

Sistem Manajemen Pengiriman dan Pencatatan Produk PT Kalbe Nutritional

Database Administrator Project Based Internship Program

Presented by
Benny Banu Adjie



Benny Banu Adjie

About You

Fresh graduate Statistic Universitas Islam Indonesia dengan. Saya sangat tertarik dengan bidang data, saya bersemangat untuk menyalurkan antusiasme saya ke peran Analis Data, Data Analyst Data Scientist dan Data Engineer

Insert Your Experience

- Beasiswa Database Design & Programming With SQL BY Digital Talent Scholarship
- Project-Based Virtual Intern : Data Scientist Home Credit Indonesia x Rakamin Academy
- Project-Based Visual Intern : Business Intelligence Analyst Bank Muamalat x Rakamin Academy

Case Study

Di dalam PT Kalbe Nutritionals akan dibuat sebuah software manajemen distribusi produk. Software ini akan digunakan untuk mencatat dan mentracking status pengiriman barang dari gudang PT Kalbe nutritionals ke toko. Sebelum dibuatnya software ini, proses pencatatan dilakukan di dalam sebuah spreadsheet. File hasil pencatatan distribusi terlampir di dalam lampiran.

[Lampiran 1](#)

[Lampiran 2](#)

- Lakukanlah normalisasi dari hasil pencatatan distribusi barang tersebut
- Buatlah ERD berdasarkan hasil dari normalisasi data distribusi barang
- Buatlah database dan struktur table & relasi menggunakan RDBMS PostgreSQL
 - Buatlah struktur table tersebut di dalam schema yang bernama app
 - Untuk data produk, silahkan import dari file lampiran kedua
 - Buatlah sebuah user yang akan digunakan oleh backend programmer untuk melakukan operasi database dengan akses hanya dapat melakukan DML (INSERT, UPDATE, DELETE, SELECT)
 - Buatlah index di dalam table sesuai kebutuhan untuk mengoptimalkan query

Case Study

- Buatlah query untuk kebutuhan - kebutuhan di bawah ini
 - Menampilkan 2 driver dengan pengiriman terbanyak bulan Mei 2023
 - Menampilkan 10 barang paling sering dikirim di bulan Mei 2023
 - Menampilkan semua pengiriman yang belum selesai
- Buatlah sebuah user defined function
 - Untuk membuat ID Shipment dengan format yymmddxxx (contoh: 230519001, 230519002)
- Buatlah 2 buah stored procedure
 - Untuk membuat shipment baru
 - Untuk menambahkan product ke dalam shipment
- Buatlah Daily Backup
 - Buatlah task / job untuk melakukan backup database pukul 23:00 setiap hari
- Daftarkan database tersebut ke dalam SolarWinds DPA
 - Buatlah alert ketika suatu query memiliki total waiting time sebesar 10 detik atau lebih

Result

Data

Lampiran 1 ☆ 📄 📁

File Edit Tampilan Sisipkan Format Data Alat Ekstensi Bantuan

🔍 🖨️ 📄 100% 📄 Hanya lihat

	A	B	C	D	E	F	G	H	I	J	K
1	No	Product Name	Qty	Unit	Store Destination	Store Address	Operator	Shipping Vehicle	No Polisi	Shipping Driver	Shipping
2	1	Hydro Coco 250ml	5	box	Apotek Agus Sari	Jln Angga Jaya no 21	Ahmad Agus	Box A001	B 1234 GA	Dimas Ahmad	Andi Wahyu
3	2	Hydro Coco Vita-D 330ml	5	box	Apotek Agus Sari	Jln Angga Jaya no 21	Ahmad Agus	Box A001	B 1234 GA	Dimas Ahmad	Andi Wahyu
4	3	Milna Biskuit Bayi Apel	10	box	Apotek Agus Sari	Jln Angga Jaya no 21	Ahmad Agus	Box A001	B 1234 GA	Dimas Ahmad	Andi Wahyu
5	4	Hydro Coco 250ml	3	box	Toko Maju Bersama	Jln Agus Salim no 22	Ahmad Agus	Box A002	B 3214 JS	Hari Saputra	Dadang Bim
6	5	Hydro Coco 330ml	2	box	Toko Maju Bersama	Jln Agus Salim no 22	Ahmad Agus	Box A002	B 3214 JS	Hari Saputra	Dadang Bim
7	6	Enterasol Gold Original	8	box	Toko Maju Bersama	Jln Agus Salim no 22	Ahmad Agus	Box A002	B 3214 JS	Hari Saputra	Dadang Bim
8	7	Milna Nature Delight Apel Peach	10	box	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
9	8	Milna Nature Delight Apel Labu Wortel	5	box	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
10	9	Milna Rice Crackers Apple Orange	12	box	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
11	10	Milna Bubur Organik Multigrain	10	box	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
12	11	Enterasol Active Vanilla latte	5	box	Apotek Agung	Pasar Senen no 301	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
13	12	Enterasol Gold Original	4	box	Apotek Agung	Pasar Senen no 301	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
14	13	Enterasol Gold Chocolate	6	box	Apotek Agung	Pasar Senen no 301	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra
15											

Lampiran 2 - Data Produk ☆ 📄 📁

File Edit Tampilan Sisipkan Format Data Alat Ekstensi

🔍 🖨️ 📄 100% 📄 Hanya lihat

	A	B	
1	no	name	
2	1	Hydro Coco 250ml	
3	2	Hydro Coco 330ml	
4	3	Hydro Coco 500ml	
5	4	Hydro Coco 1 liter	
6	5	Hydro Coco Vita-D 330ml	
7	6	Milna Biskuit Bayi Original	
8	7	Milna Biskuit Bayi Beras Merah	
9	8	Milna Biskuit Bayi Kacang Hijau	
10	9	Milna Biskuit Bayi Jeruk	
11	10	Milna Biskuit Bayi Pisang	
12	11	Milna Biskuit Bayi Apel	
13	12	Milna Biskuit Bayi Jeruk	
14	13	Milna Bubur Bayi Beras Merah Untuk 6 - 12 Bulan	
15	14	Milna Bubur Bayi Pisang Untuk 6 - 12 Bulan	
16	15	Milna Bubur Bayi Sup Ayam Wortel Untuk 6 - 12 Bulan	
17	16	Milna Bubur Bayi Sup Daging Brokoli Untuk 6 - 12 Bulan	
18	17	Milna Bubur Bayi Tim Hati Ayam Bayam Untuk 6 - 12 Bulan	
19	18	Milna Bubur Bayi Ayam Jagung Manis Untuk 8 - 12 Bulan	

Result

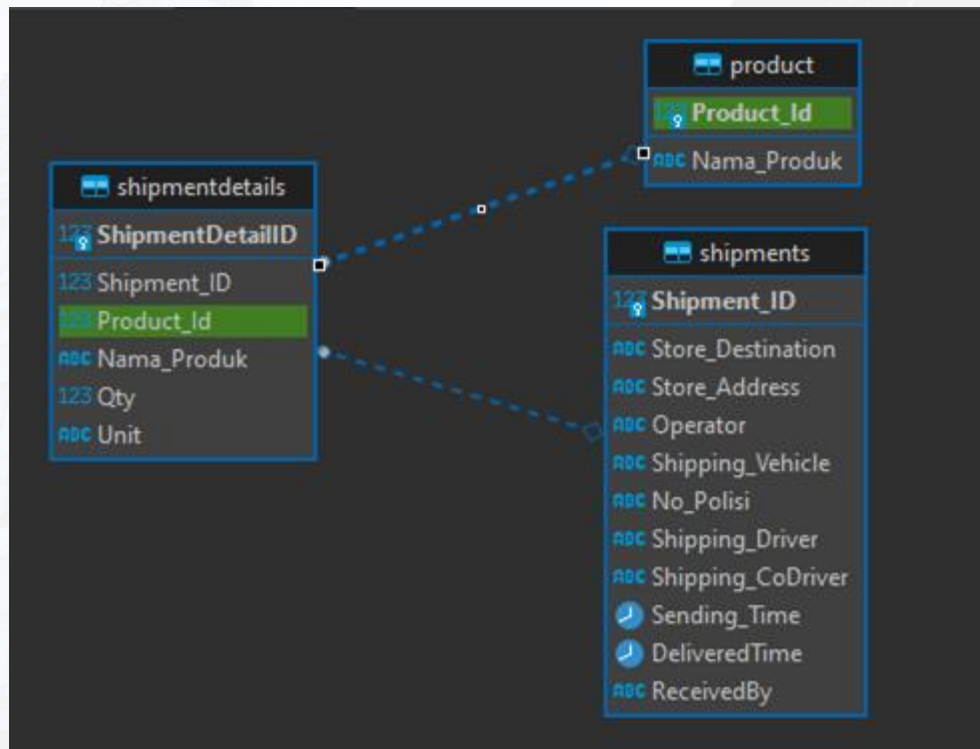
Normalisasi Data

product
123 Product_Id
ABC Nama_Produk

shipmentdetails
123 ShipmentDetailID
123 Shipment_ID
123 Product_Id
ABC Nama_Produk
123 Qty
ABC Unit

shipments
123 Shipment_ID
ABC Store_Destination
ABC Store_Address
ABC Operator
ABC Shipping_Vehicle
ABC No_Polisi
ABC Shipping_Driver
ABC Shipping_CoDriver
⌚ Sending_Time
⌚ DeliveredTime
ABC ReceivedBy

ERD



Result

Membuat Database Kalbe dan Schema app

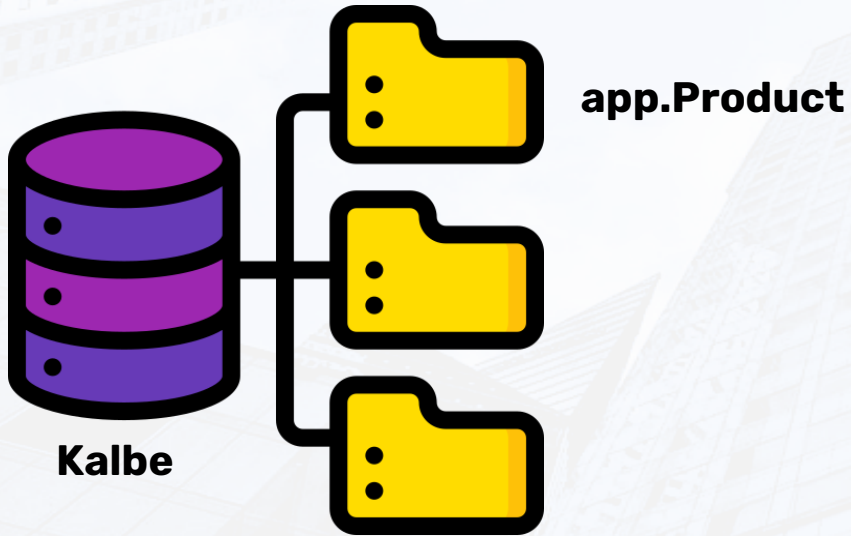
```
CREATE DATABASE kalbe
WITH
OWNER = postgres
ENCODING = 'UTF8'
LC_COLLATE = 'English_Indonesia.1252'
LC_CTYPE = 'English_Indonesia.1252'
TABLESPACE = pg_default
CONNECTION LIMIT = -1
IS_TEMPLATE = False;
```

```
CREATE SCHEMA app;
```



Result

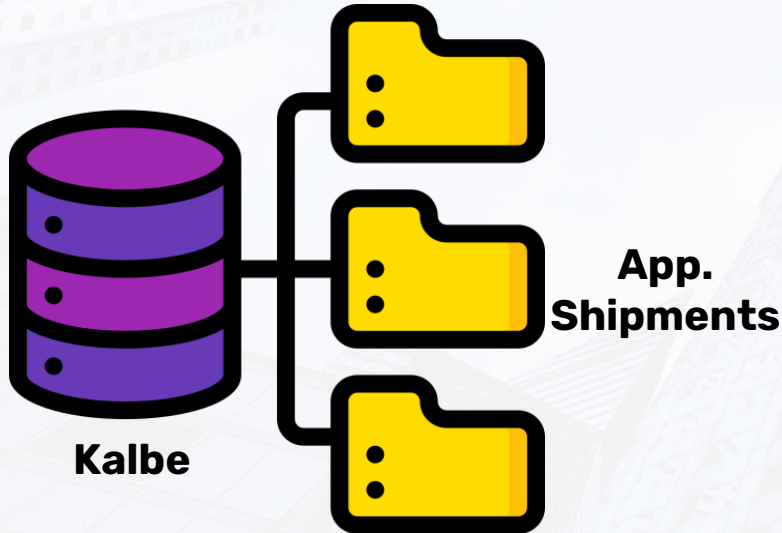
Membuat tabel, insert data dan membuat index pada tabel



```
CREATE TABLE app.Product(  
    "Product_Id" serial PRIMARY KEY,  
    "Nama_Produk" varchar(255) NOT NULL  
);  
  
COPY app.Product ("Nama_Produk")  
  
FROM  
'/Users/BENI/Documents/project/RakaminxKalbe/pro  
duct.csv' DELIMITER ';' CSV HEADER;
```


Result

Membuat tabel, insert data dan membuat index pada tabel



```
CREATE TABLE app.Shipments (
```

```
"Shipment_ID" serial PRIMARY KEY, "Store_Destination" varchar(255)
NOT NULL, "Store_Address" varchar(255), "Operator" varchar(255) NOT
NULL, "Shipping_Vehicle" varchar(255), "No_Polisi" varchar(20),
"Shipping_Driver" varchar(255), "Shipping_CoDriver" varchar(255),
"Sending_Time" timestamp NOT NULL, "DeliveredTime" timestamp,
"ReceivedBy" varchar(255) );
```

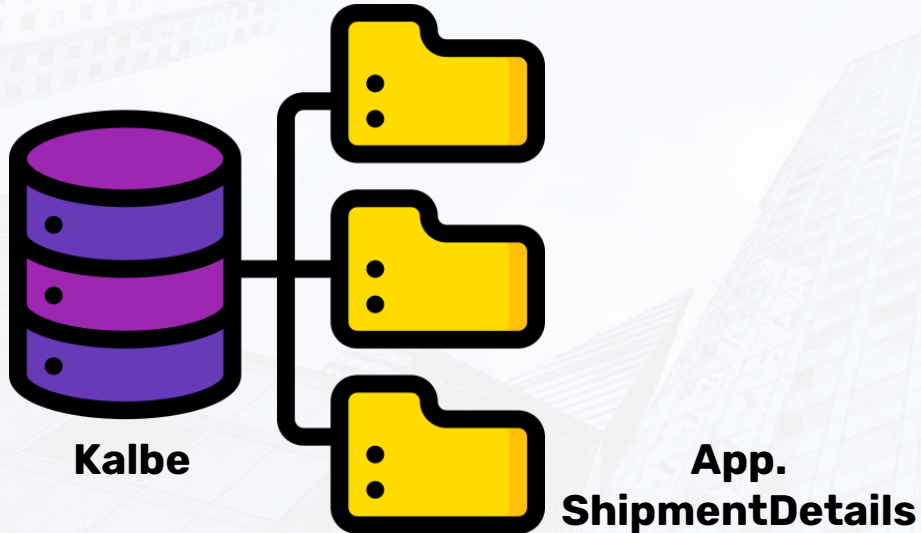
```
CREATE INDEX idx_SendingTime ON app.Shipments ("Sending_Time");
```

```
COPY app.Shipments ("Store_Destination", "Store_Address", "Operator",
"Shipping_Vehicle", "No_Polisi", "Shipping_Driver", "Shipping_CoDriver",
"Sending_Time", "DeliveredTime", "ReceivedBy")
```

```
FROM '/Users/BENI/Documents/project/RakaminxKalbe/shipments.csv'
DELIMITER ';' CSV HEADER;
```

Result

Membuat tabel, insert data dan membuat index pada tabel



```
CREATE TABLE app.ShipmentDetails (
```

```
    "ShipmentDetailID" serial PRIMARY KEY, "Shipment_ID" integer  
    REFERENCES app.Shipments ("Shipment_ID"), "Product_Id" integer  
    REFERENCES app.Product ("Product_Id"), "Nama_Produk" varchar(255),  
    "Qty" integer, "Unit" varchar(10), FOREIGN KEY ("Shipment_ID")  
    REFERENCES app.Shipments ("Shipment_ID"), FOREIGN KEY  
    ("Product_Id") REFERENCES app.Product ("Product_Id")
```

```
);
```

```
CREATE INDEX idx_ShipmentID ON app.ShipmentDetails ("Shipment_ID");
```

```
COPY app.ShipmentDetails ("Shipment_ID","Product_Id",  
    "Nama_Produk","Qty", "Unit") FROM  
    '/Users/BENI/Documents/project/RakaminxKalbe/shipments_detail.csv'  
    DELIMITER ';' CSV HEADER;
```

Result

Membuat user yang akan digunakan untuk backend



Akses

INSERT
UPDATE
DELETE
SELECT

```
CREATE USER backend_user WITH PASSWORD  
'password';
```

```
GRANT CONNECT ON DATABASE kalbe TO  
backend_user;
```

```
GRANT USAGE ON SCHEMA app TO backend_user;
```

```
GRANT SELECT, INSERT, UPDATE, DELETE ON  
ALL TABLES IN SCHEMA app TO backend_user;
```

```
ALTER DEFAULT PRIVILEGES IN SCHEMA app  
GRANT SELECT, INSERT, UPDATE, DELETE ON  
TABLES TO backend_user;
```

Result

Menampilkan 2 Driver dengan pengiriman Terbanyak Pada Bulan Mei

	Shipping_Driver character varying (255) 🔒	Jumlah_Pengiriman bigint 🔒
1	Ginanjari	7
2	Hari Saputra	3

Menampilkan Pengiriman yang belum selesai

Shipment_ID [PK] integer	Store_Destination character varying (255)	Store_Address character varying (255)	Operator character varying (255)

Menampilkan 10 barang paling sering dikirim di bulan Mei 2023

	Nama_Produk character varying (255) 🔒	Total_Pengiriman bigint 🔒
1	Entrasol Gold Original	12
2	Milna Rice Crackers Apple Orange	12
3	Milna Biskuit Bayi Apel	10
4	Milna Nature Delight Apel Peach	10
5	Milna Bubur Organik Multigrain	10
6	Hydro Coco 250ml	8
7	Entrasol Gold Chocolate	6
8	Hydro Coco Vita-D 330ml	5
9	Entrasol Active Vanilla latte	5
10	Milna Nature Delight Apel Labu Wortel	5

Result

Membuat User Defined Function

```
CREATE OR REPLACE FUNCTION generate_shipment_id()
RETURNS integer AS $$
DECLARE
    today date;
    max_id integer;
BEGIN
    today := CURRENT_DATE;

    -- Mengambil nilai maksimum ID Shipment pada tanggal yang sama
    SELECT MAX("Shipment_ID") INTO max_id FROM app.Shipments WHERE DATE("Sending_Time") = today;
    max_id := max_id + 1;

    RETURN max_id;
END;
$$ LANGUAGE plpgsql;
```


Membuat Store Procedur shipment baru

1

```
-- create_shipment --  
CREATE OR REPLACE PROCEDURE create_shipment(  
    store_destination varchar,  
    store_address varchar,  
    operator_name varchar,  
    shipping_vehicle varchar,  
    no_polisi varchar,  
    shipping_driver varchar,  
    shipping_co_driver varchar,  
    sending_time timestamp,  
    received_by varchar  
)  
LANGUAGE plpgsql AS $$  
DECLARE  
    shipment_id integer;  
BEGIN
```

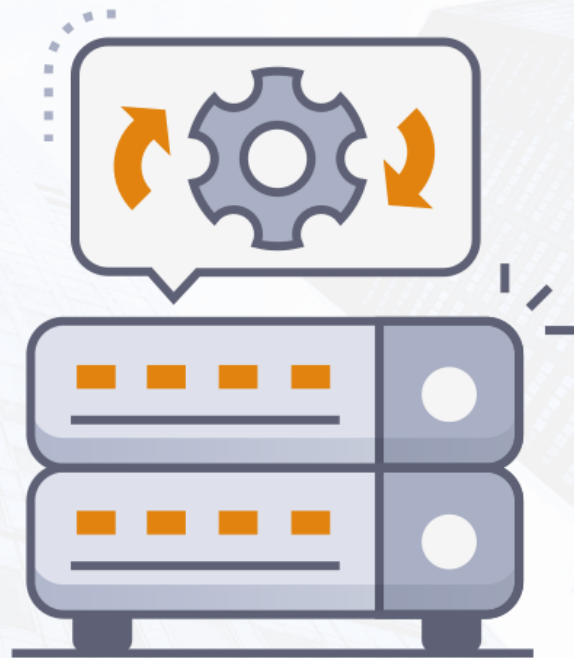
2

```
SELECT generate_shipment_id() INTO shipment_id;  
  
-- menyimpan data pengiriman ke tabel app.Shipments  
INSERT INTO app.Shipments (  
    "Shipment_ID",  
    "Store_Destination",  
    "Store_Address",  
    "Operator",  
    "Shipping_Vehicle",  
    "No_Polisi",  
    "Shipping_Driver",  
    "Shipping_CoDriver",  
    "Sending_Time",  
    "ReceivedBy"  
)
```

Membuat Store Procedur shipment baru

3

```
VALUES (  
    shipment_id,  
    store_destination,  
    store_address,  
    operator_name,  
    shipping_vehicle,  
    no_polisi,  
    shipping_driver,  
    shipping_co_driver,  
    sending_time,  
    received_by  
);  
END;  
$$;
```



Membuat Store Procedur Menambahkan produk ke dalam shipment

```
-- store procedur add produk to shipment --
CREATE OR REPLACE PROCEDURE add_product_to_shipment(
    shipment_id integer,
    product_id integer,
    qty integer,
    unit varchar
)
LANGUAGE plpgsql AS $$
BEGIN
    -- menyimpan data detail pengiriman ke dalam tabel app.ShipmentDetails
    INSERT INTO app.ShipmentDetails (
        "Shipment_ID",
        "Product_Id",
        "Qty",
        "Unit"
    )
    VALUES (
        shipment_id,
        product_id,
        qty,
        unit
    );
END;
$$;
```



Buatlah task / job untuk melakukan backup database pukul 23:00 setiap hari

1

Buatlah function ***GetAllData*** Untuk menampilkan seluruh data

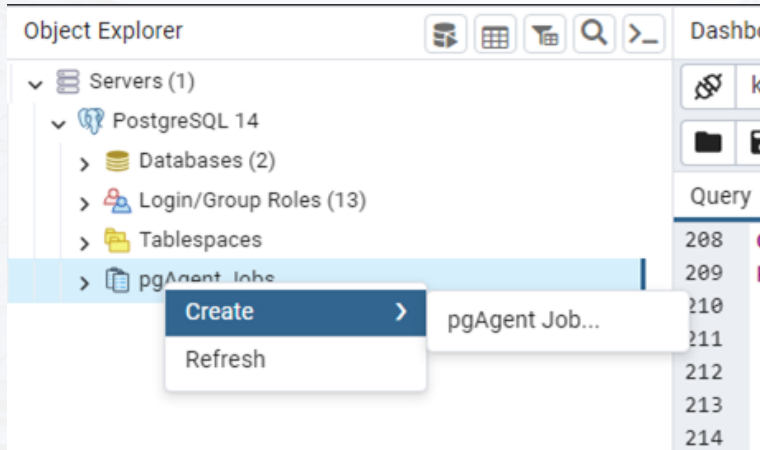
```
CREATE OR REPLACE FUNCTION GetAllData()
RETURNS TABLE (
    "Product_Id" integer, "Nama_Produk" varchar(255),
    "Shipment_ID" integer, "Store_Destination" varchar(255),
    "Store_Address" varchar(255), "Operator" varchar(255),
    "Shipping_Vehicle" varchar(255), "No_Polisi" varchar(20),
    "Shipping_Driver" varchar(255), "Shipping_CoDriver" varchar(255),
    "Sending_Time" timestamp, "DeliveredTime" timestamp,
    "ReceivedBy" varchar(255), "ShipmentDetailID" integer,
    "Qty" integer, "Unit" varchar(10)
)
AS $$
BEGIN
    RETURN QUERY
    SELECT
        p."Product_Id", p."Nama_Produk", s."Shipment_ID", s."Store_Destination",
        s."Store_Address", s."Operator", s."Shipping_Vehicle", s."No_Polisi",
        s."Shipping_Driver", s."Shipping_CoDriver", s."Sending_Time", s."DeliveredTime",
        s."ReceivedBy", sd."ShipmentDetailID", sd."Qty", sd."Unit"
    FROM
        app.ShipmentDetails as sd
    JOIN app.Shipments as s ON sd."Shipment_ID" = s."Shipment_ID"
    JOIN app.Product as p ON sd."Product_Id" = p."Product_Id";
END;
$$ LANGUAGE plpgsql;
```

Buatlah task / job untuk melakukan backup database pukul 23:00 setiap hari

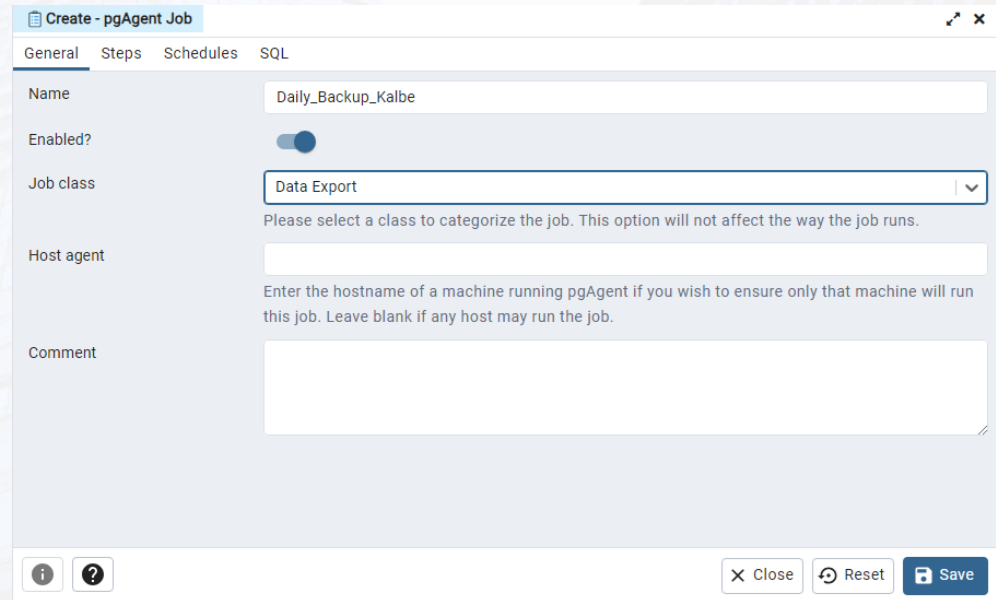
2 Lakukan backup data Seluruh Pengiriman secara rutin setiap harinya pukul 11 malam, dengan membuat scheduling dengan pgAgent.

a. Buka pgAdmin

b. Buat pgAgentjob



c. Beri nama : Daily_Backup_kalbe



Buatlah task / job untuk melakukan backup database pukul 23:00 setiap hari

3

Membuat step

Langkah 1 : pilih menu step

Langkah 2 : tambah step

Langkah 3 : buat nama step

Langkah 4 : enable step

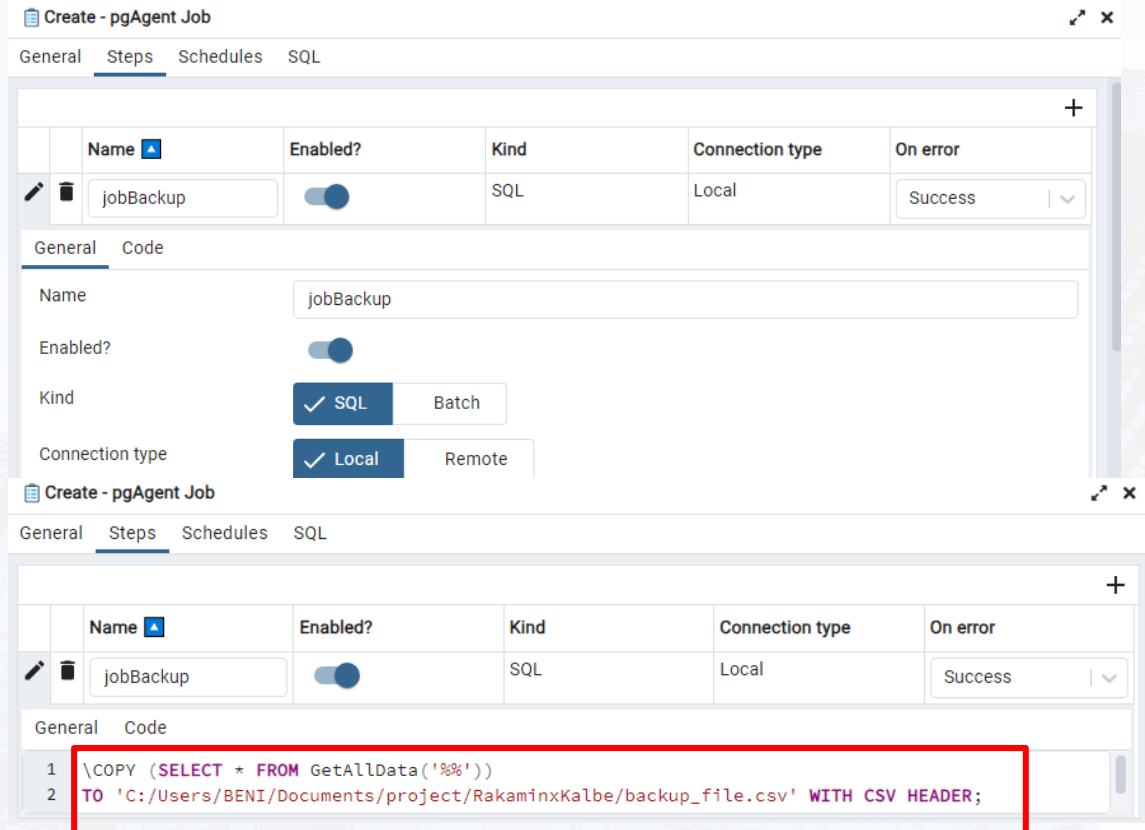
Langkah 5 : pilih type query

Langkah 6 : pilih koneksi type

Langkah 7 : pilih database yang

Digunakan

Langkah 8 : memanggil function
dan cetak file pada direktori



Create - pgAgent Job

General Steps Schedules SQL

Name	Enabled?	Kind	Connection type	On error
jobBackup	<input checked="" type="checkbox"/>	SQL	Local	Success

General Code

Name: jobBackup

Enabled?: ☒

Kind: ☒ SQL ☐ Batch

Connection type: ☒ Local ☐ Remote

Create - pgAgent Job

General Steps Schedules SQL

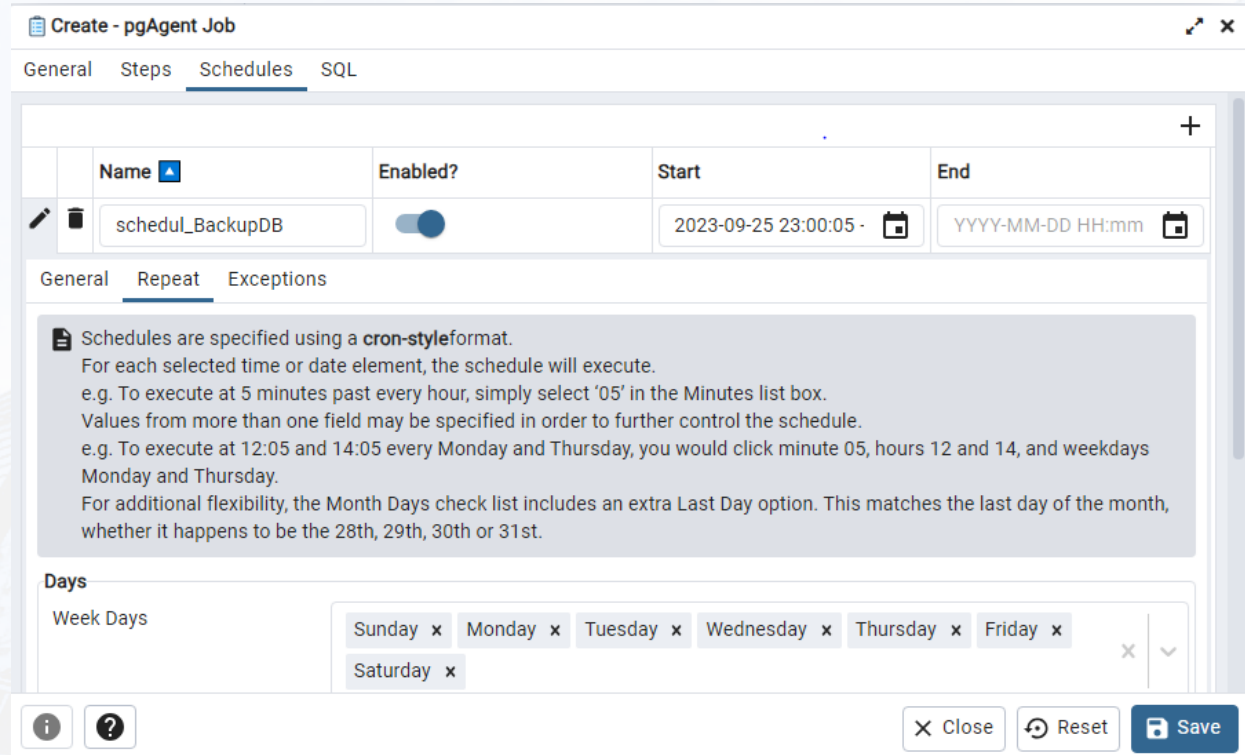
General Code

```
1 \COPY (SELECT * FROM GetAllData('%'))
2 TO 'C:/Users/BENI/Documents/project/RakaminxKalbe/backup_file.csv' WITH CSV HEADER;
```





Buatlah task / job untuk melakukan backup database pukul 23:00 setiap hari

4 Membuat *Schedule*


Menu schedule pada PgAgent adalah bagian dari pekerjaan (job) yang memungkinkan pengguna untuk menjadwalkan kapan pekerjaan tersebut akan dijalankan. Pada menu schedule, pengguna dapat menentukan waktu dan frekuensi eksekusi pekerjaan.



The screenshot shows the 'Create - pgAgent Job' dialog box with the 'Schedules' tab selected. The dialog has four tabs: General, Steps, Schedules, and SQL. The 'Schedules' tab contains a table with columns: Name, Enabled?, Start, and End. The first row shows a schedule named 'schedul_BackupDB' which is enabled (toggle is on), with a start time of '2023-09-25 23:00:05' and an end time field labeled 'YYYY-MM-DD HH:mm'. Below the table are three sub-tabs: General, Repeat, and Exceptions. The 'Repeat' sub-tab is active and contains a text box with instructions on how to specify schedules using a cron-style format. At the bottom of the 'Repeat' sub-tab, there is a 'Days' section with a 'Week Days' label and a list of days: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, each with an 'x' icon to toggle selection. The bottom of the dialog features an information icon, a help icon, and three buttons: 'Close', 'Reset', and 'Save'.

Name	Enabled?	Start	End
  schedul_BackupDB	<input checked="" type="checkbox"/>	2023-09-25 23:00:05 - 	YYYY-MM-DD HH:mm 

General Repeat Exceptions



 Schedules are specified using a **cron-style** format.
For each selected time or date element, the schedule will execute.
e.g. To execute at 5 minutes past every hour, simply select '05' in the Minutes list box.
Values from more than one field may be specified in order to further control the schedule.
e.g. To execute at 12:05 and 14:05 every Monday and Thursday, you would click minute 05, hours 12 and 14, and weekdays Monday and Thursday.
For additional flexibility, the Month Days check list includes an extra Last Day option. This matches the last day of the month, whether it happens to be the 28th, 29th, 30th or 31st.

Days

Week Days

Sunday x Monday x Tuesday x Wednesday x Thursday x Friday x

Saturday x

  Close Reset Save

Buatlah task / job untuk melakukan backup database pukul 23:00 setiap hari

5

Running dan Output

pgAgent Jobs (1)

> Daily_Backup_Kalbe

- Create
- Delete
- Refresh...
- CREATE Script
- Run now**
- Properties...

Data Backup_file.csv

backup_file.csv - Excel

Product_Id	Nama_Produk	Shipment_ID	Store_Destination	Store_Address	Operator	Shipping_Vehicle	No_Polisi	Shipping_Driver	Shipping_CoDriver	Sending_Time
1	Hydro Coco 250ml	4	Toko Maju Bersama	Jln Agus Salim no 22	Ahmad Agus	Box A002	B 3214 JS	Hari Saputra	Dadang Bima	2023-05-01 11:00:00
2	Hydro Coco 330ml	5	Toko Maju Bersama	Jln Agus Salim no 22	Ahmad Agus	Box A002	B 3214 JS	Hari Saputra	Dadang Bima	2023-05-01 11:00:00
3	Hydro Coco Vita-D 330ml	2	Apotek Agus Sari	Jln Angga Jaya no 21	Ahmad Agus	Box A001	B 1234 GA	Dimas Ahmad	Andi Wahyu	2023-05-01 10:00:00
4	Milna Biskuit Bayi Apel	3	Apotek Agus Sari	Jln Angga Jaya no 21	Ahmad Agus	Box A001	B 1234 GA	Dimas Ahmad	Andi Wahyu	2023-05-01 10:00:00
5	Milna Nature Delight Apel Labu Wortel	8	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra	2023-05-02 09:00:00
6	Milna Nature Delight Apel Peach	7	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra	2023-05-02 09:00:00
7	Milna Rice Crackers Apple Orange	9	Toko Anak Sehat	Jln Imam Bonjol no 33	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra	2023-05-02 09:00:00
8	Entrasol Active Vanilla latte	11	Apotek Agung	Pasar Senen no 301	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra	2023-05-02 09:00:00
9	Entrasol Gold Original	12	Apotek Agung	Pasar Senen no 301	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra	2023-05-02 09:00:00
10	Entrasol Gold Chocolate	13	Apotek Agung	Pasar Senen no 301	Fitrianto	Box A001	B 1234 GA	Ginanjari	Hari Saputra	2023-05-02 09:00:00

Insert Your Link Here

https://github.com/BennyBanuA/Kalbe-Nutritional_Database-Administrator_VIProgram.git

Video Presentation Here

https://drive.google.com/file/d/1SH_wljqaILc4-6sRzaUrlWmtFu5NxJlt/view?usp=sharing

Thank You



Rakamin
Academy



KALBE
Nutritional