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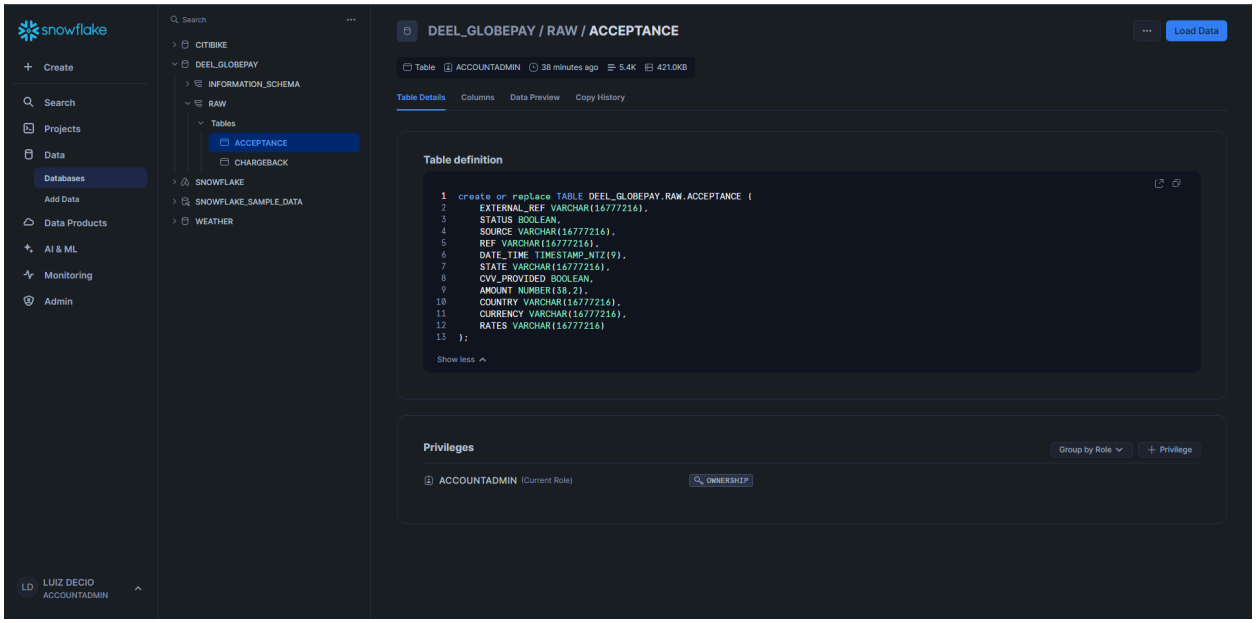
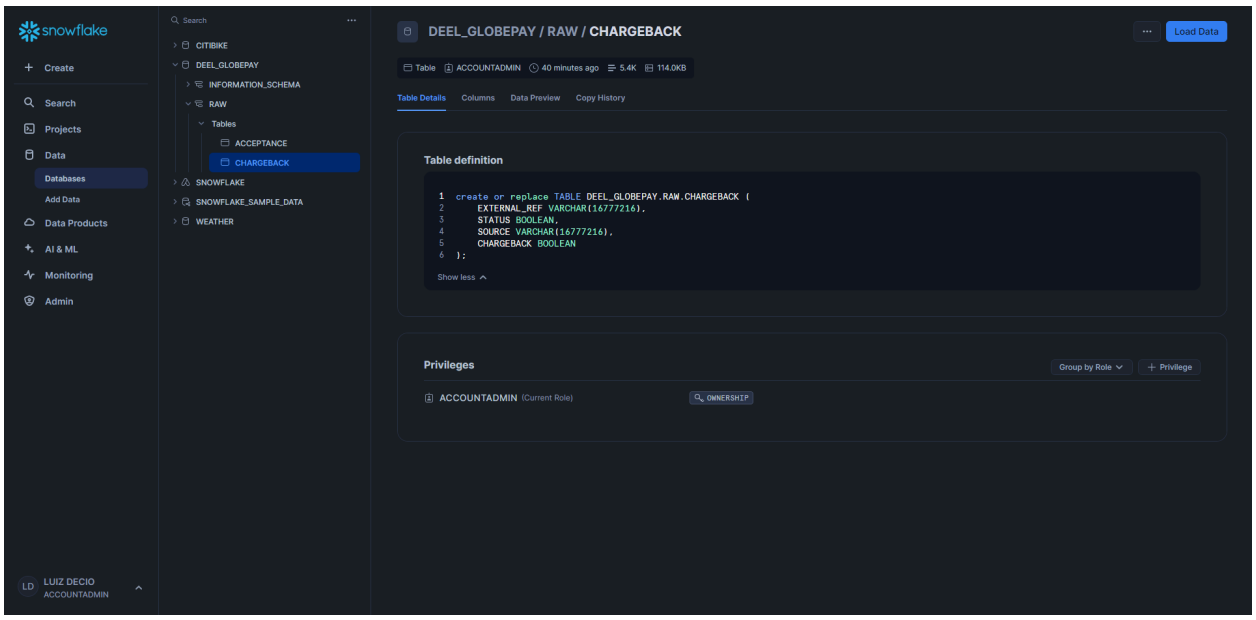
Deel Home Task: Globepay

Part 1

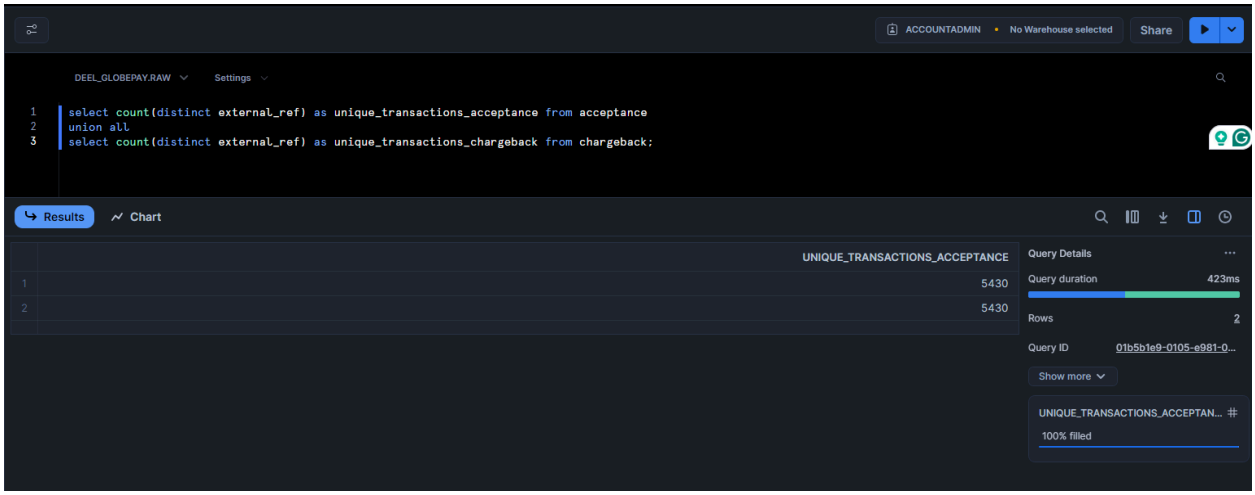
Preliminary data exploration

- First it was created a table “acceptance” and a table “chargeback”, for each CSV:





- For each table, it was checked:
    - The data type of each column, if was according to the API documentation
    - The consistency and validity of each column:
        - Negative amount values
            - There was 1 (external_ref **SPm_aqm_Rrer_6jxpLvO2**). This was considered a possible mistake and the column values was converted to positive in dbt staging model.
        - Dates up to the current date
            - All dates are from 2016 first quarter
        - Unique boolean values (only TRUE and FALSE)
        - Unique sources in the acceptance and chargeback table
            - There was only Globalpay as expected
        - Check the possible “status” values in both tables
            - All of them were TRUE
    - The uniqueness of the “external_ref” column, that will be later used as an unique identifier for each row:



Summary of your model architecture

The model architecture, was divided between two stages and three tables, as follows:

- **Staging Models**: Raw data ingestion from the source tables (CSV files), basic transformations (cleaning, type casting), and column renaming for clarity.
- **Mart Models**: Joining and aggregation after modeling the stages tables, so the data analysts can answer business questions.

Tables:

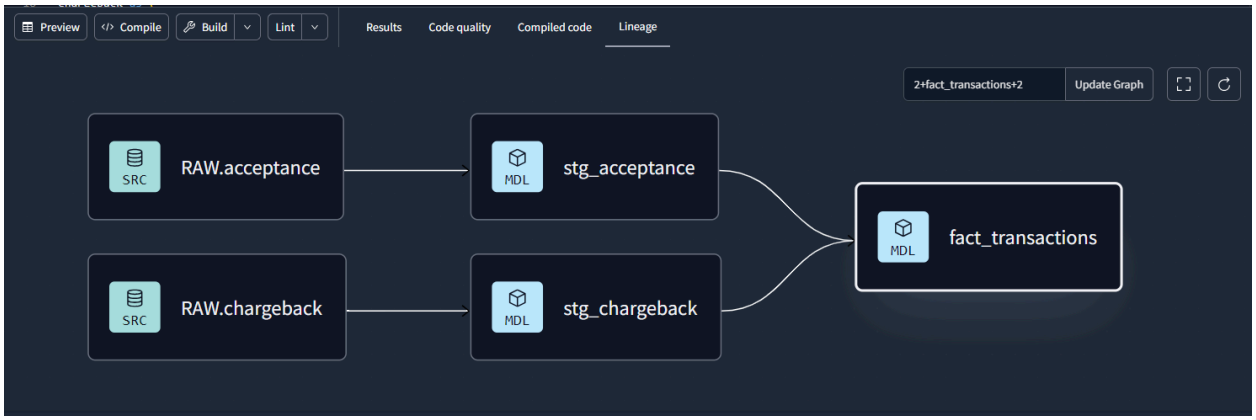
- `stg_acceptance`: Staging table for the acceptance report.
- `stg_chargeback`: Staging table for the chargeback report.
- `fact_transactions`: Fact table combining the acceptance and chargeback data.

Transformations:

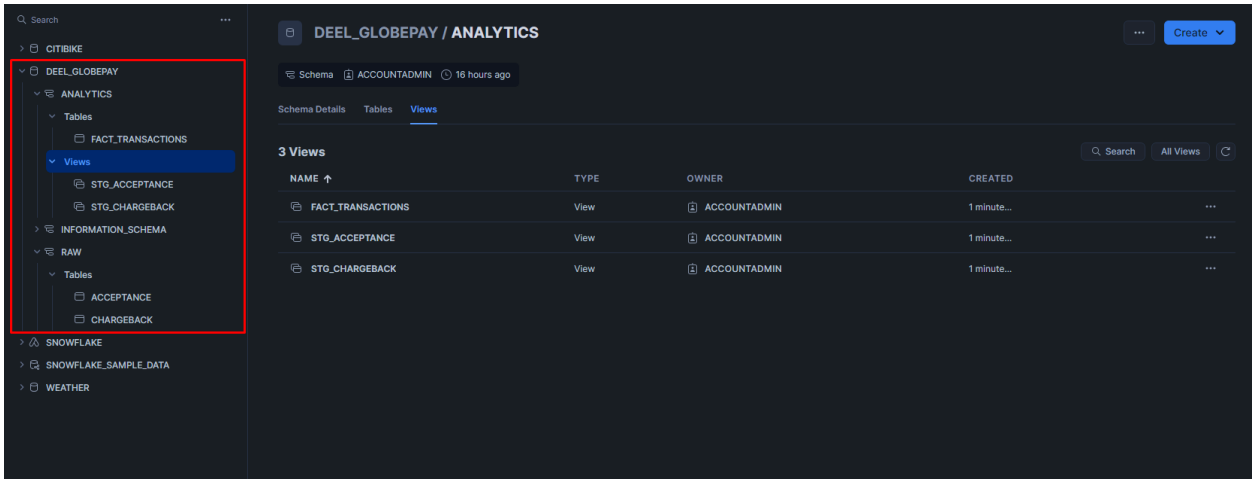
- Cleaning and normalizing data.
- Handling missing or inconsistent values.
- Getting the specific rate according to the currency that it was paid
- Convert the amount to USD

Lineage graphs

The lineage graph includes both of the staging being created from the raw sources, and then joining each other into the fact table.



Tables hierarchy in Snowflake after successful “dbt build” command



Tips around macros, data validation, and documentation

- Macros: it was create a macro called “get_rate” that used the currency code in column “currency” and searched for the correct exchange rate in the “exchange_rates” column in order to convert the amount of the transaction to USD.

Macro definition

```
{% macro get_rate(json_column, currency_column) %}

    json_extract_path_text({{ json_column }}, {{ currency_column }})

{% endmacro %}
```

Code snippet from fact_transaction table using the macro

```
with acceptance as (

    select

        transaction_id,
        transaction_date,
        state,
        amount,
        country,
        currency,

        -- Get the USD rate using get_rate macro
        {{ get_rate('exchange_rates', 'currency') }} as currency_rate

    from {{ ref('stg_acceptance') }}
),
```

- For the data validation, it was added tests in the schema.yml file for several columns in the staging and fact tables, for example:
    - Transaction_id → unique and not_null
    - Transaction_date → not_null
    - State → accepted_values: values: ['ACCEPTED', 'DECLINED']
    - Amount → not_null

- For the documentation, dbt's documentation features create comprehensive documentation for your models, including descriptions and sources for each table and column.
    - It was added every column and table description in the schema.yml and source.yml files, to have a better comprehension of the dbt docs page.

Part 2

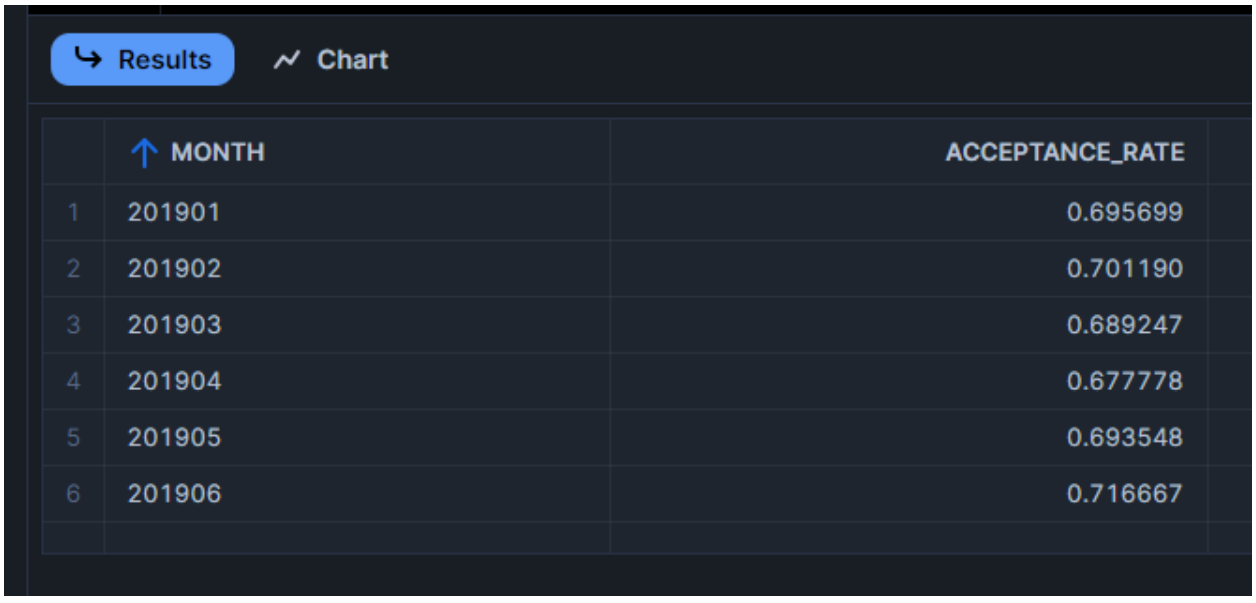
The fact_transactions table was modeled so the data analysts could deep dive into the data and get insight information regarding the origin of the payments that had chargeback, the amount of transactions in a chargeback, and so on.

In order to answer the 3 questions proposed in the assignment, the queries in Snowflake could look like:

1. What is the acceptance rate over time?

```
select
    to_char(date_trunc('month', transaction_date), 'yyyymm') as month,
    count(case when state = 'ACCEPTED' then 1 end) * 1.0 / count(*) as
acceptance_rate
from analytics.fact_transactions
group by 1;
```

The result will be:



	MONTH	ACCEPTANCE_RATE
1	201901	0.695699
2	201902	0.701190
3	201903	0.689247
4	201904	0.677778
5	201905	0.693548
6	201906	0.716667

2. List the countries where the amount of declined transactions went over $25M

```sql
select
    country,
    sum(amount) as total_declined_amount
from analytics.fact_transactions
where state = 'DECLINED'
group by country
having sum(amount) > 25000000;
```

Result:

```sql
select
    country,
    sum(amount) as total_declined_amount
from
    analytics.fact_transactions
where
    state = 'DECLINED'
group by
    country
having
    sum(amount) > 25000000;
```

Results | Chart

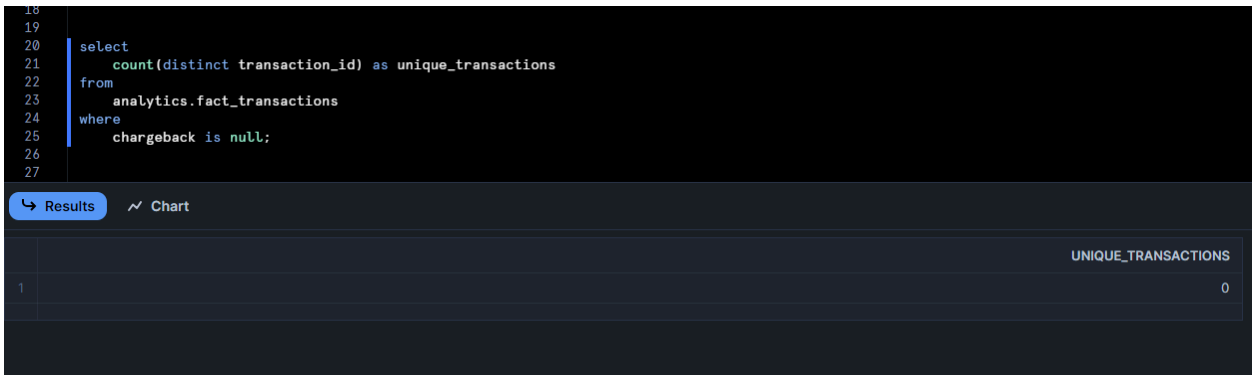
	COUNTRY	TOTAL_DECLINED_AMOUNT
1	AE	26335152.43
2	US	25125669.78
3	CA	25583266.66

3. Which transactions are missing chargeback data?

Since the chargeback column comes from a left join between the acceptance table and the chargeback table, the transactions without chargeback data would have the column chargeback null.

```sql
select
    count(distinct transaction_id) as unique_transactions
from
    analytics.fact_transactions
where
    Chargeback is null;
```

Answer: **NONE**



The same result would be obtained by doing a double check using a subquery with the staging chargeback table.