LAPORAN UJIAN AKHIR SEMESTER

OLAP GROCERY INVENTORY AND SALE

Mata Kuliah Data Warehouse
Dosen Pengampu : Vipkas Al Hadid Firdaus, S.T., M.T.

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JURUSAN TEKNOLOGI INFORMASI
PROGRAM STUDI D-IV SISTEM INFORMASI BISNIS

POLITEKNIK NEGERI MALANG
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UJIAN AKHIR SEMESTER IV
MATA KULIAH DATA WAREHOUSE

I. Link Source Dataset : Grocery Inventory And Sale

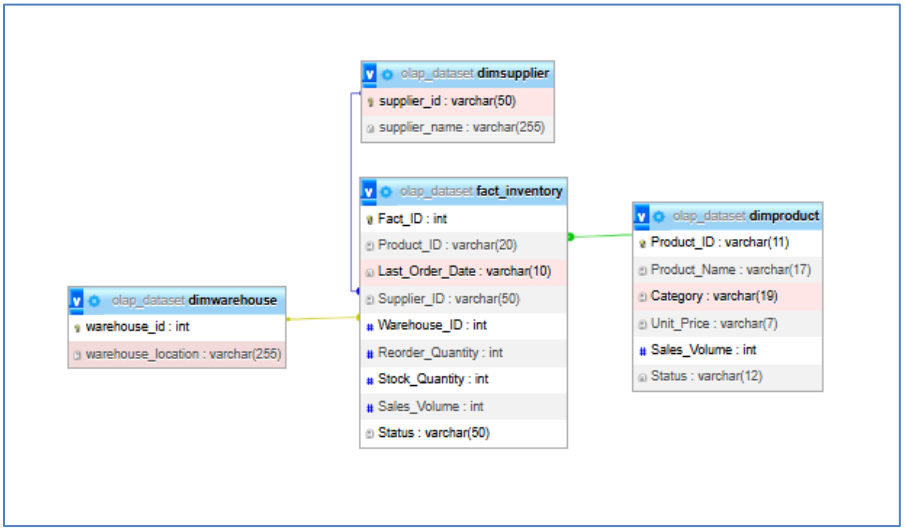
II. Key Perfomances Index (KPI) :

a. Stock Availability
b. Top Selling Products
c. Top Reorder Products
d. Reorder Efficiency

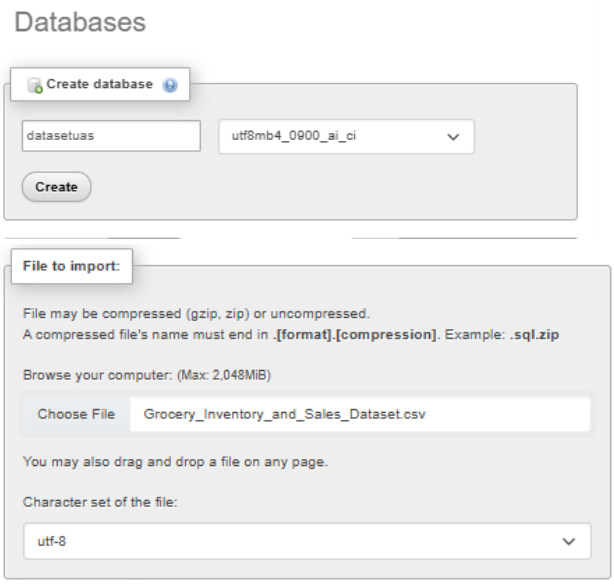
III. Langkah Praktikum

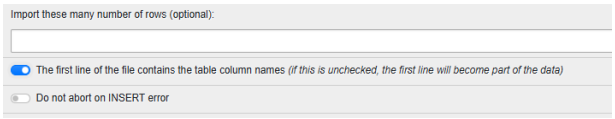
A. Proses ETL

Berikut adalah star schema dari proses ETL

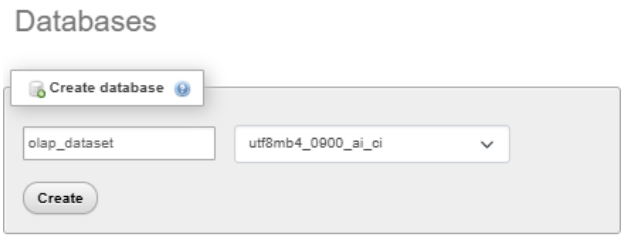


1. Buat database OLTP dengan nama datasetuas dan upload file csv dataset





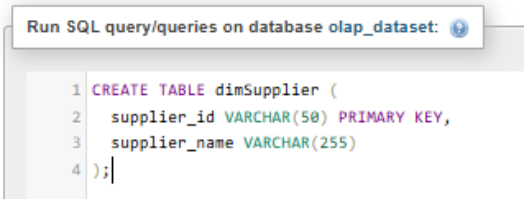
2. Buat tabel dimensi dan fakta untuk proses ETL dengan nama olap_data



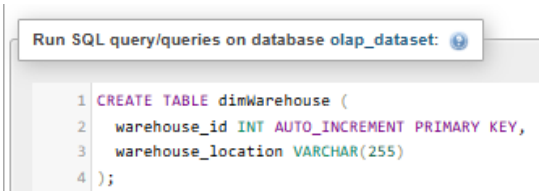
3. Buat struktur tabel dimensi dan fakta dengan query berikut
   - DimProduct

```
CREATE TABLE dimProduct (
    Product_ID VARCHAR(11) PRIMARY KEY,
    Product_Name VARCHAR(17),
    Category VARCHAR(19),
    Unit_Price VARCHAR (7),
    Sales_Volume int,
    Status VARCHAR(12)
);
```

   - DimSupplier



   - DimWarehouse



   - FactInventory

```
CREATE TABLE Fact_Reorder_Efficiency (
    Fact_ID INT AUTO_INCREMENT PRIMARY KEY,
    Product_ID VARCHAR(20) NOT NULL,
    Last_Order_Date VARCHAR(10) NOT NULL,
    Supplier_ID VARCHAR(50) NOT NULL,
    Warehouse_ID INT NOT NULL,
    Reorder_Quantity INT,
    Stock_Quantity INT,
    Sales_Volume INT,
    Status VARCHAR(50),
FOREIGN KEY (Product_ID) REFERENCES dimProduct(Product_ID),
FOREIGN KEY (Supplier_ID) REFERENCES dimSupplier(Supplier_ID),
FOREIGN KEY (Warehouse_ID) REFERENCES dimWarehouse(Warehouse_ID)
);

```

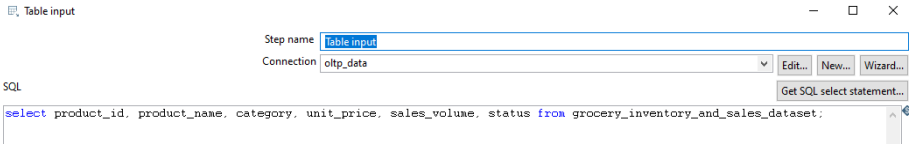
B. ETL Tabel Dimensi

- **Tabel DimProduct**

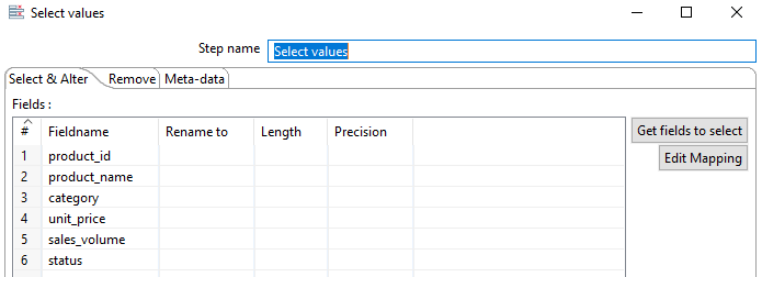
1. Buat transformasi baru untuk DimProduct, drag dan drop objek pada transformasi

   - ✓ Table input, digunakan untuk menginputkan file source oltp
   - ✓ Select value, digunakan untuk mengambil field input table oltp
   - ✓ Unique Rows, digunalan untuk menghindari duplikat product_id
   - ✓ Table output, digunakan untuk menyimpan data pada tabel tujuan

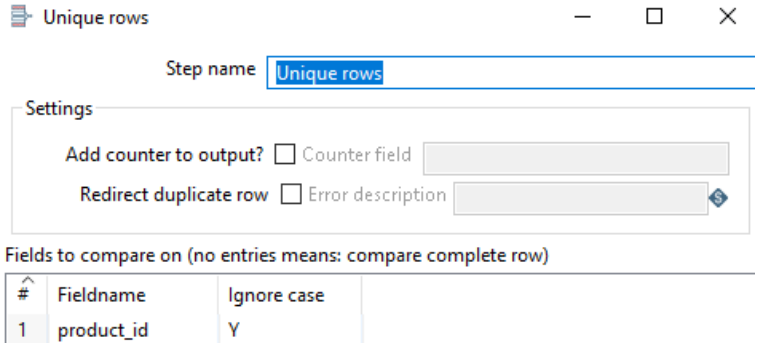
2. Lakukan konfigurasi pada **table input** dan buat koneksi database ke datasetuas dengan nama oltp_data



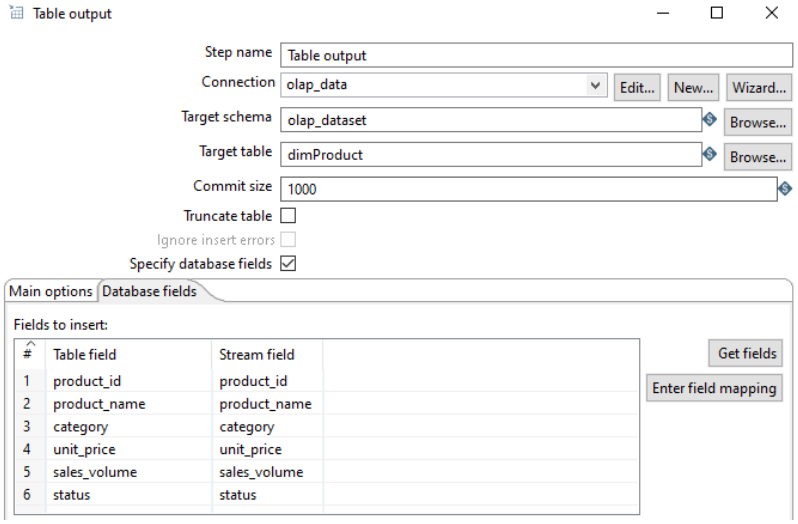
3. Lakukan konfigurasi pada **select values** seperti gambar di bawah ini



4. Lakukan konfigurasi **unique rows** seperti gambar di bawah ini

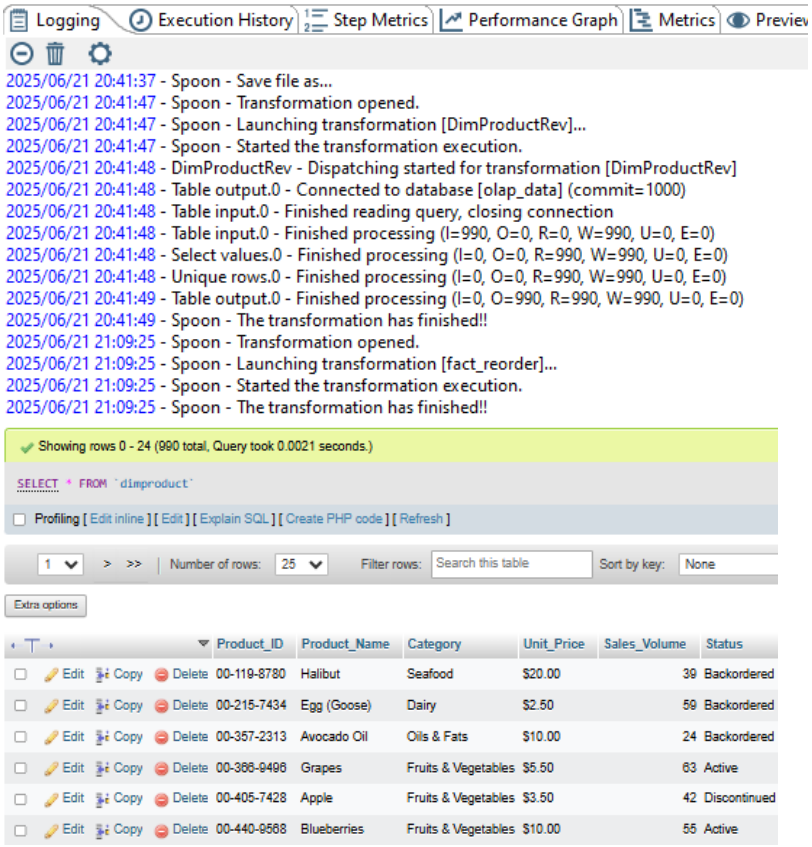


5. Lakukan konfigurasi pada **table output**. Buat koneksi database baru dengan nama olap_data untuk menyimpan output ke database olap_dataset pada tabel dimProduct.

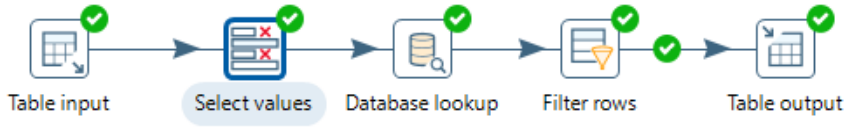


6. Jalankan transformasi dan pastikan data tersimpan ke database pada tabel dimProduct

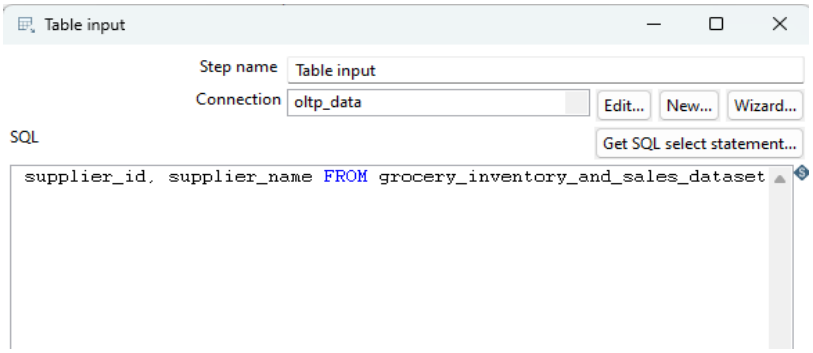
Execution Results



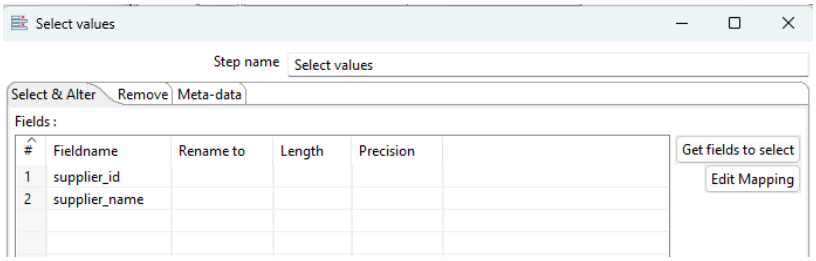
- **Tabel DimSupplier**
  1. Buat transformasi baru untuk DimSupplier, drag dan drop objek pada transformasi



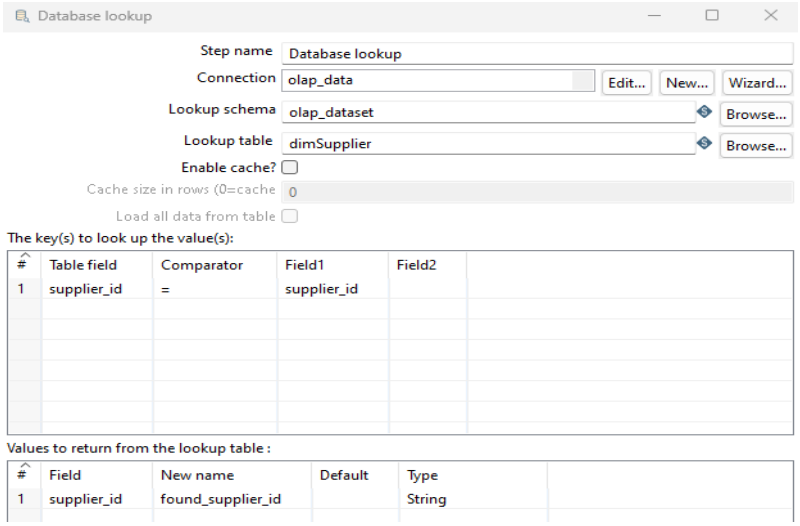
  2. Lakukan konfigurasi untuk table input, untuk mengambil data supplier berupa **supplier_id** dan **supplier_name dari database OLTP**



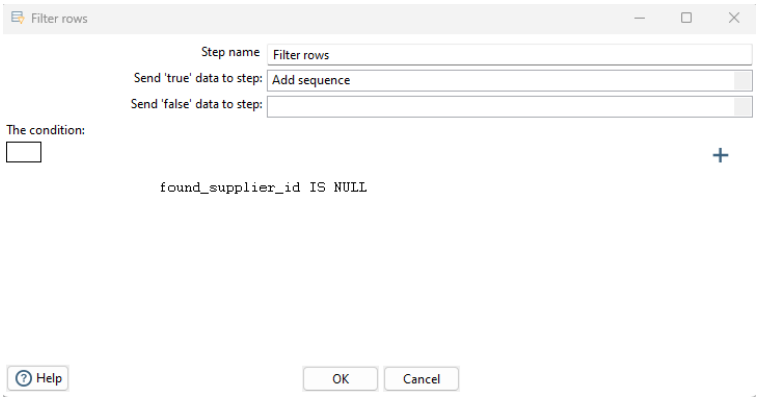
  3. Lakukan konfigurasi untuk select value untuk memilih kolom yang dibutuhkan yaitu **supplier_id** dan **supplier_name**



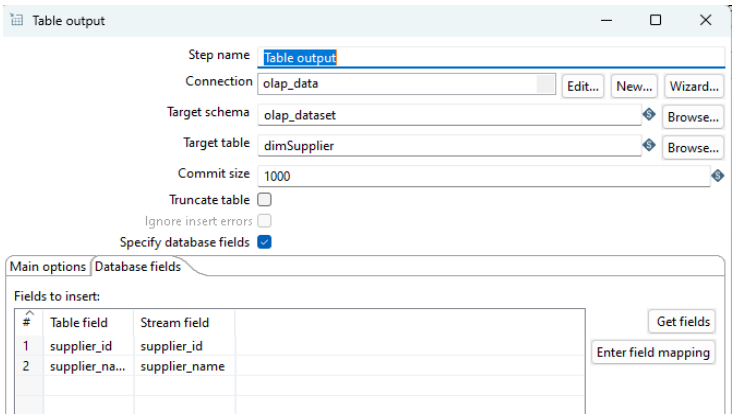
  4. Lakukan konfigurasi untuk Database lookup untuk mengecek apakah supplier_id sudah ada di olap_data



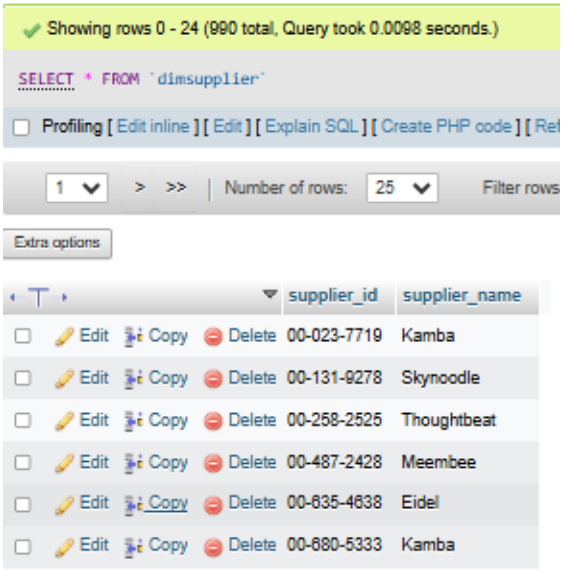
5. Lakukan konfigurasi pada filter rows agar hanya data baru atau yang belum ada di dimSupplier yang akan dilanjutkan



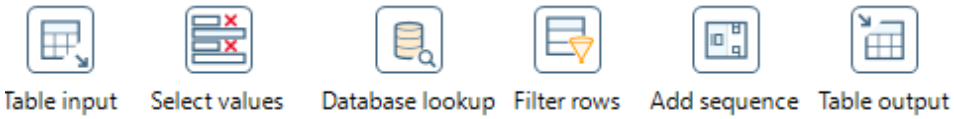
6. Lakukan konfigurasi pada Table output untuk memberikan koneksi kepada oltp_data dan olap_data dan tabel dimSupplier



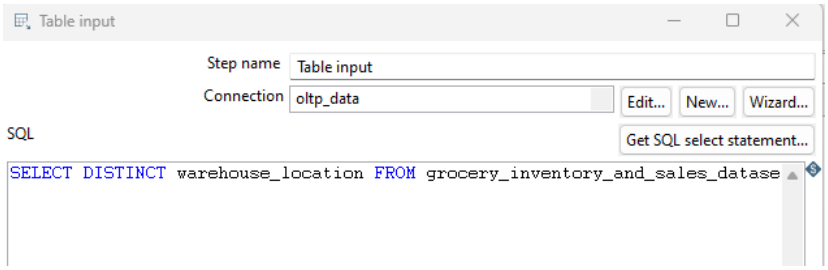
7. Jalankan transformasi dan pastikan data tersimpan ke database pada tabel dimSupplier



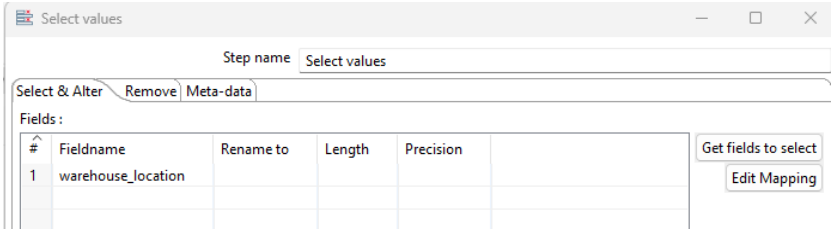
- **Tabel DimWarehouse**
  1. Buat transformasi baru untuk DimWarehouse, drag dan drop objek pada transformasi



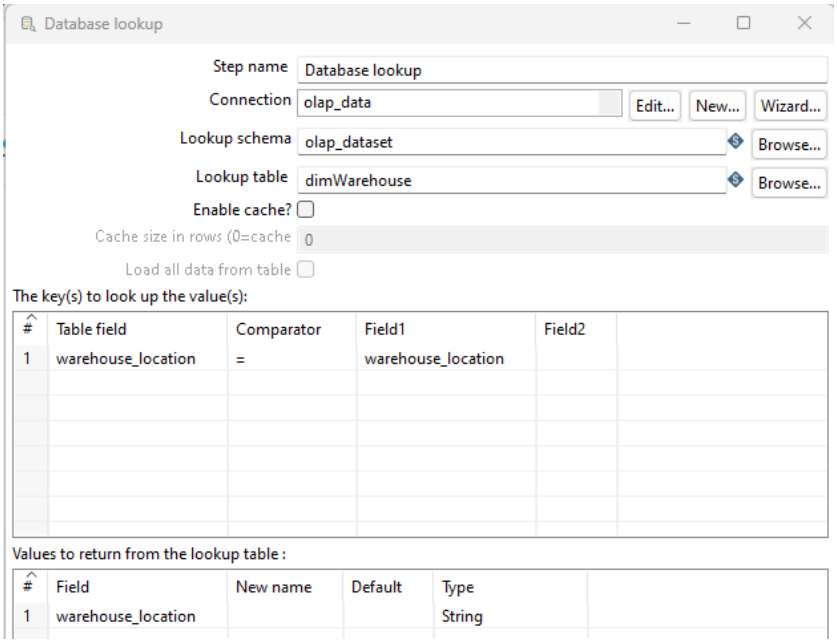
  2. Lakukan konfigurasi pada table input untuk mengambil data dari **database OLTP**



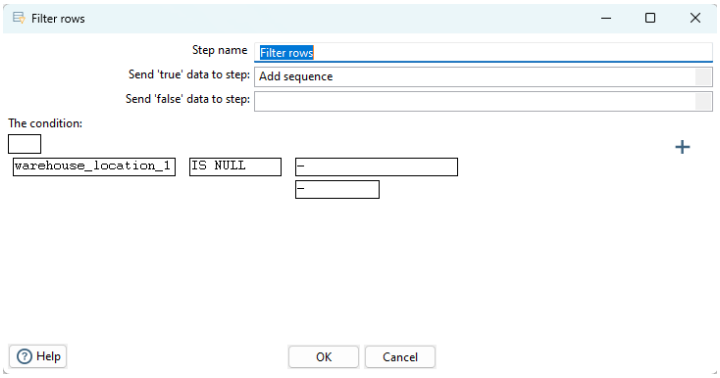
  3. Lakukan konfigurasi pada select value untuk memilih kolom yang dibutuhkan yaitu **warehouse_location**



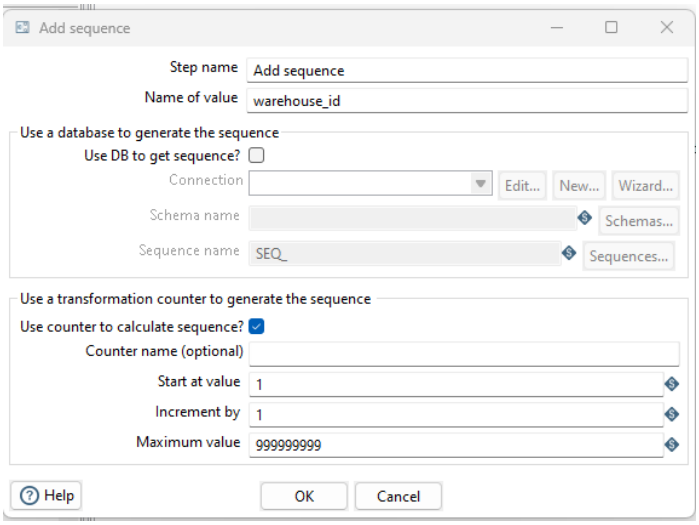
  4. Lakukan konfigurasi pada database lookup untuk mengecek apakah warehouse_location sudah ada pada OLAP_data



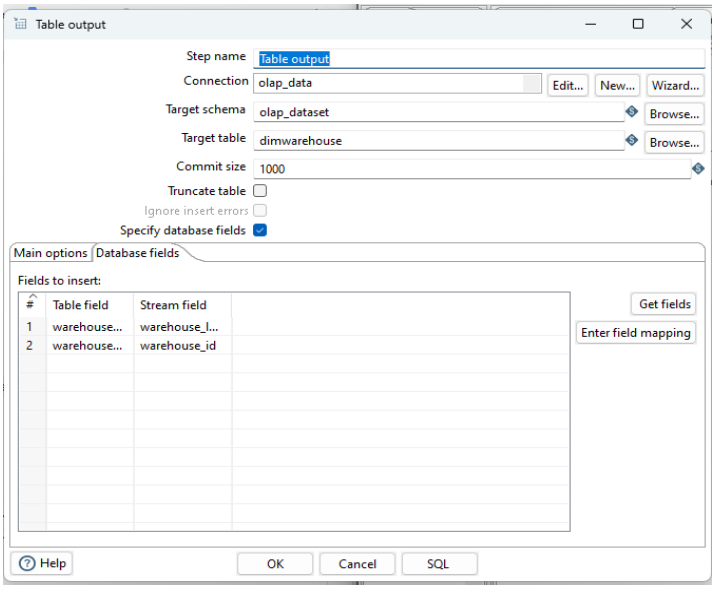
5. Lakukan konfigurasi pada filter rows agar lokasi yang belum ada pada database dilanjutkan ke output



6. Lakukan konfigurasi pada add sequence seperti pada gambar dibawah ini



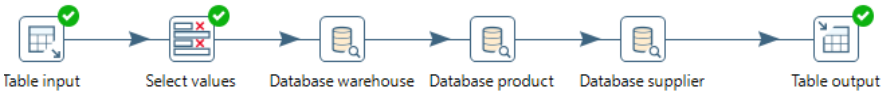
7. Lakukan konfigurasi pada table output untuk memberikan koneksi kepada oltp_data dan olap_data dan dimWarehouse



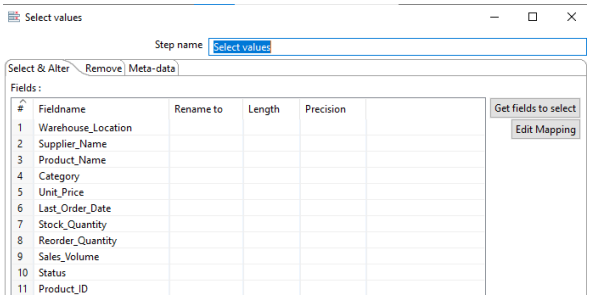
8. Jalankan transformasi dan pastikan data tersimpan ke database pada tabel dimWarehouse

C. ETL Tabel FactInverntory

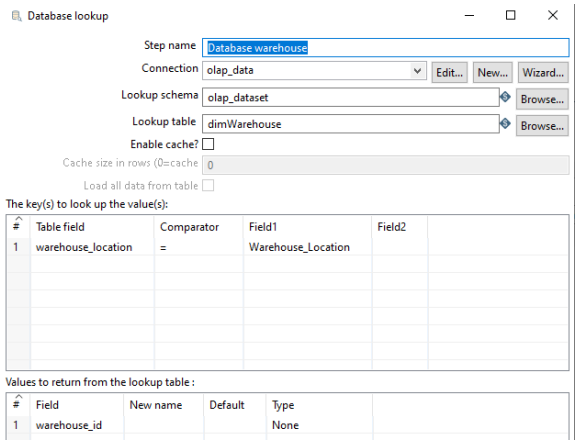
1. Buat transformasi baru untuk tabel FactInventory. Drag dan drop beberapa objek pada transformasi



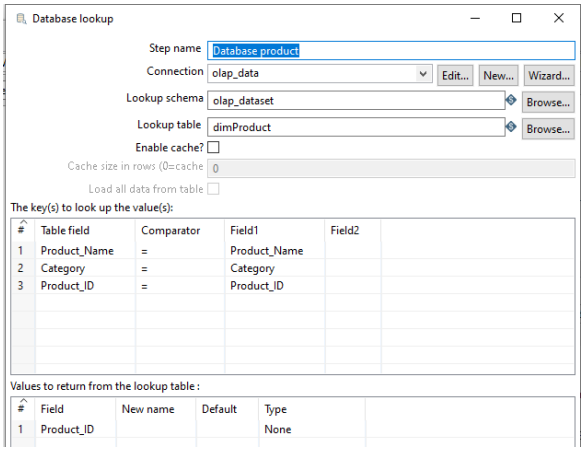
2. Lakukan konfigurasi pada table input untuk mengambil data dari oltp. Buat koneksi dengan nama oltp_data dan dihubungkan dengan database datasetuas



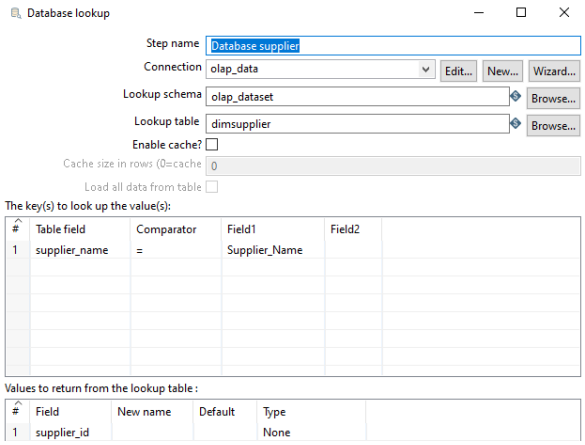
3. Lakukan konfigurasi pada **database lookup 1** untuk dengan dimWarehouse seperti gambar di bawah ini. Buat koneksi database baru dengan nama olap_data dan hubungan dengan database olap_dataset.



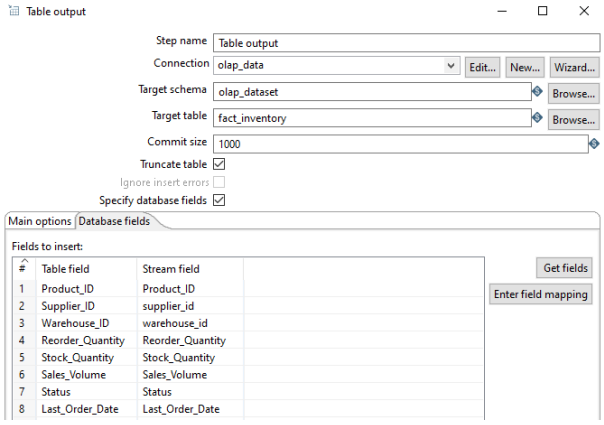
4. Lakukan konfigurasi pada **database lookup 2** untuk dengan dimProduct seperti gambar di bawah ini



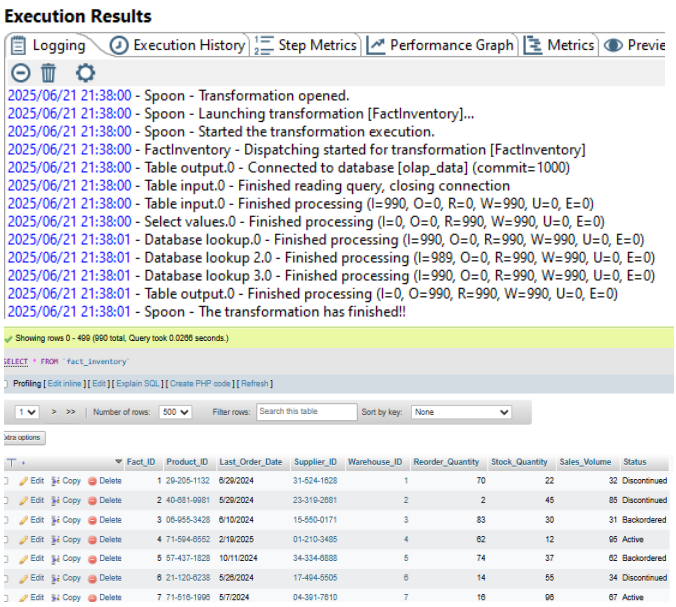
5. Lakukan konfigurasi pada **database lookup 3** untuk dengan dimSupplier seperti gambar di bawah ini



6. Lakukan konfigurasi pada **table output** dan gunakan koneksi olap_data dengan tabel tujuan Fact_Inventory

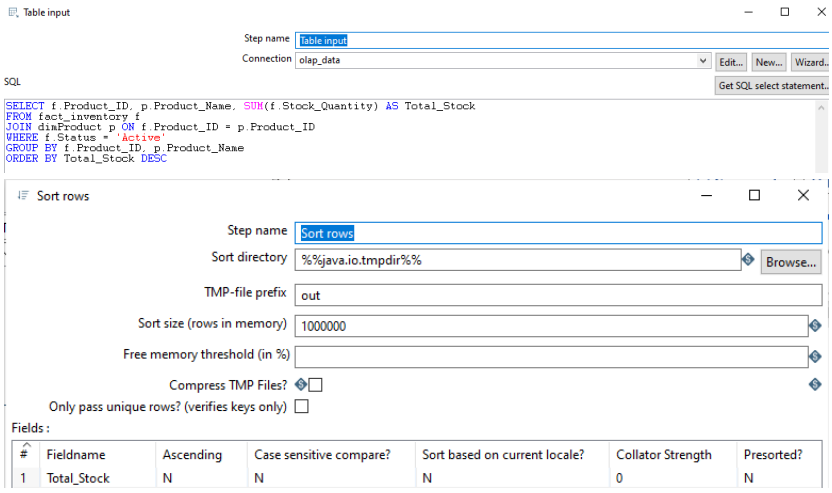


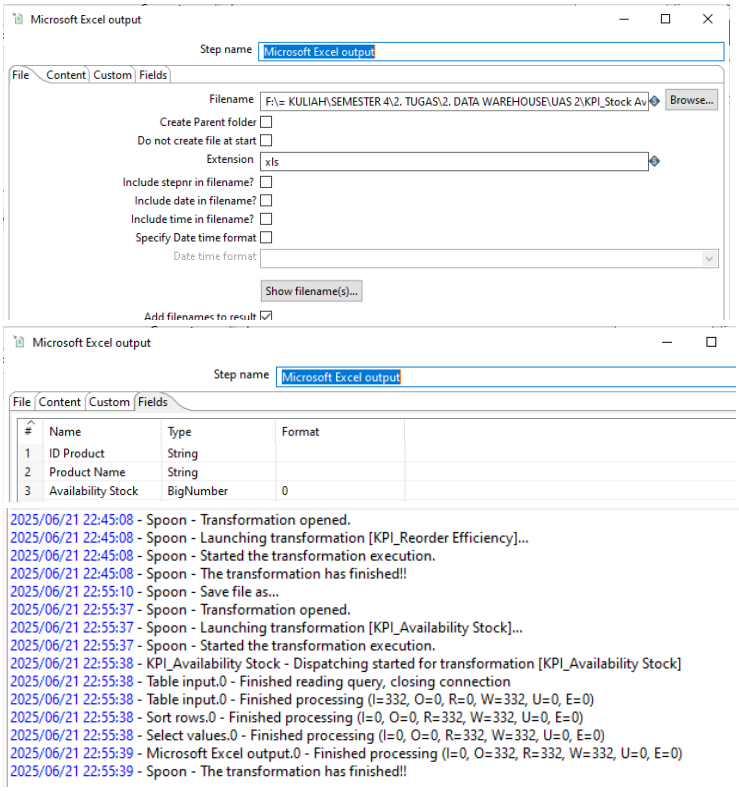
7. Jalankan transformasi dan pastikan data berhasil tersimpan ke tabel Fact_Inventory



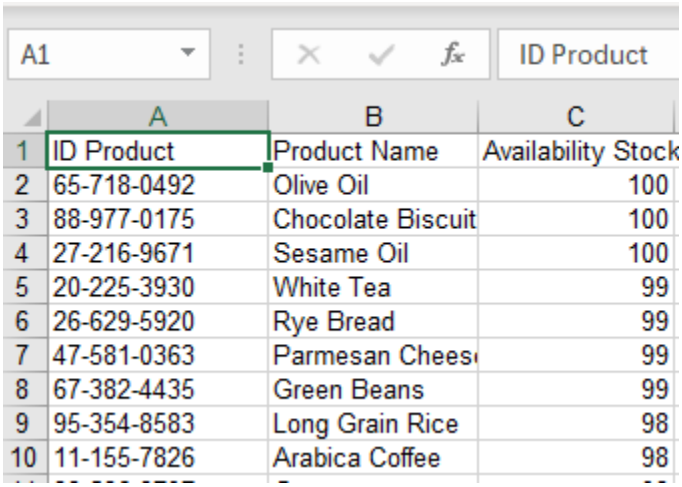
D. Key Performances Index

- **Stock Availability,** digunakan untuk mengetahui ketersediaan stok**.**

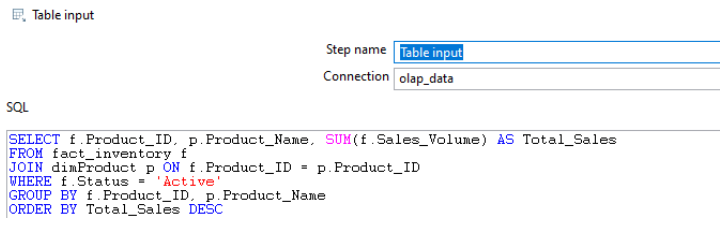


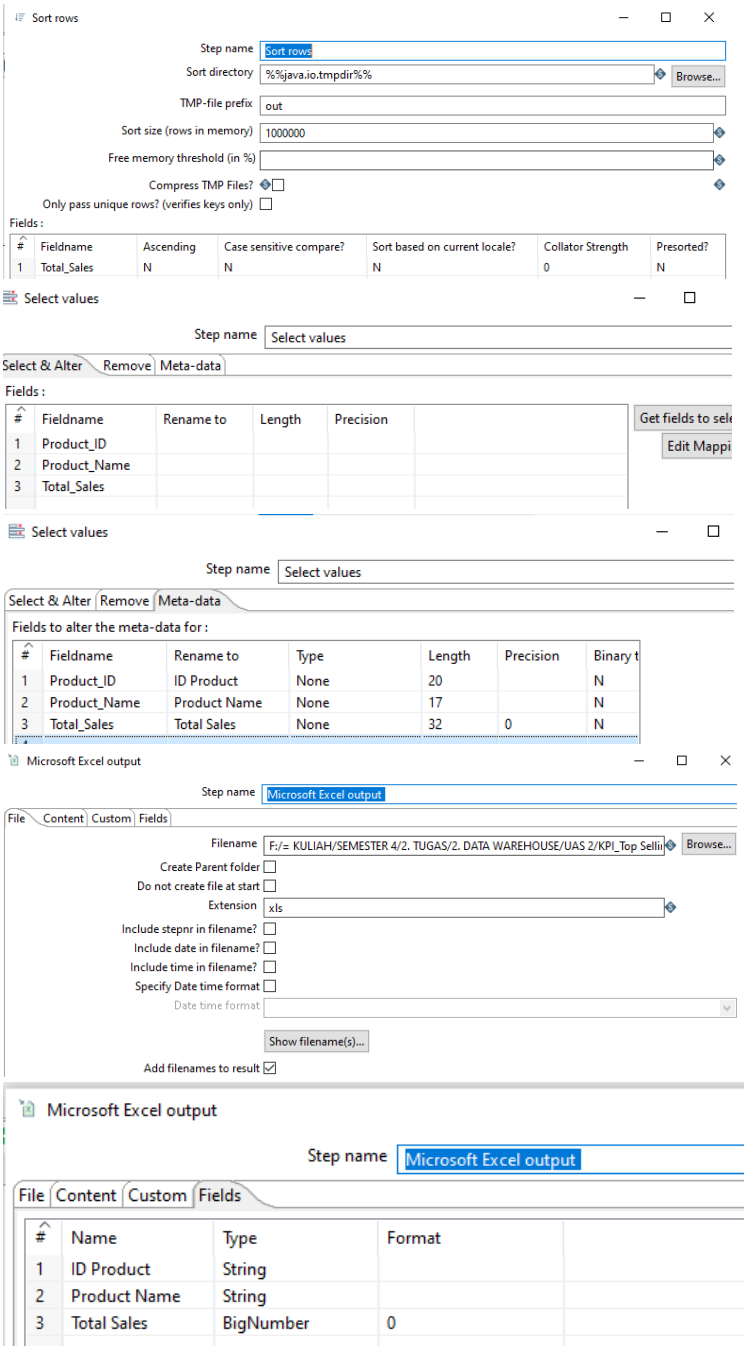


Berikut adalah file output berformat Excel

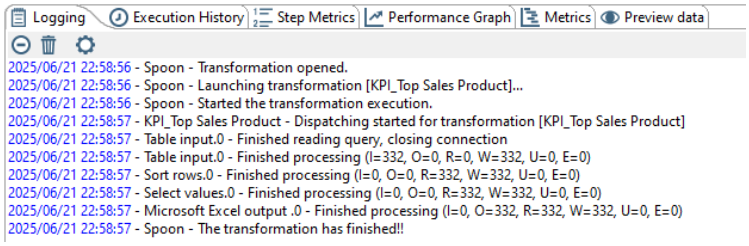


- **Top Selling Products,** digunakan untuk mencari product yang paling banyak terjual.

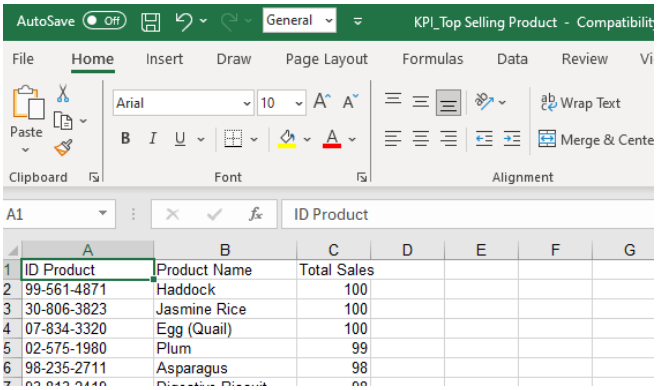




Execution Results

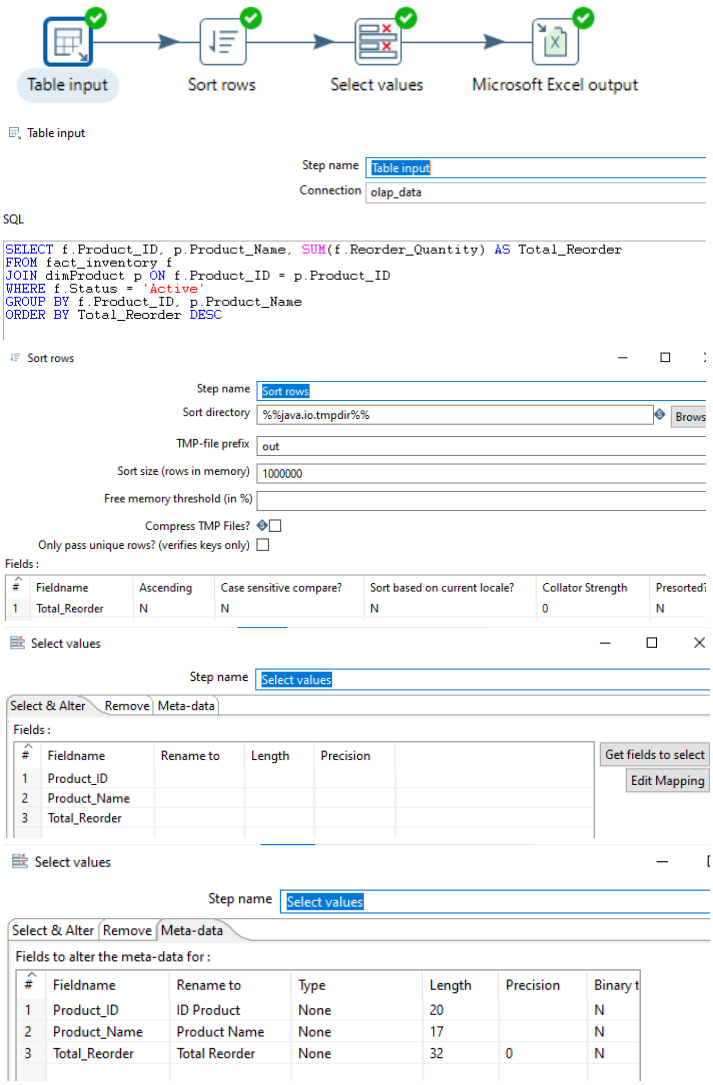


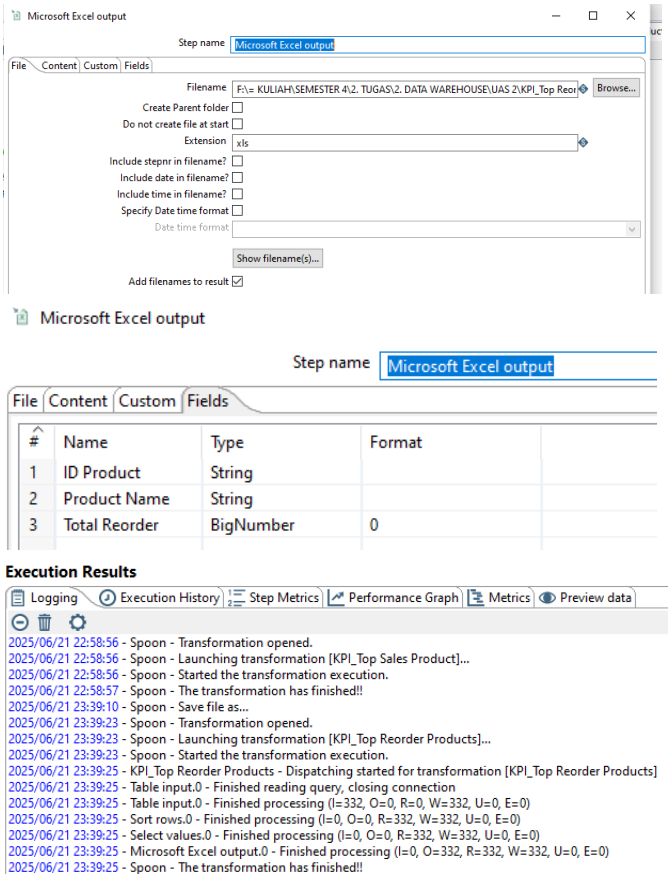
Berikut adalah file output berformat Excel



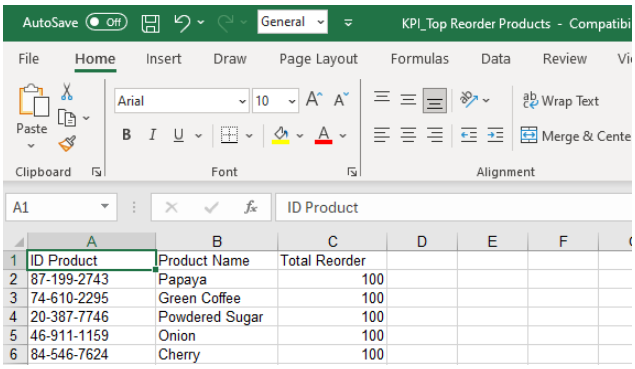
	A	B	C
1	ID Product	Product Name	Total Sales
2	99-561-4871	Haddock	100
3	30-806-3823	Jasmine Rice	100
4	07-834-3320	Egg (Quail)	100
5	02-575-1980	Plum	99
6	98-235-2711	Asparagus	98

- **Top Reorder Products,** digunakan untuk mencari product dengan tingkat reorder tinggi.





Berikut adalah file output berformat Excel



- **Reorder Efficiency,** digunakan untuk mengevaluasi seberapa efektif proses pemesanan ulang (reorder) dalam menjaga ketersediaan stok atau memenuhi kebutuhan penjualan. Tujuan utamanya memastikan stok yang dipesan ulang tidak terlalu banyak.

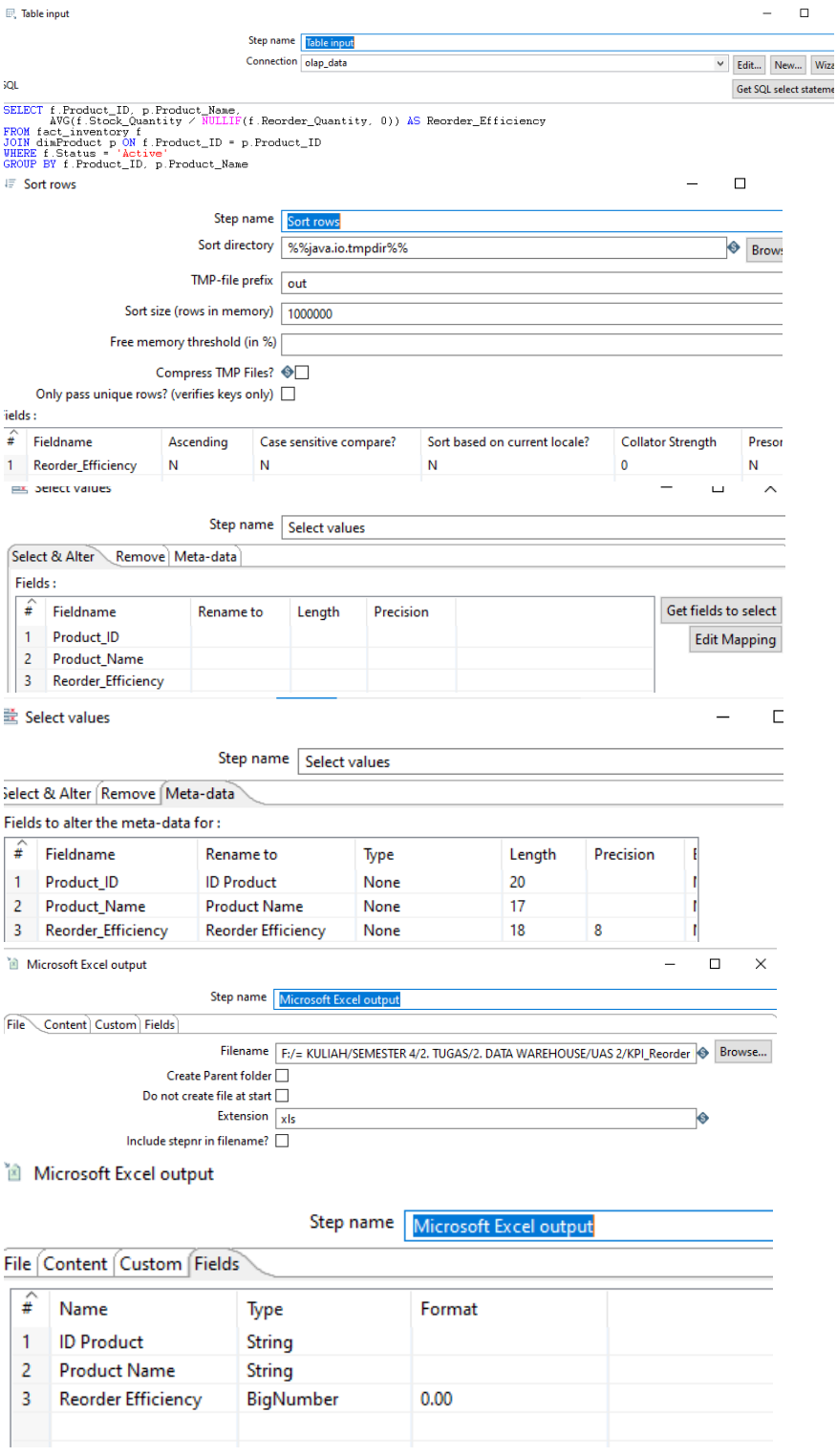
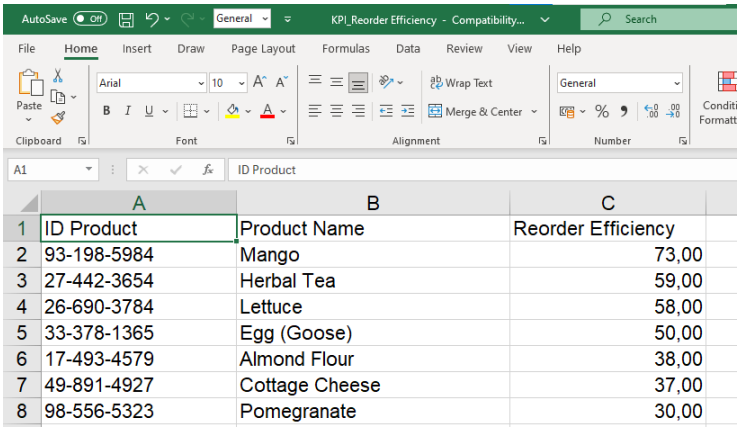


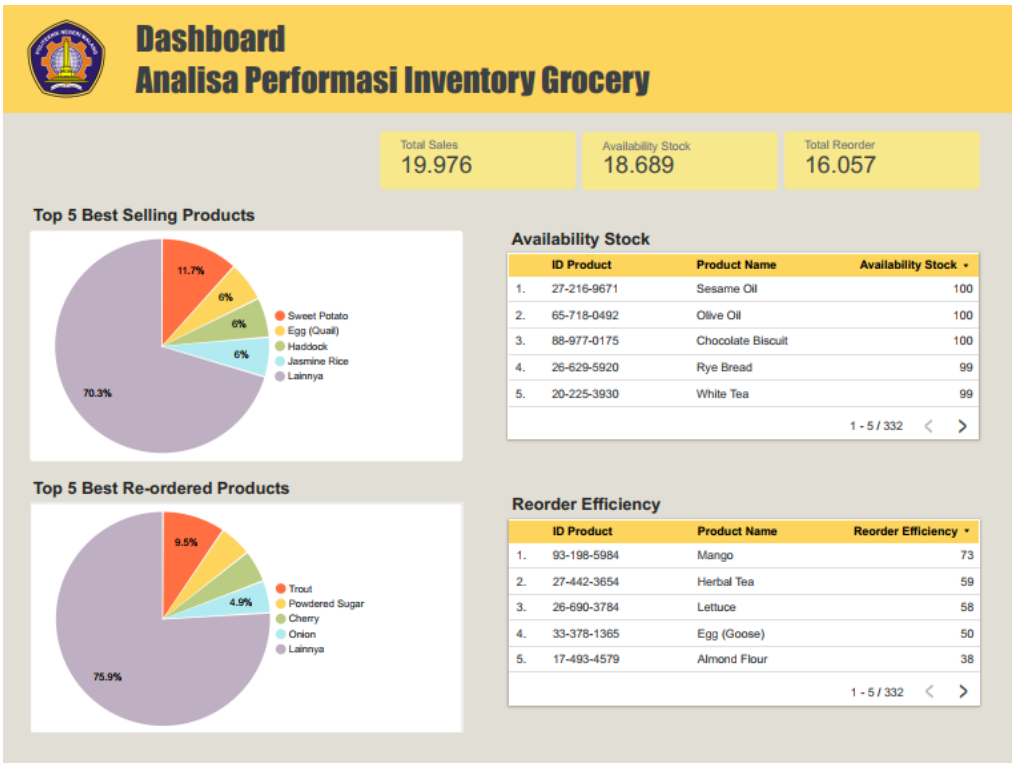
Table input
Step name
Table input
Connection
olap_data
Edit...
New...
Get SQL select statement
SELECT f.Product_ID, p.Product_Name,
AVG(f.Stock_Quantity / NULLIF(f.Reorder_Quantity, 0)) AS Reorder_Efficiency
FROM fact_inventory f
JOIN dimProduct p ON f.Product_ID = p.Product_ID
WHERE f.Status = 'Active'
GROUP BY f.Product_ID, p.Product_Name
Sort rows
Step name
Sort rows
Sort directory
%%java.io.tmpdir%%
TMP-file prefix
out
Sort size (rows in memory)
1000000
Free memory threshold (in %)
Compress TMP Files?
Only pass unique rows? (verifies keys only)
Fields :
Fieldname Ascending Case sensitive compare? Sort based on current locale? Collator Strength
1 Reorder_Efficiency N N N 0 N
Select values
Step name
Select values
Select & Alter
Remove
Meta-data
Fields :
Fieldname Rename to Length Precision
1 Product_ID
2 Product_Name
3 Reorder_Efficiency
Get fields to select
Edit Mapping
Select values
Step name
Select values
Select & Alter
Remove
Meta-data
Fields to alter the meta-data for :
Fieldname Rename to Type Length Precision
1 Product_ID ID Product None 20
2 Product_Name Product Name None 17
3 Reorder_Efficiency Reorder Efficiency None 18 8
Microsoft Excel output
Step name
Microsoft Excel output
File
Content
Custom
Fields
Filename
F:/= KULIAH/SEMESTER 4/2. TUGAS/2. DATA WAREHOUSE/UAS 2/KPI_Reorder
Browse...
Create Parent folder
Do not create file at start
Extension
xls
Include stepnr in filename?
Microsoft Excel output
Step name
Microsoft Excel output
File
Content
Custom
Fields
Name Type Format
1 ID Product String
2 Product Name String
3 Reorder Efficiency BigNumber 0.00

Berikut adalah file output berformat Excel



	A	B	C
1	ID Product	Product Name	Reorder Efficiency
2	93-198-5984	Mango	73,00
3	27-442-3654	Herbal Tea	59,00
4	26-690-3784	Lettuce	58,00
5	33-378-1365	Egg (Goose)	50,00
6	17-493-4579	Almond Flour	38,00
7	49-891-4927	Cottage Cheese	37,00
8	98-556-5323	Pomegranate	30,00

E. Visualisasi Data KPI



https://lookerstudio.google.com/reporting/8b248b35-031d-4e02-a63a-01fc890f497d