LAPORAN HASIL PRAKTIKUM

DATA WAREHOUSE

JOBSHEET 3

Oleh:

DZULFIKAR MUHAMMAD AL GHIFARI

NIM. 2341760071

SIB-2B / 08

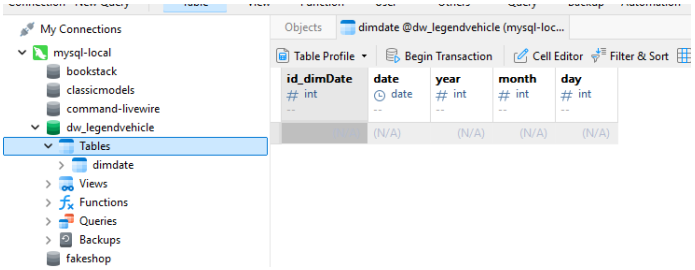
D-IV SISTEM INFORMASI BISNIS

JURUSAN TEKNOLOGI INFORMASI

POLITEKNIK NEGERI MALANG

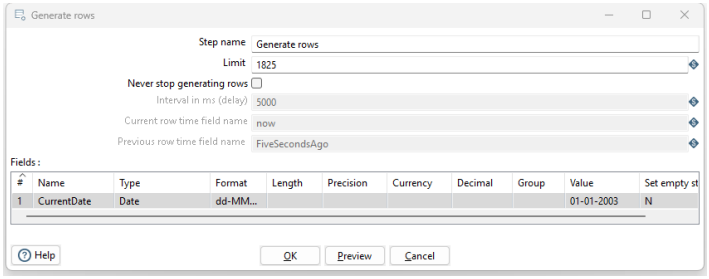
A. DIMENSI WAKTU

Membuat databse OLAP dengan nama dw_LegendVehicle. Dan



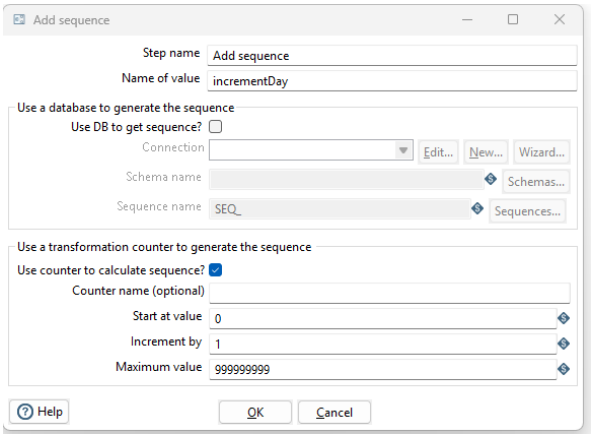
Define objek

Config generate rows object

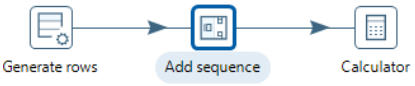


Hubungkan output generate rows -> add sequence

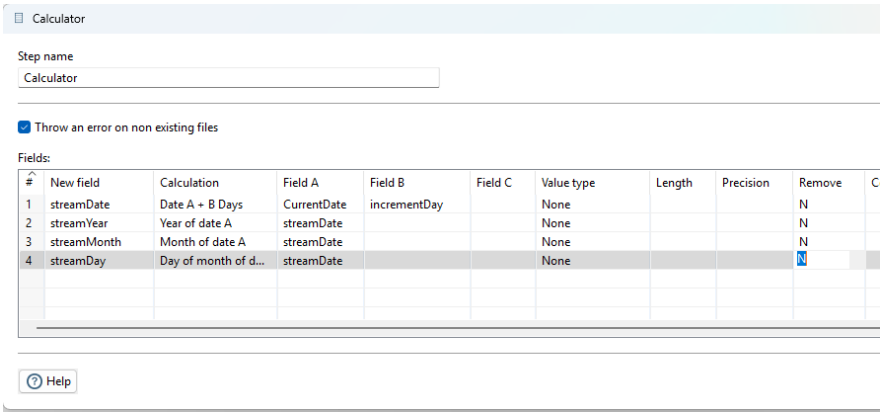
Config add sequence object



Hubungkan output dari add sequences menuju calculator.

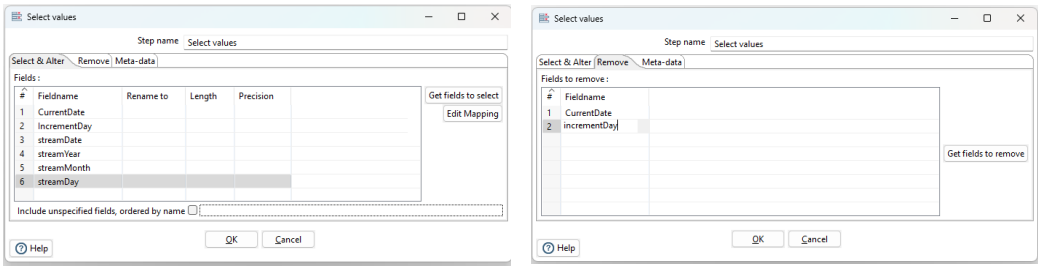


Konfigurasi Calkulator

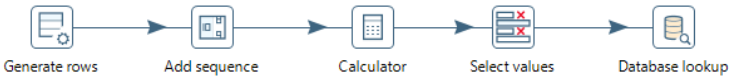


Hubungkan output dari calculator menuju Select values

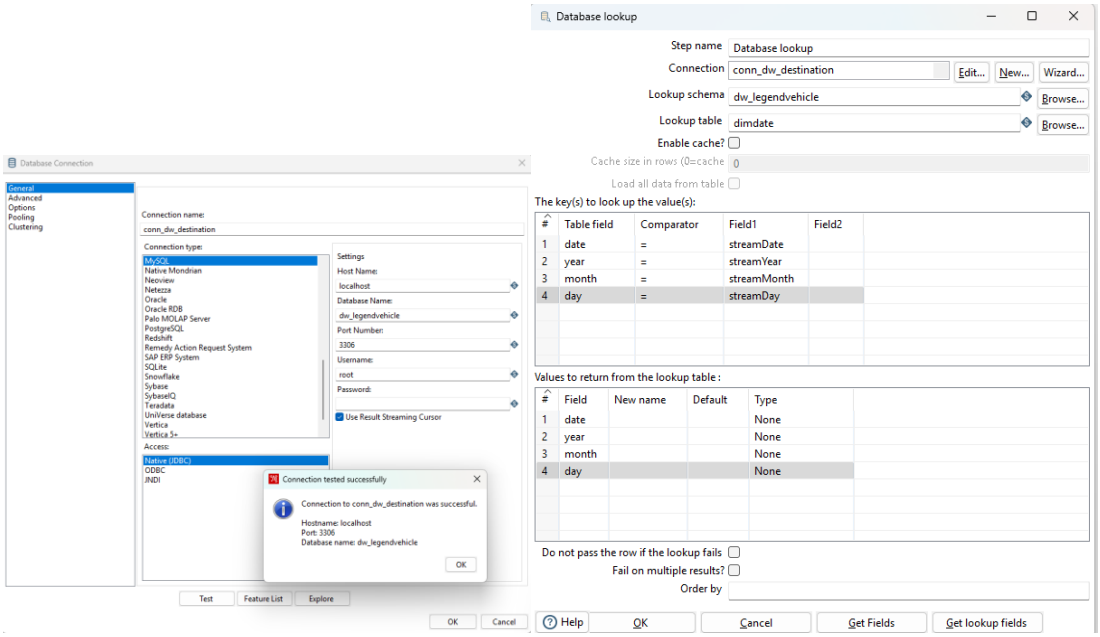
Konfigurasi pada select values



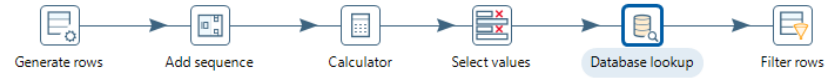
Hubungkan output select values menuju database lookup



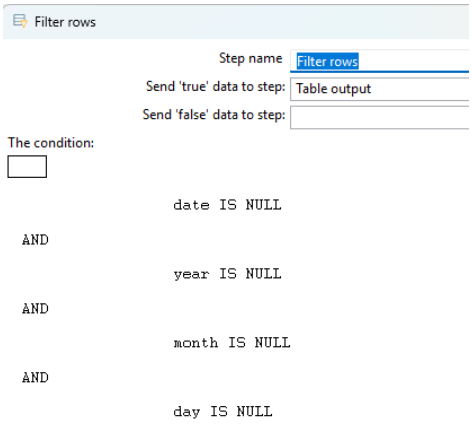
Setting db connection & database lookup



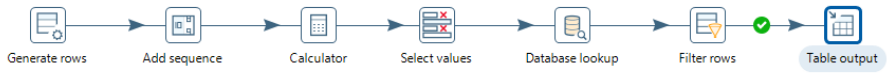
Hubungkan output dari database lookup dengan filter rows



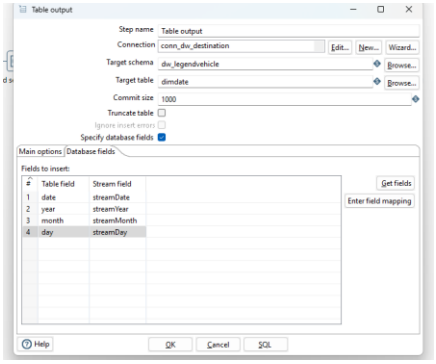
Setting filter



Hubungkan output dari filter rows menuju table output.



Setting table output



Result table dimdate

id_dimDate # int	date date	year # int	month # int	day # int
1	2003-01-01	2003	1	1
2	2003-01-02	2003	1	2
3	2003-01-03	2003	1	3
4	2003-01-04	2003	1	4
5	2003-01-05	2003	1	5
6	2003-01-06	2003	1	6
7	2003-01-07	2003	1	7
8	2003-01-08	2003	1	8
9	2003-01-09	2003	1	9
10	2003-01-10	2003	1	10
11	2003-01-11	2003	1	11
12	2003-01-12	2003	1	12
13	2003-01-13	2003	1	13
14	2003-01-14	2003	1	14
15	2003-01-15	2003	1	15
16	2003-01-16	2003	1	16
17	2003-01-17	2003	1	17

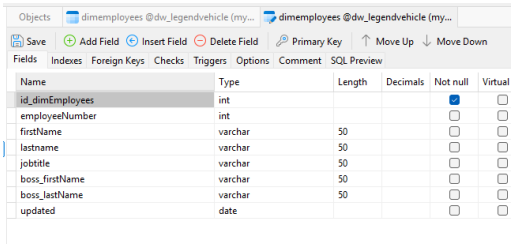
TUGAS 1

1. **Buka preview tab pada execution result area di setiap proses object. amati input dan output data yang ada. bandingkan di setiap prosesnya. jelaskan perbedaan disetiap prosesnya.**

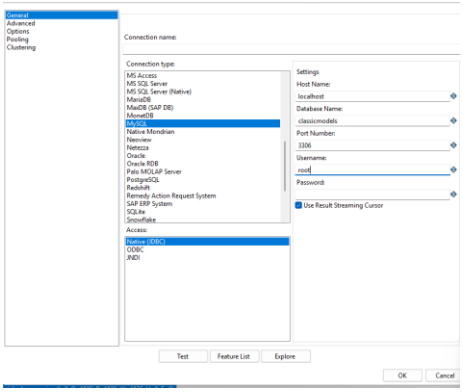
Proses Objek	SS Data Input	SS Data Output	Keterangan
Generate Rows	- (tidak ada input)	1825	Membuat 1825 baris data kosong atau default.
Add Sequences	1825	1825	Menambahkan nomor urut atau sequence ke setiap baris.
Calculator	1825	1825	Melakukan perhitungan berdasarkan nilai tertentu.
Select Values	1825	1825	Memilih kolom tertentu dari dataset.
Database Lookup	1825	1825	Mencari data dari database lain berdasarkan nilai kunci tertentu.
Filter Rows	1825	1825	Menyaring data berdasarkan kondisi tertentu.
Table Output	1825	1825 (ke database)	Menyimpan data hasil transformasi ke dalam tabel database.

B. DIMENSI PEGAWAI

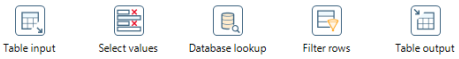
Create table dimemployees



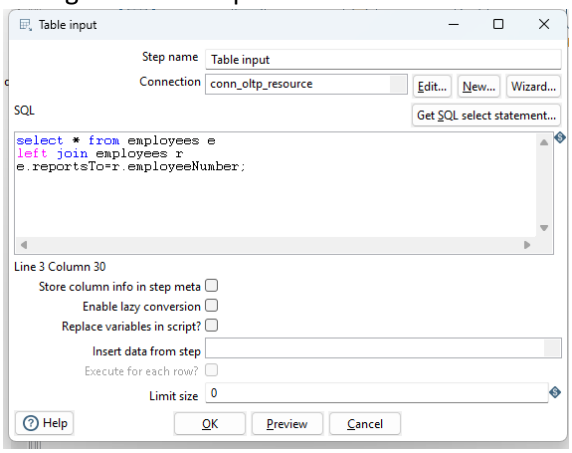
Create new connection for dimemployees



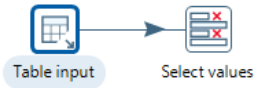
Define object



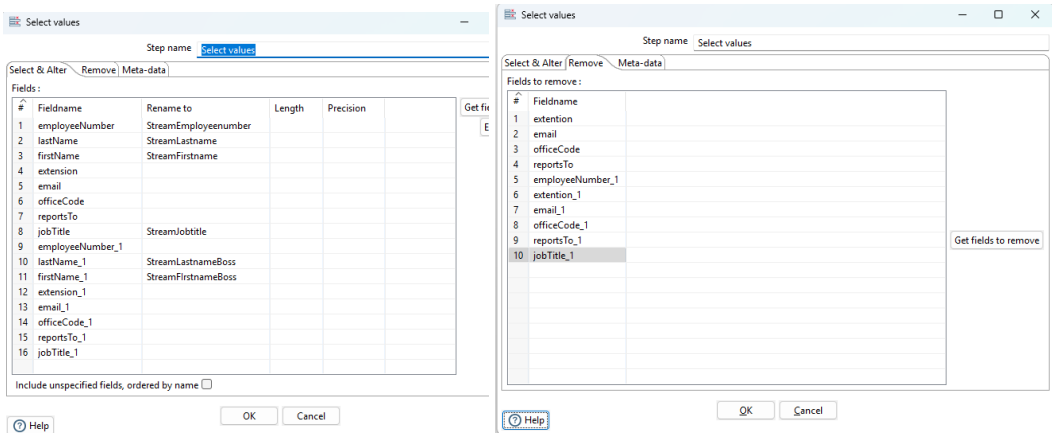
Konfigurasi table input



Hubungkan output table input pada select values

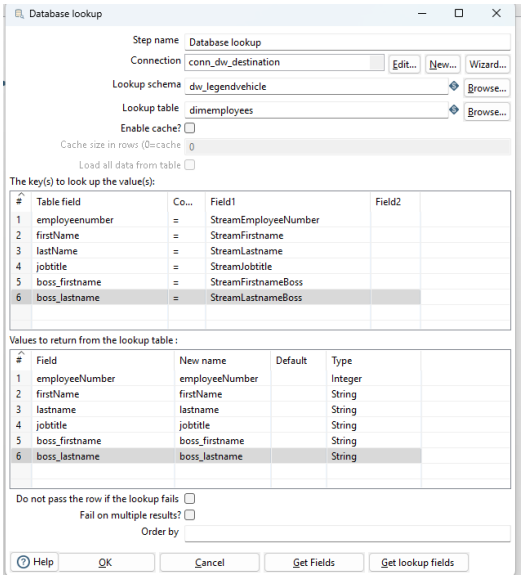


Konfigurasi pada Select values

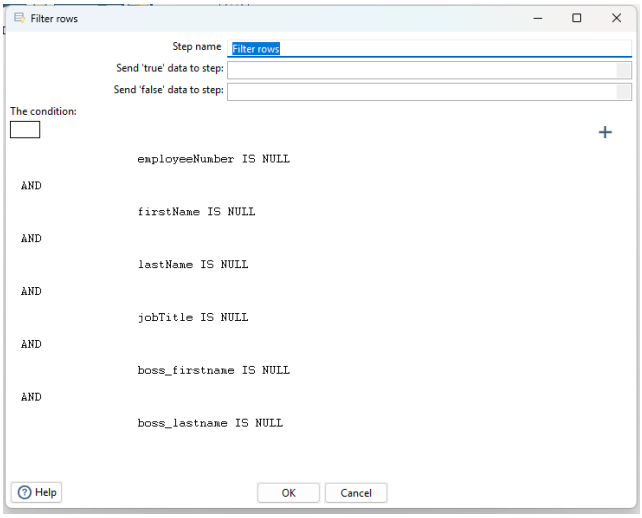


Hubungkan output select values pada database lookup

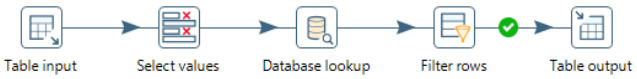
Konfigurasi pada database lookup



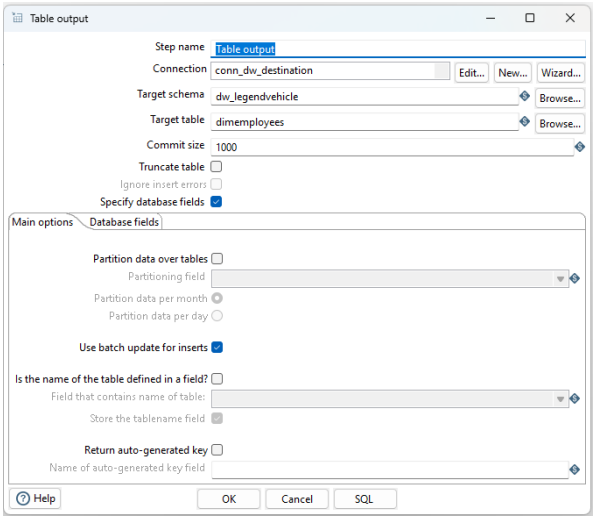
Hubungkan output databse lookup dengan filter rows.



Hubungkan output dari filter rows dengan table output.



Konfigurasi table output



Result table dimemployees

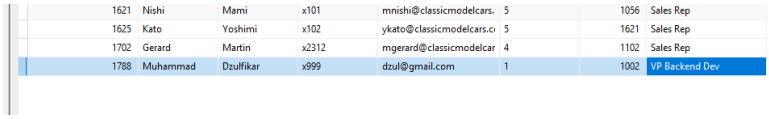
id_dimEmployees # int	employeeNumber # int	firstName varchar(50)	lastname varchar(50)	jobtitle varchar(50)	boss_firstName varchar(50)	boss_lastName varchar(50)	update date
1	1002	Diane	Murphy	President	(Null)	(Null)	(Null)
2	1056	Mary	Patterson	VP Sales	Diane	Murphy	(Null)
3	1076	Jeff	Firrelli	VP Marketing	Diane	Murphy	(Null)
4	1088	William	Patterson	Sales Manager (A	Mary	Patterson	(Null)
5	1102	Gerard	Bondur	Sale Manager (EM	Mary	Patterson	(Null)
6	1143	Anthony	Bow	Sales Manager (N	Mary	Patterson	(Null)
7	1165	Leslie	Jennings	Sales Rep	Anthony	Bow	(Null)
8	1166	Leslie	Thompson	Sales Rep	Anthony	Bow	(Null)
9	1188	Julie	Firrelli	Sales Rep	Anthony	Bow	(Null)
10	1216	Steve	Patterson	Sales Rep	Anthony	Bow	(Null)
11	1286	Foon Yue	Tseng	Sales Rep	Anthony	Bow	(Null)
12	1323	George	Vanauf	Sales Rep	Anthony	Bow	(Null)
13	1337	Loui	Bondur	Sales Rep	Gerard	Bondur	(Null)
14	1370	Gerard	Hernandez	Sales Rep	Gerard	Bondur	(Null)

TUGAS 2

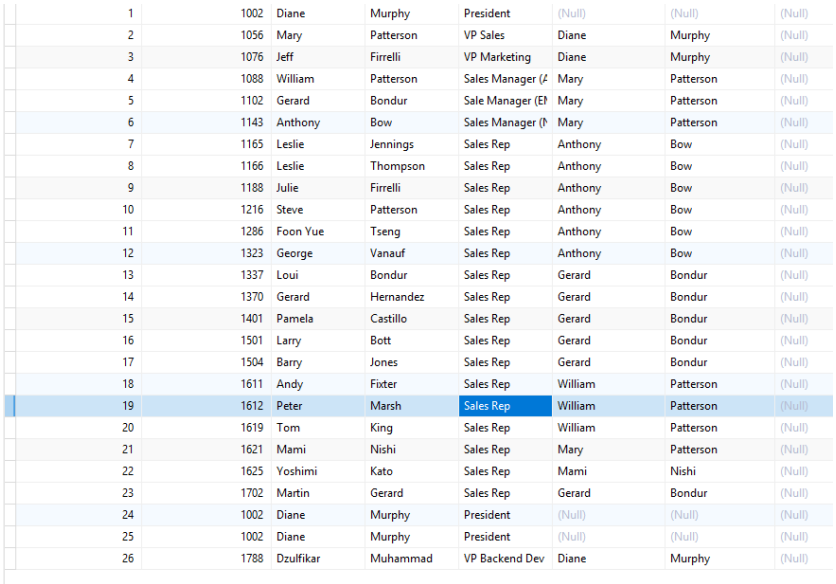
1. **Buka preview tab pada execution result area di setiap proses object. amati input dan output data yang ada. bandingkan di setiap prosesnya. jelaskan perbedaan disetiap prosesnya.**

Proses Objek	SS Data Input	SS Data Output	Keterangan
Table Input	23	0	Membaca 23 data dari database, lalu mengirimkannya ke proses selanjutnya.
Select Values	23	23	Memilih atau mengubah nama kolom tertentu. Tidak ada perubahan jumlah data.
Database Lookup	23	23	Mencari referensi data dari database lain, tetapi tidak ada perubahan jumlah record.
Filter Rows	23	23	Memfilter data berdasarkan kondisi tertentu, tetapi di sini tidak ada data yang difilter.
Table Output	23	23	Menulis hasil transformasi ke database tujuan. Semua 23 record berhasil diproses.

2. **Jika proses itu di ulangi (di run kembali) apakah data akan redudant?**
   Tidak, tidak ada data redundant Ketika di run kembali
3. **Tambahkan nama anda pada table employee di OLTP. jalankan kembali transformasi ini. Amati hasilnya, apa yang terjadi?**



1621	Nishi	Mami	x101	mnishi@classicmodelcars.	5	1056	Sales Rep
1625	Kato	Yoshimi	x102	ykato@classicmodelcars.c	5	1621	Sales Rep
1702	Gerard	Martin	x2312	mgerard@classicmodelcar	4	1102	Sales Rep
1788	Muhammad	Dzulfikar	x999	dzul@gmail.com	1	1002	VP Backend Dev



1	1002	Diane	Murphy	President	(Null)	(Null)	(Null)
2	1056	Mary	Patterson	VP Sales	Diane	Murphy	(Null)
3	1076	Jeff	Firrelli	VP Marketing	Diane	Murphy	(Null)
4	1088	William	Patterson	Sales Manager (A	Mary	Patterson	(Null)
5	1102	Gerard	Bondur	Sale Manager (EM	Mary	Patterson	(Null)
6	1143	Anthony	Bow	Sales Manager (N	Mary	Patterson	(Null)
7	1165	Leslie	Jennings	Sales Rep	Anthony	Bow	(Null)
8	1166	Leslie	Thompson	Sales Rep	Anthony	Bow	(Null)
9	1188	Julie	Firrelli	Sales Rep	Anthony	Bow	(Null)
10	1216	Steve	Patterson	Sales Rep	Anthony	Bow	(Null)
11	1286	Foon Yue	Tseng	Sales Rep	Anthony	Bow	(Null)
12	1323	George	Vanauf	Sales Rep	Anthony	Bow	(Null)
13	1337	Loui	Bondur	Sales Rep	Gerard	Bondur	(Null)
14	1370	Gerard	Hernandez	Sales Rep	Gerard	Bondur	(Null)
15	1401	Pamela	Castillo	Sales Rep	Gerard	Bondur	(Null)
16	1501	Larry	Bott	Sales Rep	Gerard	Bondur	(Null)
17	1504	Barry	Jones	Sales Rep	Gerard	Bondur	(Null)
18	1611	Andy	Fixter	Sales Rep	William	Patterson	(Null)
19	1612	Peter	Marsh	Sales Rep	William	Patterson	(Null)
20	1619	Tom	King	Sales Rep	William	Patterson	(Null)
21	1621	Mami	Nishi	Sales Rep	Mary	Patterson	(Null)
22	1625	Yoshimi	Kato	Sales Rep	Mami	Nishi	(Null)
23	1702	Martin	Gerard	Sales Rep	Gerard	Bondur	(Null)
24	1002	Diane	Murphy	President	(Null)	(Null)	(Null)
25	1002	Diane	Murphy	President	(Null)	(Null)	(Null)
26	1788	Dzulfikar	Muhammad	VP Backend Dev	Diane	Murphy	(Null)

Data dengan nama saya akan tertambahkan pada table dimemployees

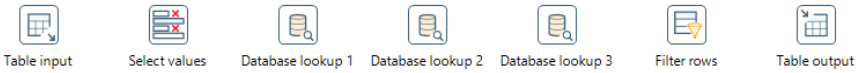
C. FAKTA PEMBAYARAN

Buat table factOmset

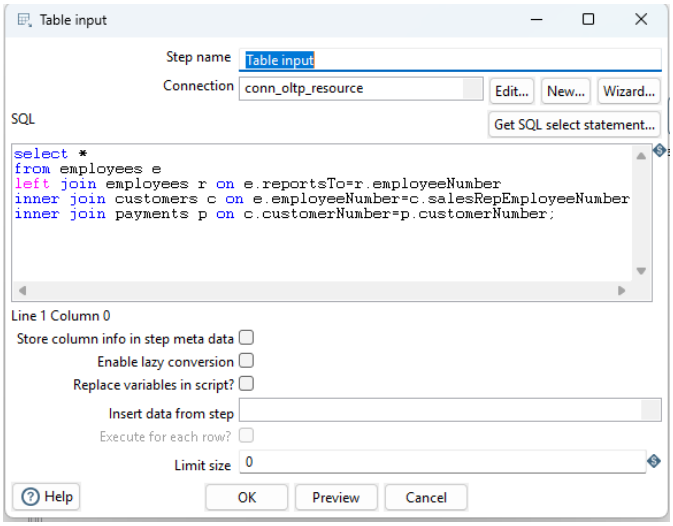
mysql-local | dw_legendvehicle | Run | Stop | Explain

```
CREATE TABLE factomset (
    id_factOmset INT AUTO_INCREMENT PRIMARY KEY,
    id_dimEmployees INT,
    id_dimDate INT,
    amount DECIMAL(10,2),
    FOREIGN KEY (id_dimEmployees) REFERENCES dimemployees(id_dimEmployees),
    FOREIGN KEY (id_dimDate) REFERENCES dimdate(id_dimDate)
);
```

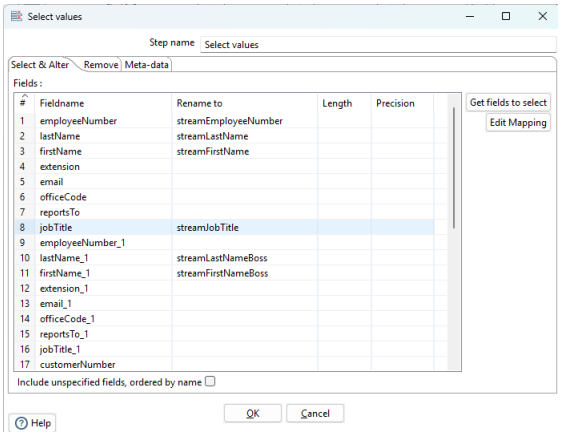
Buat Transformation baru pada PDI Spoon.

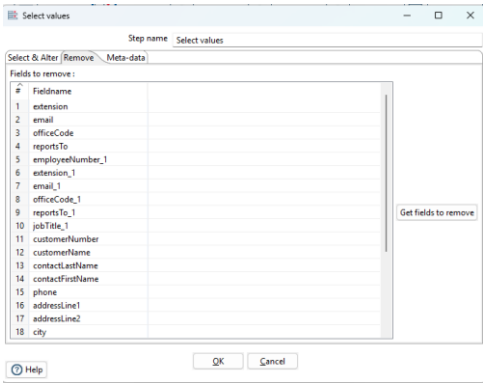


Konfigurasi pada Table input adalah untuk mendapatkan data dari OLTP

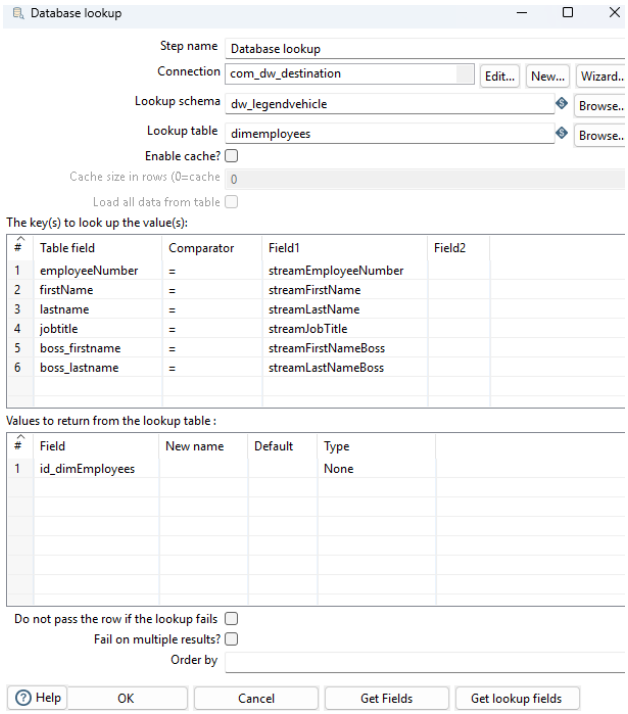


Konfigurasi pada Select Values

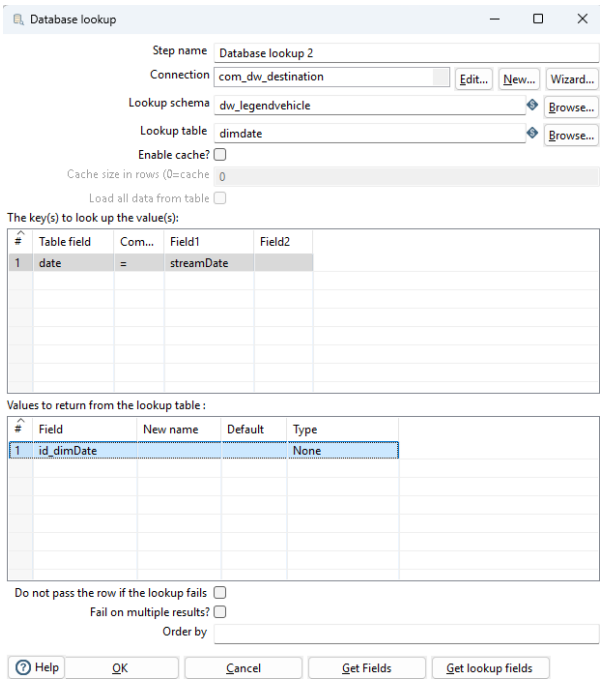




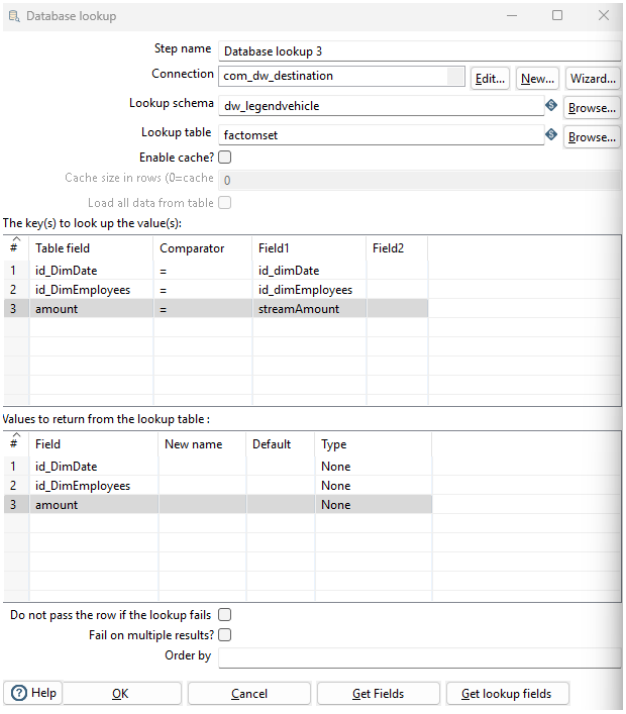
Konfigurasi pada tabel database lookup



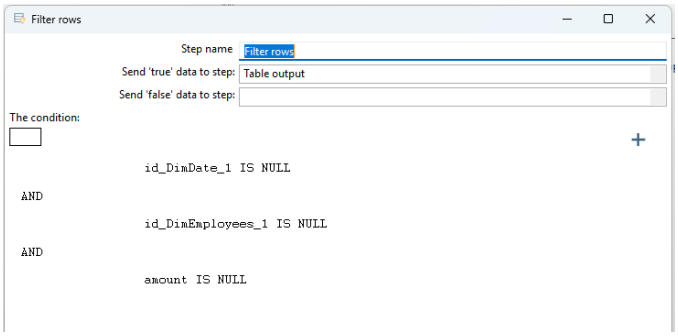
Konfigurasi pada tabel database lookup yang kedua



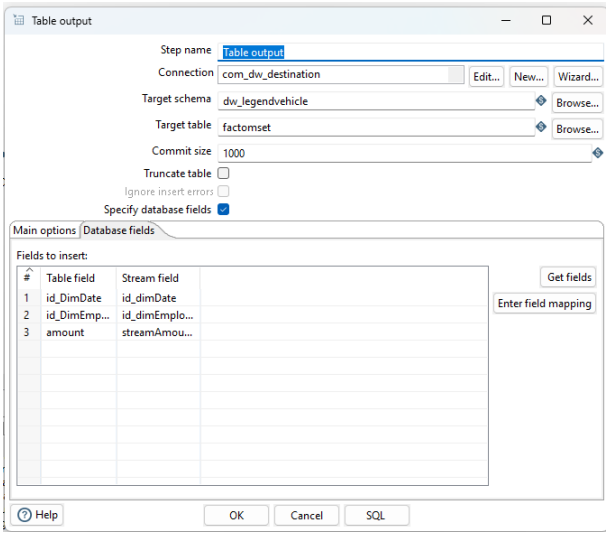
Konfigurasi pada tabel database lookup yang ketiga



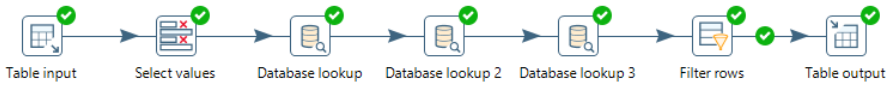
Pada bagian filter rows untuk melihat data belum ada pada tabel factOmset dengan melihat bahwa output dari lookup sebelumnya bernilai NULL.



Konfigurasi tabel output



Run transformation



TUGAS 3

1. **Buka preview tab pada execution result area di setiap proses object. amati input dan output data yang ada. bandingkan di setiap prosesnya. jelaskan perbedaan disetiap prosesnya.**

Proses Objek	SS Data Input (I)	SS Data Output (O)	Keterangan
Table Input	273	0	Membaca data dari database sumber dan meneruskannya ke proses berikutnya.
Select values	0	0	Memilih kolom yang diperlukan tanpa mengubah jumlah data.
Database lookup (1)	273	0	Lookup pertama untuk mengambil data tambahan dari tabel referensi.
Database lookup (2)	273	0	Lookup kedua untuk mendapatkan informasi tambahan.
Database lookup (3)	0	0	Tidak ada input langsung, tetapi tetap meneruskan 273 baris data. Ini bisa terjadi jika lookup hanya digunakan sebagai referensi tanpa input eksplisit.
Filter rows	0	0	Menyaring data sesuai kondisi tertentu tanpa mengurangi jumlah data.
Table Output	0	273	Menyimpan data hasil transformasi ke database tujuan.

2. **Jika proses itu di ulangi (di run kembali) apakah data akan redudant?**
   Tidak, tidak ada redundansi data

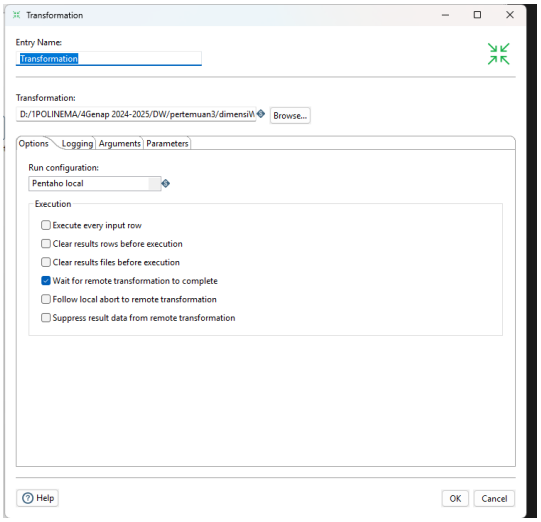
D. FAKTA PEMBAYARAN

Buka Jobs pada File - New - Jobs

Gunakan 5 objects dan hububngkan sesuai urutan sebagai berikut:

- Start: Objek untuk melakukan konfigurasi cron job dari proses ETL yag telah dibuat
- Transformation 1 : digunakan untuk menjalankan transformation pembuatan dimDate.
- Transformation 2 : digunakan untuk menjalankan transformation pembuatan dimEmployees.
- Transformation 3 : digunakan untuk menjalankan transformation pembuatan factOmset.
- Success: Objek untuk menandakan bahwa proses telah selesai.

Konfigurasi dilakukan pada setiap transformation untuk mengambil file tranformation yang telah dibuat pada bagian A, B dan C.



Jalankan jobs tersebut ketika semua transformation telah dihubungkan dengan file tranformation yang telah dibuat sebelumnya.

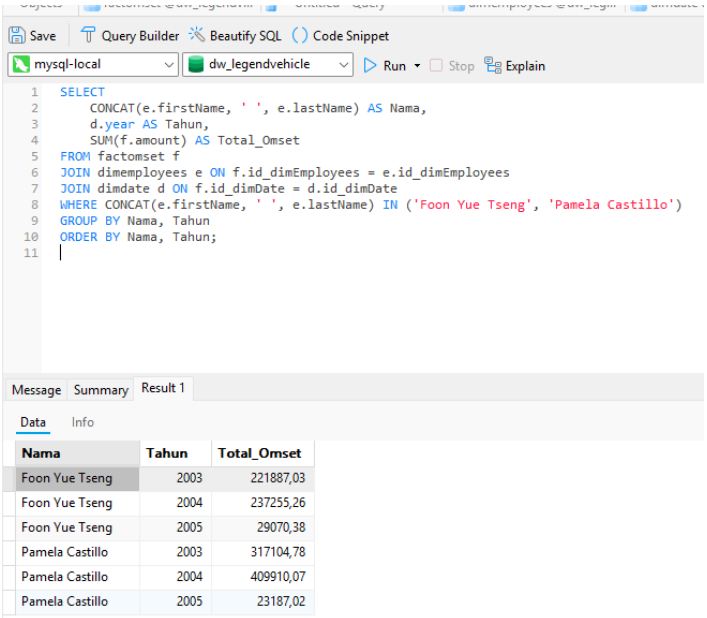
TUGAS 4

1. Buka desain database dari dw_legendvehicle pada DBMS, bandingkan design tersebut dengan desain db OLTP legendVehicle pada jobsheet 2. analisalah dan ceritakan perbedaannya.

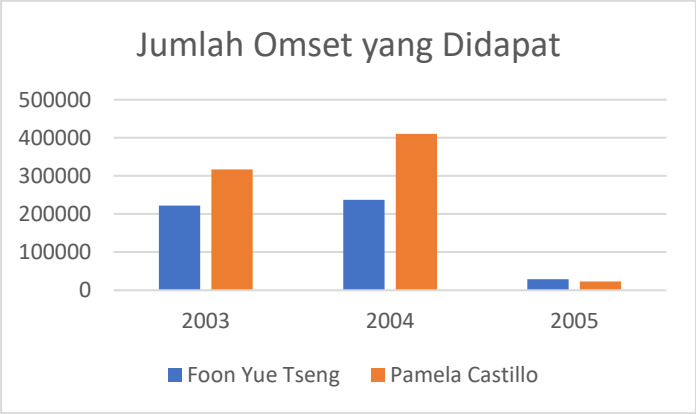
   Database OLTP legendVehicle dirancang untuk menangani transaksi harian dengan struktur tabel yang sangat ternormalisasi, memastikan kecepatan dan integritas dalam operasi CRUD,

sementara data warehouse dw_legendvehicle menggunakan denormalisasi dengan skema seperti star schema untuk analisis historis dan pembuatan laporan strategis.

2. Buatlah report pertahun untuk KPI **"Jumlah omset yang didapat"** pada **Foon Yue Tseng** dan **Pamela Castillo**. Serta gambarkan grafiknya (grafik garis).



Nama	2003	2004	2005
Foon Yue Tseng	221887,03	237255,3	29070,38
Pamela Castillo	317104,78	409910,1	23187,02



3. Jelaskan perbedaan query saat mendapatkan data pada nomor 2 dengan query pada saat Jobsheet 2!

   Jobsheet 2 terletak pada tujuan dan struktur datanya. Kueri di Jobsheet 2 bekerja dalam OLTP, yang fokus pada transaksi harian dengan tabel sangat ternormalisasi untuk operasi cepat dan akurat.

   kueri pada nomor 2 menggunakan OLAP, yang dirancang untuk analisis data historis dengan tabel yang didenormalisasi, serta menggunakan agregasi seperti *SUM* dan *GROUP BY* untuk mendukung pengambilan keputusan bisnis.

OLTP mengutamakan efisiensi transaksi, sementara OLAP dioptimalkan untuk analisis skala besar.

4. Simpulkan dengan bahasa sendiri, apa perbedaan OLTP dan OLAP?

OLTP berfungsi untuk memproses transaksi harian secara cepat dan akurat, seperti pencatatan penjualan atau transaksi perbankan.

sedangkan, OLAP berfungsi untuk menganalisis data historis dengan agregasi dan pelaporan, membantu dalam pengambilan keputusan bisnis.

STUDI KASUS

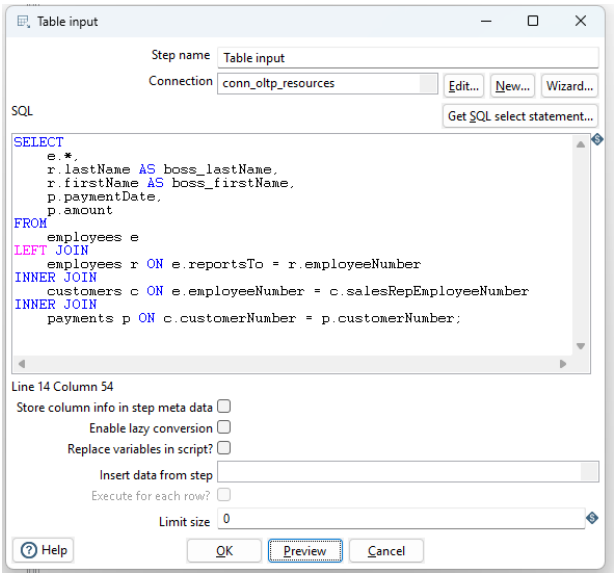
Pak Marto merupakan komisaris dari LegendVehicle. Pak Marto butuh laporan untuk analisa dari hasil penjualan dilihat dari sisi barang / product. Buatlah databse OLAP tersebut untuk membantu pak marto menganalisa penjualan barang.

Membuat Tabel dimproducts dan factsales

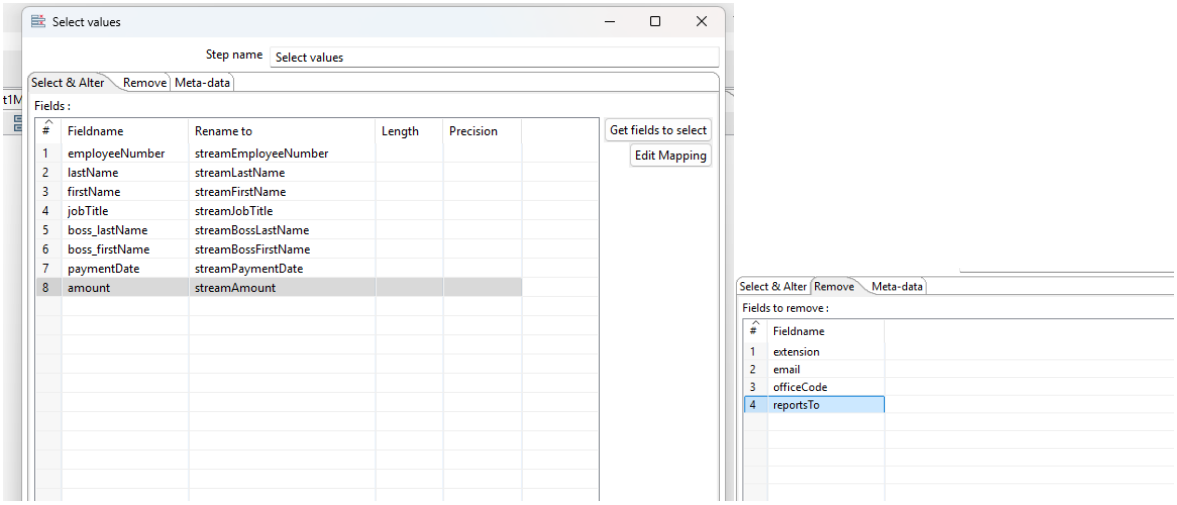
```sql
CREATE TABLE dimproduct (
    id_dimProduct INT PRIMARY KEY AUTO_INCREMENT,
    productCode VARCHAR(50),
    productName VARCHAR(100),
    productLine VARCHAR(50),
    buyPrice DECIMAL(10, 2),
    MSRP DECIMAL(10, 2)
);
CREATE TABLE factsales (
    id_factSales INT PRIMARY KEY AUTO_INCREMENT,
    id_dimEmployees INT,
    id_dimDate INT,
    amount DECIMAL(10, 2),
    FOREIGN KEY (id_dimEmployees) REFERENCES dimemployees(id_dimEmployees),
    FOREIGN KEY (id_dimDate) REFERENCES dimdate(id_dimDate)
);
```

Setup tools

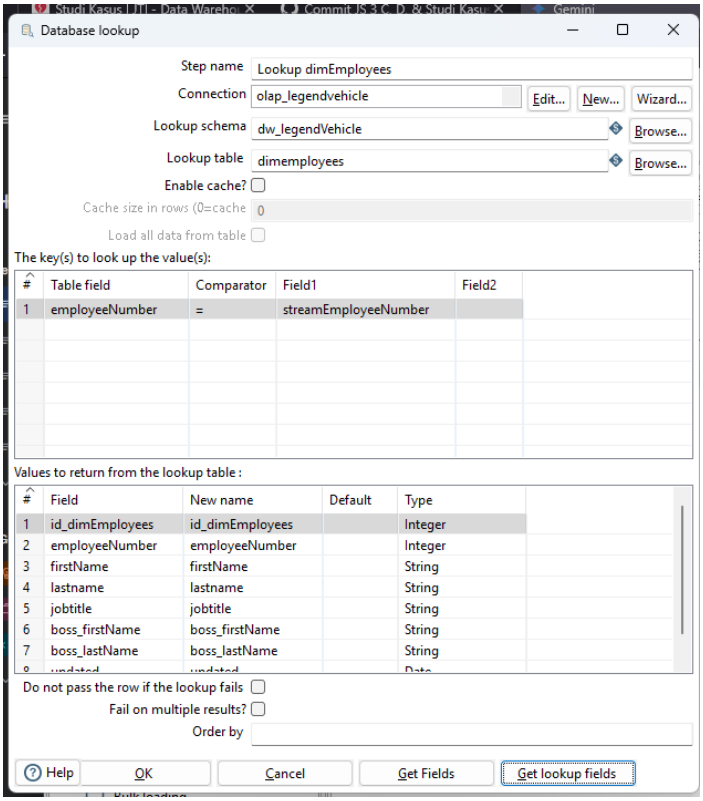
Konfigurasi Table Input

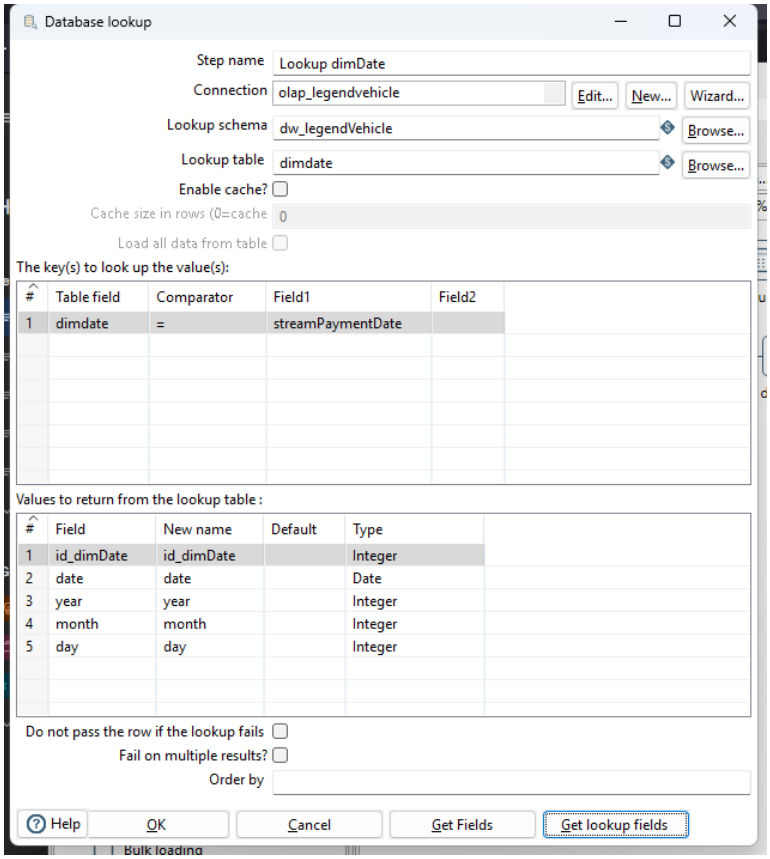


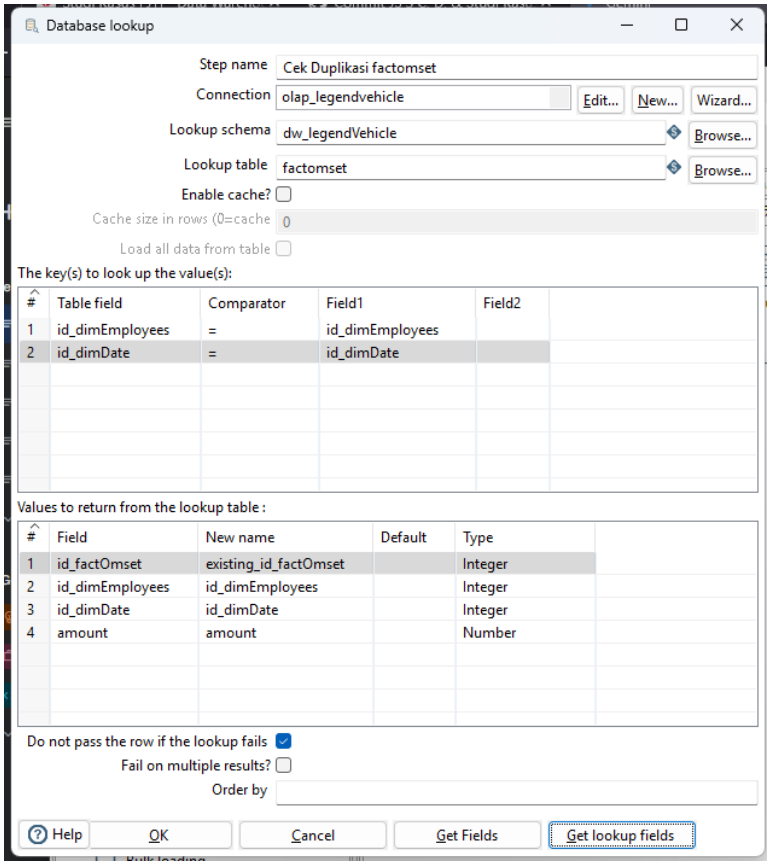
Konfigurasi selected values



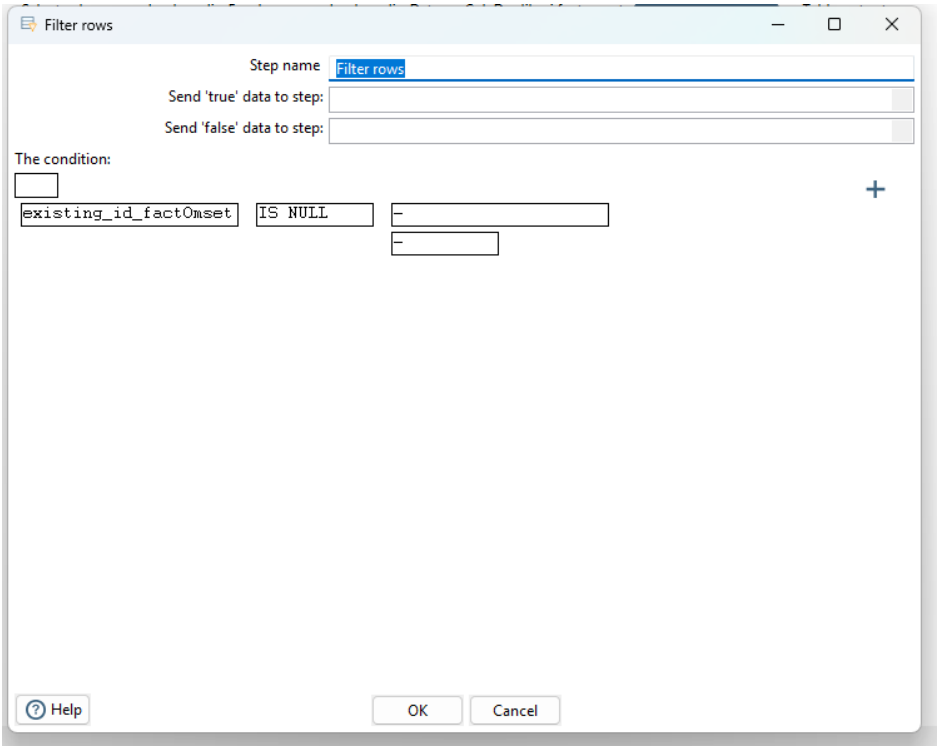
Konfigurasi database lookup



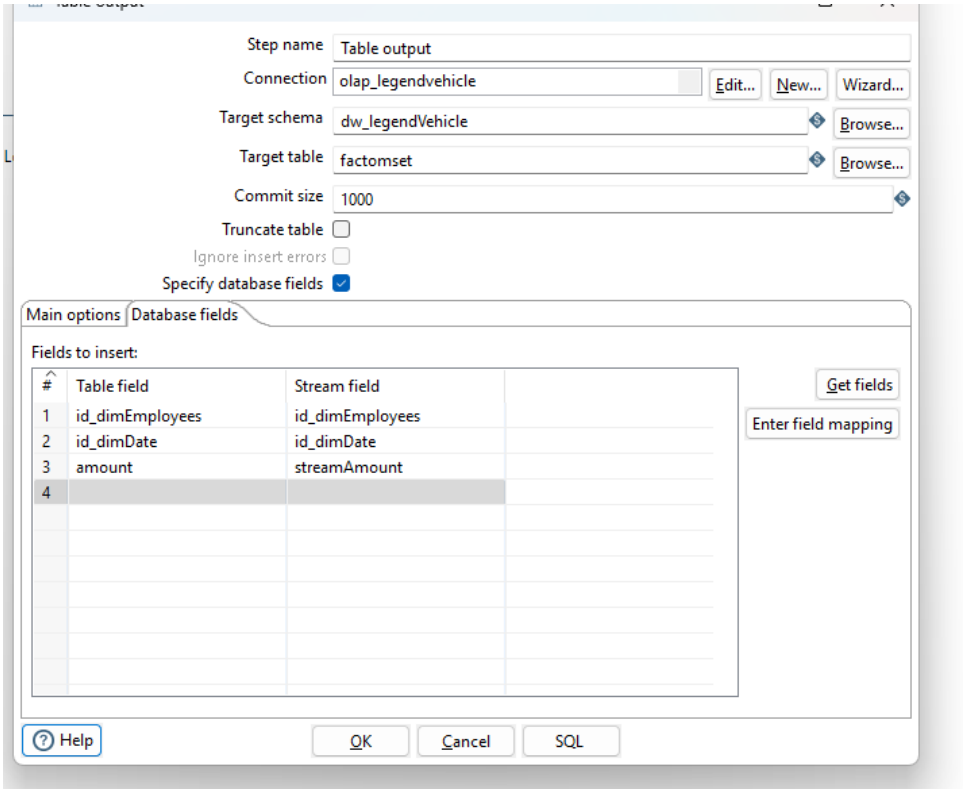

Database lookup
Step name
Lookup dimDate
Connection
olap_legendvehicle
Edit...
New...
Wizard...
Lookup schema
dw_legendVehicle
Browse...
Lookup table
dimdate
Browse...
Enable cache?
Cache size in rows (0=cache
0
Load all data from table
The key(s) to look up the value(s):
Table field Comparator Field1 Field2
1 dimdate = streamPaymentDate
Values to return from the lookup table :
Field New name Default Type
1 id_dimDate id_dimDate Integer
2 date date Date
3 year year Integer
4 month month Integer
5 day day Integer
Do not pass the row if the lookup fails
Fail on multiple results?
Order by
Help
OK
Cancel
Get Fields
Get lookup fields


Database lookup
Step name
Cek Duplikasi factomset
Connection
olap_legendvehicle
Edit...
New...
Wizard...
Lookup schema
dw_legendVehicle
Browse...
Lookup table
factomset
Browse...
Enable cache?
Cache size in rows (0=cache
0
Load all data from table
The key(s) to look up the value(s):
Table field Comparator Field1 Field2
1 id_dimEmployees = id_dimEmployees
2 id_dimDate = id_dimDate
Values to return from the lookup table :
Field New name Default Type
1 id_factOmset existing_id_factOmset Integer
2 id_dimEmployees id_dimEmployees Integer
3 id_dimDate id_dimDate Integer
4 amount amount Number
Do not pass the row if the lookup fails
Fail on multiple results?
Order by
Help
OK
Cancel
Get Fields
Get lookup fields

Konfigurasi Filter Row



Konfigurasi table output



Run

Execution Results

Logging | Execution History | Step Metrics | Performance Graph | Metrics | Preview data

```
2025/04/20 15:39:24 - Spoon - Transformation opened.
2025/04/20 15:39:24 - Spoon - Launching transformation [studyCase]...
2025/04/20 15:39:24 - Spoon - Started the transformation execution.
2025/04/20 15:39:24 - studyCase - Dispatching started for transformation [studyCase]
2025/04/20 15:39:24 - Table output.0 - Connected to database [olap_legendvehicle] (commit=1000)
2025/04/20 15:39:24 - Table input.0 - Finished reading query, closing connection
2025/04/20 15:39:24 - Table input.0 - Finished processing (I=273, O=0, R=0, W=273, U=0, E=0)
2025/04/20 15:39:24 - Select values.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)
2025/04/20 15:39:24 - Lookup dimEmployees.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)
2025/04/20 15:39:24 - Lookup dimDate.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)
2025/04/20 15:39:24 - Cek Duplikasi factomset.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)
2025/04/20 15:39:24 - Filter rows.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)
2025/04/20 15:39:25 - Table output.0 - Finished processing (I=0, O=273, R=273, W=273, U=0, E=0)
2025/04/20 15:39:25 - Spoon - The transformation has finished!!
```

Objects | factsales @dw_legendvehicle (mysql-loc... | factomset @dw_legendvehic

Table Profile | Begin Transaction | Cell Editor | Filter & Sort | Columr

id_factSales # int	id_dimEmployees # int	id_dimDate # int	amount # decimal(10,2)
1	7	795	101244,59
2	7	606	85410,87
3	7	101	11044,30
4	7	837	83598,04
5	7	727	47142,70
6	7	672	55639,66
7	7	227	111654,40
8	7	451	43369,30
9	7	329	45084,38
10	7	708	26248,78
11	7	345	23923,93
12	7	99	16537,85
13	7	684	2434,25
14	7	322	50743,65
15	7	764	12692,19
16	7	217	38675,13
17	7	307	85559,12
18	7	805	46781,66
19	7	538	59551,38
20	7	271	29997,09
21	7	425	12573,28
22	8	717	14191,12
23	8	157	32641,98

```sql
SELECT SUM(amount) AS total_penjualan
FROM factsales;
```

Message | Summary | Result 1

Data | Info

total_penjualan
17707678,46

```sql
SELECT
    e.firstName,
    e.lastName,
    SUM(f.amount) AS total_penjualan
FROM factsales f
JOIN dimemployees e ON f.id_dimEmployees = e.id_dimEmployees
GROUP BY e.firstName, e.lastName
ORDER BY total_penjualan DESC;
```

Message | Summary | Result 1

Data | Info

firstName	lastName	total_penjualan
Gerard	Hernandez	2224007,62
Leslie	Jennings	1979813,10
Pamela	Castillo	1500403,74
Larry	Bott	1373306,50
Barry	Jones	1275345,30
George	Vanauf	1168813,60
Loui	Bondur	1138971,50
Andy	Fixter	1018771,64
Peter	Marsh	995814,32
Foon Yue	Tseng	976425,34
Mami	Nishi	914220,14
Steve	Patterson	898438,26
Martin	Gerard	774954,94
Julie	Firrelli	773326,40
Leslie	Thompson	695066,06

```sql
SELECT
    d.year,
    d.month,
    SUM(f.amount) AS total_penjualan
FROM factsales f
JOIN dimdate d ON f.id_dimDate = d.id_dimDate
GROUP BY d.year, d.month
ORDER BY d.year, d.month;
```

Message | Summary | Result 1

Data | Info

year	month	total_penjualan
2003	1	52535,24
2003	2	288768,72
2003	3	399408,96
2003	4	272627,84
2003	5	319763,94
2003	6	360437,96
2003	7	316494,00
2003	8	492409,72
2003	9	322412,46
2003	10	633715,92
2003	11	1388585,36
2003	12	1653275,28
2004	1	468304,26
2004	2	213304,02
2004	3	809206,42
2004	4	346491,92
2004	5	417048,84
2004	6	371685,72
2004	7	568382,96
2004	8	756188,60

```sql
SELECT
    d.year AS Tahun,
    e.firstName,
    e.lastName,
    SUM(f.amount) AS Total_Omset
FROM factsales f
JOIN dimemployees e ON f.id_dimEmployees = e.id_dimEmployees
JOIN dimdate d ON f.id_dimDate = d.id_dimDate
WHERE e.firstName IN ('Foon Yue', 'Pamela')
  AND e.lastName IN ('Tseng', 'Castillo')
GROUP BY d.year, e.firstName, e.lastName
ORDER BY d.year, e.firstName, e.lastName;
```

Message | Summary | Result 1

Data | Info

Tahun	firstName	lastName	Total_Omset
2003	Foon Yue	Tseng	443774,06
2003	Pamela	Castillo	634209,56
2004	Foon Yue	Tseng	474510,52
2004	Pamela	Castillo	819820,14
2005	Foon Yue	Tseng	58140,76
2005	Pamela	Castillo	46374,04