PostgreSQL - Querying and Filtering

Tessy Badriyah, PhD.

Topik

Getting Started

Querying

- SELECT
- Kolom alias
- ORDER BY
- DISTINCT

Filtering

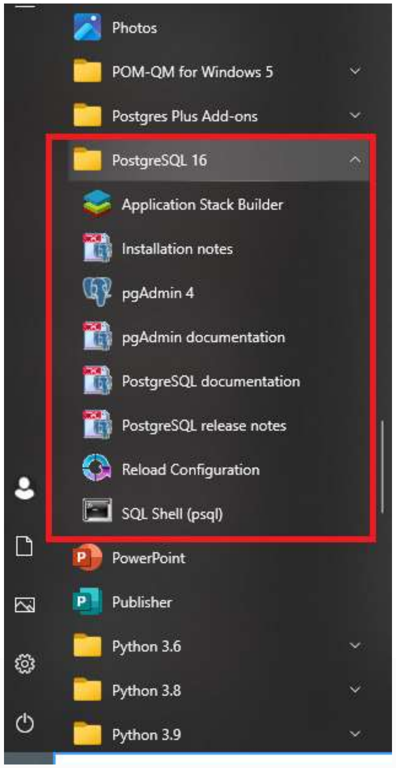
- Where
- Limit
- Fetch
- In
- Between
- Like
- Is NULL

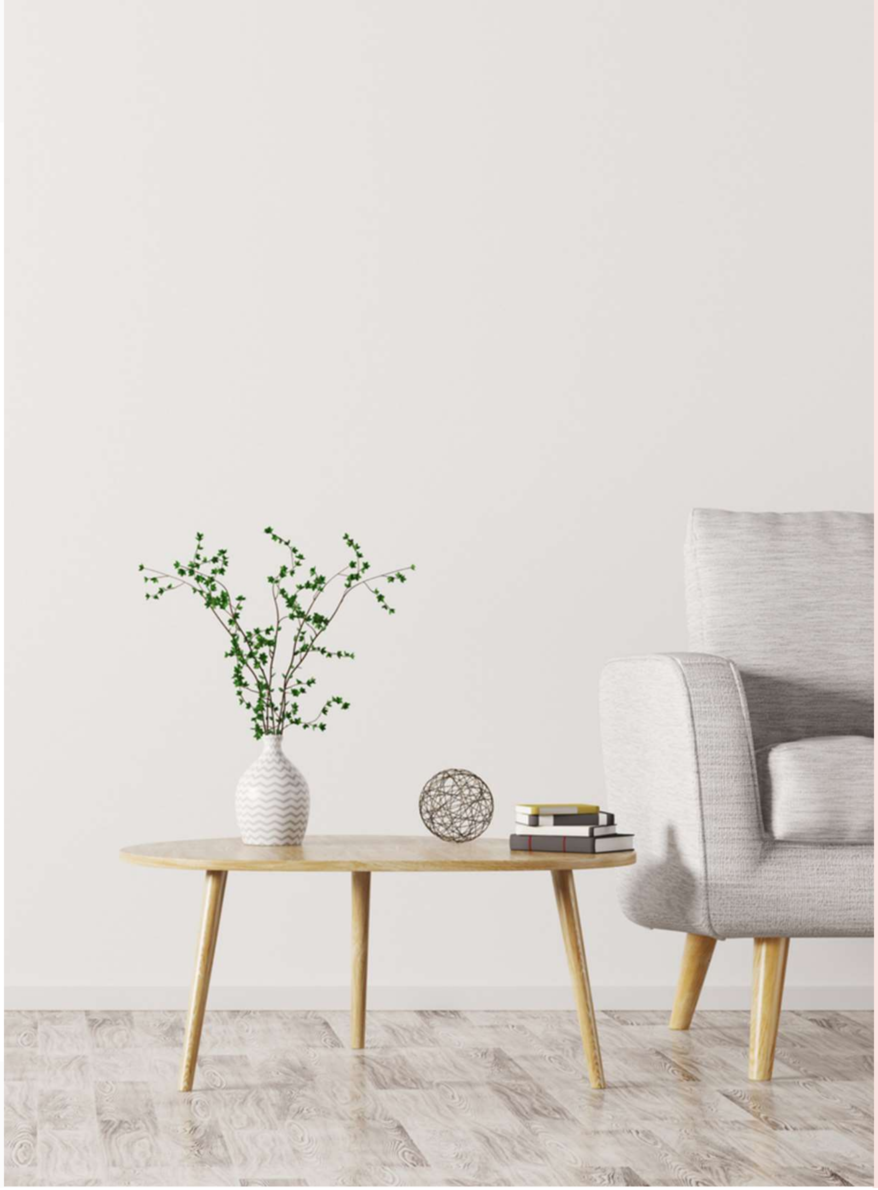
Getting started

- Install PostgreSQL on Windows
- Connect to PostgreSQL database server
- PostgreSQL Sample Database
- Load the sample database into the PostgreSQL database server

Install PostgreSQL on Windows

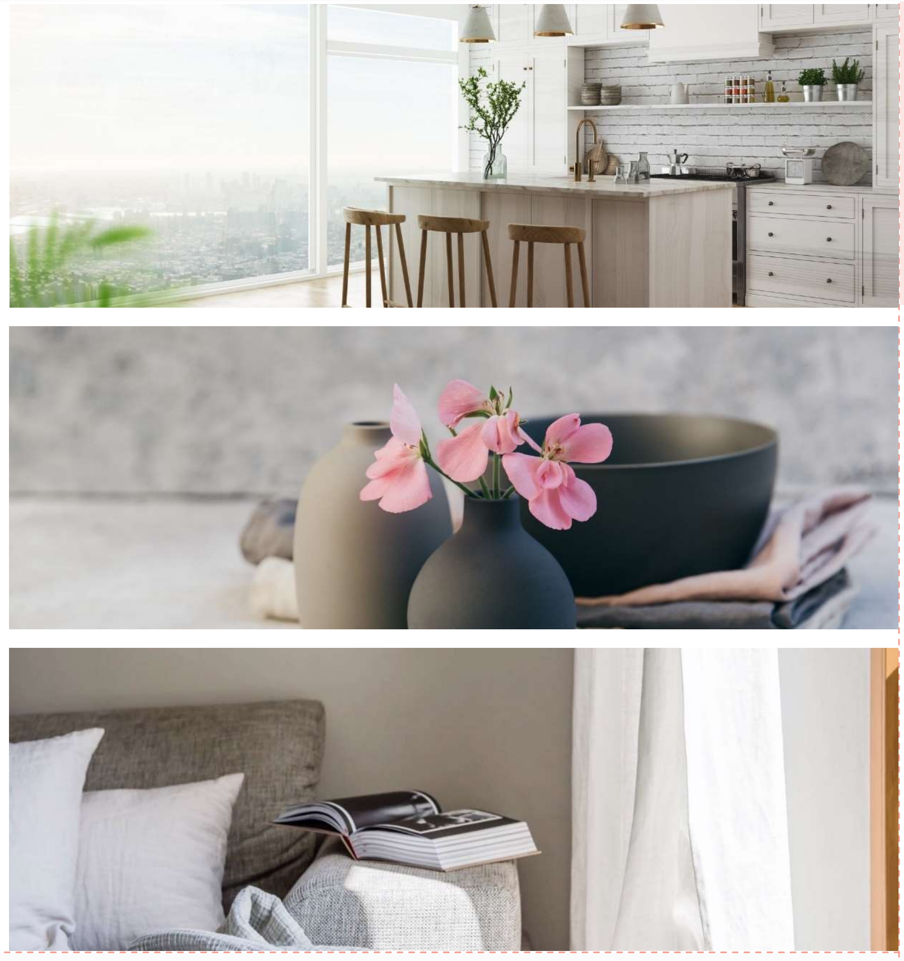
- https://www.postgresql.org/download


Photos
POM-QM for Windows 5
Postgres Plus Add-ons
PostgreSQL 16
Application Stack Builder
Installation notes
pgAdmin 4
pgAdmin documentation
PostgreSQL documentation
PostgreSQL release notes
Reload Configuration
SQL Shell (psql)
PowerPoint
Publisher
Python 3.6
Python 3.8
Python 3.9



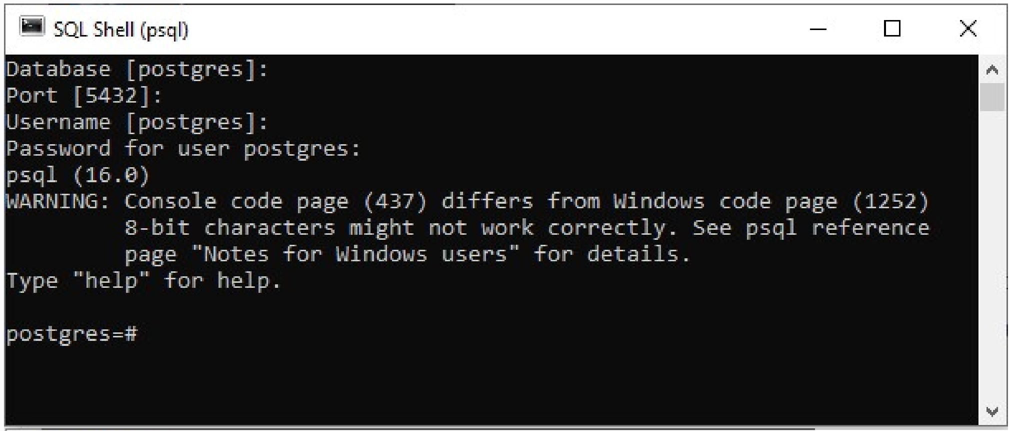
Connect to PostgreSQL database server

- Connect to PostgreSQL from psql
- Connect to PostgreSQL from pgAdmin
- Connect to PostgreSQL from PHP
    - https://www.youtube.com/watch?v=pPmLkNLTMTQ
- Connect to PostgreSQL from Python
- Connect to PostgreSQL from Java

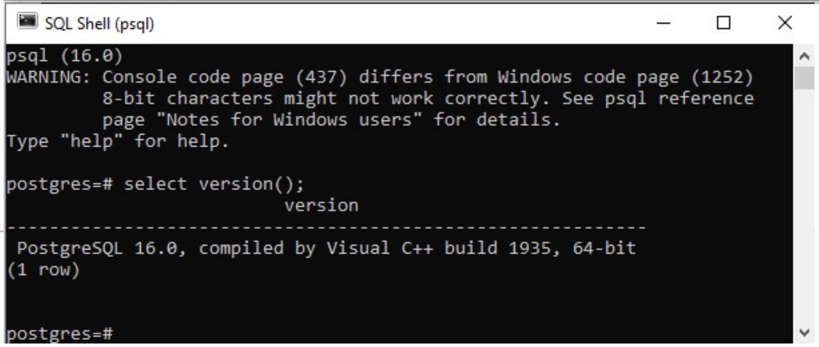


Connect to PostgreSQL from psql

- Tekan enter, enter, dst .. Sampai password: masukkan password.

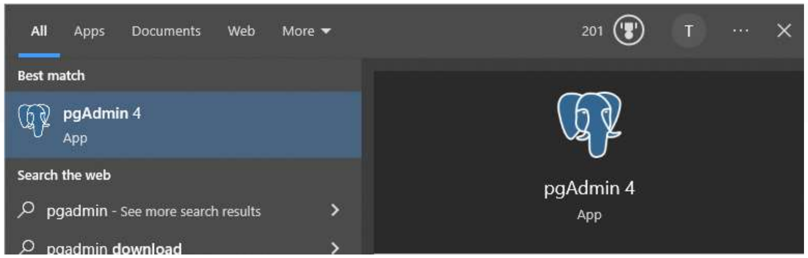


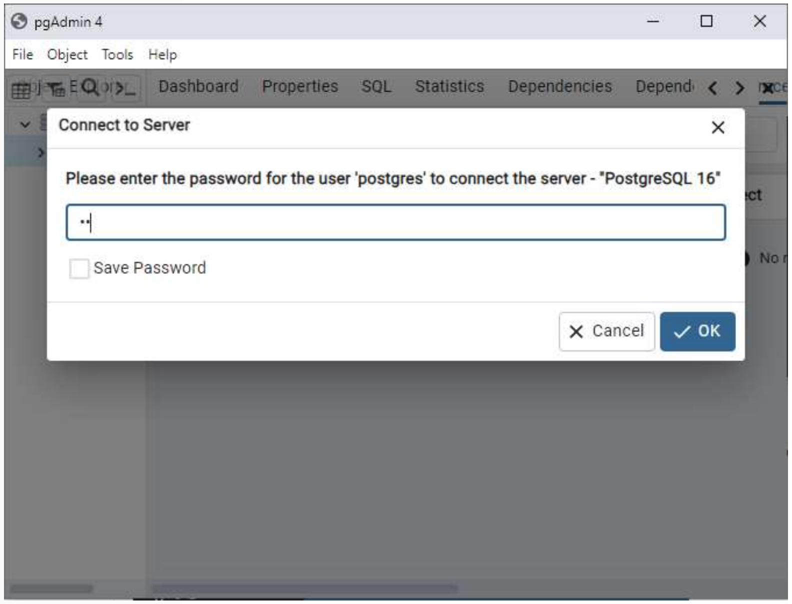
```
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:
psql (16.0)
WARNING: Console code page (437) differs from Windows code page (1252)
         8-bit characters might not work correctly. See psql reference
         page "Notes for Windows users" for details.
Type "help" for help.

postgres=#
```



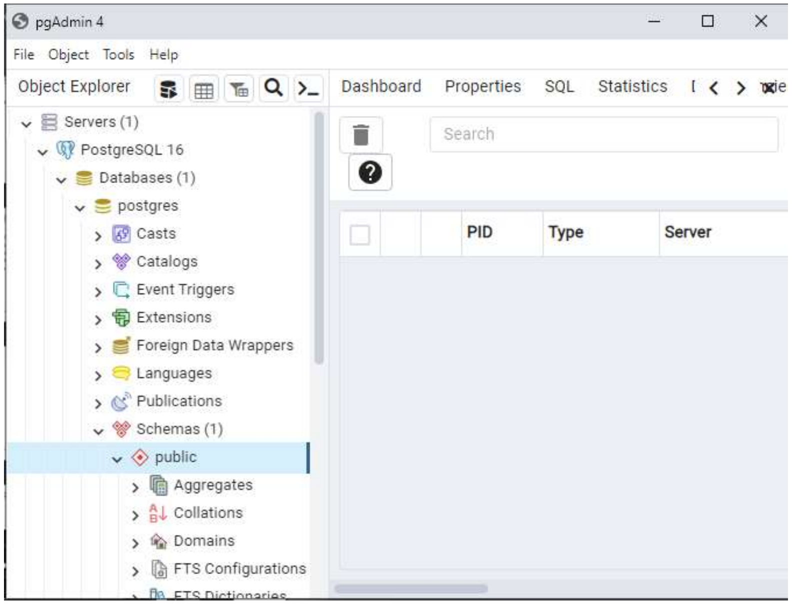
```
psql (16.0)
WARNING: Console code page (437) differs from Windows code page (1252)
         8-bit characters might not work correctly. See psql reference
         page "Notes for Windows users" for details.
Type "help" for help.

postgres=# select version();
                          version
------------------------------------------------------------
 PostgreSQL 16.0, compiled by Visual C++ build 1935, 64-bit
(1 row)


postgres=#
```

Connect to PostgreSQL from pgAdmin

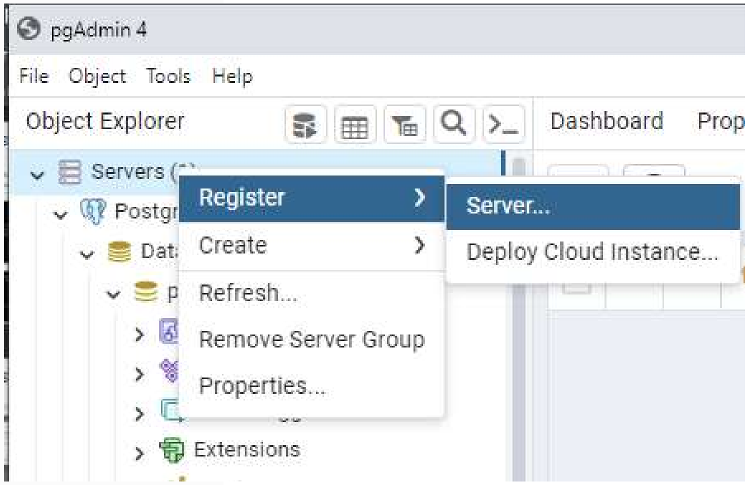

All
Apps
Documents
Web
More
201
T
Best match
pgAdmin 4
App
Search the web
pgadmin - See more search results
pgadmin download
pgAdmin 4
App

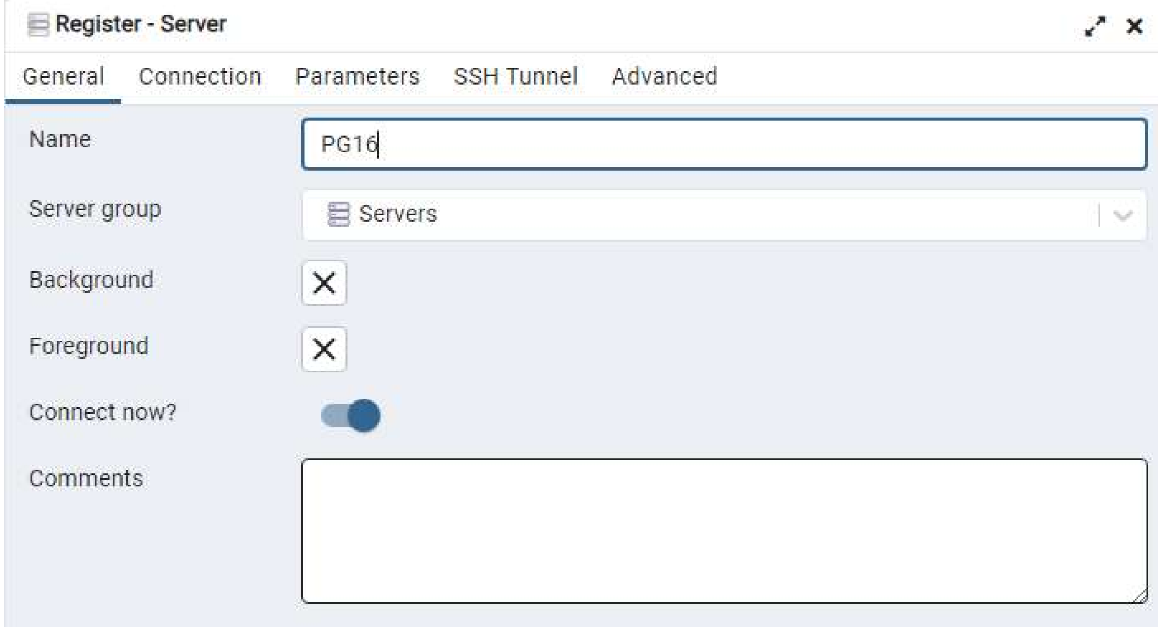

pgAdmin 4
File Object Tools Help
Dashboard Properties SQL Statistics Dependencies Depend
Connect to Server
Save Password
Cancel
OK

Please enter the password for the user 'postgres' to connect the server - "PostgreSQL 16"


pgAdmin 4
File Object Tools Help
Object Explorer
Dashboard Properties SQL Statistics
Servers (1)
PostgreSQL 16
Databases (1)
postgres
Casts
Catalogs
Event Triggers
Extensions
Foreign Data Wrappers
Languages
Publications
Schemas (1)
public
Aggregates
Collations
Domains
FTS Configurations
FTS Dictionaries
Search
PID
Type
Server

Connect to PostgreSQL from pgAdmin


pgAdmin 4
File Object Tools Help
Object Explorer
Dashboard
Prop
Servers
Postgr
Dat
p
Extensions
Register
Create
Refresh...
Remove Server Group
Properties...
Server...
Deploy Cloud Instance...


Register - Server
General
Connection
Parameters
SSH Tunnel
Advanced

Name: PG16

Server group: Servers

Background: ☒

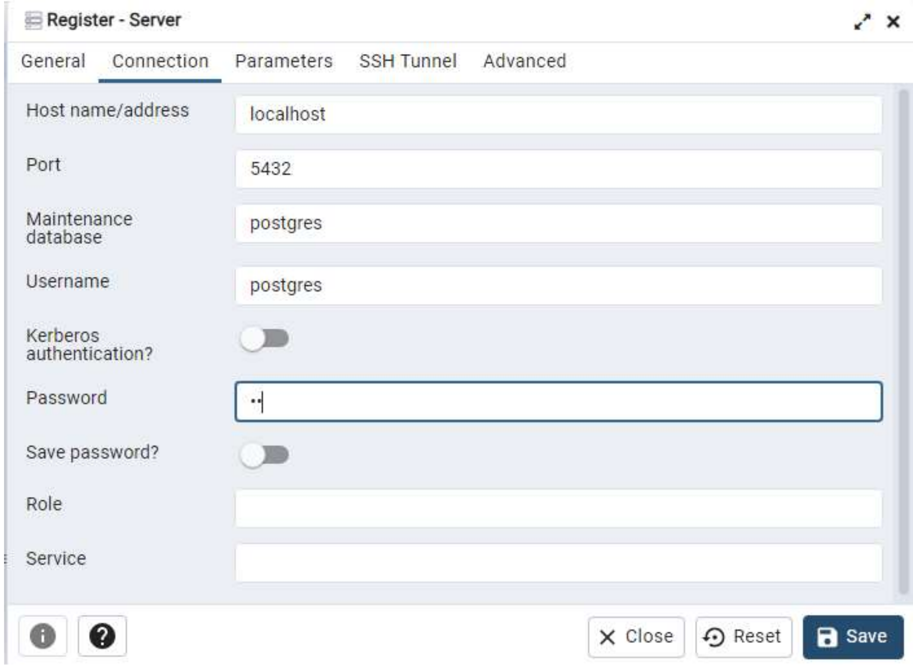
Foreground: ☒

Connect now? ●

Comments:

Connect to PostgreSQL from pgAdmin

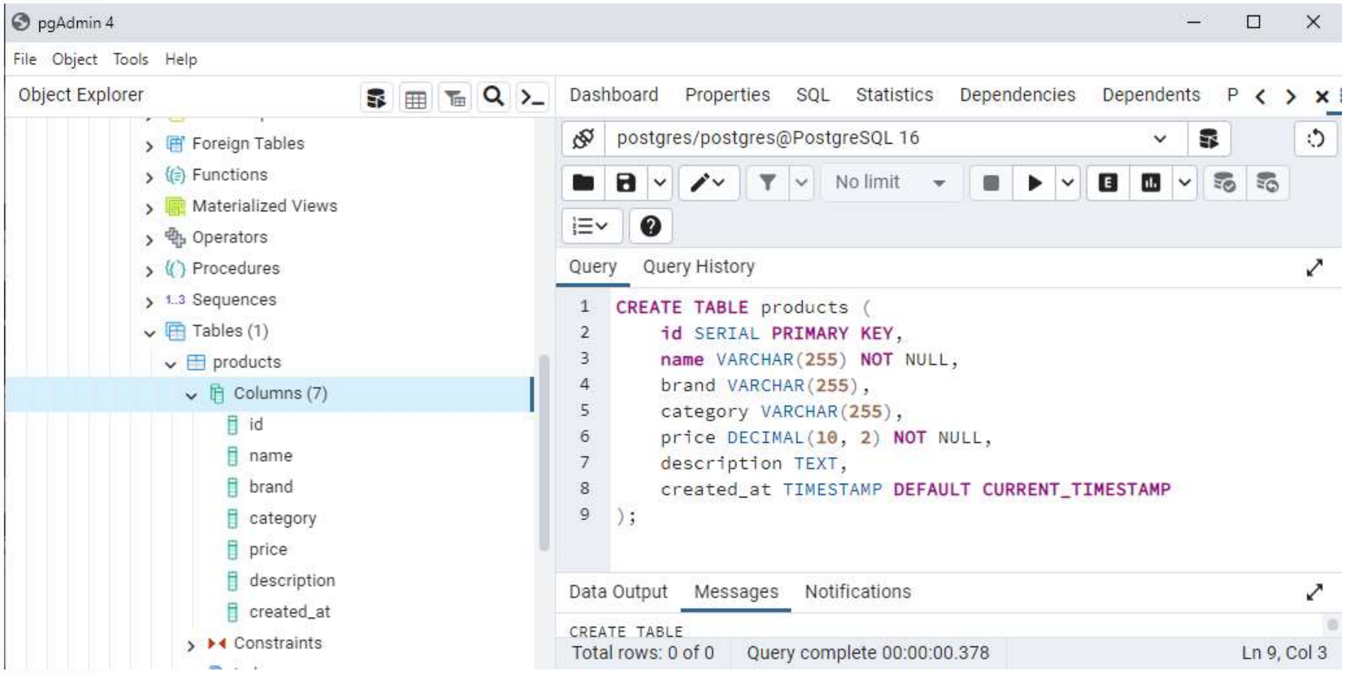
- Klik Save


Register - Server
General
Connection
Parameters
SSH Tunnel
Advanced
Close
Reset
Save

Host name/address	localhost
Port	5432
Maintenance database	postgres
Username	postgres
Kerberos authentication?	○
Password	••
Save password?	○
Role	
Service	

Connect PostgreSQL on PHP

- Untuk persiapan, jalankan pgAdmin, buat tabel products sbb:


pgAdmin 4
File Object Tools Help
Object Explorer
Foreign Tables
Functions
Materialized Views
Operators
Procedures
Sequences
Tables (1)
products
Columns (7)
id
name
brand
category
price
description
created_at
Constraints
Dashboard Properties SQL Statistics Dependencies Dependents
postgres/postgres@PostgreSQL 16
No limit
Query Query History
Data Output Messages Notifications

```
CREATE TABLE products (
    id SERIAL PRIMARY KEY,
    name VARCHAR(255) NOT NULL,
    brand VARCHAR(255),
    category VARCHAR(255),
    price DECIMAL(10, 2) NOT NULL,
    description TEXT,
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

```
CREATE TABLE
```

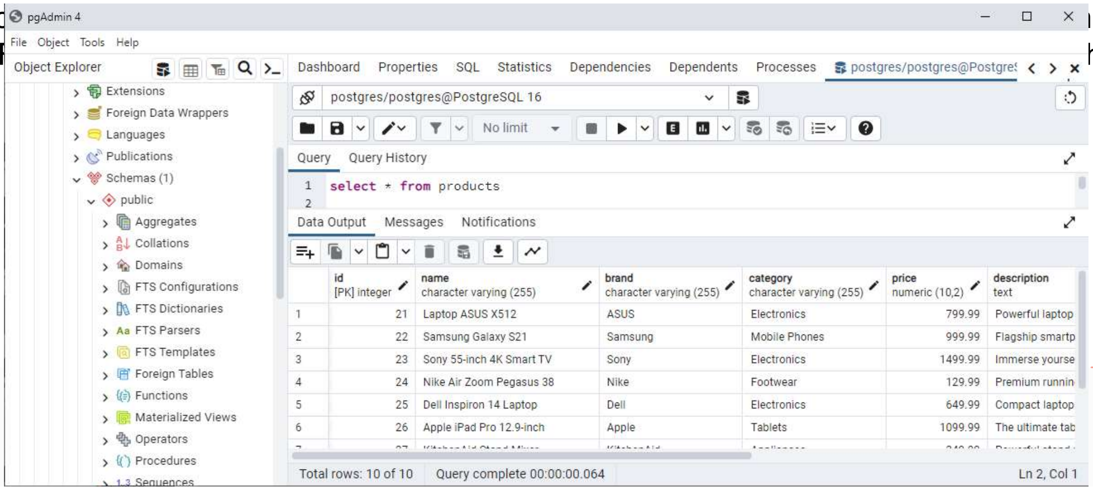
Total rows: 0 of 0 Query complete 00:00:00.378 Ln 9, Col 3

```
CREATE TABLE products (
id SERIAL PRIMARY KEY,
name VARCHAR(255) NOT
NULL, brand VARCHAR(255),
category VARCHAR(255),
price DECIMAL(10, 2) NOT
NULL, description TEXT,
created_at TIMESTAMP
DEFAULT
CURRENT_TIMESTAMP);
```

Connect PostgreSQL on PHP

- Isikan 10 data ke dalam tabel products

```
INSERT INTO products (name, brand, category, price, description, created_at)
VALUES
   ('Laptop ASUS X512', 'ASUS', 'Electronics', 799.99, 'Powerful laptop with Intel Core i7 processor and 16GB RAM.', '2023-12-15 08:00:00'),
   ('Samsung Galaxy S21', 'Samsung', 'Mobile Phones', 999.99, 'Flagship smartphone with 6.2-inch display and 128GB storage.', '2023-12-15 09:15:00'),
   ('Sony 55-inch 4K Smart TV', 'Sony', 'Electronics', 1499.99, 'Immerse yourself in stunning 4K visuals with this smart TV.', '2023-12-15 10:30:00'),
   ('Nike Air Zoom Pegasus 38', 'Nike', 'Footwear', 129.99, 'Premium running shoes for optimal comfort and performance.', '2023-12-15 11:45:00'),
   ('Dell Inspiron 14 Laptop', 'Dell', 'Electronics', 649.99, 'Compact laptop with Intel Core i5 processor and 8GB RAM.', '2023-12-15 13:00:00'),
   ('Apple iPad Pro 12.9-inch', 'Apple', 'Tablets', 1099.99, 'The ultimate tablet with M1 chip, 256GB storage, and 12.9-inch Liquid Retina XDR display.',
'2023-12-15 14:15:00'),
   ('KitchenAid Stand Mixer', 'KitchenAid', 'Appliances', 349.99, 'Powerful stand mixer for baking and cooking enthusiasts.', '2023-12-15 15:30:00'),
   ('Canon EOS R5 Mirrorless Camera', 'Canon', 'Cameras', 3499.99, 'High-performance mirrorless camera with 45MP sensor and 8K video recording.',
'2023-12-15 16:45:00'),
   ('Bose QuietComf                                                                        mersive audio experience.', '2023-12-15 18:00:00'),
   ('Fitbit Charge 5', '                                                                   h monitoring features.', '2023-12-15 19:15:00');
```


pgAdmin 4
File Object Tools Help
Object Explorer
Extensions
Foreign Data Wrappers
Languages
Publications
Schemas (1)
public
Aggregates
Collations
Domains
FTS Configurations
FTS Dictionaries
FTS Parsers
FTS Templates
Foreign Tables
Functions
Materialized Views
Operators
Procedures
Sequences
Dashboard Properties SQL Statistics Dependencies Dependents Processes postgres/postgres@Postgres
postgres/postgres@PostgreSQL 16
No limit
Query Query History
Data Output Messages Notifications

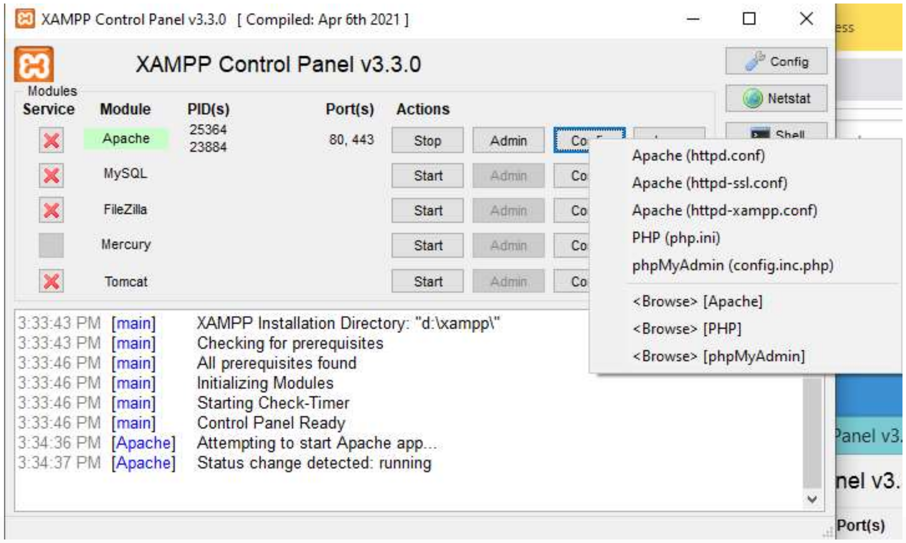
```
select * from products
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	21	Laptop ASUS X512	ASUS	Electronics	799.99	Powerful laptop
2	22	Samsung Galaxy S21	Samsung	Mobile Phones	999.99	Flagship smartp
3	23	Sony 55-inch 4K Smart TV	Sony	Electronics	1499.99	Immerse yourse
4	24	Nike Air Zoom Pegasus 38	Nike	Footwear	129.99	Premium runnin
5	25	Dell Inspiron 14 Laptop	Dell	Electronics	649.99	Compact laptop
6	26	Apple iPad Pro 12.9-inch	Apple	Tablets	1099.99	The ultimate tab

Total rows: 10 of 10 Query complete 00:00:00.064 Ln 2, Col 1

Connect PostgreSQL on PHP

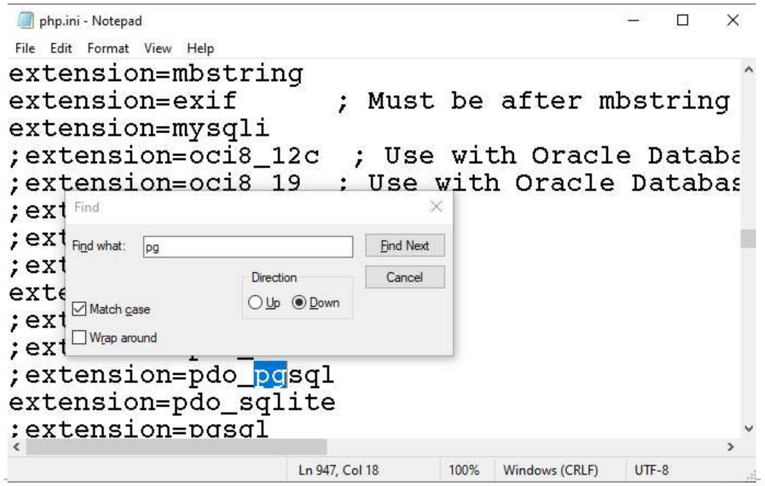
- Download XAMPP: https://www.apachefriends.org/download.html
- Install XAMPP, dan buka XAMPP Control Panel.
- Start Apache, click pada tombol Config, kemudian pilih PHP (php.ini)


XAMPP Control Panel v3.3.0 [Compiled: Apr 6th 2021]
XAMPP Control Panel v3.3.0
Config
Netstat
Shell
Modules
Service
Module
PID(s)
Port(s)
Actions
Apache
25364
23884
80, 443
Stop
Admin
MySQL
Start
Admin
FileZilla
Start
Admin
Mercury
Start
Admin
Tomcat
Start
Admin
Apache (httpd.conf)
Apache (httpd-ssl.conf)
Apache (httpd-xampp.conf)
PHP (php.ini)
phpMyAdmin (config.inc.php)
<Browse> [Apache]
<Browse> [PHP]
<Browse> [phpMyAdmin]

```
3:33:43 PM  [main]     XAMPP Installation Directory: "d:\xampp\"
3:33:43 PM  [main]     Checking for prerequisites
3:33:46 PM  [main]     All prerequisites found
3:33:46 PM  [main]     Initializing Modules
3:33:46 PM  [main]     Starting Check-Timer
3:33:46 PM  [main]     Control Panel Ready
3:34:36 PM  [Apache]   Attempting to start Apache app...
3:34:37 PM  [Apache]   Status change detected: running
```

Connect PostgreSQL on PHP

- Konfigurasi pada php.ini.
- Search pg, enable extension: extension=pdo_pgsql dan extension=pdo_sqlite, save php.ini
- Stop and Start Apache (Restart)


php.ini - Notepad
File
Edit
Format
View
Help
Find
Find Next
Cancel
Direction

```
extension=mbstring
extension=exif      ; Must be after mbstring
extension=mysqli
;extension=oci8_12c  ; Use with Oracle Databa
;extension=oci8_19   ; Use with Oracle Databas
;ext
;ext
;ext
exte
;ext
;ext
;extension=pdo_pgsql
extension=pdo_sqlite
;extension=pgsql
```

Find what: pg

○ Up ● Down

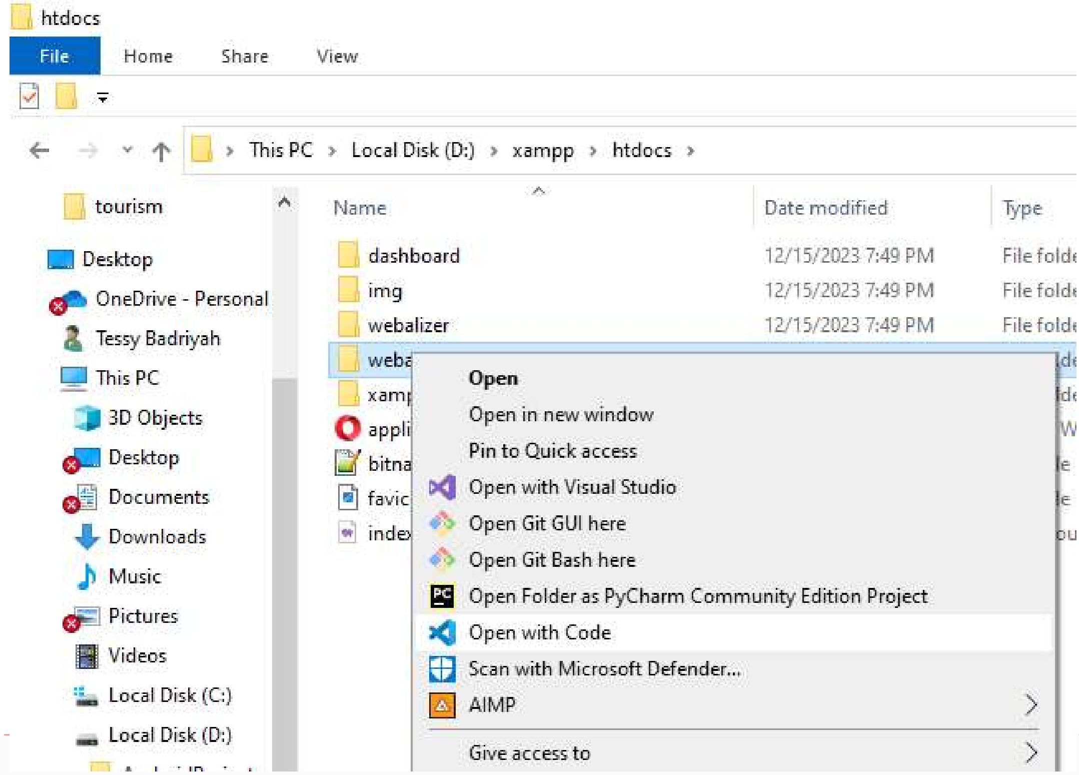
☑ Match case

☐ Wrap around

Ln 947, Col 18 | 100% | Windows (CRLF) | UTF-8

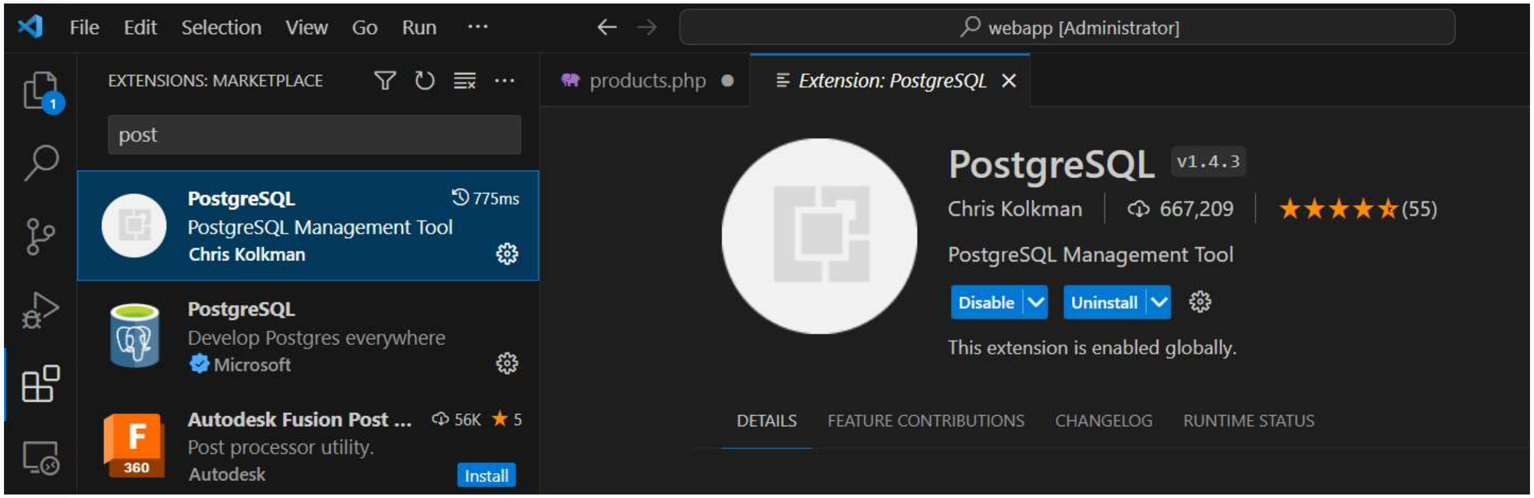
Connect PostgreSQL on PHP

- Buat folder WEBAPP pada ‘XAMPPdirectory/htdocs/’, klik kanan dan buka di VScode.


htdocs
File
Home
Share
View
This PC › Local Disk (D:) › xampp › htdocs ›
tourism
Desktop
OneDrive - Personal
Tessy Badriyah
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
Name
Date modified
Type
dashboard 12/15/2023 7:49 PM File folde
img 12/15/2023 7:49 PM File folde
webalizer 12/15/2023 7:49 PM File folde
weba
xamp
appli
bitna
favic
index
Open
Open in new window
Pin to Quick access
Open with Visual Studio
Open Git GUI here
Open Git Bash here
Open Folder as PyCharm Community Edition Project
Open with Code
Scan with Microsoft Defender...
AIMP
Give access to

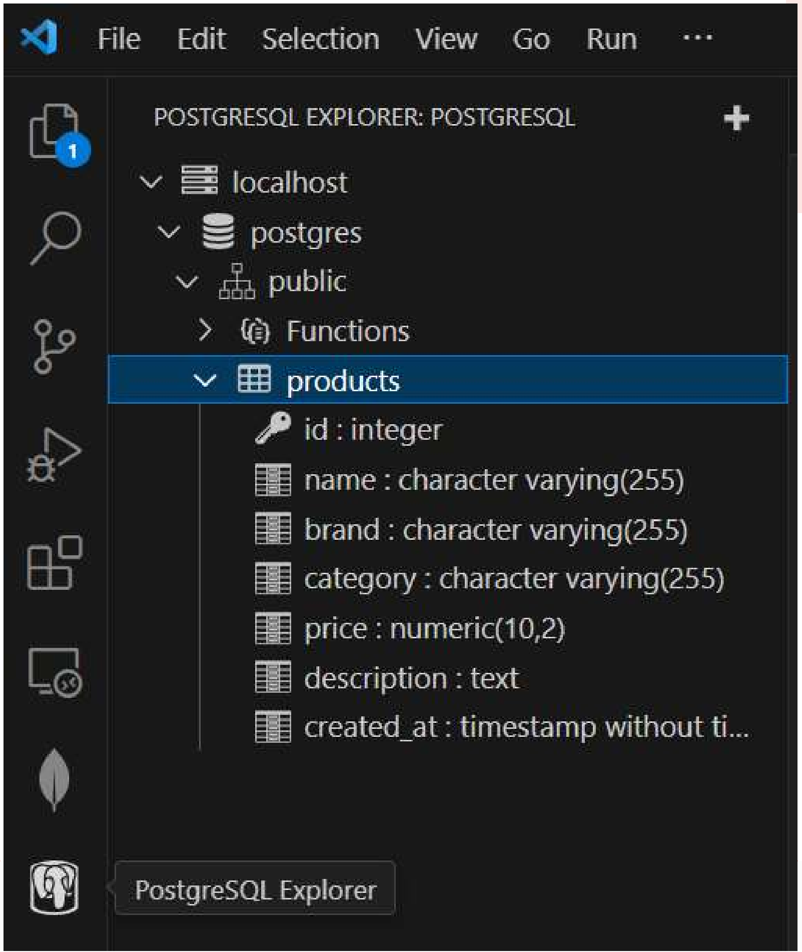
Connect PostgreSQL on PHP

- Install extension untuk connect ke Postgresql server


File
Edit
Selection
View
Go
Run
webapp [Administrator]
EXTENSIONS: MARKETPLACE
post
products.php
Extension: PostgreSQL
PostgreSQL
775ms
PostgreSQL Management Tool
Chris Kolkman
PostgreSQL
Develop Postgres everywhere
Microsoft
Autodesk Fusion Post ...
56K
5
Post processor utility.
Autodesk
Install
PostgreSQL
v1.4.3
Chris Kolkman
667,209
(55)
PostgreSQL Management Tool
Disable
Uninstall
This extension is enabled globally.
DETAILS
FEATURE CONTRIBUTIONS
CHANGELOG
RUNTIME STATUS

Connect PostgreSQL on PHP

- Klik pada PostgreSQL explorer, expand pada localhost:
-

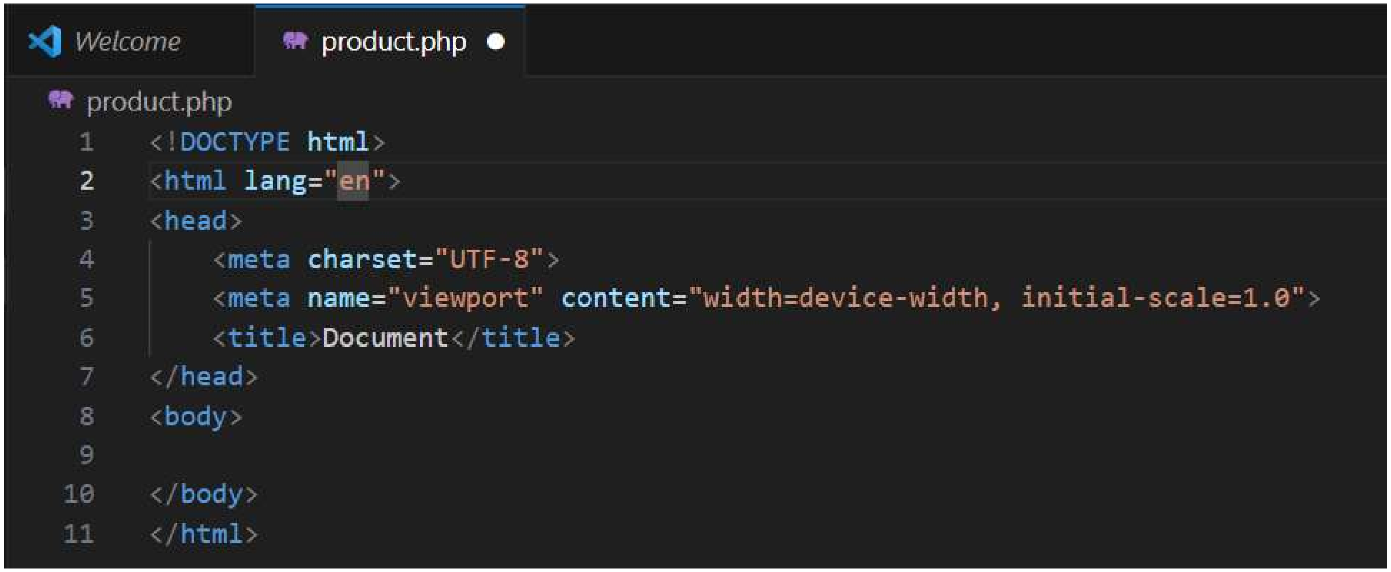

File
Edit
Selection
View
Go
Run
···
1
PostgreSQL Explorer

POSTGRESQL EXPLORER: POSTGRESQL

- localhost
  - postgres
    - public
      - Functions
      - products
        - id : integer
        - name : character varying(255)
        - brand : character varying(255)
        - category : character varying(255)
        - price : numeric(10,2)
        - description : text
        - created_at : timestamp without ti...

Connect PostgreSQL on PHP

- Create product.php in folder WEBAPP, type ! and then ENTER.
- Akan tampil code berikut:

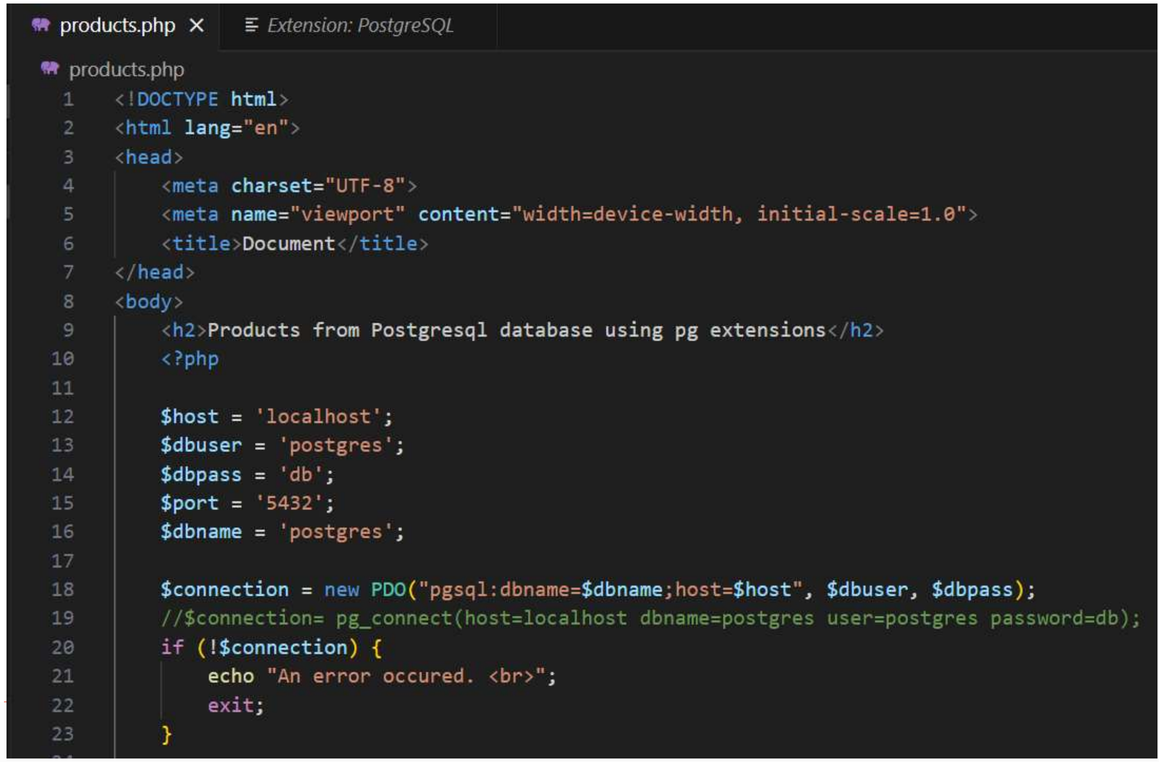


Welcome
product.php
product.php

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>

</body>
</html>
```

Connect PostgreSQL on PHP

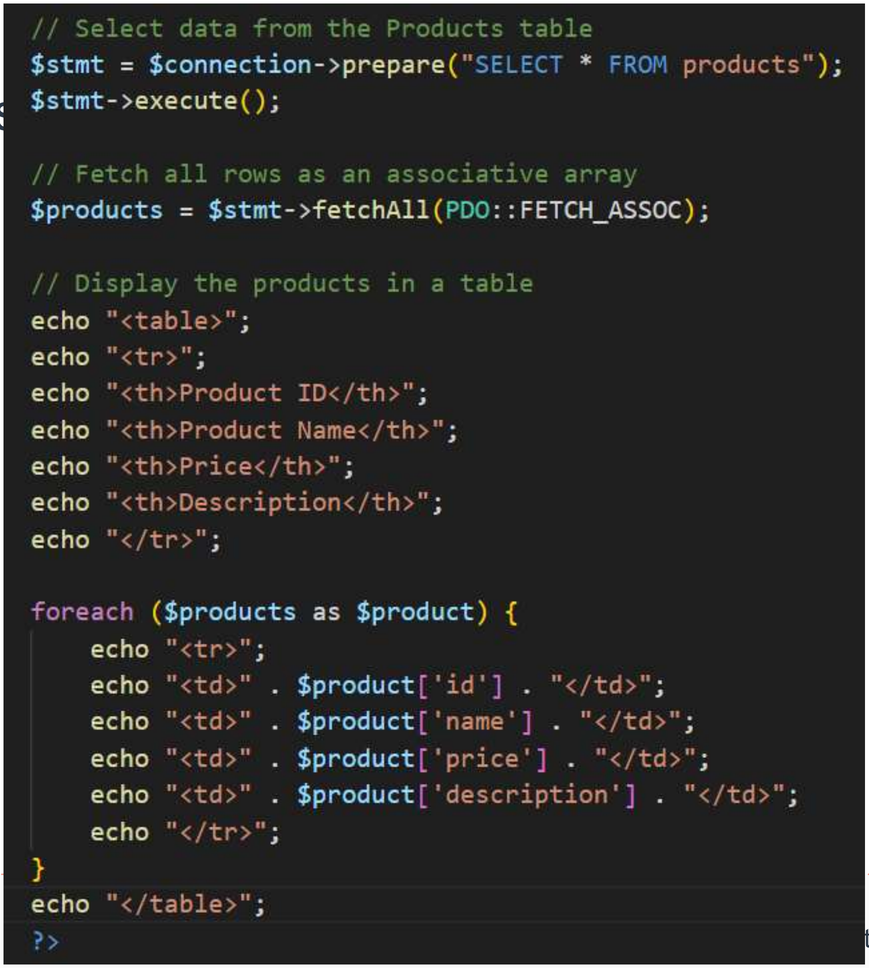
- Edit bagian <body> untuk connect ke postgresql server:


products.php
Extension: PostgreSQL
products.php

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <h2>Products from Postgresql database using pg extensions</h2>
    <?php

    $host = 'localhost';
    $dbuser = 'postgres';
    $dbpass = 'db';
    $port = '5432';
    $dbname = 'postgres';

    $connection = new PDO("pgsql:dbname=$dbname;host=$host", $dbuser, $dbpass);
    //$connection= pg_connect(host=localhost dbname=postgres user=postgres password=db);
    if (!$connection) {
        echo "An error occured. <br>";
        exit;
    }
```

Connect PostgreSQL on PHP

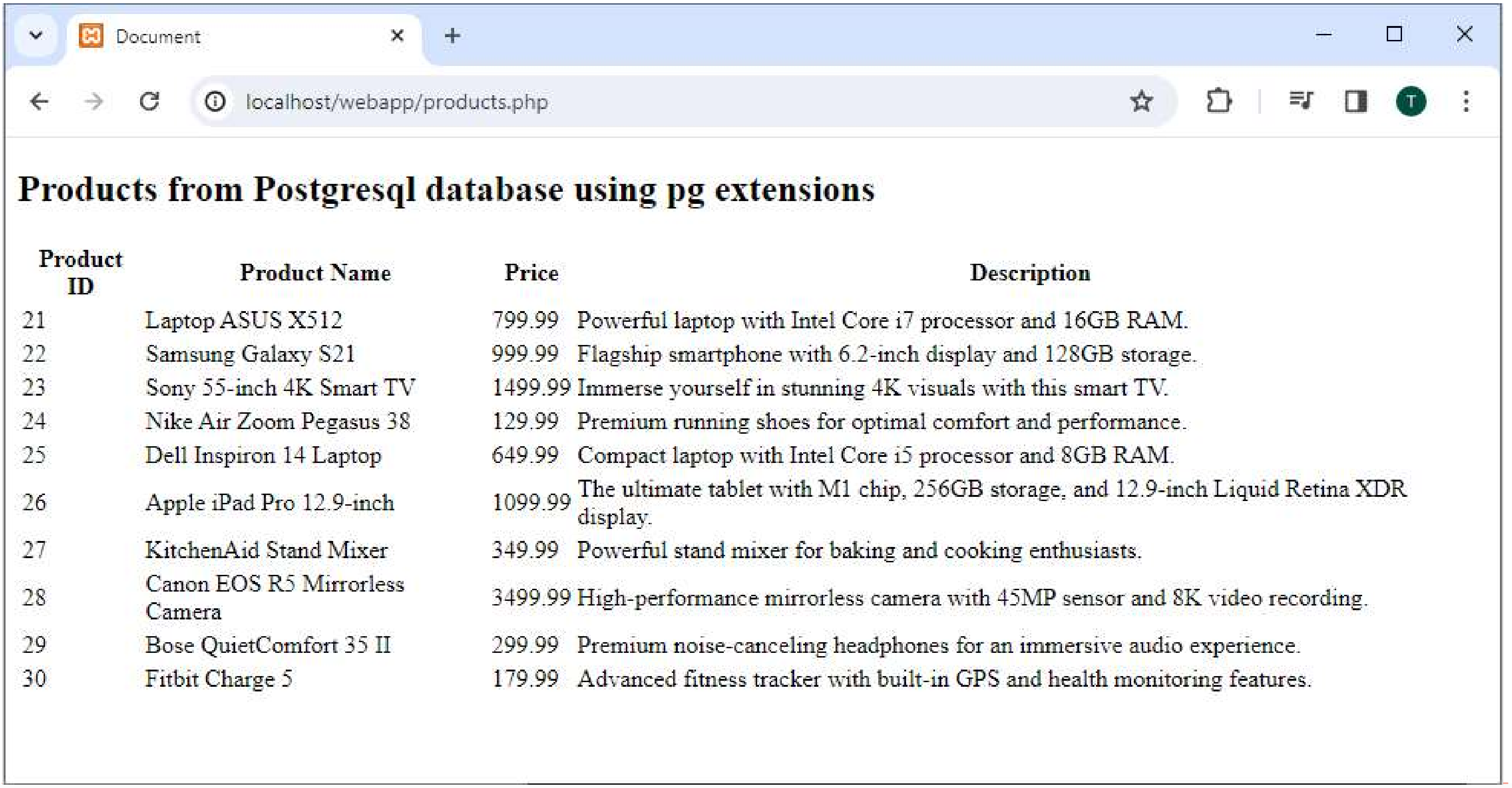
- Tampilkan data dari tabel products



```
// Select data from the Products table
$stmt = $connection->prepare("SELECT * FROM products");
$stmt->execute();

// Fetch all rows as an associative array
$products = $stmt->fetchAll(PDO::FETCH_ASSOC);

// Display the products in a table
echo "<table>";
echo "<tr>";
echo "<th>Product ID</th>";
echo "<th>Product Name</th>";
echo "<th>Price</th>";
echo "<th>Description</th>";
echo "</tr>";

foreach ($products as $product) {
    echo "<tr>";
    echo "<td>" . $product['id'] . "</td>";
    echo "<td>" . $product['name'] . "</td>";
    echo "<td>" . $product['price'] . "</td>";
    echo "<td>" . $product['description'] . "</td>";
    echo "</tr>";
}
echo "</table>";
?>
```

Connect PostgreSQL on PHP

- Hasil:



Products from Postgresql database using pg extensions

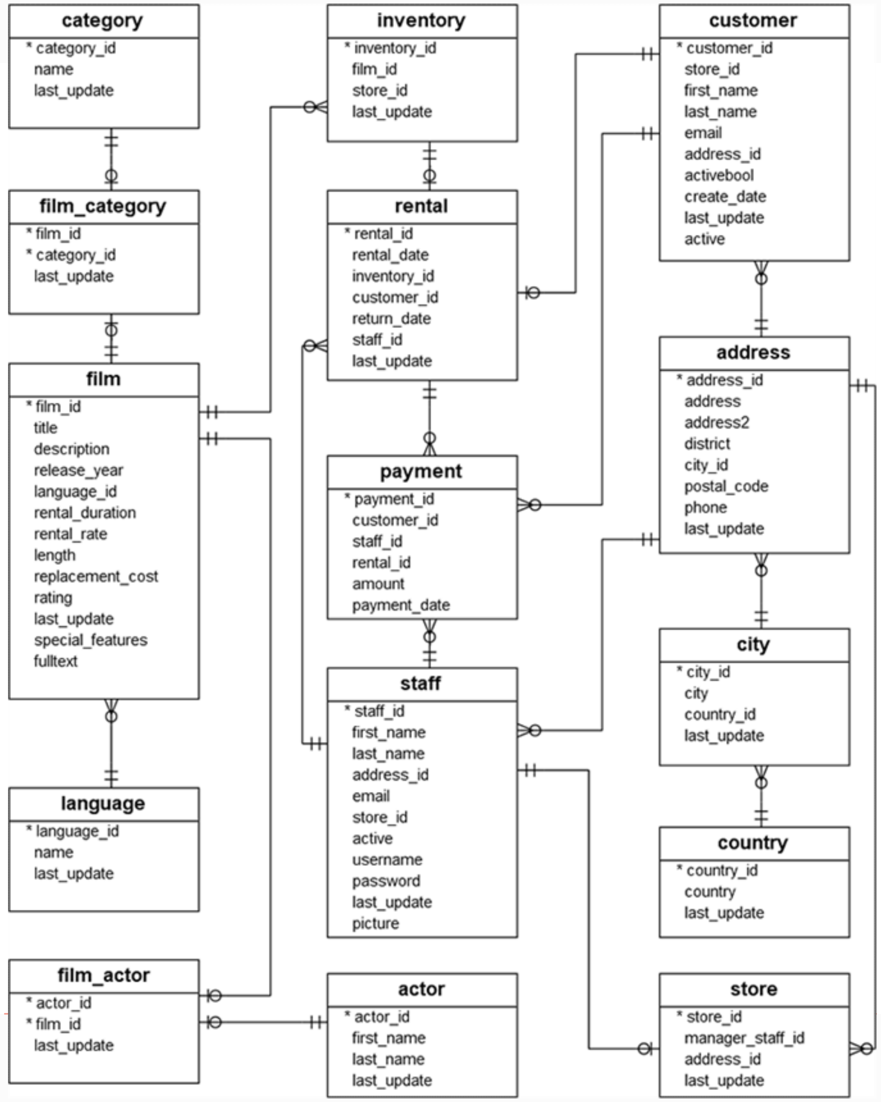
Product ID	Product Name	Price	Description
21	Laptop ASUS X512	799.99	Powerful laptop with Intel Core i7 processor and 16GB RAM.
22	Samsung Galaxy S21	999.99	Flagship smartphone with 6.2-inch display and 128GB storage.
23	Sony 55-inch 4K Smart TV	1499.99	Immerse yourself in stunning 4K visuals with this smart TV.
24	Nike Air Zoom Pegasus 38	129.99	Premium running shoes for optimal comfort and performance.
25	Dell Inspiron 14 Laptop	649.99	Compact laptop with Intel Core i5 processor and 8GB RAM.
26	Apple iPad Pro 12.9-inch	1099.99	The ultimate tablet with M1 chip, 256GB storage, and 12.9-inch Liquid Retina XDR display.
27	KitchenAid Stand Mixer	349.99	Powerful stand mixer for baking and cooking enthusiasts.
28	Canon EOS R5 Mirrorless Camera	3499.99	High-performance mirrorless camera with 45MP sensor and 8K video recording.
29	Bose QuietComfort 35 II	299.99	Premium noise-canceling headphones for an immersive audio experience.
30	Fitbit Charge 5	179.99	Advanced fitness tracker with built-in GPS and health monitoring features.

PostgreSQL Sample Database

- Called DVD rental database
- The DVD rental database has the following objects:
    - 15 tables
    - 1 trigger
    - 7 views
    - 8 functions
    - 1 domain
    - 13 sequences

PostgreSQL Sample Database

- DVD Rental ER Model


category
* category_id
name
last_update
film_category
* film_id
* category_id
last_update
film
* film_id
title
description
release_year
language_id
rental_duration
rental_rate
length
replacement_cost
rating
last_update
special_features
fulltext
language
* language_id
name
last_update
film_actor
* actor_id
* film_id
last_update
inventory
* inventory_id
film_id
store_id
last_update
rental
* rental_id
rental_date
inventory_id
customer_id
return_date
staff_id
last_update
payment
* payment_id
customer_id
staff_id
rental_id
amount
payment_date
staff
* staff_id
first_name
last_name
address_id
email
store_id
active
username
password
last_update
picture
actor
* actor_id
first_name
last_name
last_update
customer
* customer_id
store_id
first_name
last_name
email
address_id
activebool
create_date
last_update
active
address
* address_id
address
address2
district
city_id
postal_code
phone
last_update
city
* city_id
city
country_id
last_update
country
* country_id
country
last_update
store
* store_id
manager_staff_id
address_id
last_update

PostgreSQL Sample Database

PostgreSQL Sample Database Tables

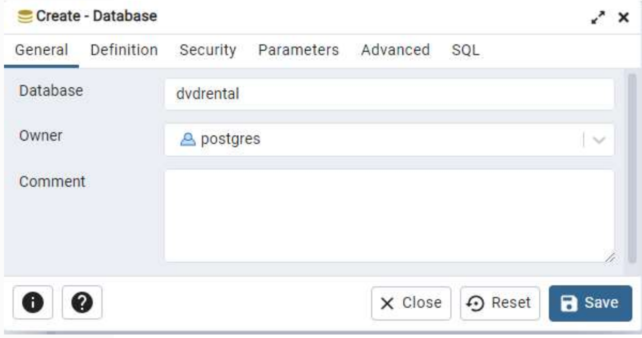
- actor – data actor
- film – data film, semisal title, release year, length, rating, etc.
- film_actor – menyimpan relasi antara film dan actor.
- category – kategori film.
- film_category- menyimpan relasi antara film dan kategori.
- store – menyimpan data store termasuk staff manager, dan Alamat..
- inventory – menyimpan data stok/inventory.
- rental – data persewaan.
- payment – menyimpan pembayaran yg dilakukan oleh customer.
- staff – data staff.
- customer – data customer.
- address – menyimpan data Alamat staff dan customers
- city – nama kota.
- country – menyimpan nama negara.

Load PostgreSQL Sample Database using psql

- Download sampel database: https://www.postgresqltutorial.com/wp-content/uploads/2019/05/dvdrental.zip
- Load sampel database using psql:
    - Jalankan psql
    - Beri perintah : CREATE DATABASE dvdrental;
    - Lalu: pg_restore -U postgres -d dvdrental D:/Data_Tessy/belajar/postgresql/dvdrental.tar

Load PostgreSQL Sample Database using PgAdmin

- Create database dvdrental, klik kanan dvdrental dan pilih Restore

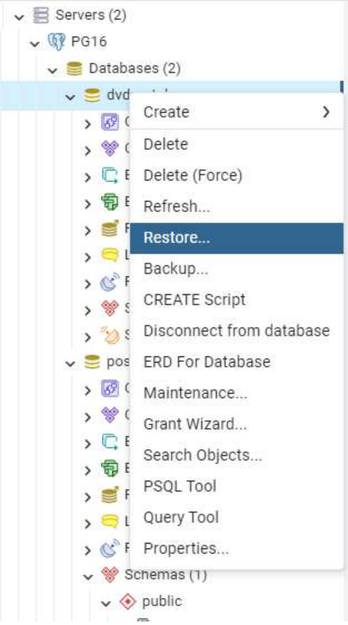

Create - Database

Database: dvdrental

Owner: postgres

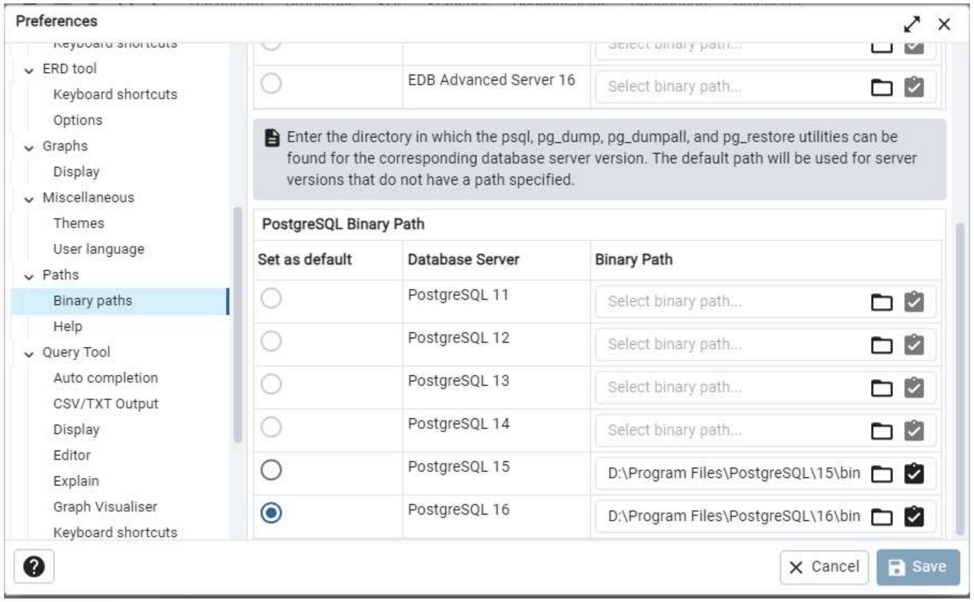
Comment:

General
Definition
Security
Parameters
Advanced
SQL
Close
Reset
Save


Servers (2)
PG16
Databases (2)
dvd
pos
Schemas (1)
public
Create
Delete
Delete (Force)
Refresh...
Restore...
Backup...
CREATE Script
Disconnect from database
ERD For Database
Maintenance...
Grant Wizard...
Search Objects...
PSQL Tool
Query Tool
Properties...

Load PostgreSQL Sample Database using PgAdmin

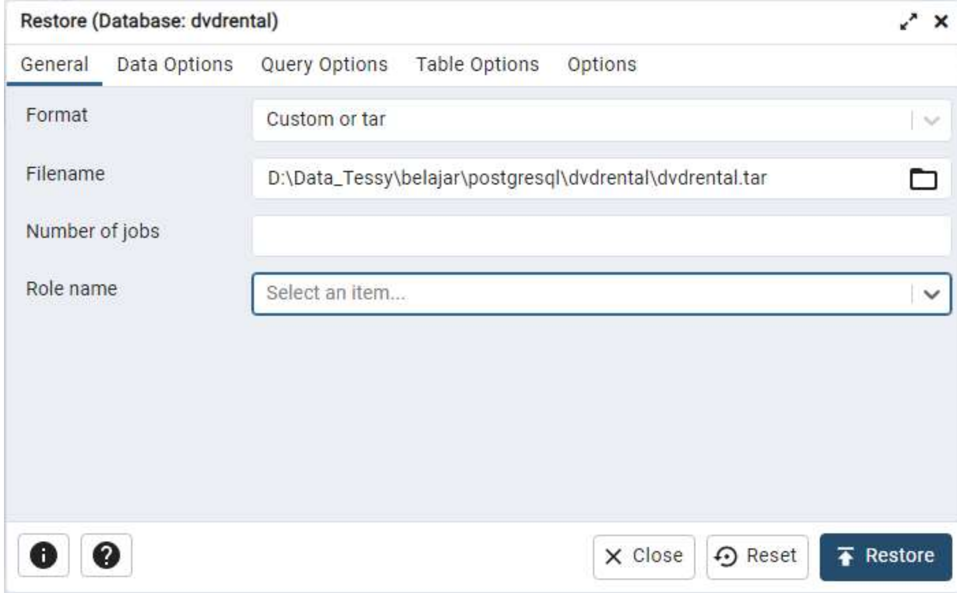
- Klik File->Preferences => Binary path
- Klik kanan dvdrental dan klik Restore


Preferences
Keyboard shortcuts
ERD tool
Keyboard shortcuts
Options
Graphs
Display
Miscellaneous
Themes
User language
Paths
Binary paths
Help
Query Tool
Auto completion
CSV/TXT Output
Display
Editor
Explain
Graph Visualiser
Keyboard shortcuts
Cancel
Save

Enter the directory in which the psql, pg_dump, pg_dumpall, and pg_restore utilities can be found for the corresponding database server version. The default path will be used for server versions that do not have a path specified.

PostgreSQL Binary Path

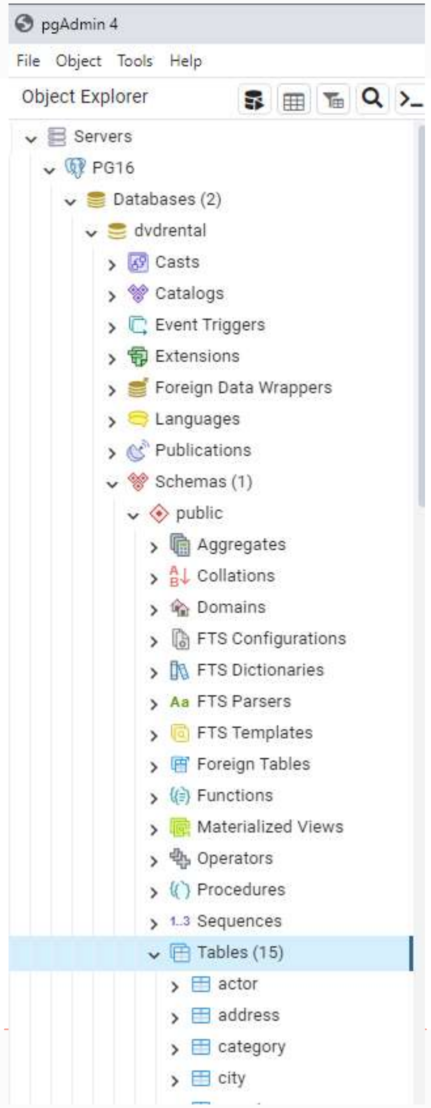
Set as default	Database Server	Binary Path
○	EDB Advanced Server 16	Select binary path...
○	PostgreSQL 11	Select binary path...
○	PostgreSQL 12	Select binary path...
○	PostgreSQL 13	Select binary path...
○	PostgreSQL 14	Select binary path...
○	PostgreSQL 15	D:\Program Files\PostgreSQL\15\bin
●	PostgreSQL 16	D:\Program Files\PostgreSQL\16\bin


Restore (Database: dvdrental)
General
Data Options
Query Options
Table Options
Options
Close
Reset
Restore

Format	Custom or tar
Filename	D:\Data_Tessy\belajar\postgresql\dvdrental\dvdrental.tar
Number of jobs	
Role name	Select an item...

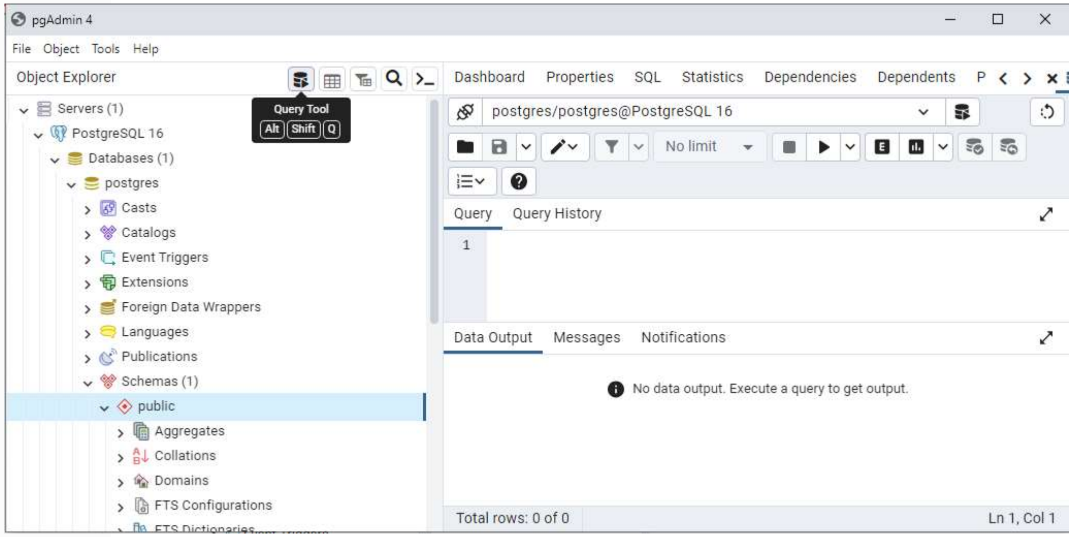
Load PostgreSQL Sample Database using PgAdmin

- Periksa hasil restore tabel
- Ada 15 tabel berhasil diekstrak.


pgAdmin 4
File Object Tools Help
Object Explorer
Servers
PG16
Databases (2)
dvdrental
Casts
Catalogs
Event Triggers
Extensions
Foreign Data Wrappers
Languages
Publications
Schemas (1)
public
Aggregates
Collations
Domains
FTS Configurations
FTS Dictionaries
FTS Parsers
FTS Templates
Foreign Tables
Functions
Materialized Views
Operators
Procedures
Sequences
Tables (15)
actor
address
category
city

Query

- Query:perintah untuk mengambil data dari database


pgAdmin 4
File Object Tools Help
Object Explorer
Query Tool
Alt Shift Q
Servers (1)
PostgreSQL 16
Databases (1)
postgres
Casts
Catalogs
Event Triggers
Extensions
Foreign Data Wrappers
Languages
Publications
Schemas (1)
public
Aggregates
Collations
Domains
FTS Configurations
FTS Dictionaries
Dashboard Properties SQL Statistics Dependencies Dependents P
No limit
Query Query History
Data Output Messages Notifications

postgres/postgres@PostgreSQL 16

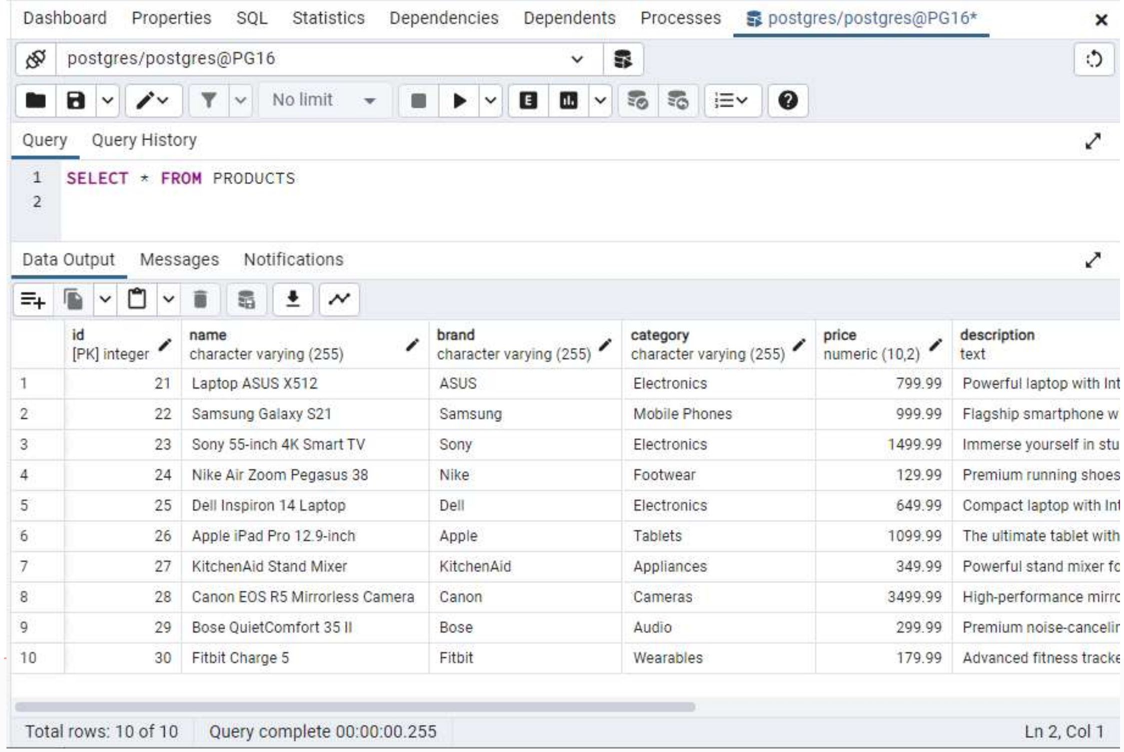
No data output. Execute a query to get output.

Total rows: 0 of 0

Ln 1, Col 1

Querying Data

- Mengambil semua kolom dari tabel Products
- SELECT * FROM PRODUCTS


Dashboard
Properties
SQL
Statistics
Dependencies
Dependents
Processes
postgres/postgres@PG16*
postgres/postgres@PG16
No limit
Query
Query History
Data Output
Messages
Notifications

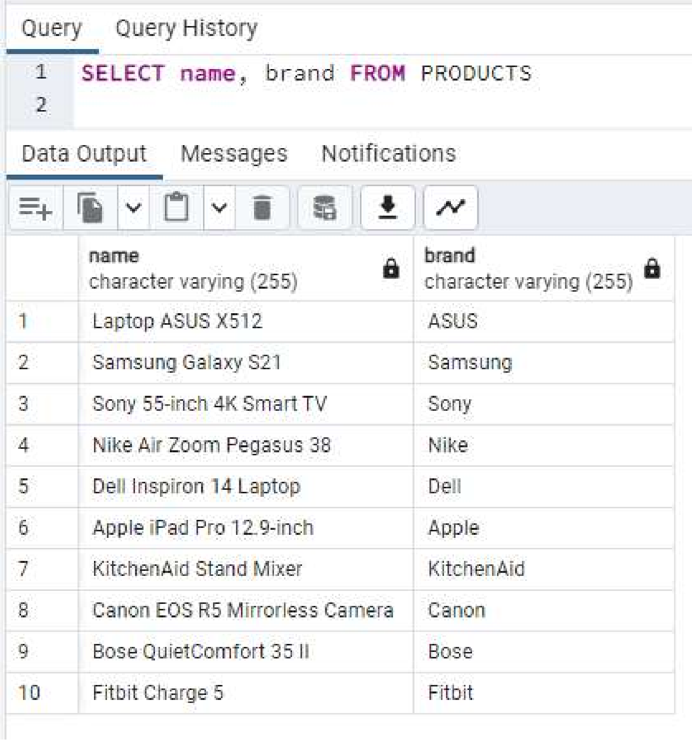
```
SELECT * FROM PRODUCTS
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	21	Laptop ASUS X512	ASUS	Electronics	799.99	Powerful laptop with Int
2	22	Samsung Galaxy S21	Samsung	Mobile Phones	999.99	Flagship smartphone w
3	23	Sony 55-inch 4K Smart TV	Sony	Electronics	1499.99	Immerse yourself in stu
4	24	Nike Air Zoom Pegasus 38	Nike	Footwear	129.99	Premium running shoes
5	25	Dell Inspiron 14 Laptop	Dell	Electronics	649.99	Compact laptop with Int
6	26	Apple iPad Pro 12.9-inch	Apple	Tablets	1099.99	The ultimate tablet with
7	27	KitchenAid Stand Mixer	KitchenAid	Appliances	349.99	Powerful stand mixer fo
8	28	Canon EOS R5 Mirrorless Camera	Canon	Cameras	3499.99	High-performance mirro
9	29	Bose QuietComfort 35 II	Bose	Audio	299.99	Premium noise-cancelir
10	30	Fitbit Charge 5	Fitbit	Wearables	179.99	Advanced fitness tracke

Total rows: 10 of 10 Query complete 00:00:00.255 Ln 2, Col 1

Querying Data

- Mengambil beberapa kolom dari tabel Produ
- SELECT name, brand FROM PRODUCTS

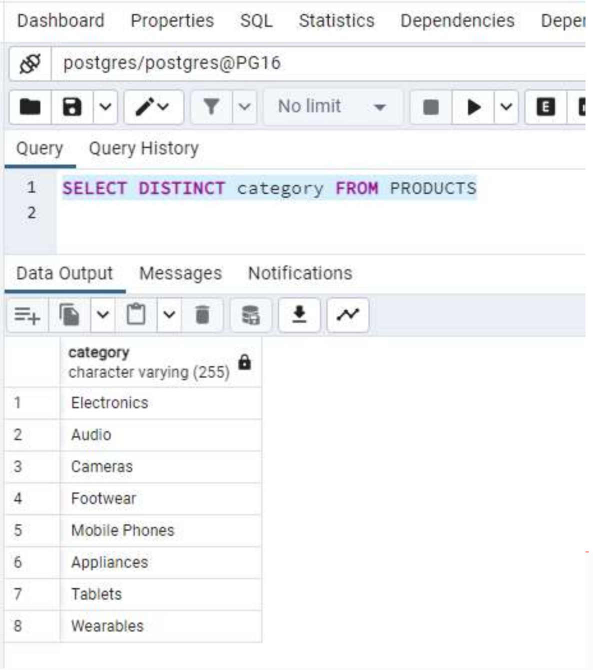


```sql
SELECT name, brand FROM PRODUCTS
```

	name character varying (255)	brand character varying (255)
1	Laptop ASUS X512	ASUS
2	Samsung Galaxy S21	Samsung
3	Sony 55-inch 4K Smart TV	Sony
4	Nike Air Zoom Pegasus 38	Nike
5	Dell Inspiron 14 Laptop	Dell
6	Apple iPad Pro 12.9-inch	Apple
7	KitchenAid Stand Mixer	KitchenAid
8	Canon EOS R5 Mirrorless Camera	Canon
9	Bose QuietComfort 35 II	Bose
10	Fitbit Charge 5	Fitbit

Querying Data

- Mengambil nilai yang unik dari kolom **category** yang ada pada table **products**
- SELECT DISTINCT category FROM PRODUCTS

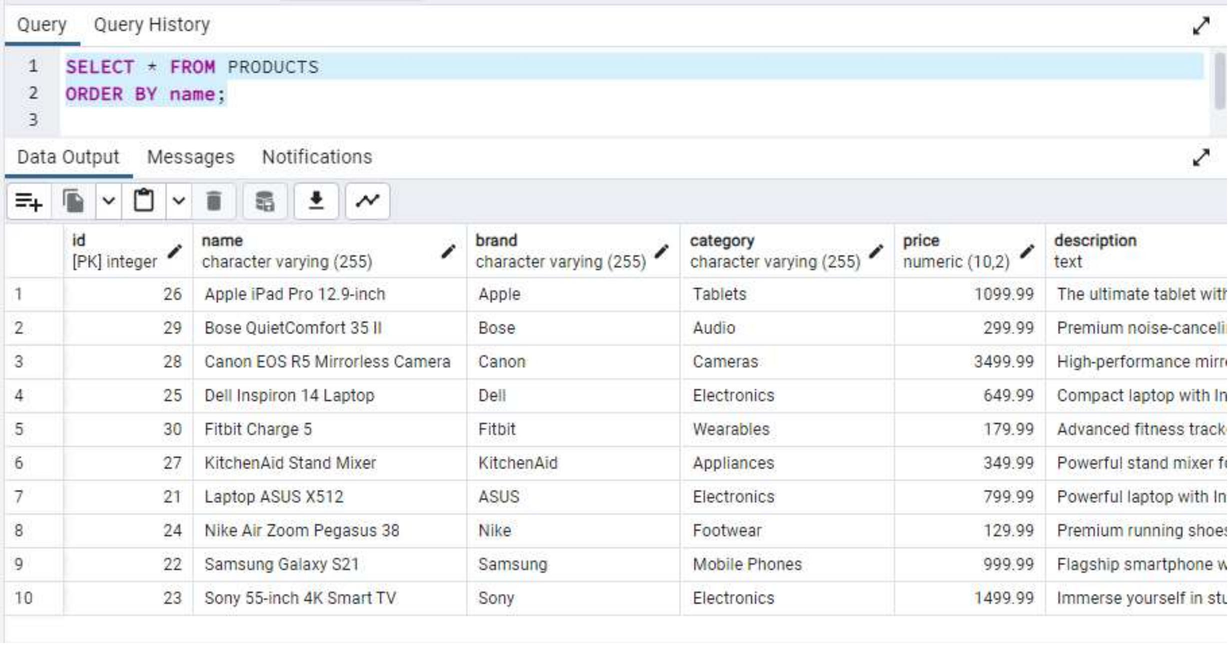

Dashboard
Properties
SQL
Statistics
Dependencies
postgres/postgres@PG16
No limit
Query
Query History
Data Output
Messages
Notifications

```sql
SELECT DISTINCT category FROM PRODUCTS
```

	category character varying (255)
1	Electronics
2	Audio
3	Cameras
4	Footwear
5	Mobile Phones
6	Appliances
7	Tablets
8	Wearables

Querying Data

- Menampilkan data dari tabel **products** urut berdasarkan kolom **name.**
- SELECT * FROM PRODUCTS
- ORDER BY name;

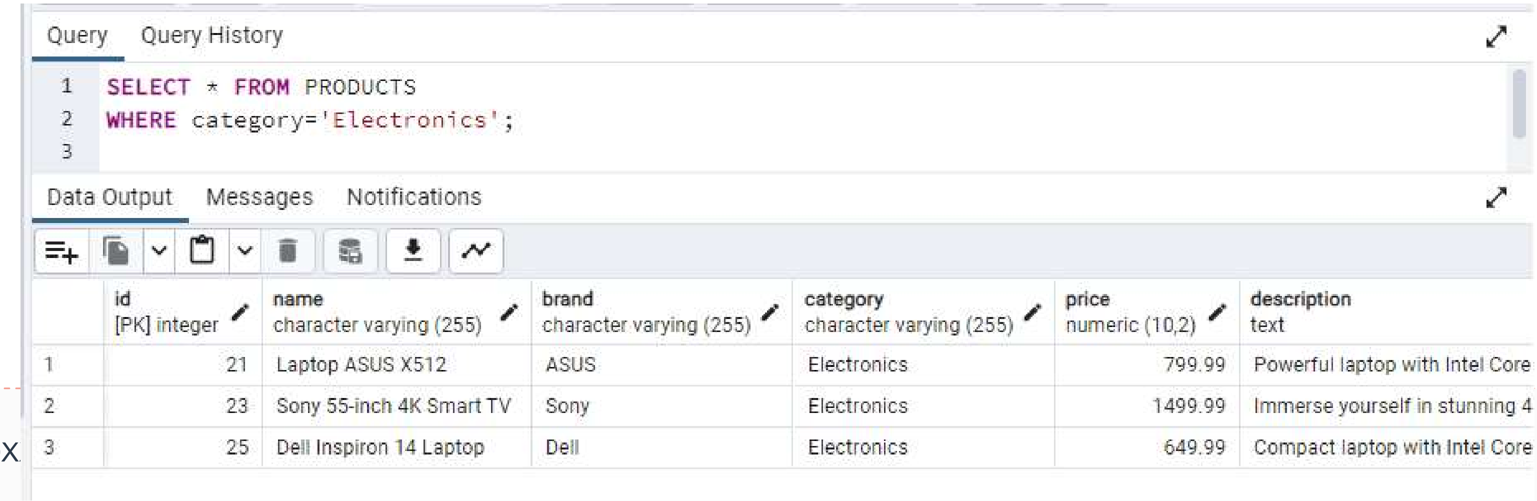


```sql
SELECT * FROM PRODUCTS
ORDER BY name;
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	26	Apple iPad Pro 12.9-inch	Apple	Tablets	1099.99	The ultimate tablet with
2	29	Bose QuietComfort 35 II	Bose	Audio	299.99	Premium noise-canceli
3	28	Canon EOS R5 Mirrorless Camera	Canon	Cameras	3499.99	High-performance mirr
4	25	Dell Inspiron 14 Laptop	Dell	Electronics	649.99	Compact laptop with In
5	30	Fitbit Charge 5	Fitbit	Wearables	179.99	Advanced fitness track
6	27	KitchenAid Stand Mixer	KitchenAid	Appliances	349.99	Powerful stand mixer fo
7	21	Laptop ASUS X512	ASUS	Electronics	799.99	Powerful laptop with In
8	24	Nike Air Zoom Pegasus 38	Nike	Footwear	129.99	Premium running shoes
9	22	Samsung Galaxy S21	Samsung	Mobile Phones	999.99	Flagship smartphone w
10	23	Sony 55-inch 4K Smart TV	Sony	Electronics	1499.99	Immerse yourself in stu

Filtering Data

- Menyaring/memfilter data dengan WHERE
- Menampilkan data dari table **products** hanya yang category-nya ‘electronics’ saja.
- SELECT * FROM PRODUCTS
- WHERE category='Electronics';

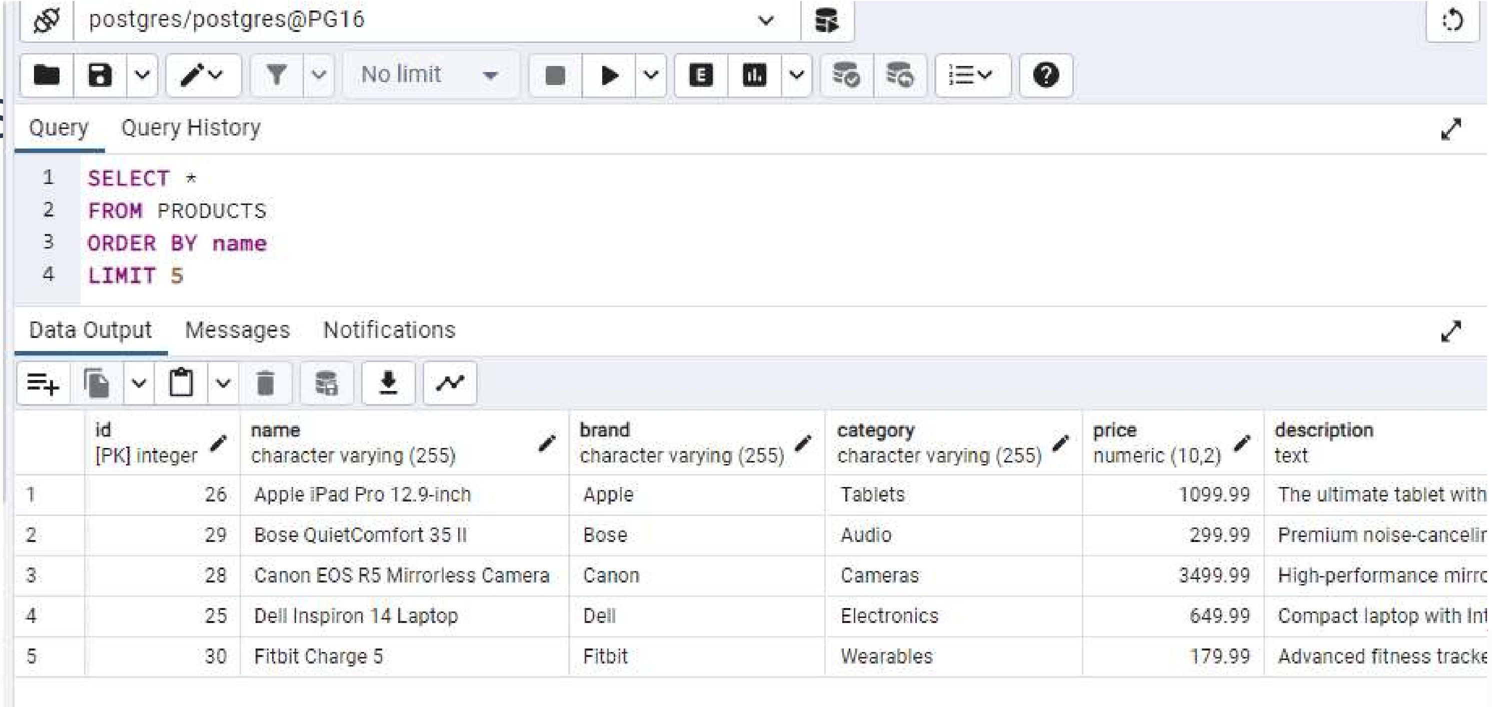


```sql
SELECT * FROM PRODUCTS
WHERE category='Electronics';
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	21	Laptop ASUS X512	ASUS	Electronics	799.99	Powerful laptop with Intel Core
2	23	Sony 55-inch 4K Smart TV	Sony	Electronics	1499.99	Immerse yourself in stunning 4
3	25	Dell Inspiron 14 Laptop	Dell	Electronics	649.99	Compact laptop with Intel Core

Filtering Data

- Membatasi banyaknya data yang ditampilkan dengan LIMIT
- Menampilkan 5 data product urut berdasarkan kolom **name**
- SELECT *
- FROM PRODUCTS
- ORDER BY name
- LIMIT 5

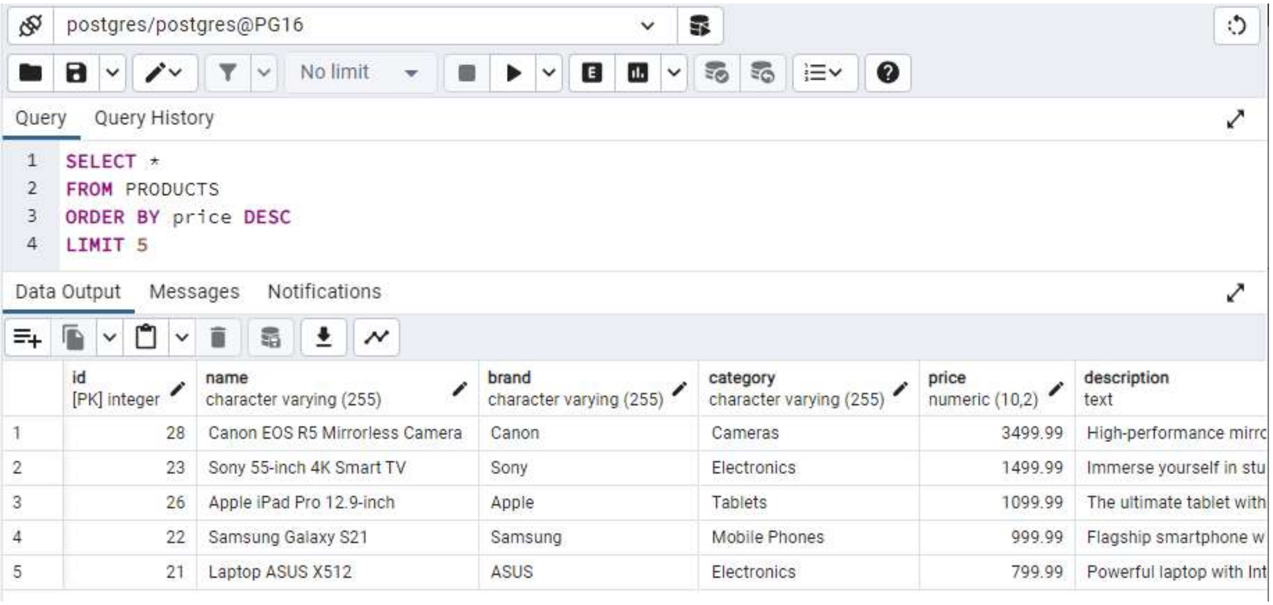

postgres/postgres@PG16
No limit
Query
Query History
Data Output
Messages
Notifications

```
SELECT *
FROM PRODUCTS
ORDER BY name
LIMIT 5
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	26	Apple iPad Pro 12.9-inch	Apple	Tablets	1099.99	The ultimate tablet with
2	29	Bose QuietComfort 35 II	Bose	Audio	299.99	Premium noise-cancel
3	28	Canon EOS R5 Mirrorless Camera	Canon	Cameras	3499.99	High-performance mirr
4	25	Dell Inspiron 14 Laptop	Dell	Electronics	649.99	Compact laptop with In
5	30	Fitbit Charge 5	Fitbit	Wearables	179.99	Advanced fitness track

Filtering Data

- Menampilkan 5 product dengan harga termahal
- SELECT *
- FROM PRODUCTS
- ORDER BY price DES
- LIMIT 5

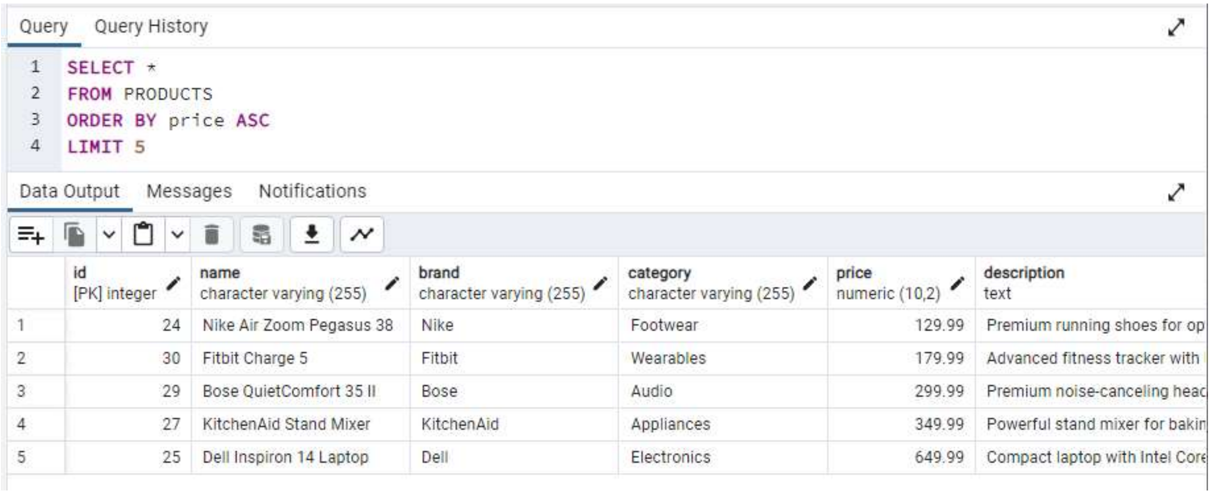

postgres/postgres@PG16
No limit
Query
Query History
Data Output
Messages
Notifications

```
SELECT *
FROM PRODUCTS
ORDER BY price DESC
LIMIT 5
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	28	Canon EOS R5 Mirrorless Camera	Canon	Cameras	3499.99	High-performance mirro
2	23	Sony 55-inch 4K Smart TV	Sony	Electronics	1499.99	Immerse yourself in stu
3	26	Apple iPad Pro 12.9-inch	Apple	Tablets	1099.99	The ultimate tablet with
4	22	Samsung Galaxy S21	Samsung	Mobile Phones	999.99	Flagship smartphone w
5	21	Laptop ASUS X512	ASUS	Electronics	799.99	Powerful laptop with Int

Filtering Data

- Menampilkan 5 product dengan harga termurah
- SELECT *
- FROM PRODUCTS
- ORDER BY price AS
- LIMIT 5



```
SELECT *
FROM PRODUCTS
ORDER BY price ASC
LIMIT 5
```

	id [PK] integer	name character varying (255)	brand character varying (255)	category character varying (255)	price numeric (10,2)	description text
1	24	Nike Air Zoom Pegasus 38	Nike	Footwear	129.99	Premium running shoes for op
2	30	Fitbit Charge 5	Fitbit	Wearables	179.99	Advanced fitness tracker with
3	29	Bose QuietComfort 35 II	Bose	Audio	299.99	Premium noise-canceling head
4	27	KitchenAid Stand Mixer	KitchenAid	Appliances	349.99	Powerful stand mixer for bakin
5	25	Dell Inspiron 14 Laptop	Dell	Electronics	649.99	Compact laptop with Intel Core

Yang telah dipelajari

- Download dan Install postgresql
- Load sample database ke dalam postgresql
- Connect ke postgresql server dengan psql, PgAdmin dan PHP
- Querying dan Filtering Data

Tessy Badriyah

Tessy.Badriyah@gmail.com

- Google scholar https://scholar.google.co.id/citations?user=jBGQ0QUAAAAJ&hl=en
- ORCID https://orcid.org/0000-0003-1905-3797
- SINTA https://sinta.kemdikbud.go.id/authors/profile/6195589/