Creating dbt descriptions and tests

CASE STUDY: BUILDING E-COMMERCE DATA MODELS WITH DBT

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docs: dbt user-defined descriptions

- User-defined descriptions in yaml files
- Used to document: dbt **models, sources, seeds, data tests**, etc.
- Naming convention:

```
_<data source>__<asset>.yml
```

- Store in the same directory as the assets

```
looker_ecommerce/
  macros/
  models/
    _looker__models.yml     <------
    _looker__sources.yml    <------
    stg_looker__distribution_center.sql
    stg_looker__orders.sql
  seeds/
    looker__distribution_center.csv
```

docs: dbt model yaml

Sample `_looker__models.yml`:

```yaml
version: 2

models:
  - name: model_name
    description: This is a table
    columns:
      - name: column_name
        description: This is a column
      - name: column_name
        description: This is a column
```

Note:

- `version: 2` is the schema configuration format used by dbt
- `models` defines what asset this user defined is documenting
- 2 spaces before table name
- 4 spaces before column name

dbt data tests: not null and unique

- Four default data tests live in yaml files:
  - unique
  - not_null
  - accepted_values
  - relationship

1. `unique` : each row value is unique

```
- name: table_name
  columns:
    - name: column_name
      data_tests:
        - not_null
```

2. `not_null` : no row can have a null value

```
- name: table_name
  columns:
    - name: column_name
      data_tests:
        - unique
        - not_null
    - name: column_name
      data_tests:
        - unique
```

dbt data tests: accepted values

3. `accepted_values` : only values in list are accepted

```
- name: table_name
  columns:
    - name: column_name
      data_tests:
        - accepted_values:
            values: ['value_a', 'value_b', 'value_c', NULL]
```

dbt data tests: relationships

4. `relationships` : referential integrity (foreign key) between tables

```
- name: table_1
  columns:
    - name: column_1
      data_tests:
        - relationships:
            to: ref('table_2')
            field: column_2
```

Let's practice!

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Building dbt data marts and snapshot models

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Introducing dbt data mart models

Data marts are clean and accessible data models at the end of the pipeline.

Use cases

- Feature stores for the data science team
- Aggregated KPIs for the finance team
- Latency metric for the engineering team
- Reduces repetition by storing the SQL as code

Looker e-commerce data marts

Customers

Answers the questions:

> Who are our customers?

> What are their purchase behaviors?

Data grain:

> One row per customer

Sample columns:

> Customer name, amount customers spent

Products

Answers the questions:

> What is our revenue, cost, and profit?

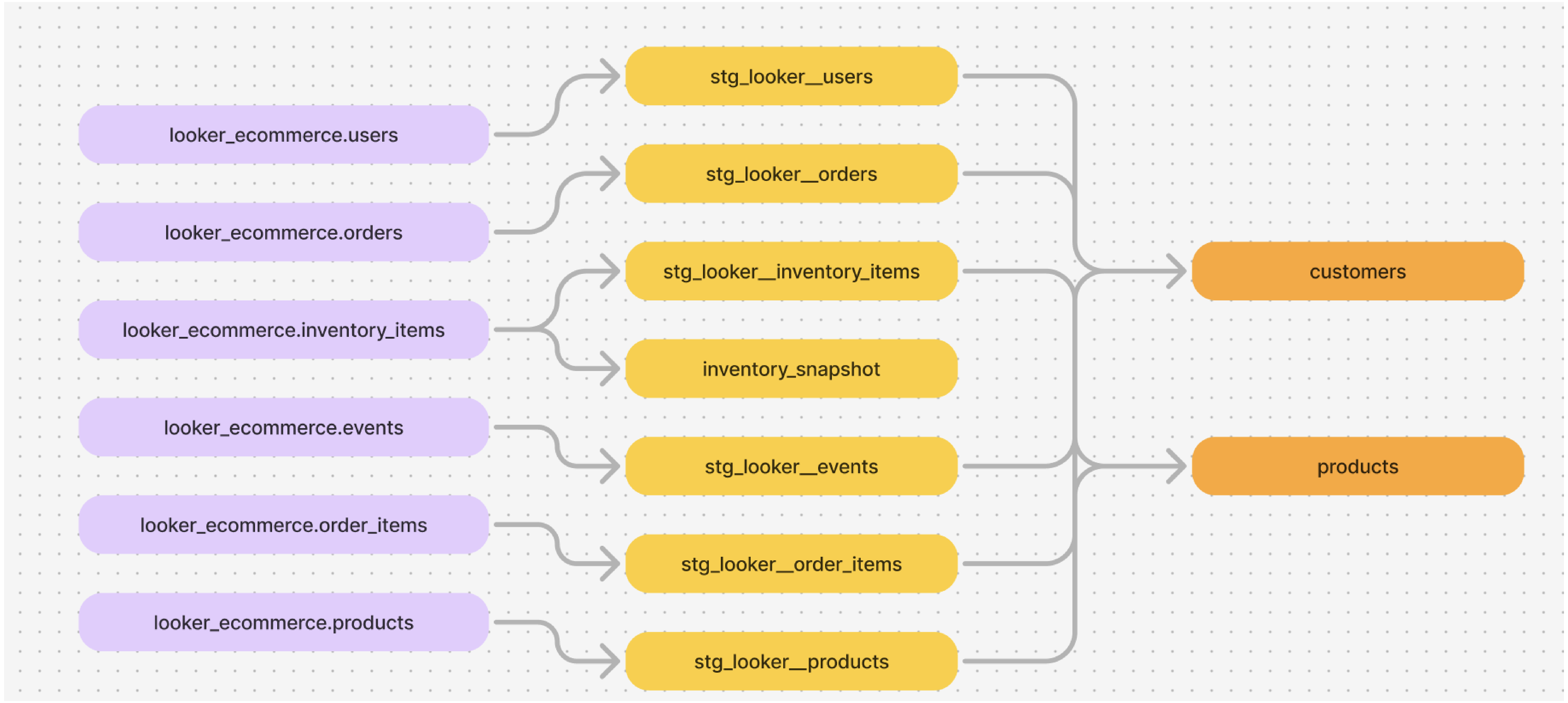
Data grain:

> One row per product

Sample columns:

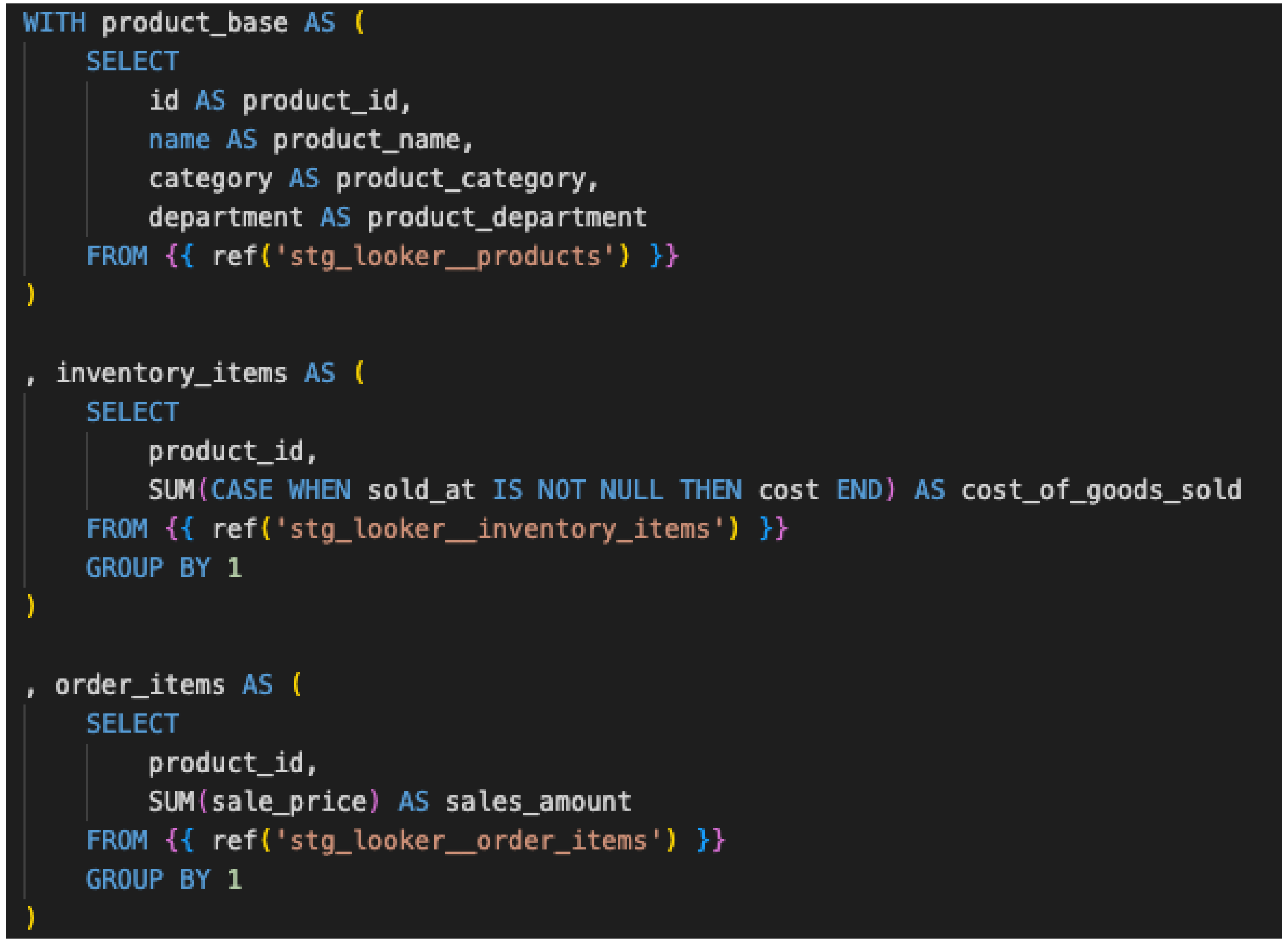
> Product category, revenue, profit

Looker e-commerce data marts



Building step-by-step

Step 1: Refine SQL logic outside of dbt, then replace references with dbt syntax.

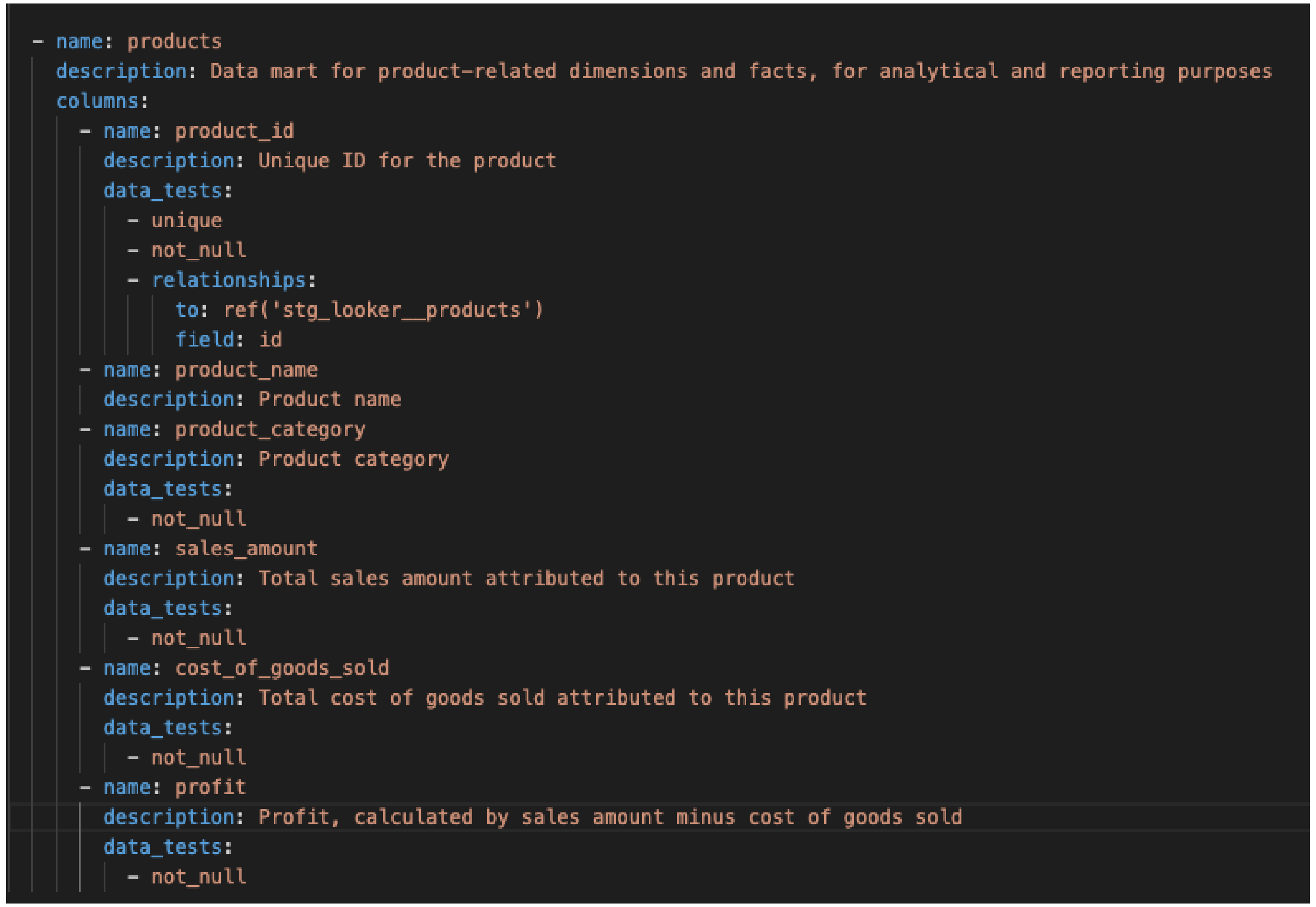


```sql
WITH product_base AS (
    SELECT
        id AS product_id,
        name AS product_name,
        category AS product_category,
        department AS product_department
    FROM {{ ref('stg_looker__products') }}
)

, inventory_items AS (
    SELECT
        product_id,
        SUM(CASE WHEN sold_at IS NOT NULL THEN cost END) AS cost_of_goods_sold
    FROM {{ ref('stg_looker__inventory_items') }}
    GROUP BY 1
)

, order_items AS (
    SELECT
        product_id,
        SUM(sale_price) AS sales_amount
    FROM {{ ref('stg_looker__order_items') }}
    GROUP BY 1
)
```

Step 2: Build out data tests and docs



```yaml
- name: products
  description: Data mart for product-related dimensions and facts, for analytical and reporting purposes
  columns:
    - name: product_id
      description: Unique ID for the product
      data_tests:
        - unique
        - not_null
        - relationships:
            to: ref('stg_looker__products')
            field: id
    - name: product_name
      description: Product name
    - name: product_category
      description: Product category
      data_tests:
        - not_null
    - name: sales_amount
      description: Total sales amount attributed to this product
      data_tests:
        - not_null
    - name: cost_of_goods_sold
      description: Total cost of goods sold attributed to this product
      data_tests:
        - not_null
    - name: profit
      description: Profit, calculated by sales amount minus cost of goods sold
      data_tests:
        - not_null
```

Step 3: Test the build! (e.g. `dbt build`)

Introducing dbt snapshot models

Five order status:

`Processing` , `Shipped` , `Complete` , `Cancelled` , and `Returned`

Data sample:

```
order_id,user_id,status,gender,created_at,returned_at,shipped_at,delivered_at,num_of_items

88616,70663,Returned,F,2024-01-15 18:12:00+00:00,2024-01-21 08:54:00+00:00,2024-01-18
05:01:00+00:00,2024-01-18 23:54:00+00:00,2

88641,70659,Returned,F,2021-03-18 17:45:00+00:00,2021-03-27 02:56:00+00:00,2021-03-21
17:08:00+00:00,2021-03-25 03:07:00+00:00,4


....
```

Orders: snapshot status change

- Create file `orders_snapshot.sql`

```
{% snapshot orders_snapshot %}
{{
    config(target_schema='main',
      unique_key='order_id',
      strategy='timestamp',
      updated_at='created_at')
}}

SELECT *
FROM
{{source('looker_ecommerce', 'orders')}}
```

[1] https://docs.getdbt.com/docs/build/snapshots

- Run a specific snapshot model

```
dbt snapshot -s orders_snapshot.sql
```

- Run all snapshot models

```
dbt snapshot
```

- Run all models (including snapshots)

```
dbt build
```

Let's practice!