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## Persiapan Proyek Akhir 1

### 1. Teori Singkat

Data warehouse adalah jenis sistem manajemen data yang dirancang untuk memungkinkan dan mendukung kegiatan business intelligence (BI), terutama analitik. Gudang data semata-mata dimaksudkan untuk melakukan kueri dan analisis dan sering berisi sejumlah besar data historis. Data dalam gudang data biasanya berasal dari berbagai sumber seperti file log aplikasi dan aplikasi transaksi. Gudang data memusatkan dan mengkonsolidasikan sejumlah besar data dari berbagai sumber. Kemampuan analitisnya memungkinkan organisasi untuk memperoleh wawasan bisnis yang berharga dari data mereka untuk meningkatkan pengambilan keputusan. Seiring waktu, ia membangun catatan sejarah yang dapat sangat berharga bagi para ilmuwan data dan analisis bisnis. Karena kemampuan ini, gudang data dapat dianggap sebagai "sumber kebenaran tunggal" organisasi.

### 2. Alat dan Bahan

Hardware : Laptop/PC

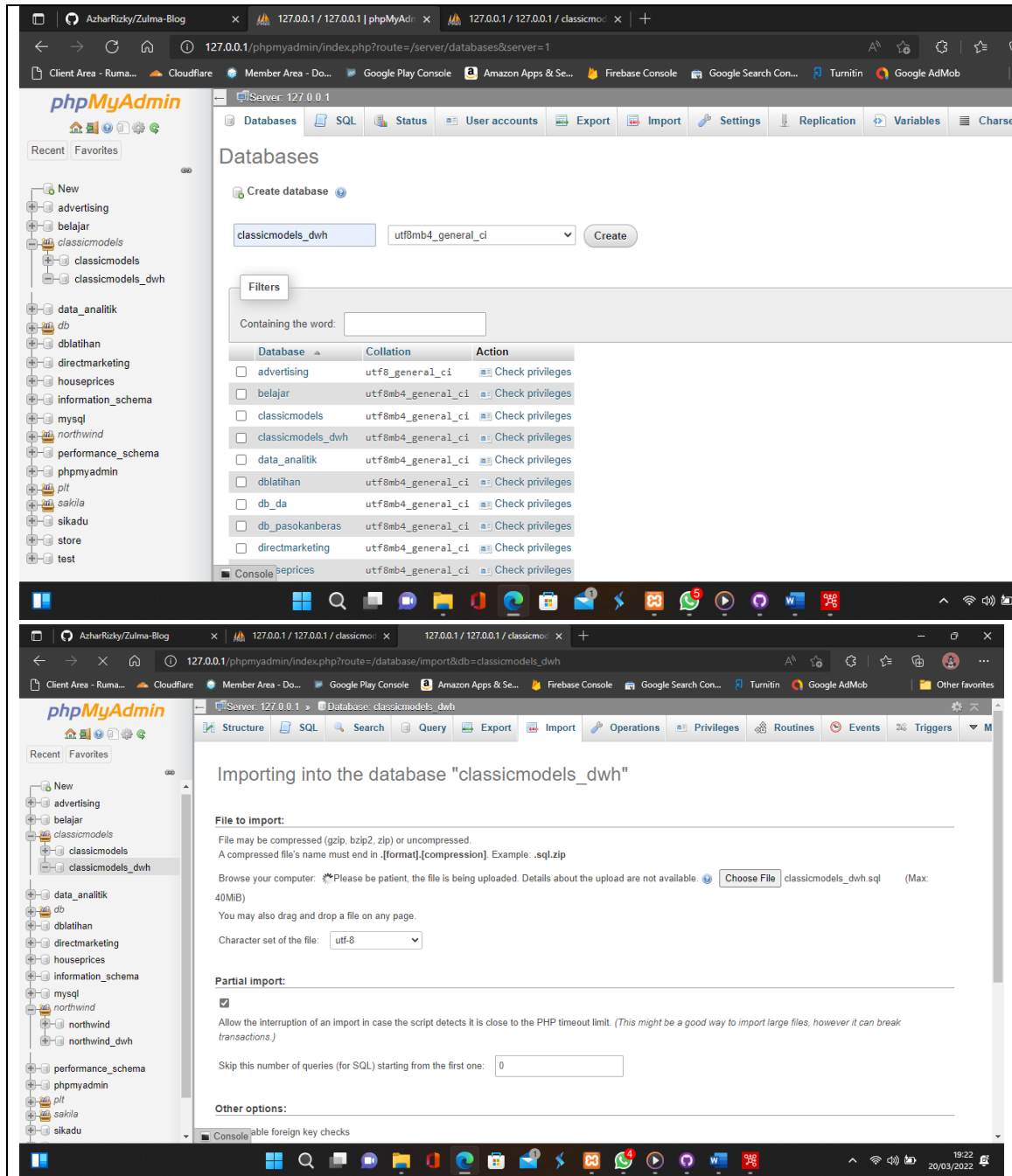
Software : Spoon Pentaho from Hitachi Vantara



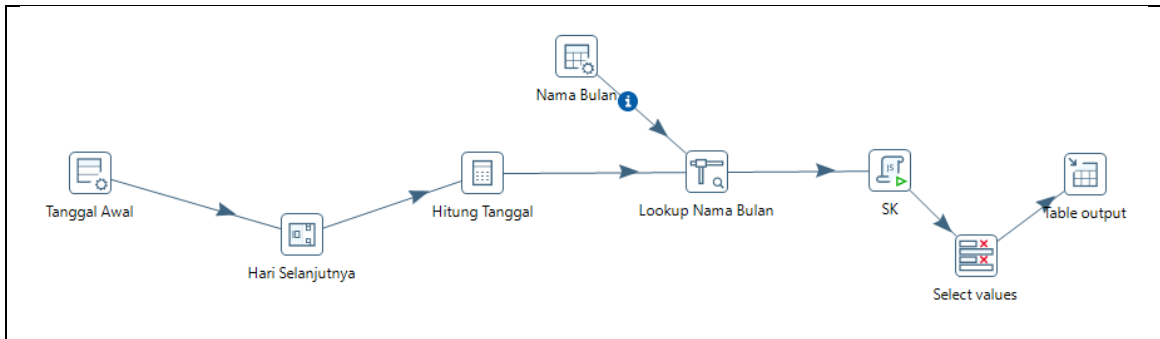
### 3. Elemen Kompetensi

#### a. Latihan pertama – Dim Date Transformation

1. Buka XAMPP dan Nyalakan Apache serta MySQL lalu buka 127.0.0.1/phpMyAdmin pada browser anda dan buat database baru bernama classicmodels\_dwh lalu import data SQL yang diberikan Asisten Laboratorium.



## 2. Struktur Dim Date



## 3. Tanggal Awal – Generate Rows

Step name: Tanggal Awal

Limit: 10000

Never stop generating rows: ☐

Interval in ms (delay): 5000

Current row time field name: now

Previous row time field name: FiveSecondsAgo

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Value	Set empty string?
1	tanggal_awal	Date	yyyy-MM-dd						2000-01-01	N

Buttons: Help, OK, Preview, Cancel

## 4. Hari Selanjutnya – Add sequence.

Step name: Hari Selanjutnya

Name of value: hari\_selanjutnya

Use a database to generate the sequence

Use DB to get sequence? ☐

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

Schema name: [Dropdown] Schemas...

Sequence name: SEQ Sequences...

Use a transformation counter to generate the sequence

Use counter to calculate sequence? ☒

Counter name (optional): [Text Box]

Start at value: 0

Increment by: 1

Maximum value: 999999999

Buttons: Help, OK, Cancel



## 5. Hitung Tanggal – Calculator.

Calculator

Step name: hitung tanggal

☐ Throw an error on non existing files

Fields:

#	New field	Calculation	Field A	Field B	Field C	Value type	Length	Precision	Remove	Conversion mask	Decimal symbol	Group
1	date	Date A + B Days	tanggal_awal	hari_selanjutnya		Date			N	yyyy-MM-dd		
2	year	Year of date A	date			Integer			N			
3	quarter_int	Quarter of date A	date			Integer			Y	0		
4	quarter_constant	Set field to constant value A	Q			String			Y			
5	quarter	A + B	quarter_constant	quarter_int		String			N			
6	month	Month of date A	date			Integer			N			
7	day	Day of month of date A	date			Integer			N			

Help OK Cancel

## 6. Nama Bulan – Data Grid.

Data grid

Step name: Nama Bulan

Meta Data

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Null if	Set empty string?
1	month_number	Integer								N
2	month_name	String								N

Help OK Preview Cancel

Data grid

Step name: Nama Bulan

Meta Data

#	month_number	month_name
1	1	Januari
2	2	Februari
3	3	Maret
4	4	April
5	5	Mei
6	6	Juni
7	7	Juli
8	8	Agustus
9	9	September
10	10	Oktober
11	11	November
12	12	Desember

Help OK Preview Cancel



## 7. Lookup Nama Bulan – Stream lookup.

Stream lookup

Step name: Lookup Nama Bulan

Lookup step: Nama Bulan

The key(s) to look up the value(s):

#	Field	LookupField
1	month	month_number

Specify the fields to retrieve :

#	Field	New name	Default	Type
1	month_name			String

Preserve memory (costs CPU) ☒

Key and value are exactly one integer field ☐

Use sorted list (i.s.o. hashtable) ☐

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

## 8. SK – Modified JavaScript value.

Modified JavaScript value

Step name: SK

Java script functions:

- Transform Scripts
- Transform Constants
- Transform Functions
- Input fields
  - tanggal\_awal
  - hari\_selanjutnya
  - date
  - year
  - quarter
  - month
  - day
  - month\_name
- Output fields
  - Please use the 'Reg

Java script:

```
Script 1
var sk;
sk = (year * 10000) + (month * 100) + day;
```

Linennr: 0

Compatibility mode? ☐ Optimization level: g

Fields

#	Fieldname	Rename to	Type	Length	Precision	Replace value 'Fieldname' or 'Rename to'
1	sk		Integer			N

Buttons: ? Help, OK, Cancel, Get variables, Test script



## 9. Select values

Step name: Select values

Select & Alter Remove Meta-data

Fields:

#	Fieldname	Rename to	Length	Precision
1	sk			
2	date			
3	year			
4	quarter			
5	month			
6	month_name			
7	day			

Get fields to select  
Edit Mapping

Include unspecified fields, ordered by name ☐

Help OK Cancel

## 10. Table output

Database Connection

General Advanced Options Pooling Clustering

Connection name: MySQL-ClassicModelsDwh

Connection type: MySQL Native Mondrian Neoview Netezza Oracle Oracle RDB Palo MOLAP Server Pentaho Data Services PostgreSQL Redshift Remedy Action Request System SAP ERP System SQLite Snowflake SparkSQL Sybase SybaseIQ Teradata

Access: Native (JDBC) ODBC JNDI

Settings: Host Name: localhost Database Name: classicmodels\_dwh Port Number: 3306 Username: root Password: Use Result Streaming Cursor

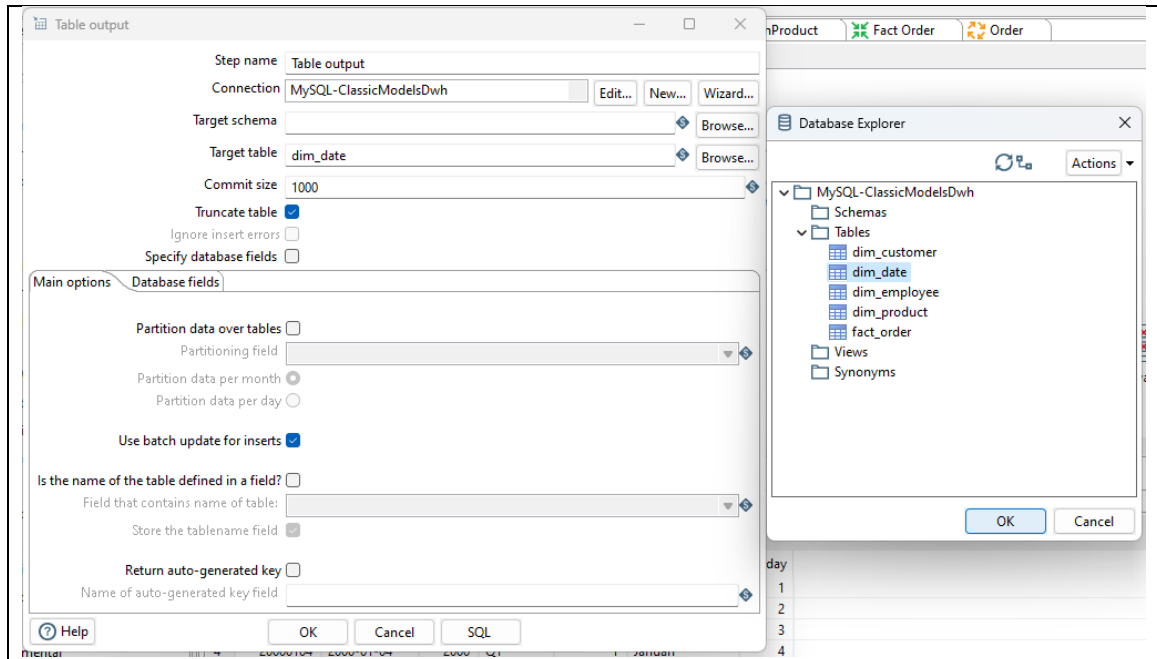
Test Feature List Explore

Connection tested successfully

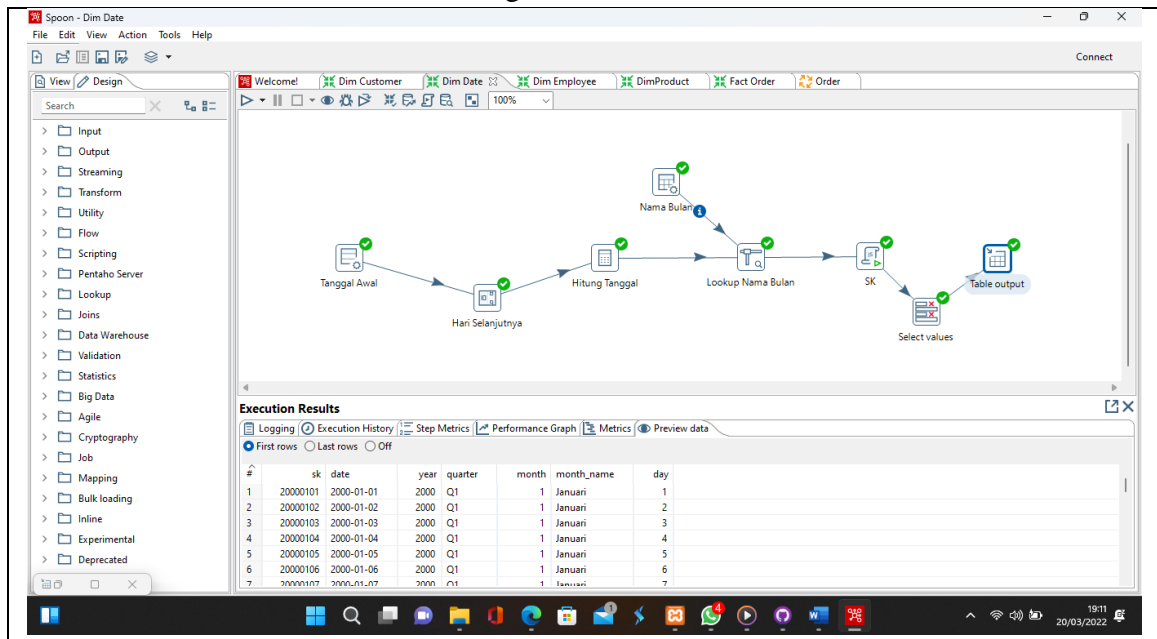
Connection to MySQL-ClassicModelsDwh was successful.  
Hostname: localhost  
Port: 3306  
Database name: classicmodels\_dwh

OK Cancel



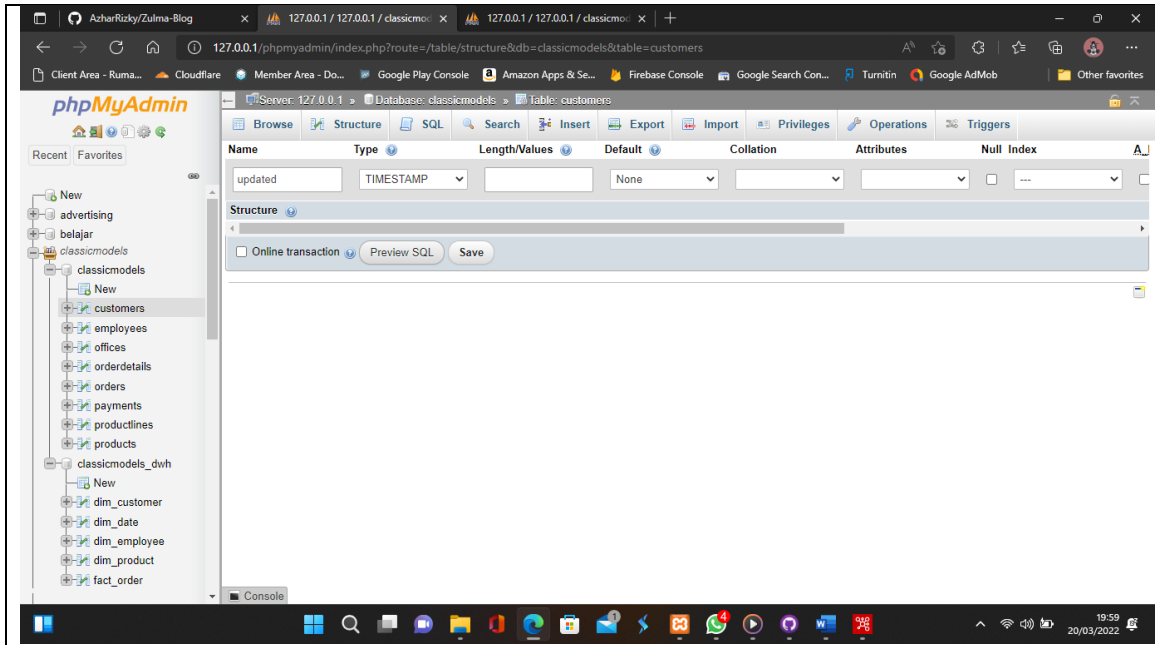


## 11. Ketika berhasil di Jalankan/Running

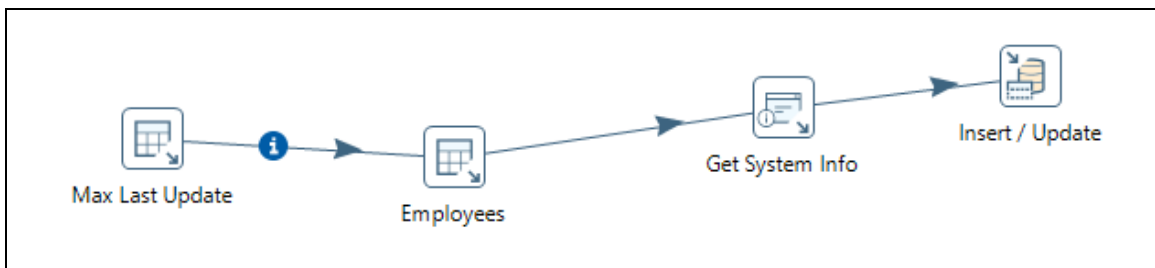


b. Latihan Kedua – Dim Customer Transformation

1. Tambahkan kolom baru bernama updated dengan tipe data timestamp pada tabel customer dalam database classicmodels seperti pada gambar dibawah ini di MySQL.



2. Struktur Dim Customer





### 3. Max Last Update – Table input.

The image shows two screenshots from a data tool interface.

**Top Screenshot: Database Connection**

- General** tab is selected.
- Connection name:** MySQL-ClassicModelsDwh
- Connection type:** MySQL (selected from a list including Native Mondrian, Neoview, Netezza, Oracle, Oracle RDB, Palo MOLAP Server, Pentaho Data Services, PostgreSQL, Redshift, Remedy Action Request System, SAP ERP System, SQLite, Snowflake, SparkSQL, Sybase, SybaseIQ, and Teradata).
- Settings:**
  - Host Name:** localhost
  - Database Name:** classicmodels\_dwh
  - Port Number:** 3306
  - Username:** root
  - Password:** (empty)
  - ☒ Use Result Streaming Cursor
- A small dialog box says: "Connection tested successfully. Connection to MySQL-ClassicModelsDwh was successful. Hostname: localhost, Port: 3306, Database name: classicmodels\_dwh." with an OK button.
- Buttons at the bottom: Test, Feature List, Explore, OK, Cancel.

**Bottom Screenshot: Table input**

- Step name:** Max Last Update
- Connection:** MySQL-ClassicModelsDwh (with Edit..., New..., Wizard... buttons)
- SQL:**

```
SELECT
COALESCE(
    MAX(last_update),
    '1970-01-01 00:00:00'
) max_last_update
FROM dim_customer
```
- Get SQL select statement...** button.
- Line 1 Column 0**
  - Store column info in step meta data ☐
  - Enable lazy conversion ☐
  - Replace variables in script? ☐
  - Insert data from step
  - Execute for each row? ☐
  - Limit size
- Buttons at the bottom: ? Help, OK, Preview, Cancel.



## 4. Employees – Table input.

The screenshot shows two windows from a data tool interface.

**Database Connection Window:**

- General tab:** Connection name: MySQL-ClassicModels. Connection type: MySQL.
- Settings:** Host Name: localhost, Database Name: classicmodels, Port Number: 3306, Username: root, Password: (empty).
- Access:** Native (JDBC), ODBC, JNDI.
- Buttons:** Test, Feature List, Explore.

**Connection Test Dialog:** Connection tested successfully. Connection to MySQL-ClassicModels was successful. Hostname: localhost, Port: 3306, Database name: classicmodels. OK.

**Table input Window:**

- Step name:** Employees
- Connection:** MySQL-ClassicModels
- Buttons:** Edit..., New..., Wizard..., Get SQL select statement...
- SQL:**

```
SELECT
c.customerNumber AS customer_number,
c.customerName AS customer_name,
c.phone AS phone,
CONCAT(COALESCE(c.addressLine1, ''),
CASE WHEN (ISNULL(c.addressLine2)) THEN ' ' ELSE ' ' END,
COALESCE(c.addressLine2, '')) AS address,
c.city AS city,
c.state AS state,
c.postalCode AS postal_code,
c.country AS country,
c.salesRepEmployeeNumber AS sales_rep_employee_number,
CONCAT(COALESCE(e.firstName, ''),
CASE WHEN (ISNULL(e.lastName)) THEN ' ' ELSE ' ' END,
COALESCE(e.lastName, '')) AS sales_rep_employee_name,
c.creditLimit AS credit_limit
FROM customers c
LEFT JOIN employees e ON c.salesRepEmployeeNumber = e.employeeNumber
WHERE c.updated > ?
```
- Options:** Store column info in step meta data ☐, Enable lazy conversion ☐, Replace variables in script? ☒, Insert data from step: Max Last Update, Execute for each row? ☐, Limit size: 0.
- Buttons:** Help, OK, Preview, Cancel.



## 5. Get System Info

Get system info

Step name:

Fields:

#	Name	Type
1	last_update	system date (fixed)

Buttons:

## 6. Insert / Update.

Database Connection

General

Connection name:

Connection type:

Settings

Host Name:

Database Name:

Port Number:

Username:

Password:

☒ Use Result Streaming Cursor

Test Feature List Explore

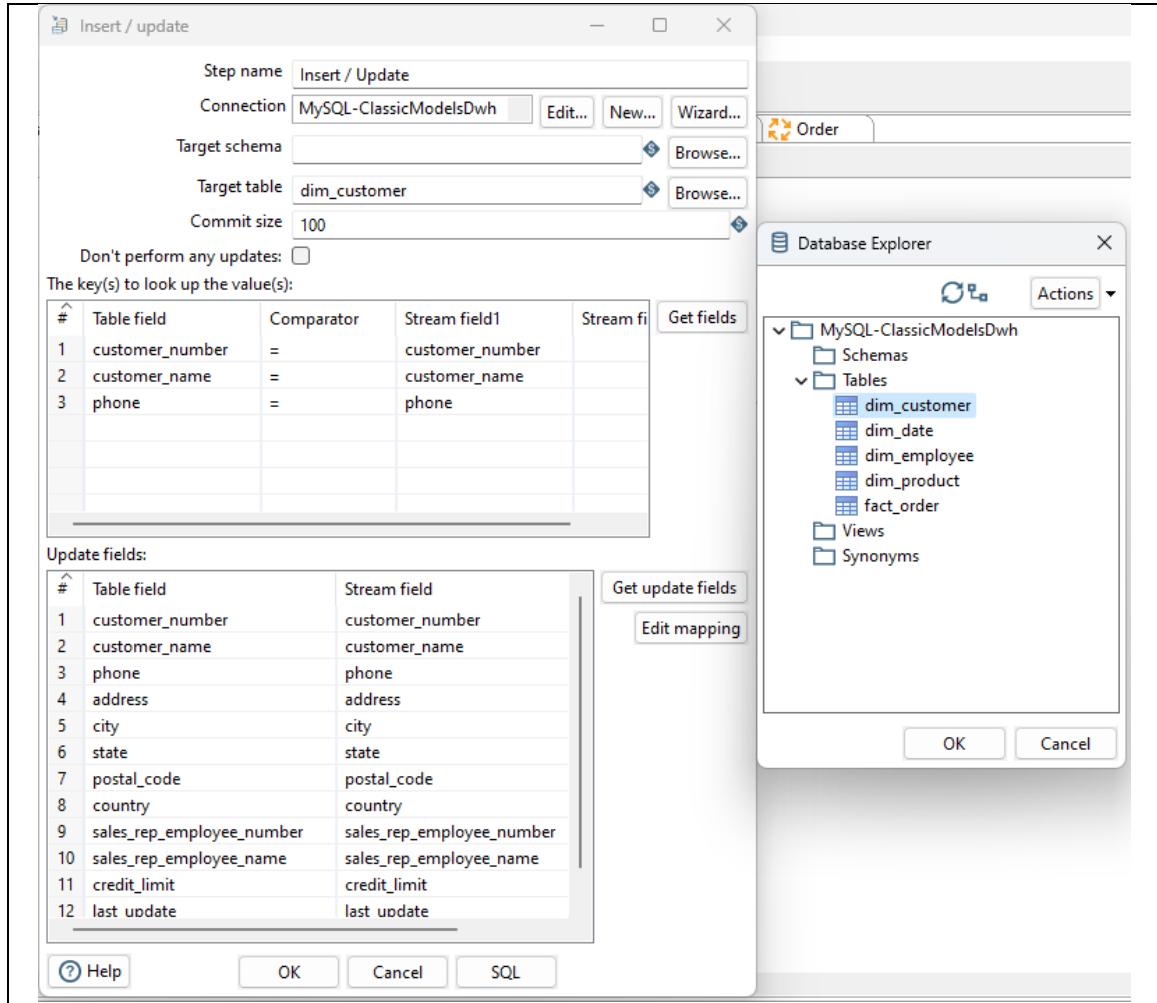
Connection tested successfully

Connection to MySQL-ClassicModelsDwh was successful.

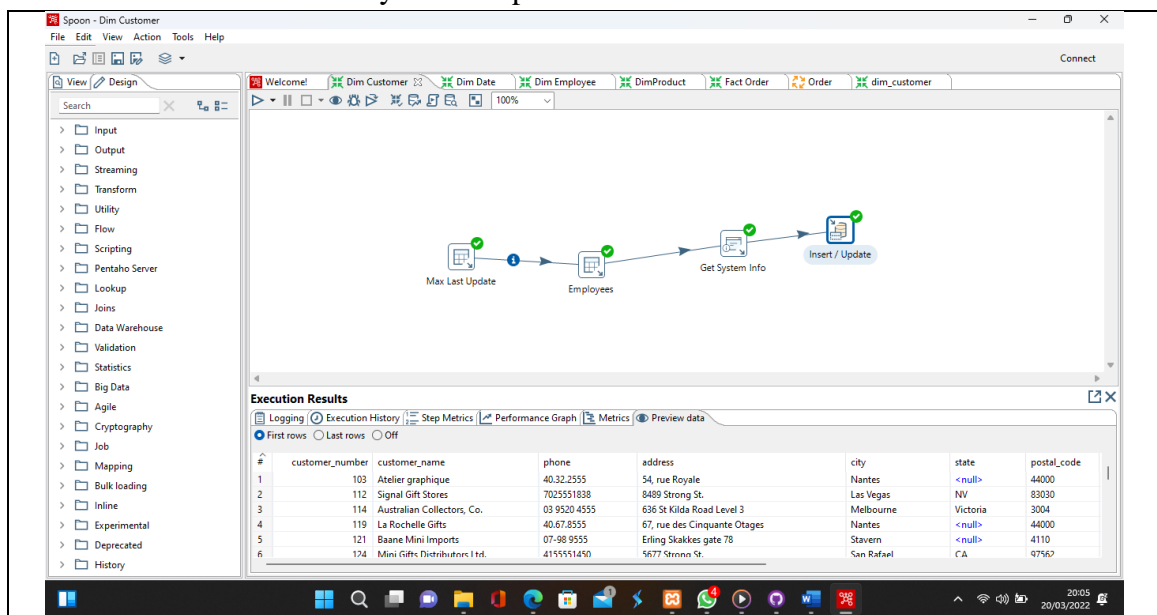
Hostname: localhost  
Port: 3306  
Database name: classicmodels\_dwh

OK Cancel



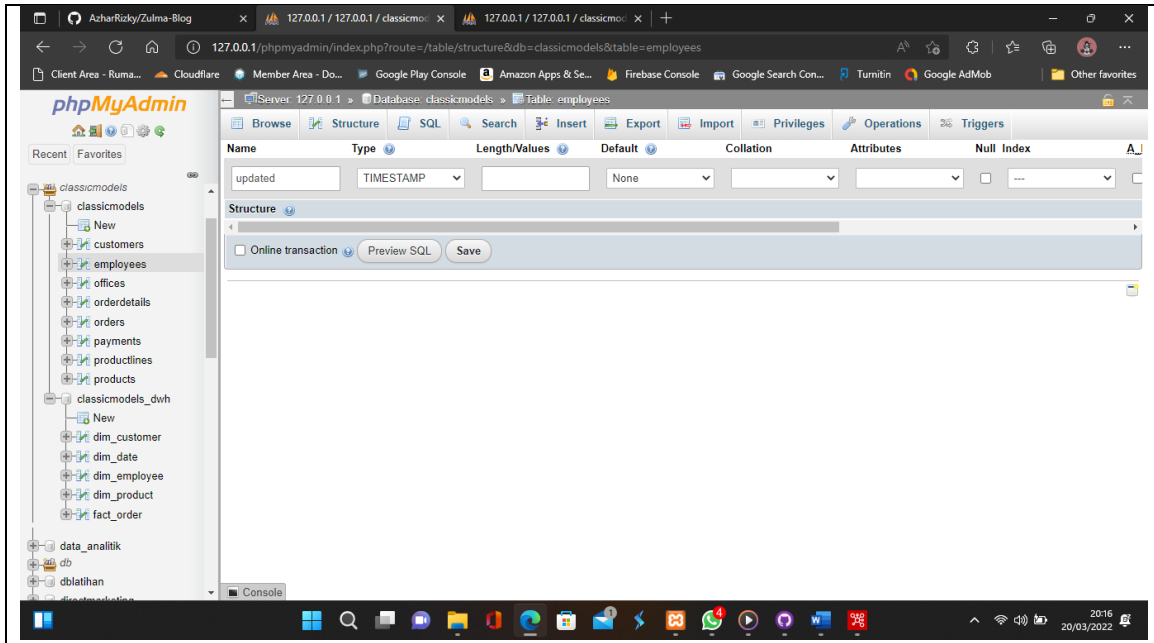


7. Lalu Jalankan maka hasilnya akan seperti ini.

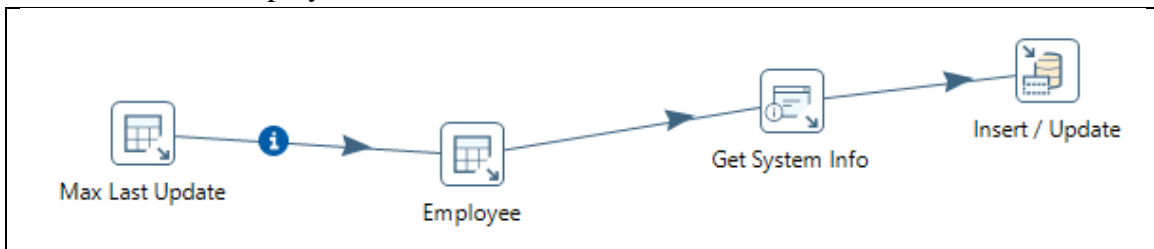


c. Latihan Ketiga – Dim Employee Transformation

1. Tambahkan kolom baru bernama updated dengan tipe data timestamp pada tabel employees dalam database classicmodels seperti pada gambar dibawah ini di MySQL.



2. Struktur Dim Employee



### 3. Max Last Update – Table input.

**Database Connection**

General  
Advanced  
Options  
Pooling  
Clustering

Connection name: MySQL-ClassicalModelsDwh

Connection type: MySQL

Settings

Host Name: localhost

Database Name: classicalmodels\_dwh

Port Number: 3306

Username: root

Password:

☒ Use Result Streaming Cursor

Connection tested successfully

Connection to MySQL-ClassicalModelsDwh was successful.

Hostname: localhost  
Port: 3306  
Database name: classicalmodels\_dwh

Test Feature List Explore

OK Cancel

**Table input**

Step name: Max Last Update

Connection: MySQL-ClassicalModelsDwh

Edit... New... Wizard...

Get SQL select statement...

SQL

```
SELECT
COALESCE(
    MAX(last_update),
    '1970-01-01 00:00:00'
) max_last_update
FROM dim_employee
```

Line 1 Column 0

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. Employee – Table input.

The image shows two windows from a data tool. The top window is 'Database Connection' and the bottom is 'Table input'.

**Database Connection Window:**

- General Tab:**
  - Connection name: MySQL-ClassicModels
  - Connection type: MySQL (selected from a list including Native Mondrian, NeoView, Netezza, Oracle, Oracle RDB, Palo MOLAP Server, Pentaho Data Services, PostgreSQL, Redshift, Remedy Action Request System, SAP ERP System, SQLite, Snowflake, SparkSQL, Sybase, SybaseIQ, and Teradata).
  - Access: Native (JDBC) (selected from a list including ODBC and JNDI).
- Settings:**
  - Host Name: localhost
  - Database Name: classicmodels
  - Port Number: 3306
  - Username: root
  - Password: (empty)
  - ☒ Use Result Streaming Cursor

A small dialog box titled 'Connection tested successfully' is overlaid on the Database Connection window, stating: 'Connection to MySQL-ClassicModels was successful. Hostname: localhost, Port: 3306, Database name: classicmodels'.

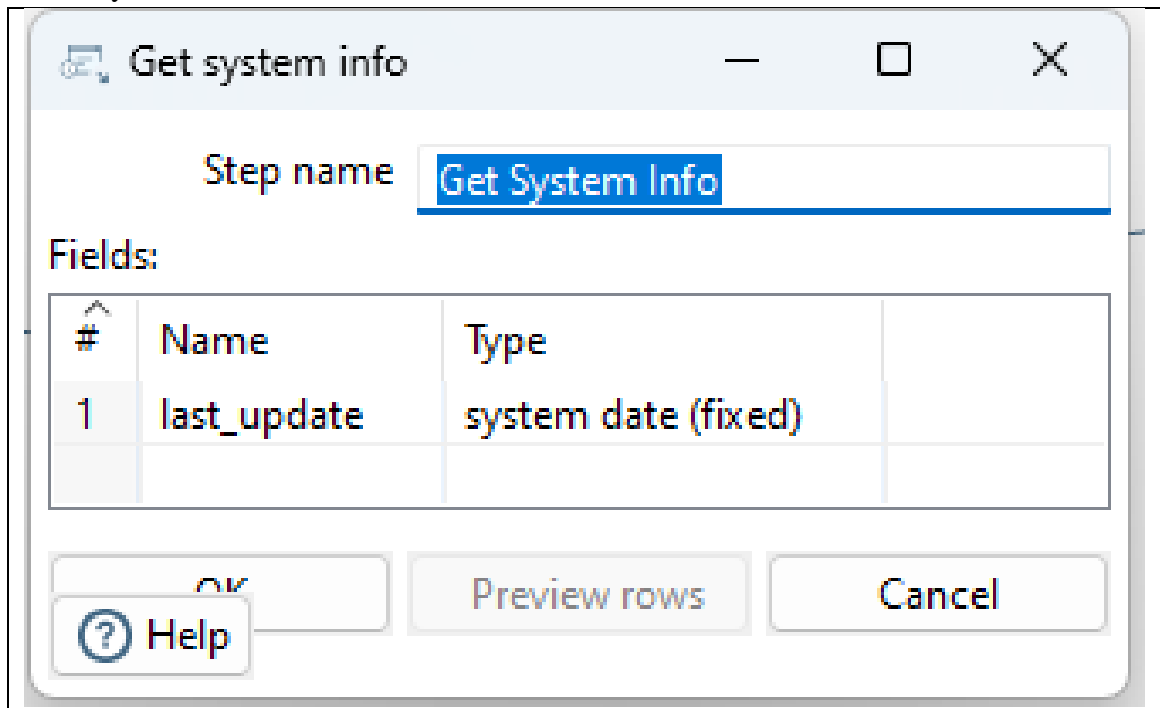
**Table input Window:**

- Step name:** Employee
- Connection:** MySQL-ClassicModels
- Buttons:** Edit..., New..., Wizard..., Get SQL select statement...
- SQL:**

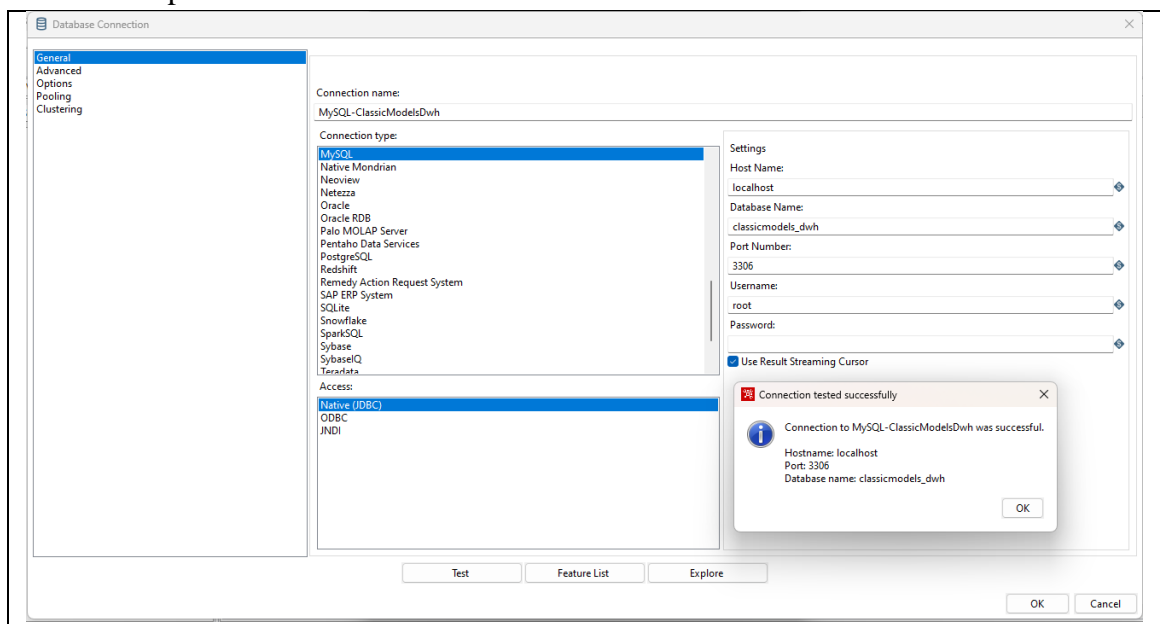
```
SELECT e.employeeNumber AS employee_number,
CONCAT (COALESCE(E.firstName, '' ),
CASE WHEN (ISNULL(E.lastName)) THEN ' ' ELSE ' ' END,
COALESCE(e.lastName, '' )) AS employee_name,
e.extension AS extension,
e.email AS email,
jobTitle AS job_title,
o.officeCode AS office_code,
CONCAT(COALESCE(o.addressLine1, '' ),
CASE WHEN (ISNULL(o.addressLine2)) THEN ' ' ELSE ' ' END,
COALESCE(o.addressLine2, '' )) AS office_address,
o.city AS office_city,
o.country AS office_country,
o.postalCode AS office_postal_code,
o.territory AS office_territory
FROM employees e
LEFT JOIN offices o ON o.officeCode = e.officeCode
WHERE e.updated > ?
```
- Line 1 Column 0:**
  - Store column info in step meta data: ☐
  - Enable lazy conversion: ☐
  - Replace variables in script?: ☒
  - Insert data from step: Max Last Update
  - Execute for each row?: ☐
  - Limit size: 0
- Buttons:** ? Help, OK, Preview, Cancel



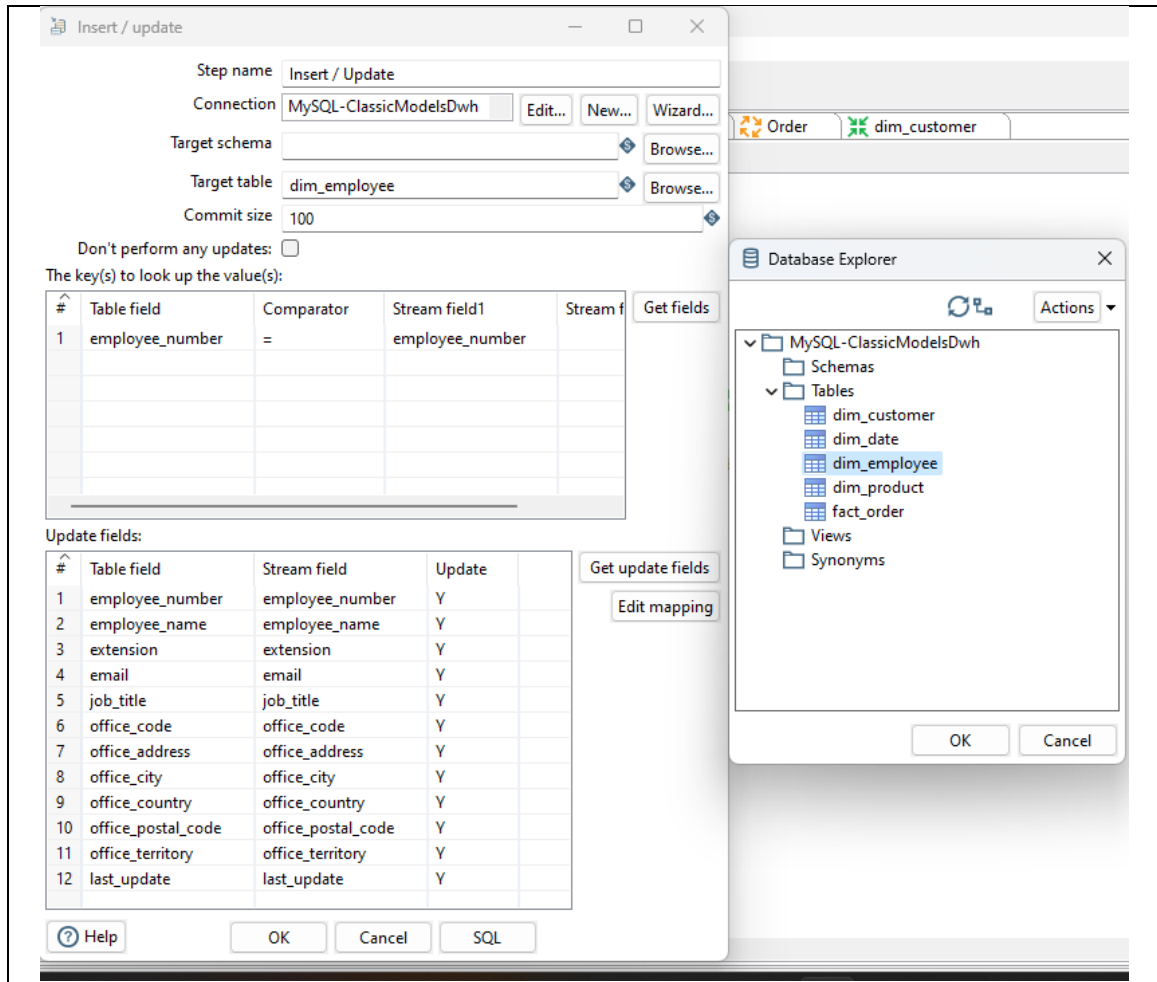
## 5. Get System Info



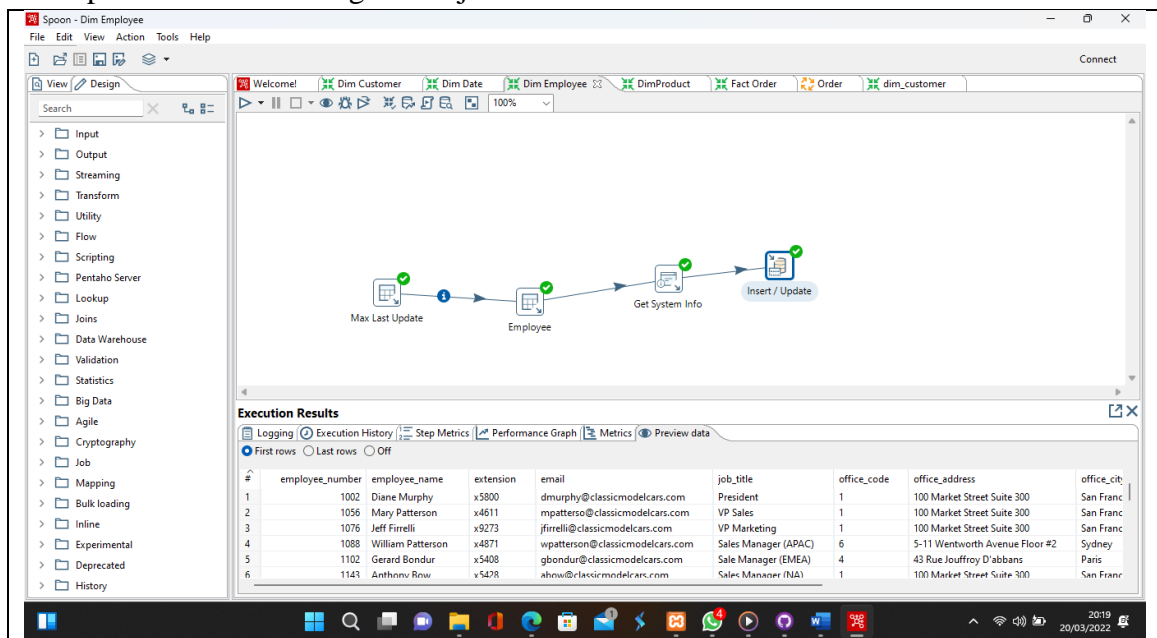
## 6. Insert / Update







## 7. Output ketika di Running dan Dijalankan



#### 4. File Praktikum

Github Repository:

#### 5. Soal Latihan

Soal:

1. Apa yang dimaksud dengan Dimensi dalam Data Warehouse?
2. Apa yang dimaksud dengan Skema dalam Data Warehouse?

Jawaban:

- 1.
- 2.

#### 6. Kesimpulan

- a. Dalam pengerjaan praktikum Data Warehouse, kita harus benar-benar teliti dalam menginputkan suatu fungsi untuk menampilkan suatu keluaran pada layar dengan sesuai.
- b. Kita dapat mengetahui...

#### 7. Cek List (✓)

No	Elemen Kompetensi	Penyelesaian	
		Selesai	Tidak Selesai
1.	Latihan Pertama	...	
2.	Latihan Kedua	...	
3.	Latihan Ketiga	...	

#### 8. Formulir Umpan Balik

No	Elemen Kompetensi	Waktu Pengerjaan	Kriteria
1.	Latihan Pertama	... Menit	...
2.	Latihan Kedua	... Menit	...
3.	Latihan Ketiga	... Menit	...

Keterangan:

1. Menarik
2. Baik
3. Cukup
4. Kurang

