

**LAPORAN JOBSHEET 3 DATA WAREHOUSE
DATABASE ANALYTICAL**



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2025**

A. Dimensi Waktu

1. Buatlah sebuah database yang digunakan sebagai OLAP dengan nama dw_LegendVehicle.
2. Buatlah table untuk menyimpan data master waktu atau yang disebut dengan tabel dimensi. Beri nama table tersebut dengan nama dimDate.

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> dimdate	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_0900_ai_ci	16.0 KiB	-
1 table	Sum	0	InnoDB	utf8mb4_0900_ai_ci	16.0 KiB	0 B

1. Buka PDI Spoon. Buat Transformation baru -> File - New - Transformation.
2. Drag and Drop beberapa objek yaitu:
 - Generate Rows: digunakan untuk membuat baris data baru.
 - Add Sequence: digunakan untuk membuat sequence, dalam hal ini membuat data di setiap harinya.
 - Calculator: digunakan untuk menjumlahkan hari dan mengambil data tahun, bulan dan hari.
 - Select Values: digunakan untuk memilih field yang digunakan.
 - Database Lookup: digunakan untuk melihat dan memastikan bahwa data yang akan dimasukkan kedalam tabel dimDate tidak kembar atau sama dengan data yang ada pada tabel dimDate itu sendiri.
 - Filter Rows: digunakan untuk mengambil data yang belum ada pada table dimDate setelah dicek sebelumnya.
 - Table Output: digunakan untuk menyimpan data pada tabel tujuan (dimDate).



3. Konfigurasi pada Generate Rows adalah merubah limit menjadi 1825 dimana memiliki arti bahwa data yang akan dibuat sebanyak 1825 data. 1825 merupakan jumlah hari dalam 5 tahun (365 hari x 5 tahun).
4. Membuat fields baru bernama CurrentDate dengan type data Date dan format dd-MM-yyyy serta value awal 01-01-2003.

Generate rows

Step name: Generate rows

Limit: 1825

Never stop generating rows: ☐

Interval in ms (delay): 5000

Current row time field name: now

Previous row time field name: FiveSecondsAgo

Fields :

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Value	Set
1	CurrentDate	Date	dd-MM-yyyy						01-01-2003	N

Help OK Preview Cancel

5. Hubungkan output dari Generate Rows menuju Add Sequence.
6. Konfigurasi pada Add Sequences adalah merubah Name of value menjadi incrementDay dengan start value bernilai 0 dan increment by bernilai 1

Add sequence

Step name: Add sequence

Name of value: incrementDay

Use a database to generate the sequence

Use DB to get sequence? ☐

Connection: Edit... New... Wizard...

Schema name: Schemas...

Sequence name: SEQ_ Sequences...

Use a transformation counter to generate the sequence

Use counter to calculate sequence? ☒

Counter name (optional):

Start at value: 0

Increment by: 1

Maximum value: 999999999

Help OK Cancel

7. Hubungkan output dari add sequences menuju calculator.
8. Konfigurasi pada calculator dengan membuat fields baru sebagai berikut:
 - streamDate merupakan kalkulasi dari CurrentDate + incrementDay
 - streamYear merupakan Year dari streamDate
 - streamMonth merupakan Month dari streamDate
 - streamDay merupakan Day of month dari streamDate

Calculator

Step name
Calculator

☒ Throw an error on non existing files

Fields:

#	New field	Calculation	Field A	Field B	Field C	Value type	Length	Precision	Remove
1	streamDate	Date A + B...	Current...	increm...		None			N
2	streamYear	Year of dat...	stream...			None			N
3	streamMonth	Month of ...	stream...			None			N
4	streamDay	Day of mo...	stream...			None			N

9. Hubungkan output dari calculator menuju Select values
10. Konfigurasi pada select values adalah dengan menekan tombol Get fields to select pada tab Select & Alter. Secara otomatis semua fields dari data input akan muncul.
11. Dikarenakan tidak semua fields digunakan, maka pada tab Remove diisikan fields CurrentDate dan incrementDay dikarenakan kedua fields tersebut tidak digunakan.

Select values

Step name Select values

Select & Alter Remove Meta-data

Fields :

#	Fieldname	Rename to	Length	Precision
1	CurrentDate			
2	incrementDay			
3	streamDate			
4	streamYear			
5	streamMonth			
6	streamDay			

Get fields to select

Edit Mapping

Include unspecified fields, ☐

Help OK Cancel

Select values

Step name Select values

Select & Alter Remove Meta-data

Fields to remove :

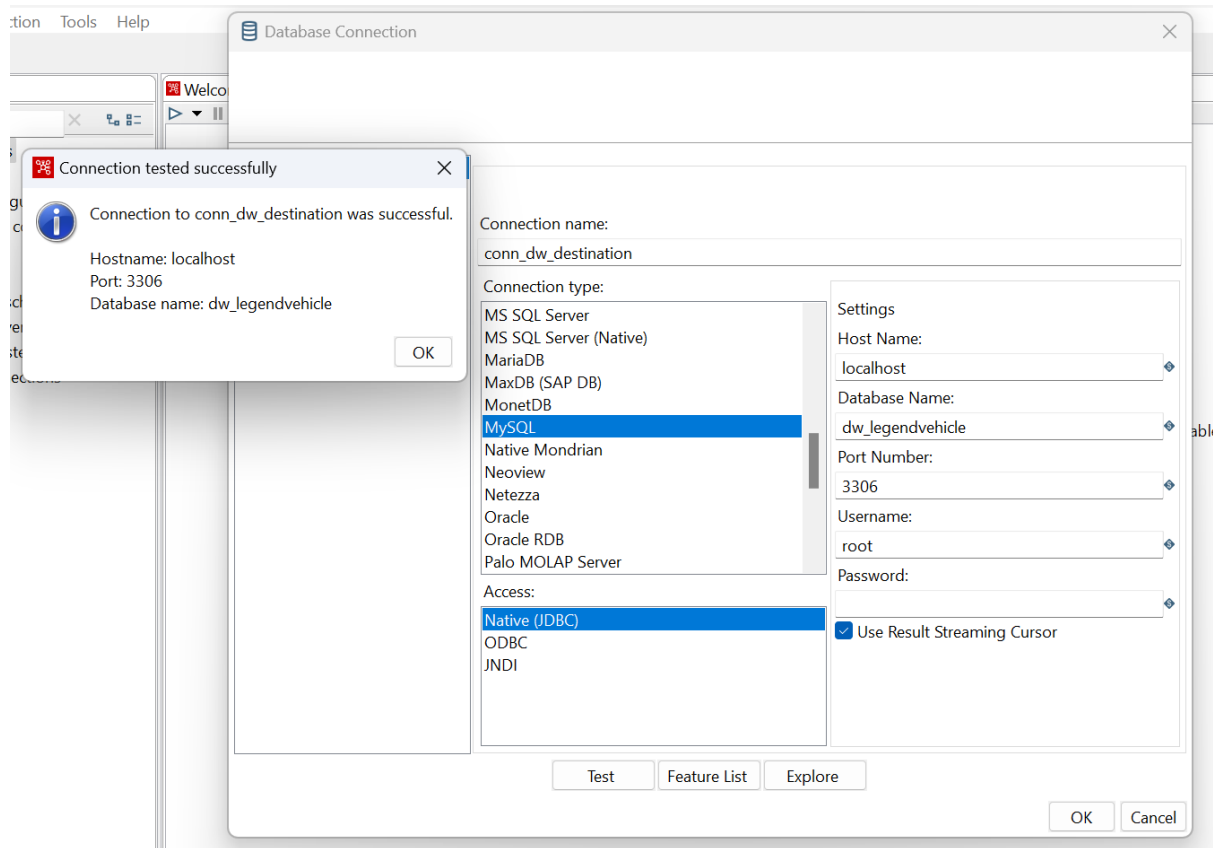
#	Fieldname
1	CurrentDate
2	incrementDay

Get fields to remove

Help OK Cancel

12. Hubungkan output select values menuju database lookup.

13. Sebelum melakukan konfigurasi pada database lookup, buatlah koneksi terlebih dahulu pada database melalui File - New - Database Connection. Gunakan Connection type MySQL dengan host name , database name, port number, username dan password sesuai konfigurasi MySQL pada device masing-masing. beri nama connection name tersebut dengan nama conn_dw_destination.



14. Konfigurasi pada database lookup adalah dengan memberikan connection dengan koneksi yang sudah dibuat pada step sebelumnya. dengan schema nama database yang digunakan dan tabel dimdate yang telah dibuat pada langkah pertama.
15. Field yang akan dicek untuk melihat kesamaan isi datanya agar tidak kembar adalah:
- field date pada table dimdate dengan field streamDate
 - field year pada table dimdate dengan field streamYear
 - field month pada table dimdate dengan field streamMonth
 - field day pada table dimdate dengan field streamDay
16. Field yang akan di retrieve adalah field yang ada pada table dimDate yaitu date, year, month, dan day.

Database lookup

Step name: Database lookup

Connection: conn_dw_destination [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	date	=	strea...	
2	year	=	strea...	
3	month	=	strea...	
4	day	=	strea...	

Values to return from the lookup table :

#	Field	New name	Default	Type
1	date			None
2	year			None
3	month			None
4	day			None

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by:

[Help] [OK] [Cancel] [Get Fields] [Get lookup fields]

17. Hubungkan output dari database lookup dengan filter rows

18. Konfigurasi pada filter rows adalah dengan melakukan konfigurasi output true data pada table output. Pada bagian ini data yang tidak memiliki kesamaan pada tahapan sebelumnya akan dicek dimana jika fields Stream tidak memiliki kesamaan dengan field dimDate, maka field dimDate tersebut akan bernilai null. Pada pernyataan kondisi tuliskan (date is null and year is null and month is null and day is null)

Filter rows

Step name: Filter rows

Send 'true' data to step: Table output

Send 'false' data to step:

The condition:

[]

date IS NULL

AND

year IS NULL

AND

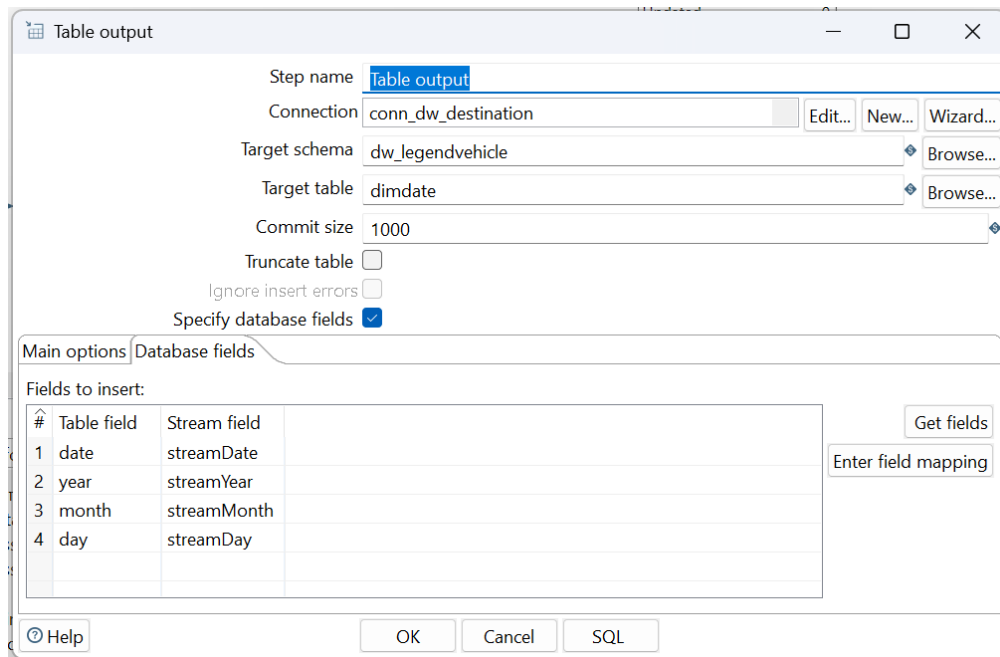
month IS NULL

AND

day IS NULL

[Help] [OK] [Cancel]

19. Hubungkan output dari filter rows menuju table output.
20. Konfigurasi pada table output adalah memberikan koneksi pada conn_dw_destination dengan schema dw_legendvehicle dan table dimdate.
21. Aktifkan specify database fields.
22. Pada tab Database fields, mapping data input streamDate, streamYear, streamMonth dan streamDay dengan fields yang ada pada dimDate. Pada tahapan ini akan dilakukan insert data menuju tabel dimDate.

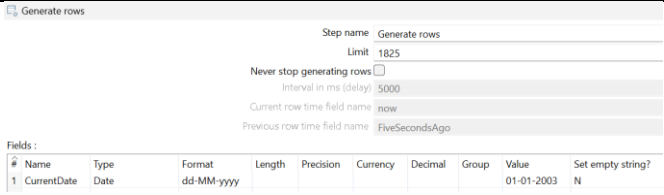
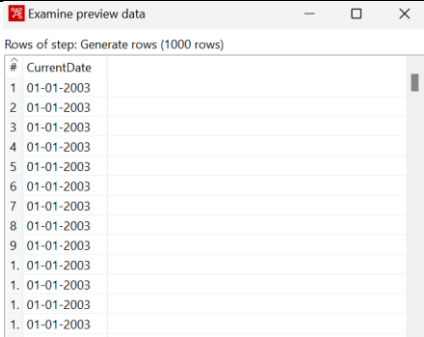
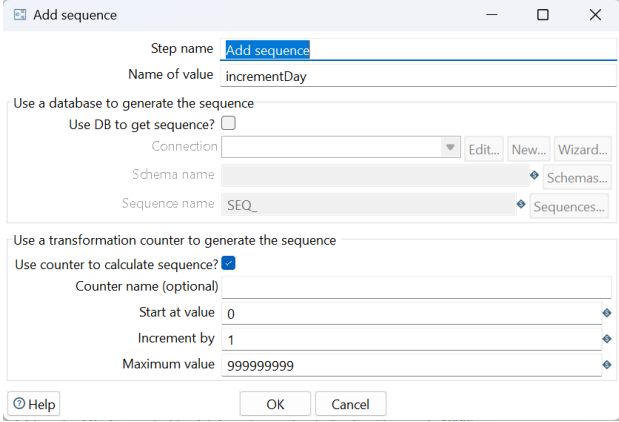
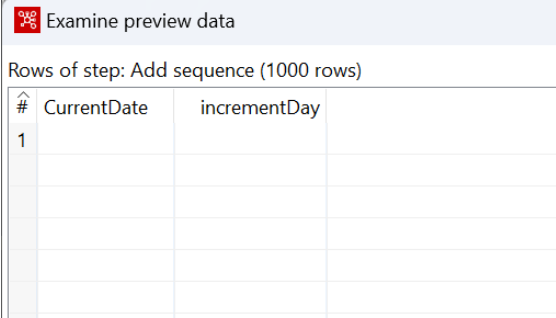


23. cek isi table dimdate pada database. Jika sukses maka pada table dimdate akan terisi 1825 data.

		id_dimDate	date	year	month	day
<input type="checkbox"/>	Edit Copy Delete	1	2003-01-01	2003	1	1
<input type="checkbox"/>	Edit Copy Delete	2	2003-01-02	2003	1	2
<input type="checkbox"/>	Edit Copy Delete	3	2003-01-03	2003	1	3
<input type="checkbox"/>	Edit Copy Delete	4	2003-01-04	2003	1	4
<input type="checkbox"/>	Edit Copy Delete	5	2003-01-05	2003	1	5
<input type="checkbox"/>	Edit Copy Delete	6	2003-01-06	2003	1	6
<input type="checkbox"/>	Edit Copy Delete	7	2003-01-07	2003	1	7
<input type="checkbox"/>	Edit Copy Delete	8	2003-01-08	2003	1	8
<input type="checkbox"/>	Edit Copy Delete	9	2003-01-09	2003	1	9
<input type="checkbox"/>	Edit Copy Delete	10	2003-01-10	2003	1	10
<input type="checkbox"/>	Edit Copy Delete	11	2003-01-11	2003	1	11
<input type="checkbox"/>	Edit Copy Delete	12	2003-01-12	2003	1	12
<input type="checkbox"/>	Edit Copy Delete	13	2003-01-13	2003	1	13
<input type="checkbox"/>	Edit Copy Delete	14	2003-01-14	2003	1	14
<input type="checkbox"/>	Edit Copy Delete	15	2003-01-15	2003	1	15

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			Data input menetapkan 01-01-2003 tanpa perubahan, dan data output menghasilkan 1000 baris dengan nilai yang sama
Add Sequences			Add Sequence menambahkan kolom incrementDay yang dimulai dari 0 dan bertambah 1 setiap baris, namu nilai CurrentDay masih 01-01-2003.

Calculator

Step name

calculator

Throw an error on non existing files

Fields:

#	New field	Calculation	Field A	Field B	Field C	Value type	Length	Precision	Remove
1	streamDate	Date A + B Days	CurrentDate	incrementDay		None			N
2	streamYear	Year of date A	streamDate			None			N
3	streamMonth	Month of date A	streamDate			None			N
4	streamDay	Day of month of date A	streamDate			None			N

Examine preview data

Rows of step: Calculator (1000 rows)

#	CurrentDate	incrementDay	streamDate	streamYear	streamMonth	streamDay
1	01-01-2003	0	2003/01/01 00:00:00.000	2003	1	1
2	01-01-2003	1	2003/01/02 00:00:00.000	2003	1	2
3	01-01-2003	2	2003/01/03 00:00:00.000	2003	1	3
4	01-01-2003	3	2003/01/04 00:00:00.000	2003	1	4
5	01-01-2003	4	2003/01/05 00:00:00.000	2003	1	5
6	01-01-2003	5	2003/01/06 00:00:00.000	2003	1	6
7	01-01-2003	6	2003/01/07 00:00:00.000	2003	1	7
8	01-01-2003	7	2003/01/08 00:00:00.000	2003	1	8
9	01-01-2003	8	2003/01/09 00:00:00.000	2003	1	9
10	01-01-2003	9	2003/01/10 00:00:00.000	2003	1	10

Select values

Select & Alter

Remove

Meta-data

Fields :

#	Fieldname	Rename to	Length	Precision
1	CurrentDate			
2	incrementDay			
3	streamDate			
4	streamYear			
5	streamMonth			
6	streamDay			

Step name

Select values

Select & Alter

Remove

Meta-data

Fields to remove :

#	Fieldname
1	CurrentDate
2	incrementDay

Examine preview data

Rows of step: Select values (1000 rows)

#	streamDate	streamYear	streamMonth	streamDay
1	2003/01/01 00:00:00.000	2003	1	1
2	2003/01/02 00:00:00.000	2003	1	2
3	2003/01/03 00:00:00.000	2003	1	3
4	2003/01/04 00:00:00.000	2003	1	4
5	2003/01/05 00:00:00.000	2003	1	5
6	2003/01/06 00:00:00.000	2003	1	6
7	2003/01/07 00:00:00.000	2003	1	7
8	2003/01/08 00:00:00.000	2003	1	8
9	2003/01/09 00:00:00.000	2003	1	9
10	2003/01/10 00:00:00.000	2003	1	10

Proses Calculator membuat kolom streamDate dengan menambahkan nilai incrementDay ke CurrentDate, sehingga menghasilkan tanggal yang bertambah setiap baris. Dan juga mengekstrak streamDate menjadi streamYear, streamMonth, streamDay.

Kolom CurrentDate dan incrementDay dihapus, yang menyisakan streamDate, steamYear, streamMonth, dan streamDay.

Database lookup

Database lookup

Step nameDatabase lookup

Connectionconn_dw_destination

Lookup schemadw_legendvehicle

Lookup tabledimdate

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	date	=	streamDate	
2	year	=	streamYear	
3	month	=	streamMonth	
4	day	=	streamDay	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	date			None
2	year			None
3	month			None
4	day			None

Do not pass the row if the lookup fails

Fail on multiple results?

Order by

HelpOKCancelGet FieldsGet lookup fields

Examine preview data

Rows of step: Database lookup (1000 rows)

#	streamDate	streamYear	streamMonth	streamDay	date	year	month	day
1	2003/01/01 00:00:00.000	2003	1	1	2003/01/01 00:00:00.000	2003	1	1
2	2003/01/02 00:00:00.000	2003	1	2	2003/01/02 00:00:00.000	2003	1	2
3	2003/01/03 00:00:00.000	2003	1	3	2003/01/03 00:00:00.000	2003	1	3
4	2003/01/04 00:00:00.000	2003	1	4	2003/01/04 00:00:00.000	2003	1	4
5	2003/01/05 00:00:00.000	2003	1	5	2003/01/05 00:00:00.000	2003	1	5
6	2003/01/06 00:00:00.000	2003	1	6	2003/01/06 00:00:00.000	2003	1	6
7	2003/01/07 00:00:00.000	2003	1	7	2003/01/07 00:00:00.000	2003	1	7
8	2003/01/08 00:00:00.000	2003	1	8	2003/01/08 00:00:00.000	2003	1	8
9	2003/01/09 00:00:00.000	2003	1	9	2003/01/09 00:00:00.000	2003	1	9
10	2003/01/10 00:00:00.000	2003	1	10	2003/01/10 00:00:00.000	2003	1	10

Mencocokkan data dari tabel referensi dimdate berdasarkan kolom year, month, dan day dengan nilai streamYear, streamMonth, dan streamDay.

Filter rows

Filter rows

Step nameFilter rows

Send 'true' data to step:Table output

Send 'false' data to step:

The condition:

date IS NULL

AND

year IS NULL

AND

month IS NULL

AND

day IS NULL

Step fields and their origin

Step name: Filter rows

Fields:

#	Fieldname	Type	Length	Precision	Step origin	Storage	Mask	Currency	Decimal	Group	Trim	Comments
1	streamDate	Date	-	-	Calculator	normal					none	ADD_DAYS
2	streamYear	Integer	-	0	Calculator	normal					none	YEAR_OF_DATE
3	streamMonth	Integer	-	0	Calculator	normal					none	MONTH_OF_DATE
4	streamDay	Integer	-	0	Calculator	normal					none	DAY_OF_MONTH
5	date	Date	-	-	Database lookup	normal					none	date
6	year	Integer	9	0	Database lookup	normal	####-####0				none	year
7	month	Integer	9	0	Database lookup	normal	####0-####0				none	month
8	day	Integer	9	0	Database lookup	normal	####0-####0				none	day

Edit origin stepCancel

Menyaring data berdasarkan kondisi date IS NULL, year IS NULL, month IS NULL, dan day IS NULL. Jika semua nilai NULL, data akan dikirim ke langkah Table Output.

Table
Output

Table output

Step name

table output

Connection

conn_dw_destination

Edit...

New...

Wizard...

Target schema

dw_legendvehicle

Browse...

Target table

dimdate

Browse...

Commit size

1000

Truncate table

☐

Ignore insert errors

☐

Specify database fields

☒

Main options

Database fields

Fields to insert:

#	Table field	Stream field
1	date	streamDate
2	year	streamYear
3	month	streamMonth
4	day	streamDay

Get fields

Enter field mapping

Step fields and their origin

Step name: table output

Fields:

#	Fieldname	Type	Length	Precision	Step origin	Storage	Mask	Currency	Decimal	Group	Trim	Comments
1	streamDate	Date	-	-	Calculator	normal					none	ADD_DAYS
2	streamYear	Integer	-	0	Calculator	normal					none	YEAR_OF_DATE
3	streamMonth	Integer	-	0	Calculator	normal					none	MONTH_OF_DATE
4	streamDay	Integer	-	0	Calculator	normal					none	DAY_OF_MONTH
5	date	Date	-	-	Database lookup	normal					none	date
6	year	Integer	9	0	Database lookup	normal	####-####				none	year
7	month	Integer	9	0	Database lookup	normal	####-####				none	month
8	day	Integer	9	0	Database lookup	normal	####-####				none	day

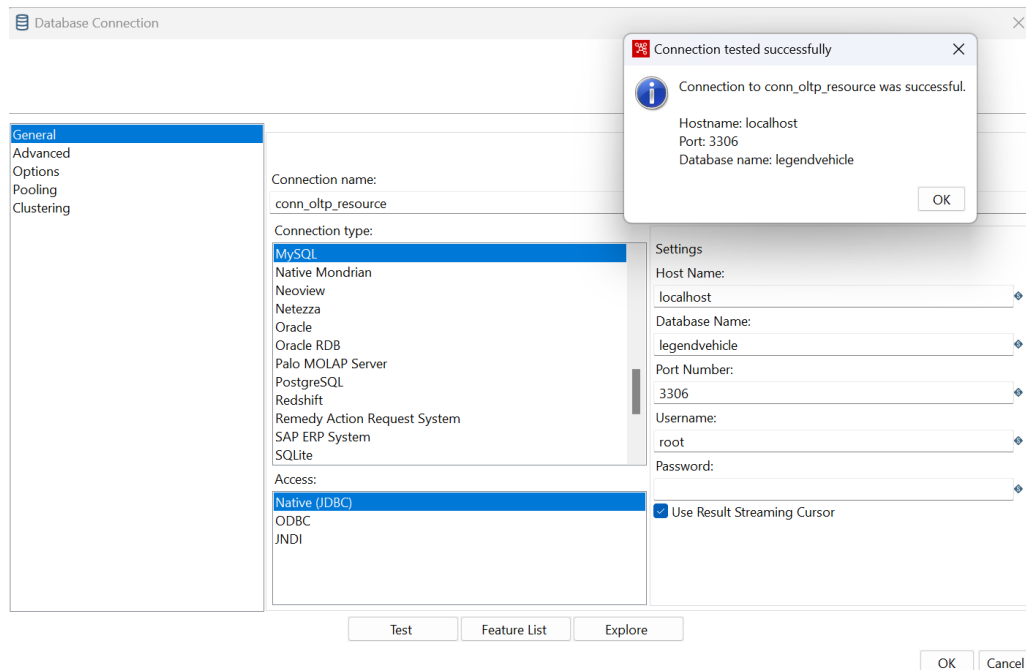
Edit origin step

Cancel

Table Output menyimpan data hasil transformasi ke dalam tabel dimdate pada skema dw_legendvehicle.

B. Dimensi Pegawai

1. Buatlah tabel dimPegawai pada dw_legendVehicle.
2. Pada PDI Spoon buatlah koneksi baru dengan nama conn_oltp_resources yang menghubungkan dengan database oltp. sesuaikan hostname, database name, port number, username dan password dengan keadaan pada device masing-masing.



3. Drag and drop beberapa objek sebagai berikut:
 - Table input: digunakan mengambil data dari database OLTP.
 - Select values: memilih field yang digunakan untuk proses Transform dan Load.
 - Database lookup: digunakan untuk melihat data pada tabel dimEmployees untuk memastikan data tidak kembar
 - Filter rows: digunakan untuk memilih data stream yang masih belum ada pada tabel dimEmployees.
 - Table output: Memasukkan data ke dalam table dimEmployees



Table input



Select values



Database lookup



Filter rows



Table output

4. Konfigurasi pada table input dengan menghubungkan Connection pada koneksi conn_oltp_resources. Untuk mengambil data sumber menggunakan query dibawah ini.

Table input

Step name Table input

Connection conn_oltp_resource Edit... New... Wizard...

SQL

Get SQL select statement...

```
SELECT *
FROM employees e
LEFT JOIN employees r
ON e.reportsTo = r.employeeNumber;
```

Line 1 Column 0

Store column info in step meta data ☐

Enable lazy conversion ☐

5. Hubungkan output table input pada select values.
6. Konfigurasi pada Select values yaitu mengambil data dari field employeenumber, lastname, firstname, jobtitle, lastname_1 dan firstname_1 sebagai data stream yang digunakan pada proses ETL pada tab select & alter.
7. Hilangkan field lain yang tidak digunakan pada tab remove.

Select values

Step name Select values

Select & Alter Remove Meta-data

Fields :

#	Fieldname	Rename to	Length	Precision
1	employeeNumber	StreamEmployeeenumber		
2	lastName	StreamLastname		
3	firstName	StreamFirstname		
4	extension			
5	email			
6	officeCode			
7	reportsTo			
8	jobTitle	StreamJobtitle		
9	employeeNumber_1			
1.	lastName_1	StreamLastnameBoss		
1.	firstName_1	StreamFirstnmaeBoss		
1.	extension_1			
1.	email_1			
1.	officeCode_1			
1.	reportsTo_1			
1.	jobTitle_1			

Get fields to select

Edit Mapping

Include unspecified fields, ordered by ☐

Help OK Cancel

Select values

Step name Select values

Select & Alter Remove Meta-data

Fields to remove :

#	Fieldname
1	extension
2	email
3	officeCode
4	reportsTo
5	employeeNumber_1
6	extension_1
7	email_1
8	officeCode_1
9	reportsTo_1
1.	jobTitle_1

Get fields to remove

Help OK Cancel

8. Hubungkan output select values pada database lookup
9. Konfigurasi pada database lookup adalah dengan menghubungkan koneksi pada conn_dw_destination dengan table lookup dimEmployees yang telah dibuat pada tahap pertama.

10. Field yang di lookup adalah field pada tabel dimEmployees dengan field stream input dari OLTP. sedangkan field yang di retrieve adalah field dari dimEmployees itu sendiri. Jika tidak ada data yang sama maka akan muncul null.

Step name: Database lookup

Connection: conn_dw_destination

Lookup schema: dw_legendvehicle

Lookup table: dimemployees

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	employeeNumber	=	StreamEmployeeNumber	
2	firstName	=	StreamFirstname	
3	lastName	=	StreamLastname	
4	jobTitle	=	StreamJobtitle	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	employeeNumber			Integer
2	firstName			String
3	lastName	lastname		String
4	jobTitle	jobtitle		String

Do not pass the row if the lookup fails: ☐

Fail on multiple results?: ☐

Order by:

11. Hubungl

12. Pada fil

oyees untuk

dimasukkan pada proses selanjutnya. Hal itu menandakan bahwa data stream belum memiliki kesamaan pada data di dimemployees.

Step name: Filter rows

Send 'true' data to step: Table output

Send 'false' data to step:

The condition:

```

employeeNumber IS NOT NULL
AND
firstName IS NOT NULL
AND
lastName IS NOT NULL
AND
jobtitle IS NOT NULL
AND
boss_firstname IS NOT NULL
AND
boss_lastname IS NOT NULL

```

13. Hubungkan output dari filter rows dengan table output.
14. Pada table output, gunakan connection conn_dw_destination untuk memasukkan data pada tabel dimemployees.
15. Aktifkan specify database fields, dan mapping data stream input dari oltp terhadap field yang ada pada dimemployees.

Table output

Step name: **Table output**

Connection: **conn_dw_destination** [Edit...] [New...] [Wizard...]

Target schema: **dw_legendvehicle** [Browse...]

Target table: **dimemployees** [Browse...]

Commit size: **1000**

Truncate table: ☐

Ignore insert errors: ☐

Specify database fields: ☒

Main options | Database fields

Fields to insert:

#	Table field	Stream field
1	employee...	StreamEmpl...
2	firstName	StreamFirstn...
3	lastName	StreamLastn...
4	jobTitle	StreamJobti...
5	boss_first...	StreamFirstn...
6	boss_last...	StreamLastn...

[Get fields] [Enter field mapping]

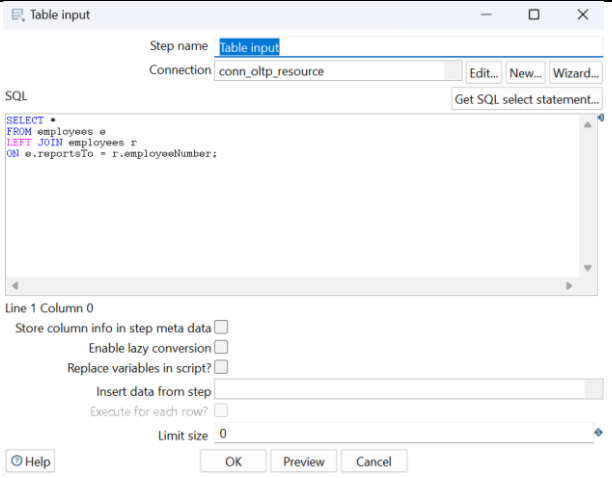
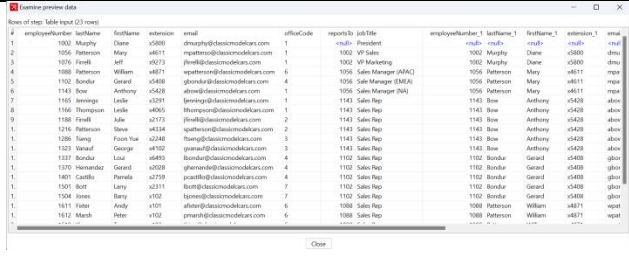
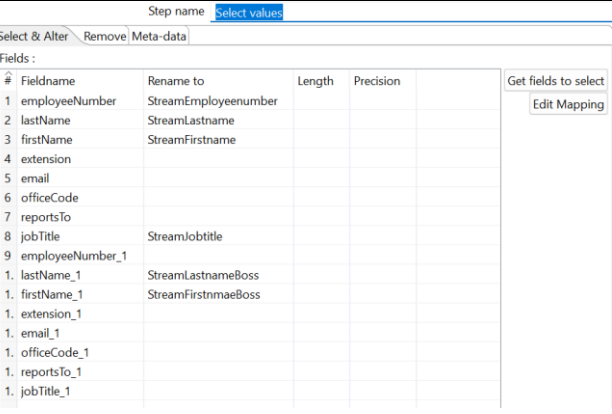
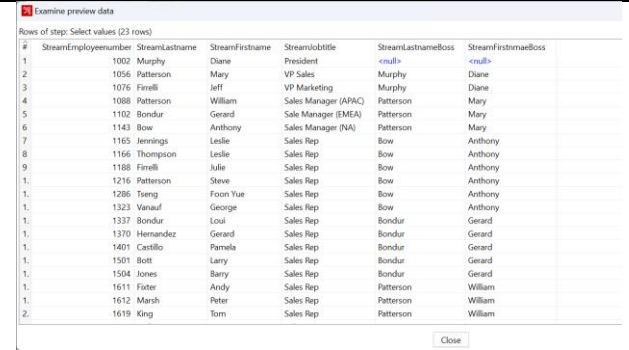
[Help] [OK] [Cancel] [SQL]

16. jika proses keseluruhan berhasil maka tabel dimemployees akan terisi data pegawai dari database OLTP.

	id_dimEmployees	employeeNumber	firstName	lastName	jobTitle	boss_firstname	boss_lastname	updated	reportsTo
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		1	1002	Diane	Murphy	President	NULL	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		2	1056	Mary	Patterson	VP Sales	Diane	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		3	1076	Jeff	Firrelli	VP Marketing	Diane	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		4	1088	William	Patterson	Sales Manager (APAC)	Mary	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		5	1102	Gerard	Bondur	Sale Manager (EMEA)	Mary	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		6	1143	Anthony	Bow	Sales Manager (NA)	Mary	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		7	1165	Leslie	Jennings	Sales Rep	Anthony	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		8	1166	Leslie	Thompson	Sales Rep	Anthony	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		9	1188	Julie	Firrelli	Sales Rep	Anthony	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		10	1216	Steve	Patterson	Sales Rep	Anthony	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		11	1286	Foon Yue	Tseng	Sales Rep	Anthony	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		12	1323	George	Vanauf	Sales Rep	Anthony	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		13	1337	Loui	Bondur	Sales Rep	Gerard	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		14	1370	Gerard	Hernandez	Sales Rep	Gerard	2025-03-11 10:01:17	NULL
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete		15	1401	Pamela	Castillo	Sales Rep	Gerard	2025-03-11 10:01:17	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			Data input mengambil data dari tabel employees dalam koneksi conn_oltp_resource. Melakukan LEFT JOIN pada tabel yang sama untuk menghubungkan table input mengambil data dari tabel employees.
Select Values			Input memiliki lebih banyak kolom dan beberapa duplikat dengan akhiran _1. Pada proses ini beberapa kolom diubah namanya dan kolom yang tidak diperlukan dihapus.

Select & Alter Remove Meta-data

Fields to remove :

#	Fieldname
1	extension
2	email
3	officeCode
4	reportsTo
5	employeeNumber_1
6	extension_1
7	email_1
8	officeCode_1
9	reportsTo_1
1.	jobTitle 1

insert preview data

Rows of step: Database lookup (23 rows)

#	StreamEmployeeNumber	StreamLastname	StreamFirstname	StreamJobTitle	StreamLastnameBoss	StreamFirstnameBoss	employeeNumber	firstName	lastName	jobTitle	boss_Ext
1	1001	Murphy	Diane	President	crudi	crudi	crudi	crudi	crudi	crudi	crudi
2	1050	Patterson	Mary	VP Sales	Murphy	Diane	1050	Mary	Patterson	VP Sales	Diane
3	1076	Fordell	Jeff	VP Marketing	Murphy	Diane	1076	Jeff	Fordell	VP Marketing	Diane
4	1088	Patterson	William	Sales Manager (SM/A)	Patterson	Mary	1088	William	Patterson	Sales Manager (SM/A)	Mary
5	1102	Bondur	Gerard	Sales Manager (SM/A)	Patterson	Mary	1102	Gerard	Bondur	Sales Manager (SM/A)	Mary
6	1143	Bow	Anthony	Sales Manager (NA)	Patterson	Mary	1143	Anthony	Bow	Sales Manager (NA)	Mary
7	1165	Leavins	Louie	Sales Rep	Bow	Anthony	1165	Louie	Leavins	Sales Rep	Anthony
8	1166	Thompson	Louie	Sales Rep	Bow	Anthony	1166	Louie	Thompson	Sales Rep	Anthony
9	1188	Fordell	Julie	Sales Rep	Bow	Anthony	1188	Julie	Fordell	Sales Rep	Anthony
1	1216	Patterson	Steve	Sales Rep	Bow	Anthony	1216	Steve	Patterson	Sales Rep	Anthony
1	1286	Tsang	Foon Yue	Sales Rep	Bow	Anthony	1286	Foon Yue	Tsang	Sales Rep	Anthony
1	1323	Vandaf	George	Sales Rep	Bow	Anthony	1323	George	Vandaf	Sales Rep	Anthony
1	1337	Bondur	Louie	Sales Rep	Bondur	Gerard	1337	Louie	Bondur	Sales Rep	Gerard
1	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	1370	Gerard	Hernandez	Sales Rep	Gerard
1	1401	Castillo	Penelope	Sales Rep	Bondur	Gerard	1401	Penelope	Castillo	Sales Rep	Gerard
1	1501	Burt	Larry	Sales Rep	Bondur	Gerard	1501	Larry	Burt	Sales Rep	Gerard
1	1504	Jones	Barry	Sales Rep	Bondur	Gerard	1504	Barry	Jones	Sales Rep	Gerard
1	1611	Fisher	Andy	Sales Rep	Patterson	William	1611	Andy	Fisher	Sales Rep	William
1	1612	Marsh	Peter	Sales Rep	Patterson	William	1612	Peter	Marsh	Sales Rep	William

Close

Mencocokkan data input berdasarkan employeeNumber, firstname, dan lastname, dan menambahkan kolom dari tabel referensi.

Database
Lookup

Database lookup

Step name Database lookup

Connection conn_dw_destination Edit... New... Wizard...

Lookup schema dw_legendvehicle Browse...

Lookup table dimemployees 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	employeeNumber	=	StreamEmployeeNumber	
2	firstName	=	StreamFirstname	
3	lastName	=	StreamLastname	
4	jobTitle	=	StreamJobTitle	

Values to return from the lookup table :

#	Field	New name	Default	Type
1	employeeNumber			Integer
2	firstName			String
3	lastName	lastname		String
4	jobTitle	jobtitle		String

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by

Filter rows

Filter rows

Step name: **Filter rows**

Send 'true' data to step: **Table output**

Send 'false' data to step:

The condition:

☐ +

employeeNumber IS NOT NULL

AND

firstName IS NOT NULL

AND

lastName IS NOT NULL

AND

jobtitle IS NOT NULL

AND

boss_firstname IS NOT NULL

AND

boss_lastname IS NOT NULL

Stream preview data

Rows of step: Filter rows (22 rows)

#	StreamEmployeeNumber	StreamLastname	StreamFirstname	StreamJobTitle	StreamLastnameBoss	StreamFirstnameBoss	employeeNumber	JobTitle	boss_firstname	boss_lastname
1	1056	Patterson	Mary	VP Sales	Murphy	Diane	1056	Mary	Patterson	Diane
2	1076	Fordell	Jeff	VP Marketing	Murphy	Diane	1076	Jeff	Fordell	VP Marketing
3	1088	Patterson	William	Sales Manager (JARC)	Patterson	Mary	1088	William	Patterson	Sales Manager (JARC)
4	1102	Bondur	General	Sales Manager (EMEA)	Patterson	Mary	1102	General	Bondur	Sales Manager (EMEA)
5	1143	Bow	Anthony	Sales Rep (NA)	Patterson	Mary	1143	Anthony	Bow	Sales Rep (NA)
6	1165	Savings	Luelle	Sales Rep	Bow	Anthony	1165	Luelle	Savings	Sales Rep
7	1166	Thompson	Luelle	Sales Rep	Bow	Anthony	1166	Luelle	Thompson	Sales Rep
8	1188	Fordell	Julie	Sales Rep	Bow	Anthony	1188	Julie	Fordell	Sales Rep
9	1216	Patterson	Steve	Sales Rep	Bow	Anthony	1216	Steve	Patterson	Sales Rep
10	1286	Tsang	Foon Yue	Sales Rep	Bow	Anthony	1286	Foon Yue	Tsang	Sales Rep
11	1323	Vanauf	George	Sales Rep	Bow	Anthony	1323	George	Vanauf	Sales Rep
12	1337	Bondur	Lois	Sales Rep	Bondur	General	1337	Lois	Bondur	Sales Rep
13	1370	Hernandez	General	Sales Rep	Bondur	General	1370	General	Hernandez	Sales Rep
14	1401	Castillo	Perrella	Sales Rep	Bondur	General	1401	Perrella	Castillo	Sales Rep
15	1501	Butt	Larry	Sales Rep	Bondur	General	1501	Larry	Butt	Sales Rep
16	1504	Jones	Barry	Sales Rep	Bondur	General	1504	Barry	Jones	Sales Rep
17	1611	Fisher	Andy	Sales Rep	Patterson	William	1611	Andy	Fisher	Sales Rep
18	1612	Marsh	Peter	Sales Rep	Patterson	William	1612	Peter	Marsh	Sales Rep
19	1619	King	Tom	Sales Rep	Patterson	William	1619	Tom	King	Sales Rep

Menyaring data berdasarkan kondisi IS NULL untuk beberapa kolom. Data yang memenuhi kondisi akan difilter dan tidak muncul dalam output.

Table Output

Table output

Step name: **table output**

Connection: **conn_dw_destination**

Target schema: **dw_legendvehicle**

Target table: **dimemployees**

Commit size: **1000**

Truncate table: ☐

Ignore insert errors: ☐

Specify database fields: ☒

Main options: Database fields

Fields to insert:

#	Table field	Stream field
1	employee...	StreamEmpl...
2	firstName	StreamFirstn...
3	lastName	StreamLastn...
4	jobTitle	StreamJobti...
5	boss_first...	StreamFirstn...
6	boss_last...	StreamLastn...

Get fields

Enter field mapping

Stream preview data

Rows of step: Table output (22 rows)

#	StreamEmployeeNumber	StreamLastname	StreamFirstname	StreamJobTitle	StreamLastnameBoss	employeeNumber	JobTitle	boss_firstname	boss_lastname
1	1056	Patterson	Mary	VP Sales	Murphy	Diane	1056	Mary	Patterson
2	1076	Fordell	Jeff	VP Marketing	Murphy	Diane	1076	Jeff	Fordell
3	1088	Patterson	William	Sales Manager (JARC)	Patterson	Mary	1088	William	Patterson
4	1102	Bondur	General	Sales Manager (EMEA)	Patterson	Mary	1102	General	Bondur
5	1143	Bow	Anthony	Sales Rep (NA)	Patterson	Mary	1143	Anthony	Bow
6	1165	Savings	Luelle	Sales Rep	Bow	Anthony	1165	Luelle	Savings
7	1166	Thompson	Luelle	Sales Rep	Bow	Anthony	1166	Luelle	Thompson
8	1188	Fordell	Julie	Sales Rep	Bow	Anthony	1188	Julie	Fordell
9	1216	Patterson	Steve	Sales Rep	Bow	Anthony	1216	Steve	Patterson
10	1286	Tsang	Foon Yue	Sales Rep	Bow	Anthony	1286	Foon Yue	Tsang
11	1323	Vanauf	George	Sales Rep	Bow	Anthony	1323	George	Vanauf
12	1337	Bondur	Lois	Sales Rep	Bondur	General	1337	Lois	Bondur
13	1370	Hernandez	General	Sales Rep	Bondur	General	1370	General	Hernandez
14	1401	Castillo	Perrella	Sales Rep	Bondur	General	1401	Perrella	Castillo
15	1501	Butt	Larry	Sales Rep	Bondur	General	1501	Larry	Butt
16	1504	Jones	Barry	Sales Rep	Bondur	General	1504	Barry	Jones
17	1611	Fisher	Andy	Sales Rep	Patterson	William	1611	Andy	Fisher
18	1612	Marsh	Peter	Sales Rep	Patterson	William	1612	Peter	Marsh
19	1619	King	Tom	Sales Rep	Patterson	William	1619	Tom	King

Table Output memasukkan data hasil filter ke dalam tabel dimemployees di database dw_legendvehicle.

2. Jika proses itu di ulangi (di run kembali) apakah data akan redudant?

= Jika proses di ulangi, tidak akan ada redudansi data karena terdapat proses yang mencegah terjadinya duplikasi yaitu Database Lookup yang mengecek data yang sudah ada sebelum dimasukkan dan filter rows yang menyaring data supaya tidak terjadi duplikasi.

3. Tambahkan nama anda pada table employee di OLTP. jalankan kembali transformasi ini. Amati hasilnya, apa yang terjadi?

=

✔ 1 row inserted.
Inserted row id: 288 (Query took 0.0307 seconds.)

```
INSERT INTO dw_legendvehicle.dimemployees (employeeNumber, lastName, firstName, jobTitle, reportsTo) VALUES (2326, 'Wirawan', 'Maharani', 'Business Woman', NULL);
```

[[Edit inline](#)] [[Edit](#)] [[Create PHP code](#)]

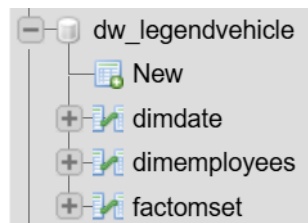
<input type="checkbox"/>	Edit	Copy	Delete	285	1621	Mami	Nishi	Sales Rep	Mary	Patterson	2025-03-23 22:45:24	NULL
<input type="checkbox"/>	Edit	Copy	Delete	286	1625	Yoshimi	Kato	Sales Rep	Mami	Nishi	2025-03-23 22:45:24	NULL
<input type="checkbox"/>	Edit	Copy	Delete	287	1702	Martin	Gerard	Sales Rep	Gerard	Bondur	2025-03-23 22:45:24	NULL
<input type="checkbox"/>	Edit	Copy	Delete	288	2326	Maharani	Wirawan	Business Woman	NULL	NULL	2025-03-24 12:06:40	NULL

C. Fakta Pembayaran

1. Buatlah sebuah tabel pada database OLAP yang telah dibuat (database dw_legendVehicle).

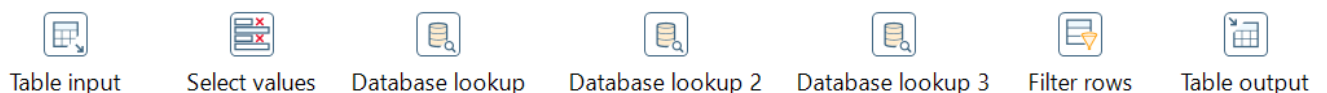
- nama tabel: FactOmset
- Field: id_dimEmployees int FK tabel dimEmployee
- Field: id_dimDate int FK tabel dimDate
- Field: amount decimal(10.2)

```
1 CREATE TABLE FactOmset (  
2     id_dimEmployees INT,  
3     id_dimDate INT,  
4     amount DECIMAL(10, 2),  
5     FOREIGN KEY (id_dimEmployees) REFERENCES dimEmployees(id_dimEmployees),  
6     FOREIGN KEY (id_dimDate) REFERENCES dimDate(id_dimDate)  
7 );
```



2. Buat Transformation baru pada PDI Spoon. Gunakan object-object yang dihubungkan sebagai berikut:

- Table Input: Digunakan untuk mengambil data transaksi dari OLTP
- Select values: digunakan untuk memilih field yang akan digunakan untuk OLAP
- Database lookup (1) : digunakan untuk mencocokkan data pada tabel dimEmployee untuk mengambil id_dimEmployee.
- Database lookup (2) : digunakan untuk mencocokkan data pada tabel dimDate untuk mengambil id_dimDate.
- Database lookup (3): digunakan untuk mencocokkan data pada tabel factomset untuk melihat data yang sama atau tidak.
- Filter rows: digunakan untuk memilih data yang sudah ada pada tabel factomset tidak dimasukkan lagi.
- Table output: digunakan untuk memasukkan data pada tabel factOmset.



3. Konfigurasi pada Table input adalah untuk mendapatkan data dari OLTP sesuai dengan hasil dari query berikut. query tersebut akan menampilkan seluruh isi field dari employee hingga transaksi yang didapat dilihat dari payments yang didapat.

Table input

Step name: Table input

Connection: conn_oltp_resource

SQL

```
select *
from employees e
left join employees r on e.reportsTo=r.employeeNumber
inner join customers c on e.employeeNumber=c.salesRepEmployeeNumber
inner join payments p on c.customerNumber=p.customerNumber;
```

Line 5 Column 59

Store column info in step meta data ☐

Enable lazy conversion ☐

Replace variables in script? ☐

Insert data from step

Execute for each row? ☐

Limit size: 0

Help OK Preview Cancel

4. Konfigurasi pada Select Values adalah untuk menghapus semua field kecuali employeeNumber, lastname dari employee, firstname dari employee, jobTitle dari employee, lastname dari manager, firstname dari manager, payment date dan amount.

Step name

Select values

Select & Alter

Remove

Meta-data

Fields :

#	Fieldname	Rename to	Length	Precision
1	employeeNumber	streamEmployeeNumber		
2	lastName	streamLastName		
3	firstName	streamFirstName		
4	extension			
5	email			
6	officeCode			
7	reportsTo			
8	jobTitle	streamJobTitle		
9	employeeNumber_1			
10	lastName_1	streamLastNameBoss		
11	firstName_1	streamFirstNameBoss		
12	extension_1			
13	email_1			
14	officeCode_1			
15	reportsTo_1			
16	jobTitle_1			
17	customerNumber			
18	customerName			
19	contactLastName			
20	contactFirstName			
21	phone			
22	addressLine1			
23	addressLine2			
24	city			
25	state			

Select & Alter

Remove

Meta-data

Fields to remove :

#	Fieldname		
1	extension		
2	email		
3	officeCode		
4	reportsTo		
5	employeeNumber_1		
6	extension_1		
7	email_1		
8	officeCode_1		
9	reportsTo_1		
10	jobTitle_1		
11	customerNumber		
12	customerName		
13	contactLastName		
14	contactFirstName		
15	phone		
16	addressLine1		
17	addressLine2		
18	city		
19	state		
20	postalCode		
21	country		
22	salesRepEmployeeNumber		
23	creditLimit		
24	customerNumber_1		
25	checkNumber		

5. Konfigurasi pada tabel database lookup adalah dengan melakukan komparasi field stream (output dari proses sebelumnya) dengan field isi data pada tabel dimEmployees. Jika data tersebut cocok maka akan diambil id_dimEmployees nya.

Database lookup

Step name: Database lookup

Connection: conn_dw_destination [Edit...] [New...] [Wizard...]

Lookup schema: dw_legendvehicle [Browse...]

Lookup table: dimemployees [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	employeeNumber	=	streamEmployeeNumber	
2	firstName	=	streamFirstName	
3	lastName	=	streamLastName	
4	jobtitle	=	streamJobTitle	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	id_dimEmployees			None

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by:

[Help] [OK] [Cancel] [Get Fields] [Get lookup fields]

6. Konfigurasi pada tabel database lookup yang kedua adalah dengan melakukan komparasi field stream (output dari proses sebelumnya untuk field date) dengan field isi data pada tabel dimDate. Jika data tersebut cocok maka akan diambil id_dimDate nya.

Database lookup

Step name: Database lookup 2

Connection: conn_dw_destination [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	date	=	streamDate	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	id_dimDate			None

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by:

[Help] [OK] [Cancel] [Get Fields] [Get lookup fields]

7. Konfigurasi pada tabel database lookup yang ketiga adalah dengan melakukan komparasi id_dimDate dan id_dimEmployees yang diambil dari proses lookup sebelumnya dengan field isi data pada tabel factOmset. Jika data tersebut cocok data tidak akan dimasukkan dalam tabel factOmset.

Database lookup

Step name: Database lookup 3

Connection: conn_dw_destination [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_dimDate	=	id_dimDate	
2	id_dimEmployees	=	id_dimEmployees	
3	amount	=	streamAmount	

Values to return from the lookup table :

#	Field	New name	Default	Type
1	id_dimDate			None
2	id_dimEmployees			None
3	amount			None

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by:

[?] Help [OK] [Cancel] [Get Fields] [Get lookup fields]

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

Filter rows

Step name: Filter rows

Send 'true' data to step: Table output

Send 'false' data to step:

The condition:

☐ id_dimDate_1 IS NULL

AND

☐ id_dimEmployees_1 IS NULL

AND

☐ amount IS NULL

9. Konfigurasi terakhir pada table output adalah dengan melkukan mapping data output dari proses seblumnya kedalam field pada tabel factOmset.

Table output

Step name: Table output

Connection: conn_dw_destination

Target schema: dw_legendvehicle

Target table: factomset

Commit size: 1000

Truncate table: ☐

Ignore insert errors: ☐

Specify database fields: ☒

Main options: Database fields

Fields to insert:

#	Table field	Stream field
1	id_dimDate	id_dimDate_1
2	id_dimEmployees	id_dimEmployees_1
3	amount	streamAmount

10. Jalankan proses transformation tersebut.

CFaktaPembayaran

100%

Table input → Select values → Database lookup → Database lookup 2 → Database lookup 3 → Filter rows → Table output

Execution Results

Logging Execution History Step Metrics Performance Graph Metrics Preview data

2025/03/27 13:26:52 - Spoon - Transformation opened.

2025/03/27 13:26:52 - Spoon - Launching transformation [CFaktaPembayaran]...

2025/03/27 13:26:52 - Spoon - Started the transformation execution.

2025/03/27 13:26:52 - CFaktaPembayaran - Dispatching started for transformation [CFaktaPembayaran]

2025/03/27 13:26:52 - Table output.0 - Connected to database [conn_dw_destination] (commit=1000)

2025/03/27 13:26:52 - Table input.0 - Finished reading query, closing connection

2025/03/27 13:26:52 - Table input.0 - Finished processing (I=273, O=0, R=0, W=273, U=0, E=0)

2025/03/27 13:26:52 - Select values.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)

2025/03/27 13:26:53 - Database lookup.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)

2025/03/27 13:26:53 - Database lookup 2.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)

2025/03/27 13:26:53 - Database lookup 3.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)

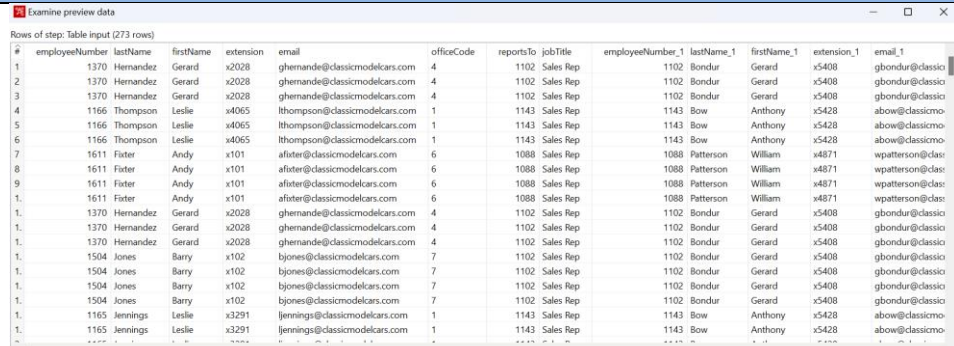
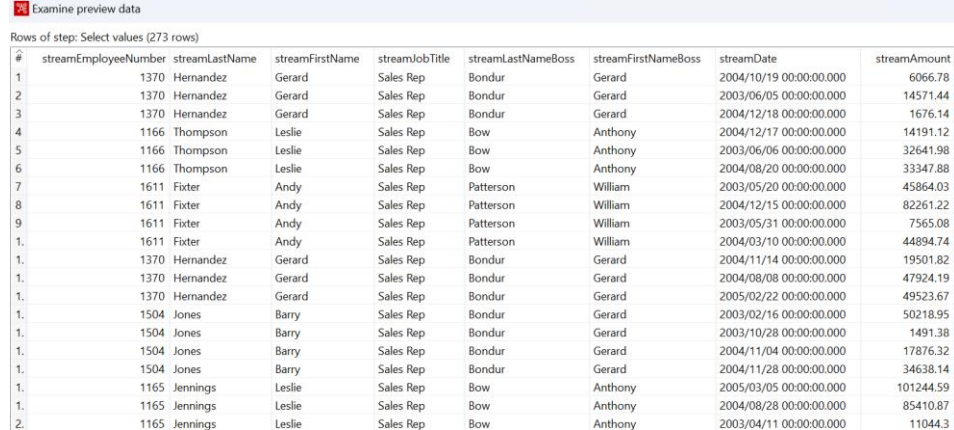
2025/03/27 13:26:53 - Filter rows.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)

2025/03/27 13:26:53 - Table output.0 - Finished processing (I=0, O=273, R=273, W=273, U=0, E=0)

2025/03/27 13:26:53 - Spoon - The transformation has finished!!

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 di setiap prosesnya.

Proses Objek	SS data input	SS data output	Keterangan																																																																																																								
Table Input	<pre> 1 CREATE TABLE FactOmset (2 id_dimEmployees INT, 3 id_dimDate INT, 4 amount DECIMAL(10, 2), 5 FOREIGN KEY (id_dimEmployees) REFERENCES dimEmployees(id_dimEmployees), 6 FOREIGN KEY (id_dimDate) REFERENCES dimDate(id_dimDate) 7); </pre>		Data input mendefinisikan tabel, menggambarkan struktur dan hubungan antar tabel. Data output merupakan data yang sudah diinput dalam tabel, berisi informasi tentang karyawan.																																																																																																								
Select values	<p>Step name: Select values</p> <p>Select & Alter Remove Meta-data</p> <p>Fields:</p> <table border="1"> <thead> <tr> <th>#</th> <th>Fieldname</th> <th>Rename to</th> <th>Let</th> </tr> </thead> <tbody> <tr><td>1</td><td>employeeNumber</td><td>streamEmployeeNumber</td><td></td></tr> <tr><td>2</td><td>lastName</td><td>streamLastName</td><td></td></tr> <tr><td>3</td><td>firstName</td><td>streamFirstName</td><td></td></tr> <tr><td>4</td><td>extension</td><td></td><td></td></tr> <tr><td>5</td><td>email</td><td></td><td></td></tr> <tr><td>6</td><td>officeCode</td><td></td><td></td></tr> <tr><td>7</td><td>reportsTo</td><td></td><td></td></tr> <tr><td>8</td><td>jobTitle</td><td>streamJobTitle</td><td></td></tr> <tr><td>9</td><td>employeeNumber_1</td><td></td><td></td></tr> <tr><td>10</td><td>lastName_1</td><td>streamLastNameBoss</td><td></td></tr> <tr><td>11</td><td>firstName_1</td><td>streamFirstNameBoss</td><td></td></tr> <tr><td>12</td><td>extension_1</td><td></td><td></td></tr> <tr><td>13</td><td>email_1</td><td></td><td></td></tr> <tr><td>14</td><td>officeCode_1</td><td></td><td></td></tr> <tr><td>15</td><td>reportsTo_1</td><td></td><td></td></tr> <tr><td>16</td><td>jobTitle_1</td><td></td><td></td></tr> <tr><td>17</td><td>customerNumber</td><td></td><td></td></tr> <tr><td>18</td><td>customerName</td><td></td><td></td></tr> <tr><td>19</td><td>contactLastName</td><td></td><td></td></tr> <tr><td>20</td><td>contactFirstName</td><td></td><td></td></tr> <tr><td>21</td><td>phone</td><td></td><td></td></tr> <tr><td>22</td><td>addressLine1</td><td></td><td></td></tr> <tr><td>23</td><td>addressLine2</td><td></td><td></td></tr> <tr><td>24</td><td>city</td><td></td><td></td></tr> <tr><td>25</td><td>state</td><td></td><td></td></tr> </tbody> </table>	#	Fieldname	Rename to	Let	1	employeeNumber	streamEmployeeNumber		2	lastName	streamLastName		3	firstName	streamFirstName		4	extension			5	email			6	officeCode			7	reportsTo			8	jobTitle	streamJobTitle		9	employeeNumber_1			10	lastName_1	streamLastNameBoss		11	firstName_1	streamFirstNameBoss		12	extension_1			13	email_1			14	officeCode_1			15	reportsTo_1			16	jobTitle_1			17	customerNumber			18	customerName			19	contactLastName			20	contactFirstName			21	phone			22	addressLine1			23	addressLine2			24	city			25	state				Pada data input melakukan seleksi dan transformasi data, serta membuang informasi yang tidak dibutuhkan, mengurangi kompleksitas, dan meningkatkan efisiensi. Data output menghasilkan data setelah transformasi dan standarisasi yang mudah dipahami
#	Fieldname	Rename to	Let																																																																																																								
1	employeeNumber	streamEmployeeNumber																																																																																																									
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24	city																																																																																																										
25	state																																																																																																										

	<div><div>26 postalCode</div><div>27 country</div><div>28 salesRepEmployeeNumber</div><div>29 creditLimit</div><div>30 customerNumber_1</div><div>31 checkNumber</div><div>32 paymentDate<div>streamDate</div></div><div>33 amount<div>streamAmount</div><div>Step name Select values</div></div></div> <div><div>Select & Alter Remove Meta-data</div><div>Fields to remove :</div><div><div># Fieldname</div><div>1 extension</div><div>2 email</div><div>3 officeCode</div><div>4 reportsTo</div><div>5 employeeNumber_1</div><div>6 extension_1</div><div>7 email_1</div><div>8 officeCode_1</div><div>9 reportsTo_1</div><div>10 jobTitle_1</div><div>11 customerNumber</div><div>12 customerName</div><div>13 contactLastName</div><div>14 contactFirstName</div><div>15 phone</div><div>16 addressLine1</div><div>17 addressLine2</div><div>18 city</div><div>19 state</div><div>20 postalCode</div><div>21 country</div><div>22 salesRepEmployeeNumber</div><div>23 creditLimit</div><div>24 customerNumber_1</div><div>25 checkNumber</div></div></div>		
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Database lookup

Database lookup

Step name: Database lookup

Connection: conn_dw_destination

Lookup schema: dw_legendvehicle

Lookup table: dimemployees

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	employeeNumber	=	streamEmployeeNumber	
2	firstName	=	streamFirstName	
3	lastName	=	streamLastName	
4	jobtitle	=	streamJobTitle	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	id_dimEmployees			None

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by

Help OK Cancel Get Fields Get lookup field

Examine preview data

Rows of step: Database lookup (273 rows)

#	streamEmployeeNumber	streamLastName	streamFirstName	streamJobTitle	streamLastNameBoss	streamFirstNameBoss	streamDate	streamAmount	id_dimEmployees
1	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/10/19 00:00:00.000	6066.78	14
2	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2003/06/05 00:00:00.000	14571.44	14
3	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/12/18 00:00:00.000	1676.14	14
4	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/12/17 00:00:00.000	14191.12	8
5	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2003/06/06 00:00:00.000	32641.98	8
6	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/08/20 00:00:00.000	33347.88	8
7	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/20 00:00:00.000	45864.03	18
8	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/12/15 00:00:00.000	82261.22	18
9	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/31 00:00:00.000	7565.08	18
1.	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/03/10 00:00:00.000	44894.74	18
1.	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/11/14 00:00:00.000	19501.82	14
1.	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/08/08 00:00:00.000	47924.19	14
1.	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2005/02/22 00:00:00.000	49523.67	14
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/02/16 00:00:00.000	50218.95	17
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/10/28 00:00:00.000	1491.38	17
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/04 00:00:00.000	17876.32	17
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/28 00:00:00.000	34638.14	17
1.	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2005/03/05 00:00:00.000	101244.59	7
1.	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2004/08/28 00:00:00.000	85410.87	7
2.	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2003/04/11 00:00:00.000	11044.3	7

Data lookup dilakukan dengan koneksi conn_dw_destination ke schema dw_legendvehicle dan tabel dimemployees. Proses pencocokan data menggunakan empat kunci (keys) dari tabel utama terhadap tabel dimemployees. Data yang dikembalikan dari tabel dimemployees adalah id_dimEmployees. Hasil lookup menambahkan ID unik (id_dimEmployees) untuk setiap karyawan yang cocok.

Database lookup (2)

Database lookup

Step name: Database lookup 2

Connection: conn_dw_destination

Lookup schema: dw_legendvehicle

Lookup table: dimdate

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	date	=	streamDate	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	id_dimDate			None

Do not pass the row if the lookup fails ☐

Fail on multiple results? ☐

Order by

Help OK Cancel Get Fields Get lookup fields

Examine preview data

Rows of step: Database lookup 2 (273 rows)

#	streamEmployeeNumber	streamLastName	streamFirstName	streamJobTitle	streamLastNameBoss	streamFirstNameBoss	streamDate	streamAmount	id_dimEmployees	id_dimDate
1	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/10/19 00:00:00.000	6066.78	14	658
2	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2003/06/05 00:00:00.000	14571.44	14	156
3	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/12/18 00:00:00.000	1676.14	14	718
4	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/12/17 00:00:00.000	14191.12	8	717
5	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2003/06/06 00:00:00.000	32641.98	8	157
6	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/08/20 00:00:00.000	33347.88	8	598
7	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/20 00:00:00.000	45864.03	18	140
8	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/12/15 00:00:00.000	82261.22	18	715
9	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/31 00:00:00.000	7565.08	18	151
1.	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/03/10 00:00:00.000	44894.74	18	435
1.	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/11/14 00:00:00.000	19501.82	14	684
1.	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/08/08 00:00:00.000	47924.19	14	586
1.	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2005/02/22 00:00:00.000	49523.67	14	784
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/02/16 00:00:00.000	50218.95	17	47
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/10/28 00:00:00.000	1491.38	17	301
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/04 00:00:00.000	17876.32	17	674
1.	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/28 00:00:00.000	34638.14	17	698
1.	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2005/03/05 00:00:00.000	101244.59	7	795
1.	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2004/08/28 00:00:00.000	85410.87	7	606
2.	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2003/04/11 00:00:00.000	11044.3	7	101

Close

Proses ini melakukan pencarian (lookup) pada tabel dimdate menggunakan kolom streamDate sebagai kunci pencarian. Hasil pencarian adalah nilai id_dimDate yang kemudian ditambahkan ke data output.

Database lookup (3)

Step name: Database lookup

Connection: conn_dw_destination

Lookup schema: dw_legendvehicle

Lookup table: factomset

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_dimDate	=	id_dimDate	
2	id_dimEmployees	=	id_dimEmployees	
3	amount	=	streamAmount	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	id_dimDate			None
2	id_dimEmployees			None
3	amount			None

Do not pass the row if the lookup fails ☒

Fail on multiple results? ☒

Order by: [empty]

Buttons: Help, OK, Cancel, Get Fields, Get lookup fields

Examine preview data

Rows of step: Database lookup 3 (273 rows)

#	streamEmployeeNumber	streamLastName	streamFirstName	streamJobTitle	streamLastBoss	streamFirstBoss	streamDate	streamAmount	id_dimEmployees	id_dimDate	id_dir
1	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/10/19 00:00:00.000	6066.78	14	658	
2	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2003/06/05 00:00:00.000	14571.44	14	156	
3	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/12/18 00:00:00.000	1676.14	14	718	
4	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/12/17 00:00:00.000	14191.12	8	717	
5	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2003/06/06 00:00:00.000	32641.98	8	157	
6	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/08/20 00:00:00.000	33347.88	8	598	
7	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/20 00:00:00.000	45864.03	18	140	
8	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/12/15 00:00:00.000	82261.22	18	715	
9	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/31 00:00:00.000	7565.08	18	151	
10	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/03/10 00:00:00.000	44894.74	18	435	
11	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/11/14 00:00:00.000	19501.82	14	684	
12	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/08/08 00:00:00.000	47924.19	14	586	
13	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2005/02/22 00:00:00.000	49523.67	14	784	
14	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/02/16 00:00:00.000	50218.95	17	47	
15	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/10/28 00:00:00.000	1491.38	17	301	
16	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/04 00:00:00.000	17876.32	17	674	
17	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/28 00:00:00.000	34638.14	17	698	
18	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2005/03/05 00:00:00.000	101244.59	7	795	
19	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2004/08/28 00:00:00.000	85410.87	7	606	

Proses ini melakukan pencarian (lookup) pada tabel factomset menggunakan kolom id_dimDate, id_dimEmployees, dan streamAmount. Output menampilkan data karyawan dengan beberapa nilai yang ditambahkan pada input.

Filter rows

Step name: Filter rows

Send 'true' data to step: Table output

Send 'false' data to step: [empty]

The condition:

[empty box] id_dimDate_1 IS NULL

AND

[empty box] id_dimEmployees_1 IS NULL

AND

[empty box] amount IS NULL

Examine preview data

Rows of step: Filter rows (273 rows)

#	streamEmployeeNumber	streamLastName	streamFirstName	streamJobTitle	streamLastBoss	streamFirstBoss	streamDate	streamAmount	id_dimEmployees	id_dimDate	id_dir
1	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/10/19 00:00:00.000	6066.78	14	658	
2	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2003/06/05 00:00:00.000	14571.44	14	156	
3	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/12/18 00:00:00.000	1676.14	14	718	
4	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/12/17 00:00:00.000	14191.12	8	717	
5	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2003/06/06 00:00:00.000	32641.98	8	157	
6	1166	Thompson	Leslie	Sales Rep	Bow	Anthony	2004/08/20 00:00:00.000	33347.88	8	598	
7	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/20 00:00:00.000	45864.03	18	140	
8	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/12/15 00:00:00.000	82261.22	18	715	
9	1611	Fixter	Andy	Sales Rep	Patterson	William	2003/05/31 00:00:00.000	7565.08	18	151	
10	1611	Fixter	Andy	Sales Rep	Patterson	William	2004/03/10 00:00:00.000	44894.74	18	435	
11	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/11/14 00:00:00.000	19501.82	14	684	
12	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2004/08/08 00:00:00.000	47924.19	14	586	
13	1370	Hernandez	Gerard	Sales Rep	Bondur	Gerard	2005/02/22 00:00:00.000	49523.67	14	784	
14	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/02/16 00:00:00.000	50218.95	17	47	
15	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2003/10/28 00:00:00.000	1491.38	17	301	
16	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/04 00:00:00.000	17876.32	17	674	
17	1504	Jones	Barry	Sales Rep	Bondur	Gerard	2004/11/28 00:00:00.000	34638.14	17	698	
18	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2005/03/05 00:00:00.000	101244.59	7	795	
19	1165	Jennings	Leslie	Sales Rep	Bow	Anthony	2004/08/28 00:00:00.000	85410.87	7	606	

Langkah Filter Rows ini bertujuan untuk menyaring baris data di mana kolom id_dimDate_1, id_dimEmployees_1, dan amount semuanya bernilai NULL. Konfigurasi filter menentukan kondisi penyaringan, dan output menunjukkan bahwa filter telah berhasil diterapkan. Hasil output memperlihatkan data yang sudah sesuai dengan kriteria pemfilteran.

Table Output

Langkah **Table Output** ini bertujuan untuk memasukkan data ke dalam tabel factomset di database conn_dw_destination. Konfigurasi Table Output menentukan tabel target dan pemetaan kolom. Hasil output menunjukkan bahwa semua data dari input telah berhasil dimasukkan ke dalam tabel.

2. Jika proses itu di ulangi (di run kembali) apakah data akan redudant?

= data akan menjadi redundan jika proses Table Output dijalankan kembali.

Karena:

- **Tidak Ada Primary Key:** Tabel Factomset tidak memiliki primary key atau unique constraint. Ini berarti database tidak akan mencegah duplikasi baris.
- **Foreign Key Constraints:** Foreign key constraints hanya memastikan integritas referensial, bukan keunikan baris.
- **Proses Table Output:** Proses Table Output akan memasukkan semua data dari input ke dalam tabel Factomset tanpa memeriksa duplikasi.

D. Jobs

1. Buka Jobs pada File - New - Jobs
2. 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.
3. Konfigurasi dilakukan pada setiap transformation untuk mengambil file tranformation yang telah dibuat pada bagian A, B dan C.
4. Jalankan jobs tersebut ketika semua transformation telah dihubungkan dengan file tranformation yang telah dibuat sebelumnya.

The screenshot shows the configuration of a job named 'Job 1' in Pentaho Data Integration. The job consists of five steps: Start, Transformation, Transformation 2, Transformation 3, and Success. All steps are connected in a linear sequence and marked with green checkmarks, indicating they are configured correctly.

Below the job configuration, the 'Execution Results' tab is selected, showing a detailed log of the job's execution. The log entries are as follows:

```
2025/03/27 19:50:47 - Table input.0 - Finished processing (I=23, O=0, R=0, W=23, U=0, E=0)
2025/03/27 19:50:47 - Select values.0 - Finished processing (I=0, O=0, R=23, W=23, U=0, E=0)
2025/03/27 19:50:47 - Database lookup.0 - Finished processing (I=22, O=0, R=23, W=23, U=0, E=0)
2025/03/27 19:50:47 - Filter rows.0 - Finished processing (I=0, O=0, R=23, W=22, U=0, E=0)
2025/03/27 19:50:47 - Table output.0 - Finished processing (I=0, O=22, R=22, W=22, U=0, E=0)
2025/03/27 19:50:47 - Job 1 - Starting entry [Transformation 3]
2025/03/27 19:50:47 - Transformation 3 - Using run configuration [Pentaho local]
2025/03/27 19:50:47 - CFaktaPembayaran - Dispatching started for transformation [CFaktaPembayaran]
2025/03/27 19:50:47 - Table output.0 - Connected to database [conn_dw_destination] (commit=1000)
2025/03/27 19:50:47 - Table input.0 - Finished reading query, closing connection
2025/03/27 19:50:47 - Table input.0 - Finished processing (I=273, O=0, R=0, W=273, U=0, E=0)
2025/03/27 19:50:47 - Select values.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)
2025/03/27 19:50:47 - Database lookup.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)
2025/03/27 19:50:47 - Database lookup 2.0 - Finished processing (I=273, O=0, R=273, W=273, U=0, E=0)
2025/03/27 19:50:47 - Database lookup 3.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)
2025/03/27 19:50:47 - Filter rows.0 - Finished processing (I=0, O=0, R=273, W=273, U=0, E=0)
2025/03/27 19:50:47 - Table output.0 - Finished processing (I=0, O=273, R=273, W=273, U=0, E=0)
2025/03/27 19:50:47 - Job 1 - Starting entry [Success]
2025/03/27 19:50:47 - Job 1 - Finished job entry [Success] (result=[true])
2025/03/27 19:50:47 - Job 1 - Finished job entry [Transformation 3] (result=[true])
2025/03/27 19:50:47 - Job 1 - Finished job entry [Transformation 2] (result=[true])
2025/03/27 19:50:47 - Job 1 - Finished job entry [Transformation] (result=[true])
2025/03/27 19:50:47 - Job 1 - Job execution finished
2025/03/27 19:50:47 - Spoon - Job has ended.
```

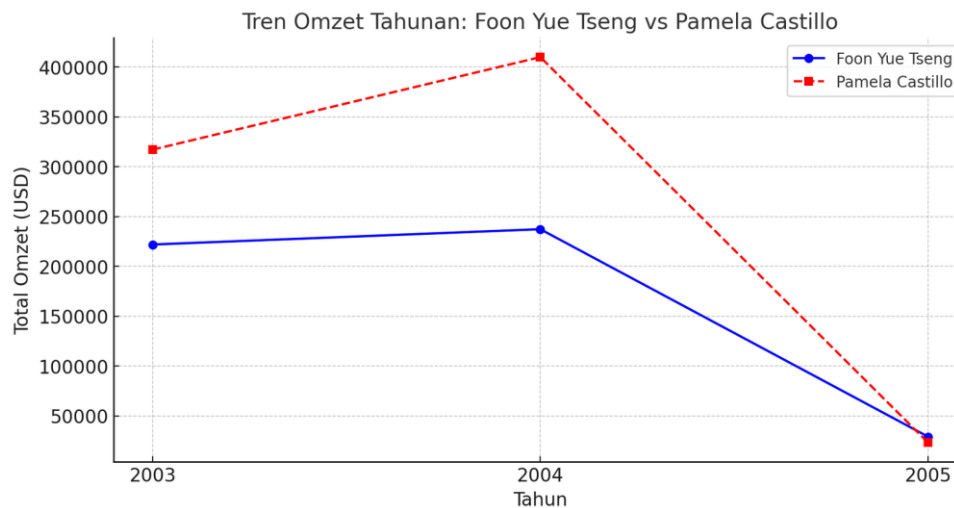
TUGAS 4

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

Aspek	dw_legendvehicle (Data Warehouse)	legendVehicle (OLTP)
Tujuan	Analisis data historis, pelaporan, dan <i>business intelligence</i> .	Menangani transaksi harian secara efisien.
Struktur Desain	<i>Star Schema</i> dengan tabel fakta dan tabel dimensi.	<i>Relational Model</i> dengan banyak tabel transaksi yang saling berelasi.
Jumlah Tabel	Lebih sedikit (misalnya: factset, dimemployees, dimdate).	Lebih banyak (misalnya: employees, customers, orders, orderdetails, products, dll.).
Tabel Fakta	factset (berisi data numerik seperti jumlah transaksi).	Tidak memiliki tabel fakta, hanya tabel transaksi langsung.
Tabel Dimensi	dimemployees (data karyawan), dimdate (dimensi waktu).	Tidak menggunakan konsep tabel dimensi, tetapi memiliki tabel relasional untuk entitas utama.
Relasi Antar Tabel	Relasi sederhana antara tabel fakta dan dimensi.	Relasi kompleks antara banyak tabel yang mendukung transaksi bisnis.
Redundansi Data	Lebih banyak redundansi untuk mempercepat analisis.	Minim redundansi untuk menghindari duplikasi data.
Kecepatan Akses	Optimasi untuk <i>read-heavy operations</i> (analisis data dalam jumlah besar).	Optimasi untuk <i>read-write operations</i> (insert, update, delete dalam jumlah kecil).
Jenis Query	Query bersifat agregasi (<i>SUM, AVG, COUNT</i>) untuk analisis data.	Query bersifat transaksi (<i>INSERT, UPDATE, DELETE, SELECT</i>).
Contoh Data	Data historis untuk analisis kinerja karyawan atau tren penjualan.	Data transaksi aktif seperti order, pembayaran, dan stok produk.
Proses Data	Data berasal dari sistem OLTP melalui proses <i>ETL</i> (Extract, Transform, Load).	Data diperbarui secara langsung dari transaksi bisnis.

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

Tahun	Foon Yue Tseng	Pamela Castillo
2003	221,887.03	317,104.78
2004	237,255.26	409,910.07
2005	29,070.38	23,187.02



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

Query pada jobsheet 2 (OLTP): Menggunakan tabel transaksi langsung.

Query pada nomor 2 (OLAP): Menggunakan dimensional modeling, yaitu factOmzet, dimEmployees, dan dimDate.

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

OLTP berfokus pada transaksi cepat dan akurat dalam operasional harian, sedangkan OLAP digunakan untuk menganalisis data dalam jumlah besar guna membantu pengambilan keputusan strategis.