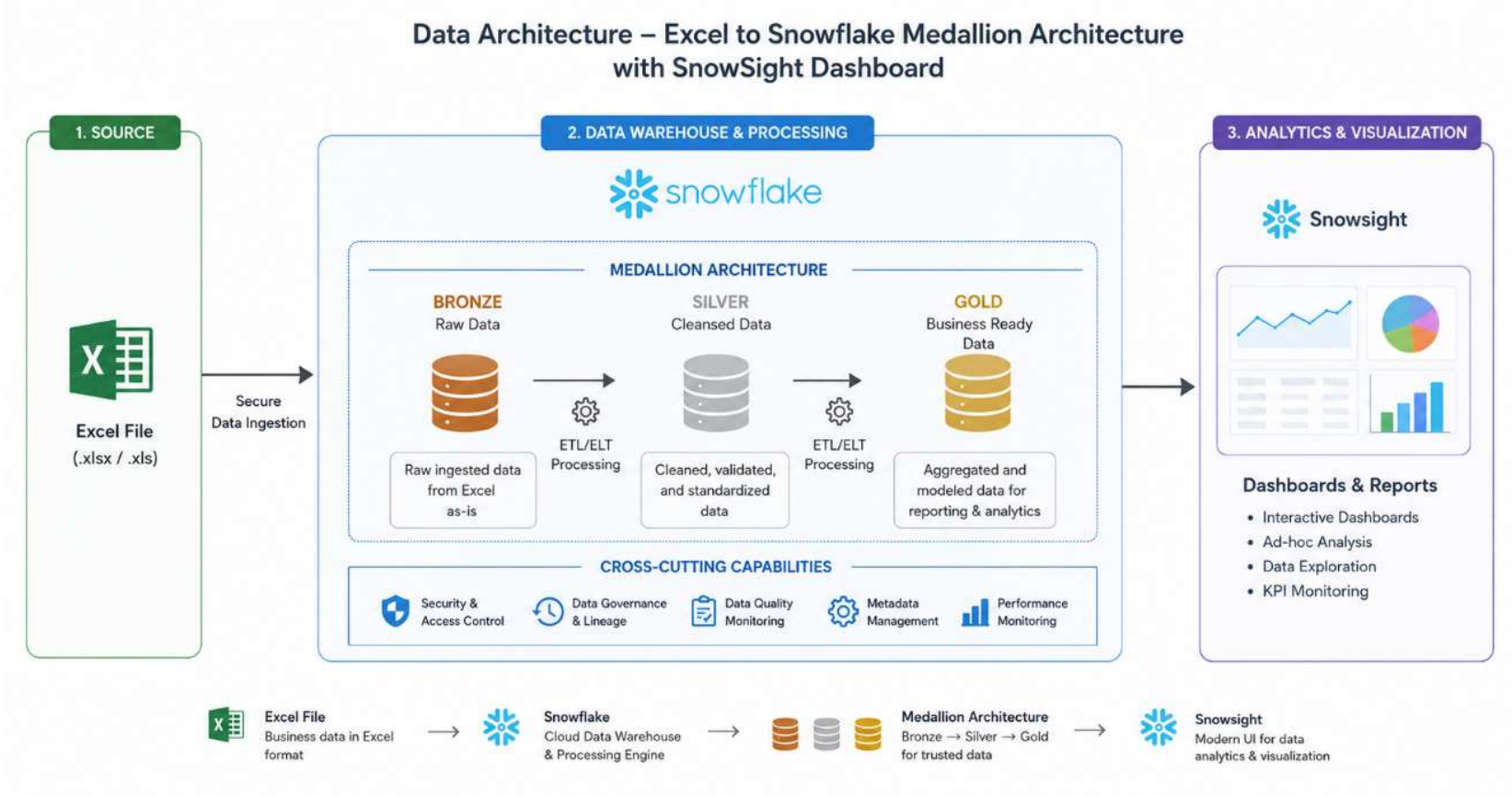
Functional Requirements

- Clean raw dataset (fix dates, duplicates, missing values)
- Transform data to monthly aggregates
- Build visuals:
    - Revenue per month (line chart)
    - Bookings per month (line chart)
    - Top cities by revenue (bar chart)
    - Bookings by type (bar chart)
    - Bookings by status (bar chart)
    - Expose KPIs on dashboard

Deliverables

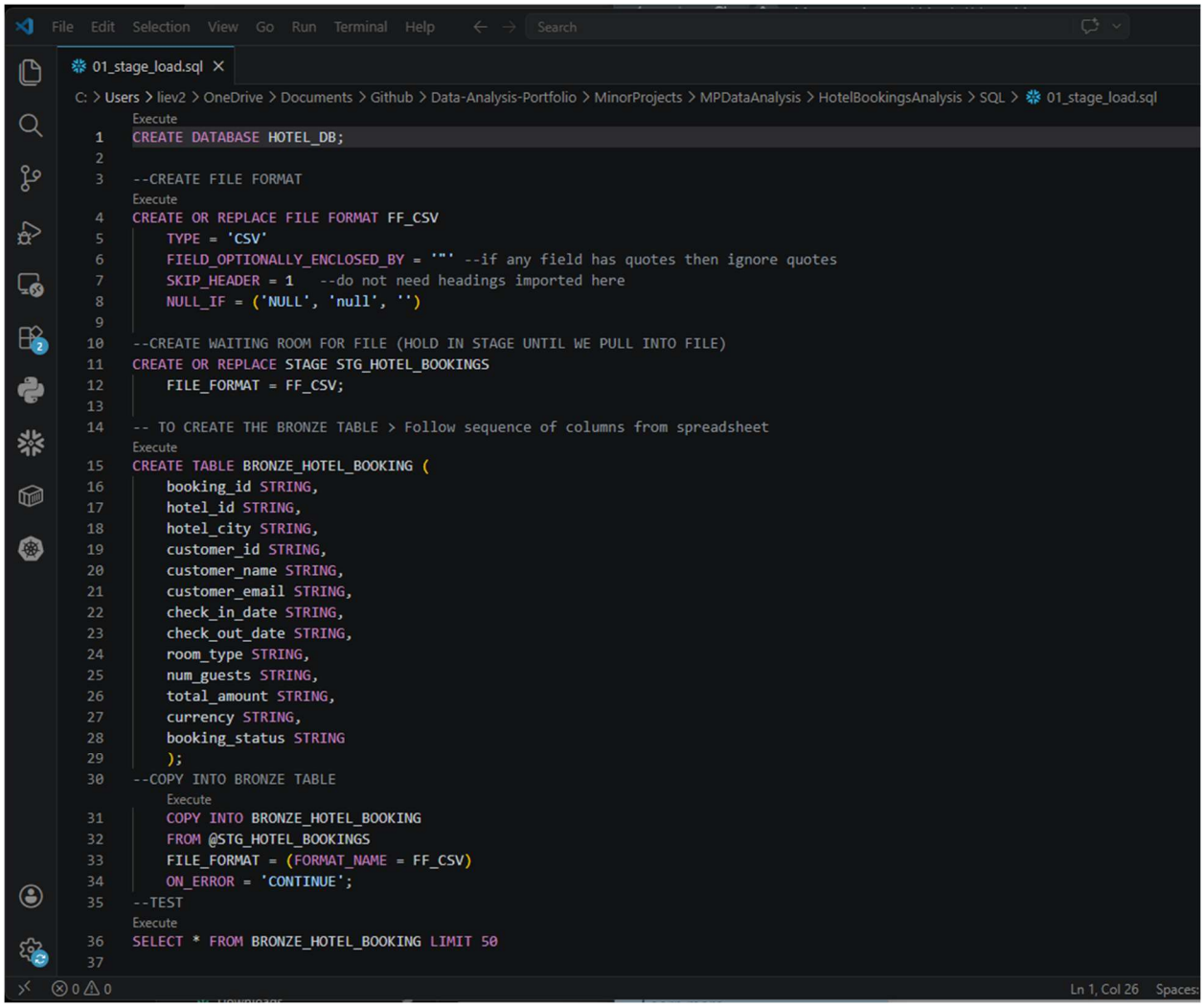
- Accurate monthly metrics
- Correct KPIs
- Dashboard easy to interpret
- No data quality issues in final output

Solution Architecture Overview

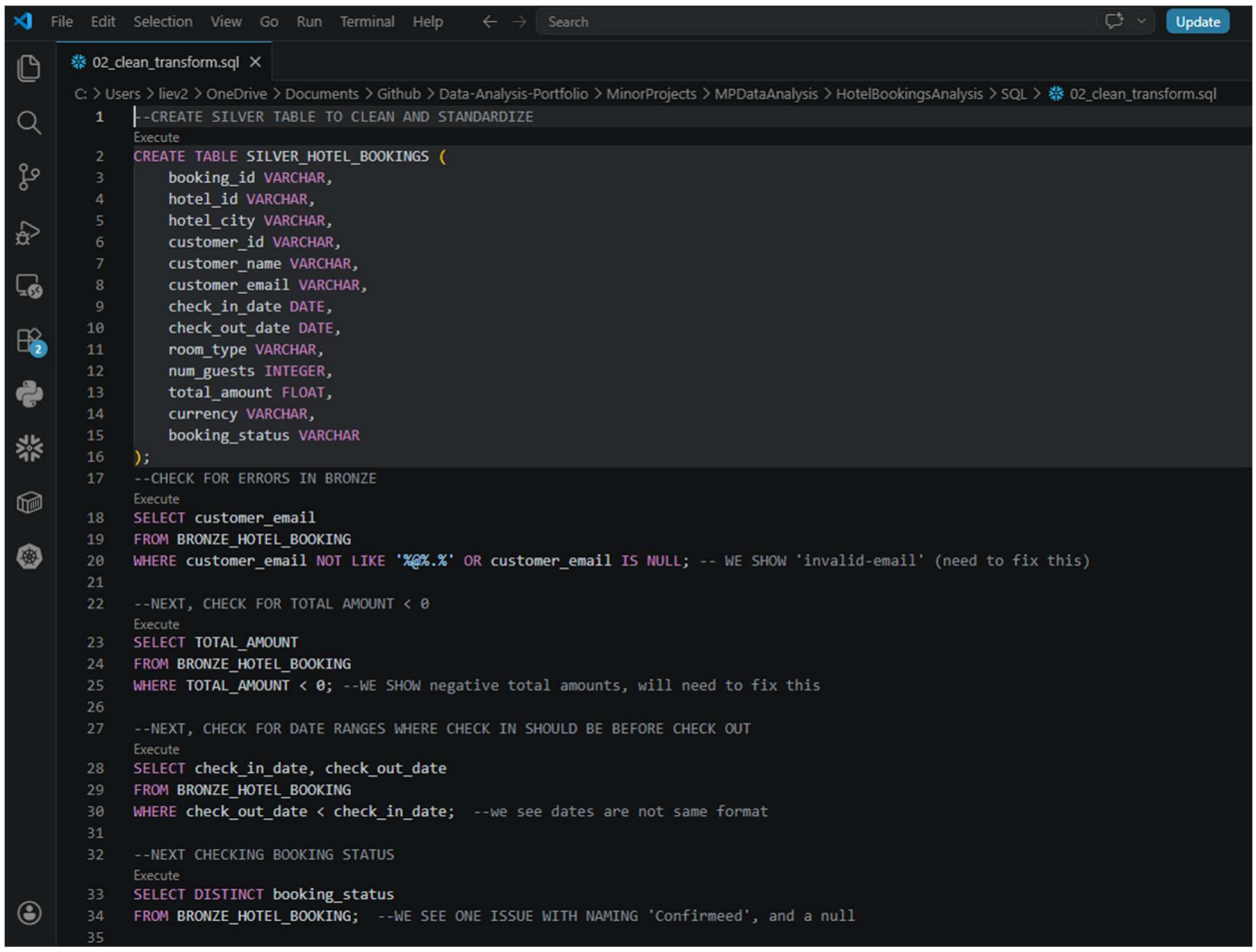


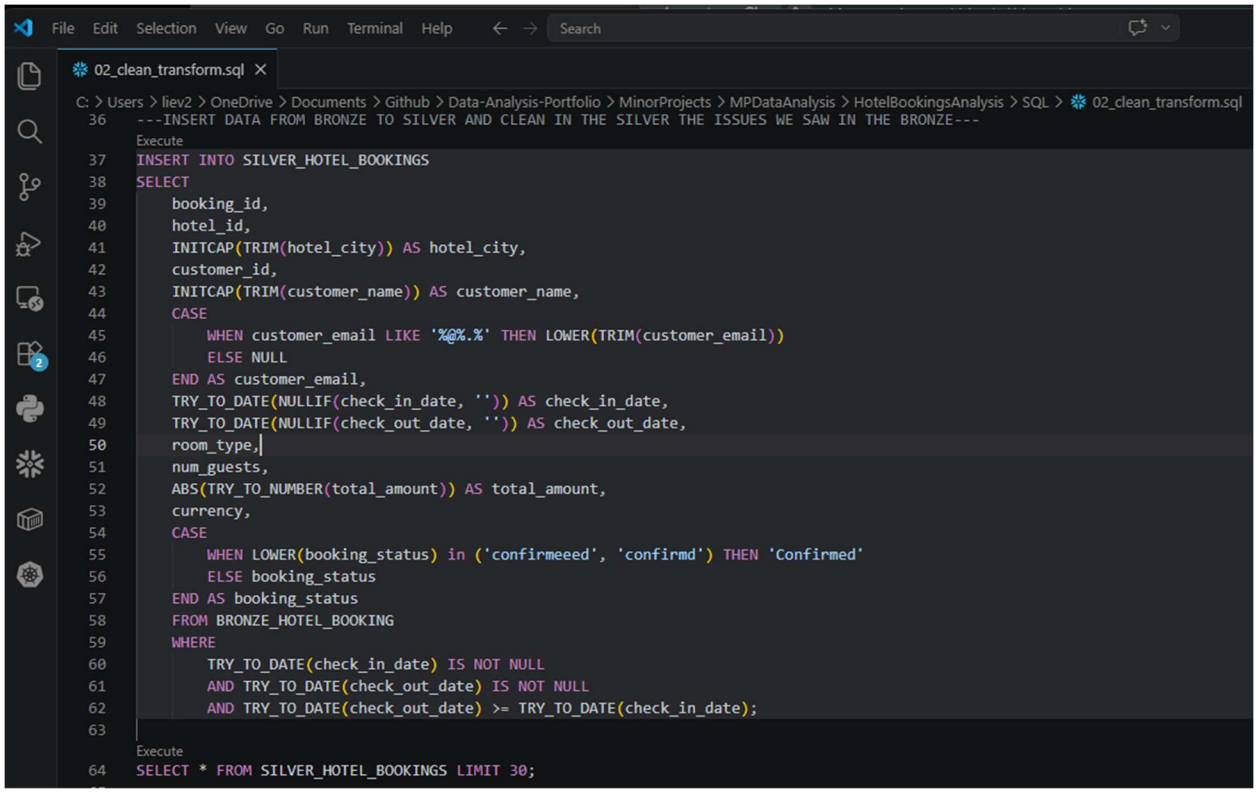
Data Warehouse & Processing Design

Bronze Layer – Raw Data Ingestion

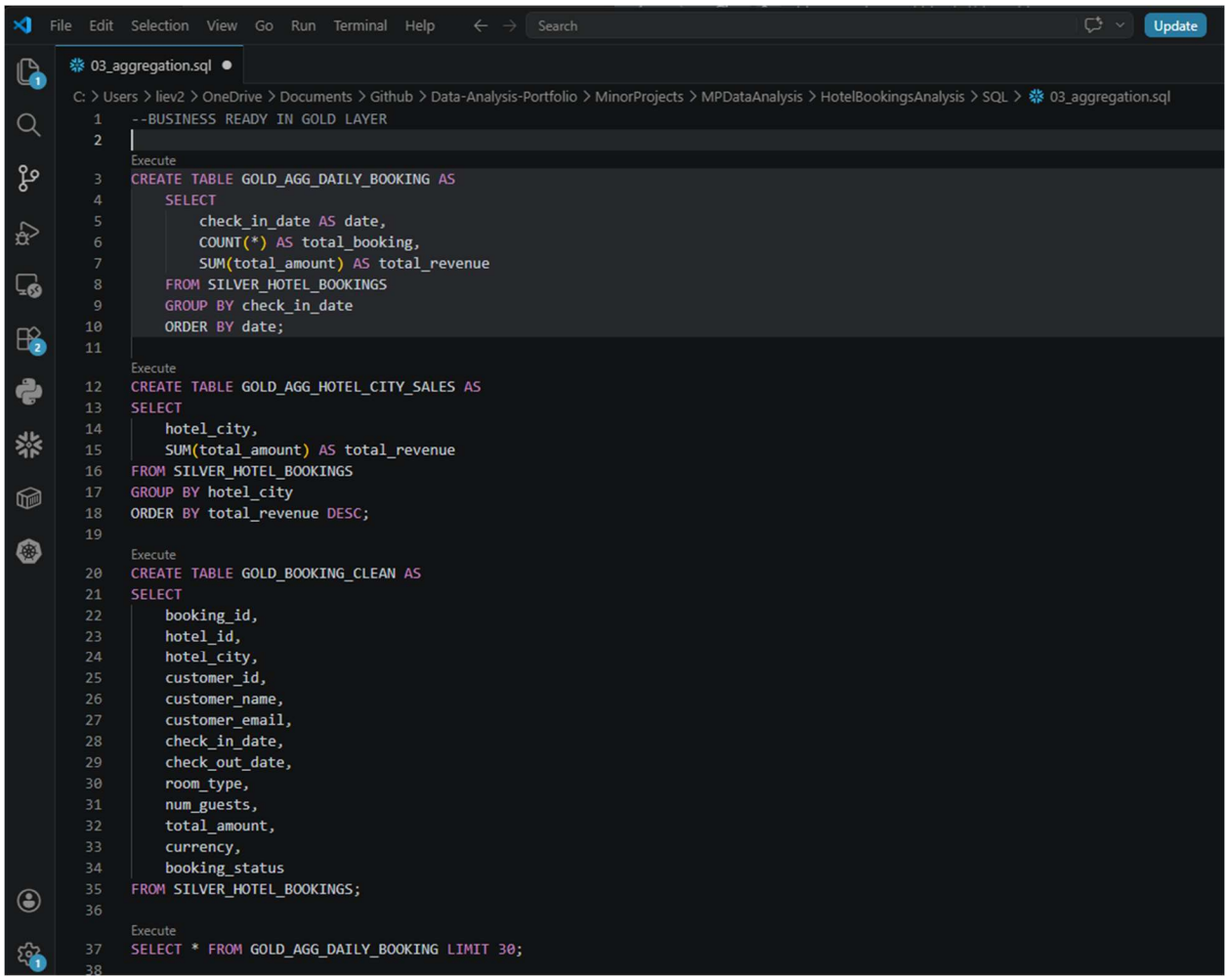


Silver Layer – Cleansed & Transformed Data

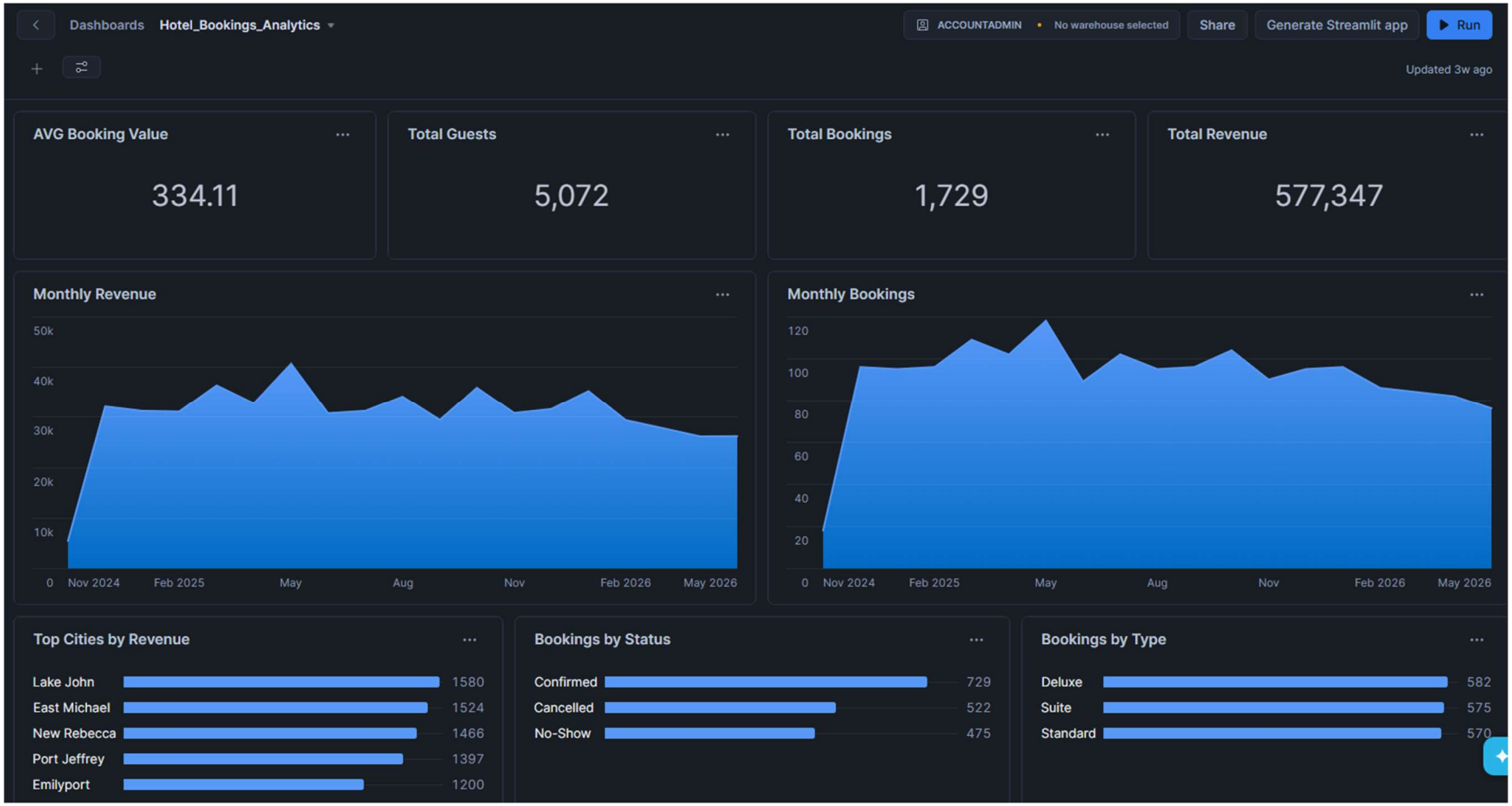



File Edit Selection View Go Run Terminal Help
Search
02_clean_transform.sql
C: > Users > liev2 > OneDrive > Documents > Github > Data-Analysis-Portfolio > MinorProjects > MPDataAnalysis > HotelBookingsAnalysis > SQL > 02_clean_transform.sql
36 ---INSERT DATA FROM BRONZE TO SILVER AND CLEAN IN THE SILVER THE ISSUES WE SAW IN THE BRONZE---
Execute
37 INSERT INTO SILVER_HOTEL_BOOKINGS
38 SELECT
39 booking_id,
40 hotel_id,
41 INITCAP(TRIM(hotel_city)) AS hotel_city,
42 customer_id,
43 INITCAP(TRIM(customer_name)) AS customer_name,
44 CASE
45 WHEN customer_email LIKE '%@%.%' THEN LOWER(TRIM(customer_email))
46 ELSE NULL
47 END AS customer_email,
48 TRY_TO_DATE(NULLIF(check_in_date, '')) AS check_in_date,
49 TRY_TO_DATE(NULLIF(check_out_date, '')) AS check_out_date,
50 room_type,
51 num_guests,
52 ABS(TRY_TO_NUMBER(total_amount)) AS total_amount,
53 currency,
54 CASE
55 WHEN LOWER(booking_status) in ('confirmeeed', 'confirmd') THEN 'Confirmed'
56 ELSE booking_status
57 END AS booking_status
58 FROM BRONZE_HOTEL_BOOKING
59 WHERE
60 TRY_TO_DATE(check_in_date) IS NOT NULL
61 AND TRY_TO_DATE(check_out_date) IS NOT NULL
62 AND TRY_TO_DATE(check_out_date) >= TRY_TO_DATE(check_in_date);
63
Execute
64 SELECT * FROM SILVER_HOTEL_BOOKINGS LIMIT 30;

Gold Layer – Business Ready Data



Dashboard & Reporting– Hotel Bookings Analytics



Summary of Findings

This end-to-end Hotel Booking Analytics project successfully transformed raw and inconsistent hotel booking data into a reliable, business-ready analytics solution using the Snowflake Medallion Architecture and SnowSight dashboards.

The project began with cleansing and standardizing raw booking data by resolving missing values, correcting date inconsistencies, and removing duplicates to improve overall data quality and reporting accuracy. Through the Bronze, Silver, and Gold data processing layers in Snowflake, the data was progressively refined into trusted analytical datasets optimized for reporting and decision-making.

The final SnowSight dashboard provided management with a centralized and easy-to-interpret view of hotel performance metrics. Key KPIs revealed:

- **Total Revenue:** 577,347
- **Total Bookings:** 1,729
- **Total Guests:** 5,072
- **Average Booking Value:** 334.11

Trend analysis showed relatively stable monthly booking activity and revenue generation, with seasonal fluctuations indicating periods of higher customer demand. City-level analysis identified the highest revenue-generating locations, enabling management to better understand regional performance and potential growth opportunities. Additionally, booking type and booking status analysis provided visibility into customer preferences, cancellation behavior, and operational performance.

Overall, the project delivered:

- Accurate and validated monthly metrics
- Clean and standardized reporting data
- Actionable business insights for leadership
- Improved visibility into hotel operational trends
- A scalable Snowflake-based analytics framework for future reporting enhancements

The completed solution demonstrates how cloud data warehousing and modern analytics platforms can convert raw operational data into meaningful business intelligence that supports faster and more informed decision-making.