



**Muslim Millenials
Bootcamp**
Build Your Future Career!



Data Analyst BOOTCAMP

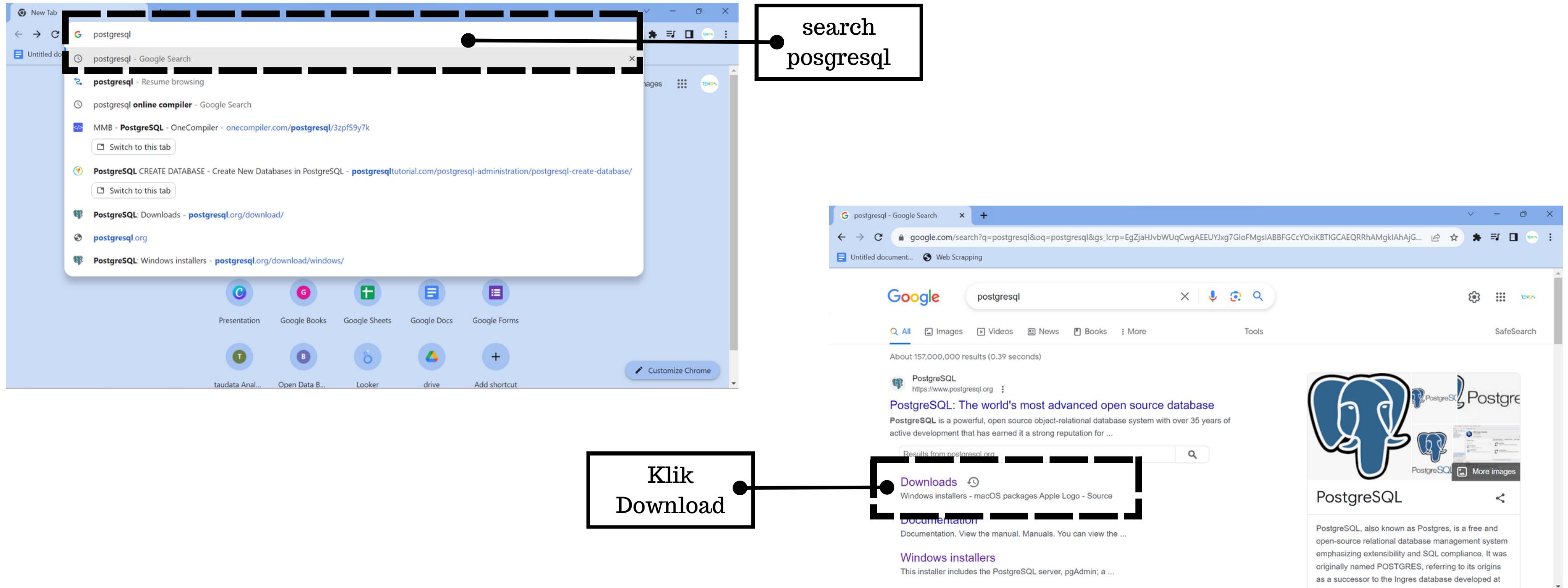
Pertemuan 2 : SQL

Basic SQL

Outline SQL

- Perkenalan SQL
- Membuat Database
- Membuat Tabel
- Menambahkan Data
- Mengambil Data dengan **SELECT Clause**
- Menggunakan **WHERE Clause**
- Menggunakan **ORDER BY Clause**
- Menggunakan **JOIN**
- Menggunakan Fungsi Agregasi
- Menggunakan **CASE WHEN**

Install postgresql



Install postgresql

The screenshot shows the PostgreSQL Downloads page. A callout box points to the Windows icon in the 'Packages and Installers' section, with the text 'Klik yang windows jika OS komputermu winsows'.

Quick Links

Downloads

PostgreSQL Downloads

PostgreSQL is available for download as ready-to-use packages or installers for various platforms, as well as a source code archive if you want to build it yourself.

Packages and Installers

Select your operating system family:

- Linux
- macOS
- Windows**
- BSD
- Solaris

Klik yang windows jika OS komputermu winsows

The screenshot shows the PostgreSQL Windows installers page. A callout box points to the 'Interactive installer by EDB' section, with the text 'klik download the installer'.

Quick Links

Windows installers

Interactive installer by EDB

Download the installer certified by EDB for all supported PostgreSQL versions.

Note! This installer is hosted by EDB and not on the PostgreSQL community servers. If you have issues with the website it's hosted on, please contact webmaster@enterprisedb.com.

This installer includes the PostgreSQL server, pgAdmin; a graphical tool for managing and developing your databases, and StackBuilder; a package manager that can be used to download and install additional PostgreSQL tools and drivers. Stackbuilder includes management, integration, migration, replication, geospatial, connectors and other tools.

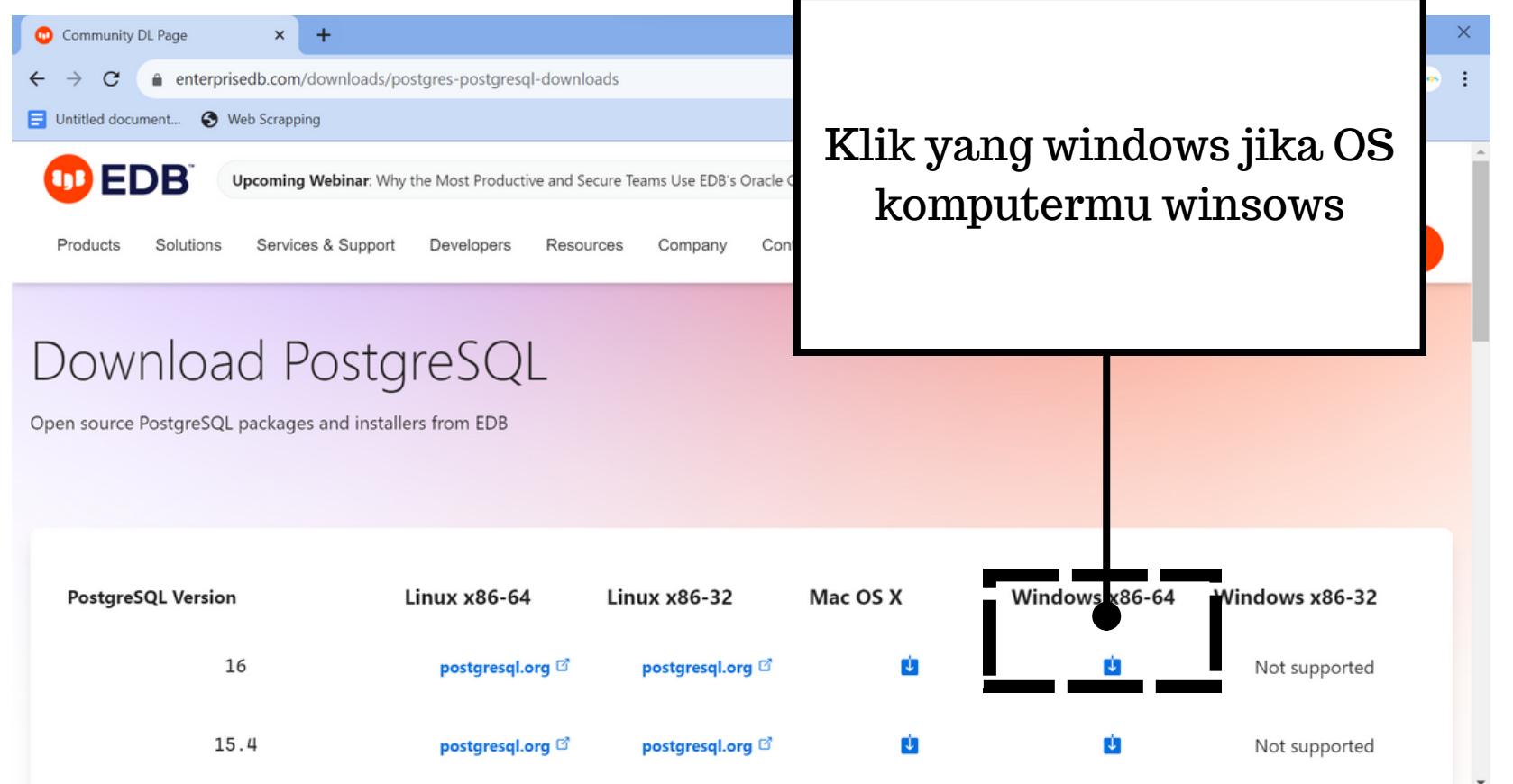
This installer can run in graphical or silent install modes.

The installer is designed to be a straightforward, fast way to get up and running with PostgreSQL on Windows.

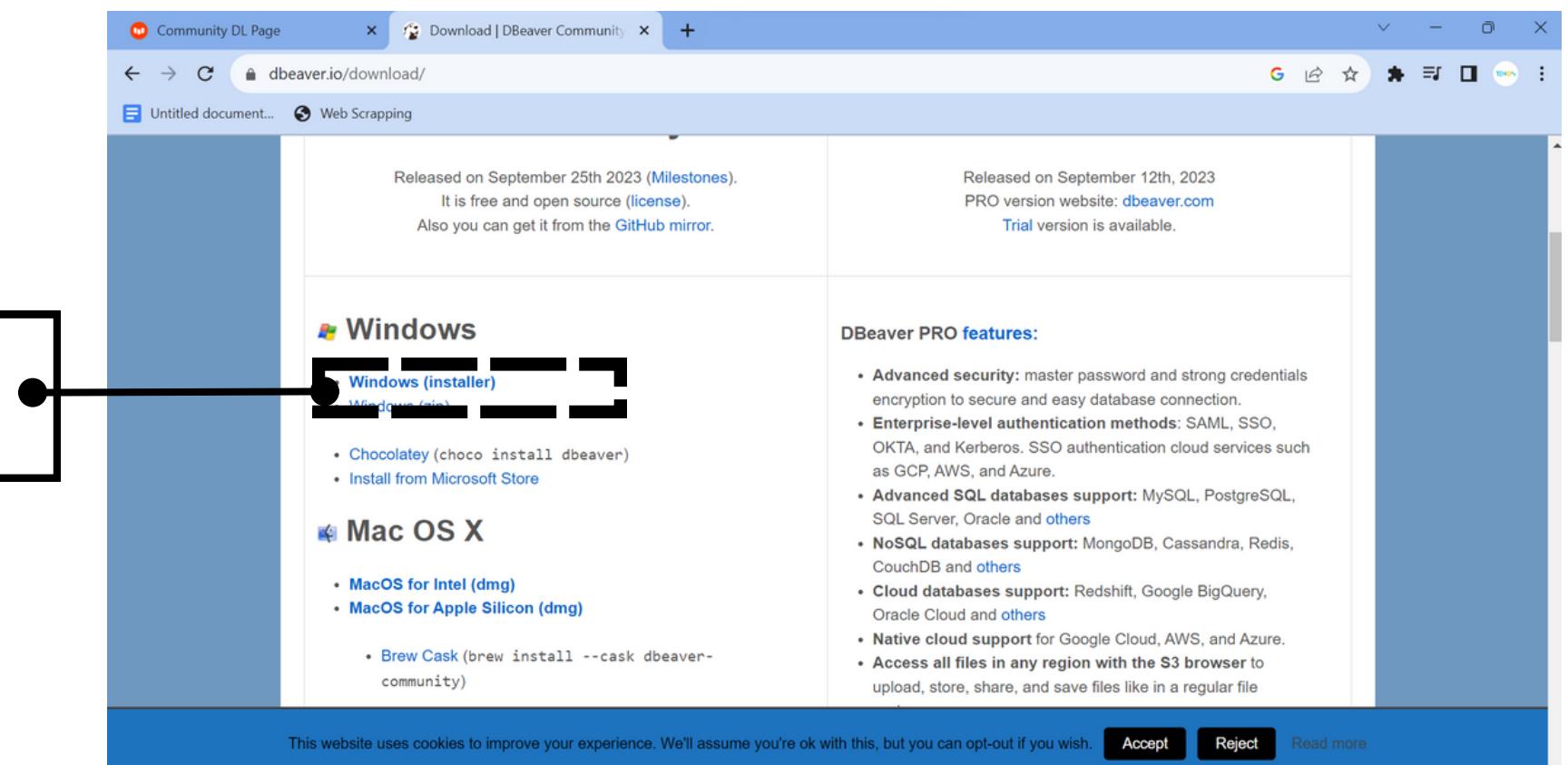
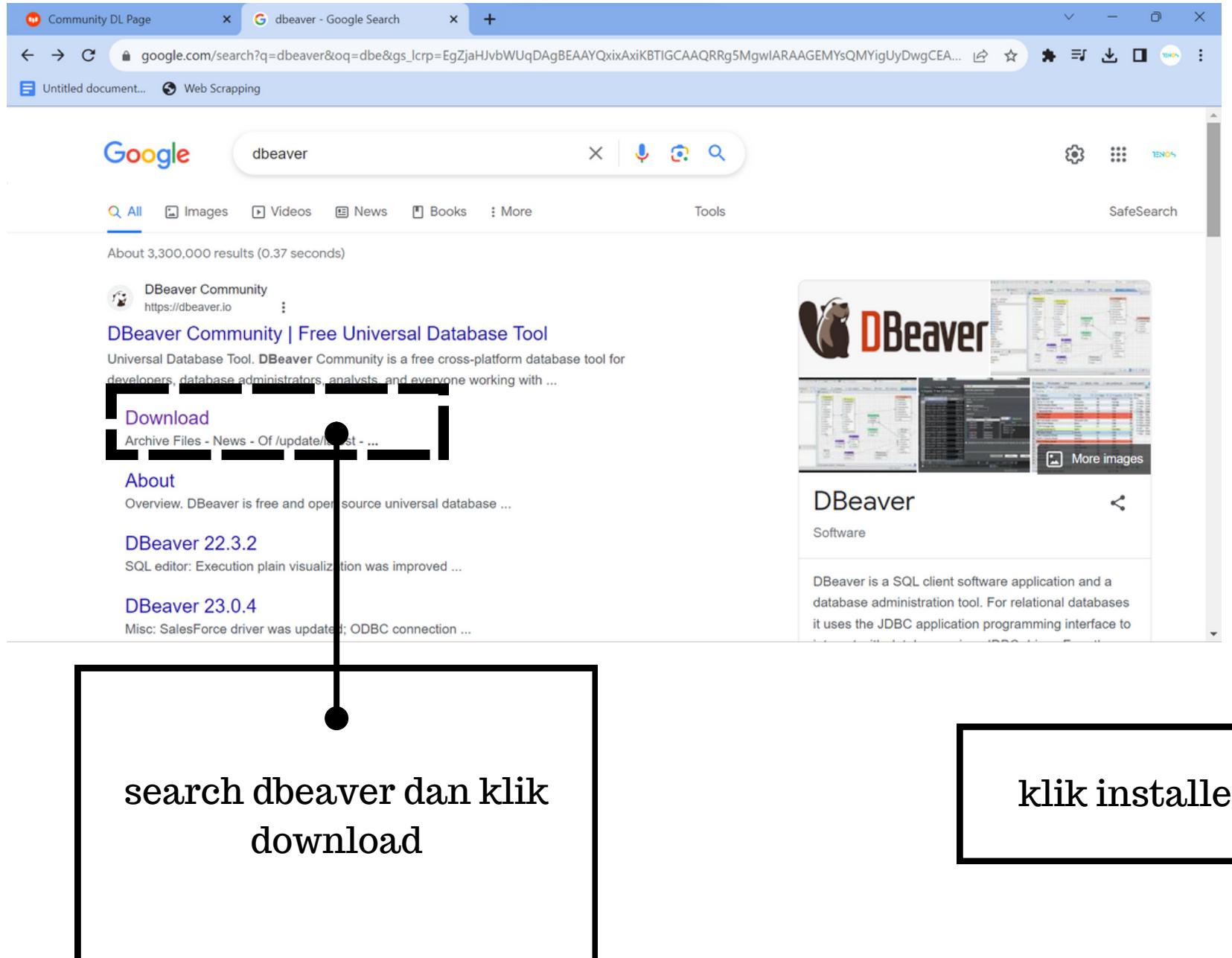
Advanced users can also download a [zip archive](#) of the binaries, without the installer. This download is intended for users who wish to include PostgreSQL as part of another application installer.

Platform support

Install postgresql



Install Dbeaver



Database dan SQL

Apa itu Database ?

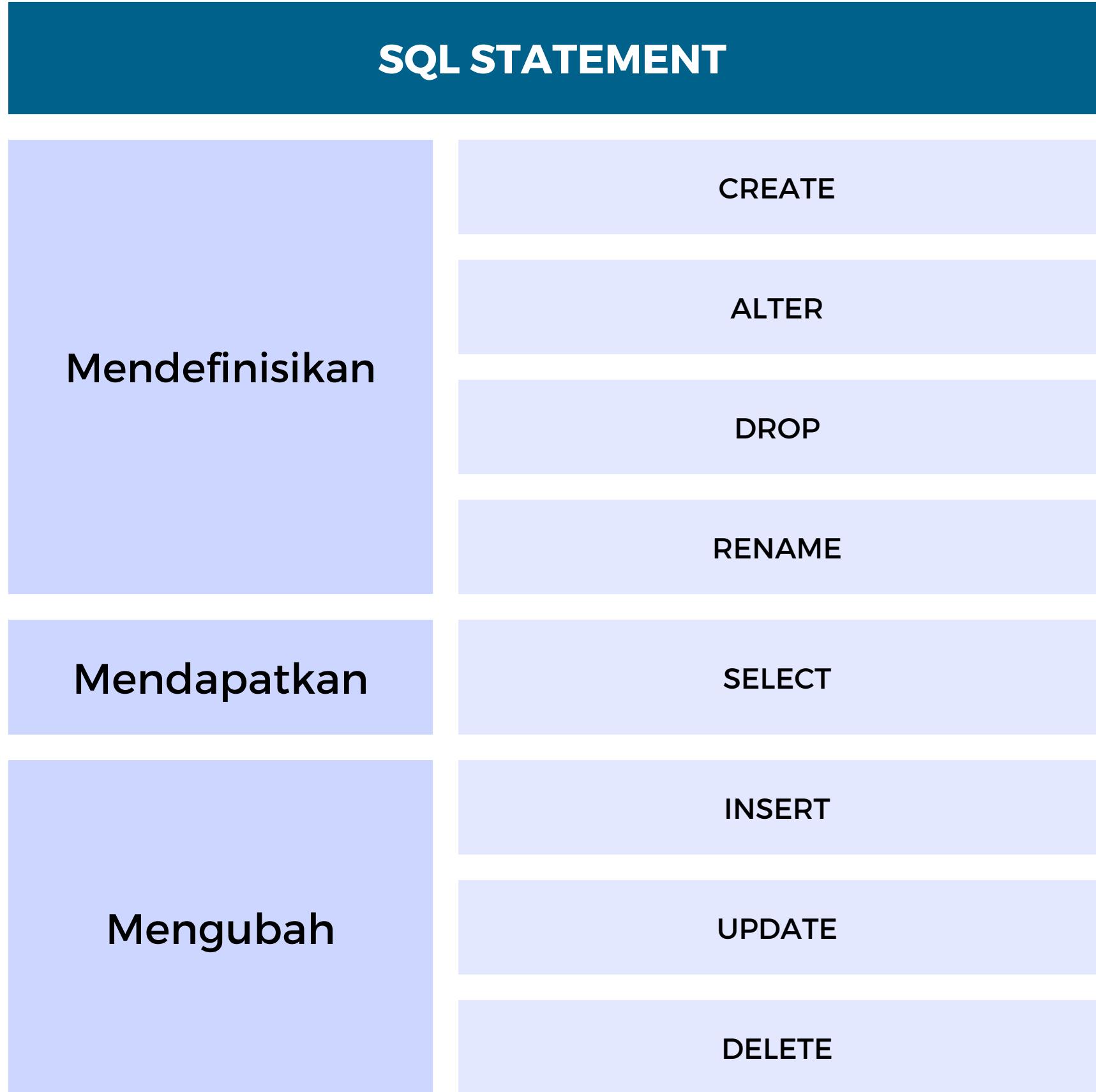
- A Collection of Data
- Penyimpanan data yang dapat diakses dan dimanipulasi
- DBMS (Database Management System)

Mengapa data perlu disimpan di Database ?

- Dapat mengolah data lebih mudah dan cepat
- integritas data lebih baik
- Data yang lebih konsisten
- penyimpanan data yang lebih efisien



Structure Query Language



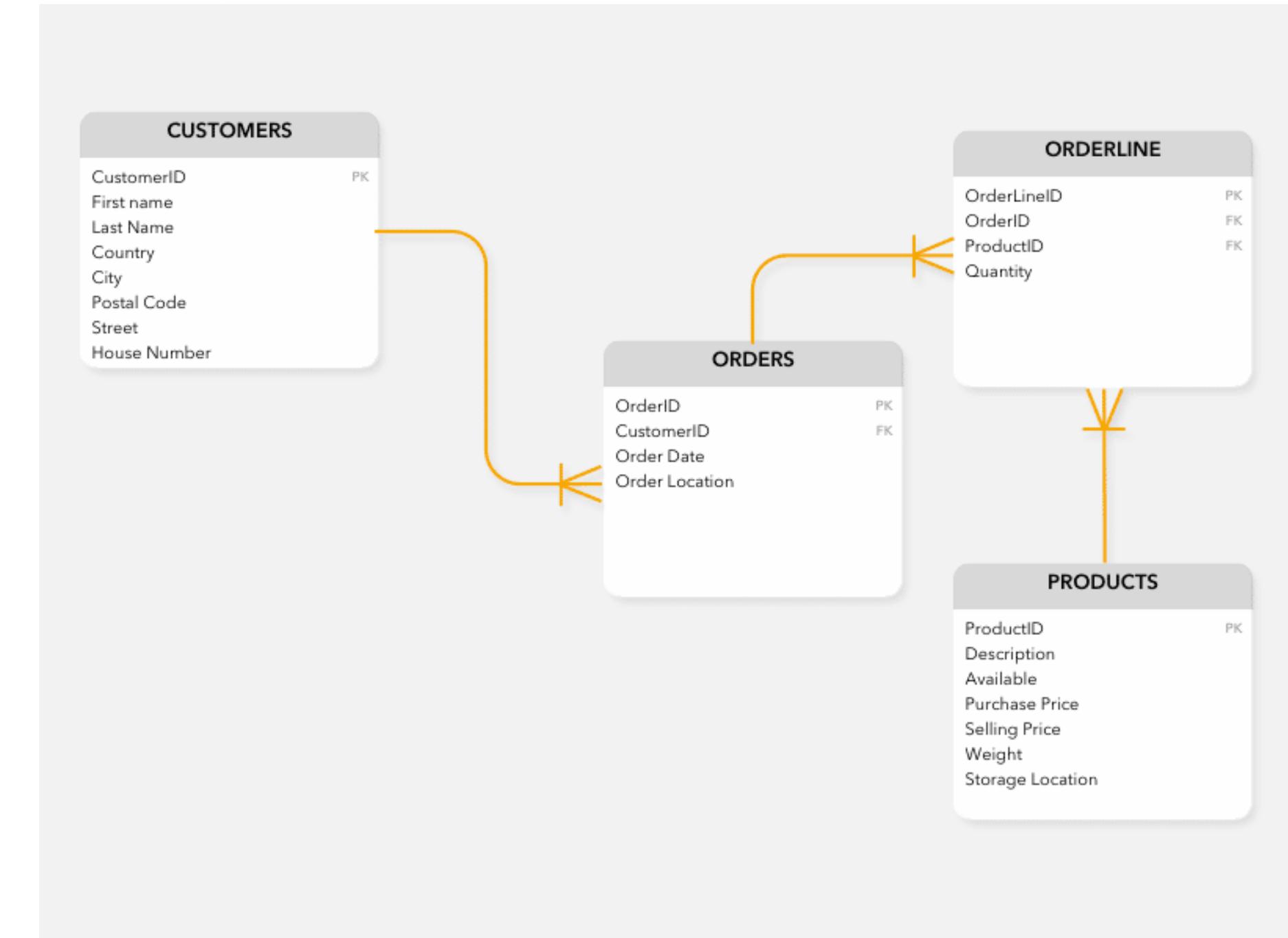
Operator

Operator	Description	Example
+	Addition - Adds values on either side of the operator	a + b will give 5
-	Subtraction - Subtracts right hand operand from left hand operand	a - b will give -1
*	Multiplication - Multiplies values on either side of the operator	a * b will give 6
/	Division - Divides left hand operand by right hand operand	b / a will give 1
%	Modulus - Divides left hand operand by right hand operand and returns remainder	b % a will give 1
^	Exponentiation - This gives the exponent value of the right hand operand	a ^ b will give 8
/	square root	/ 25.0 will give 5
/	Cube root	/ 27.0 will give 3
!	factorial	5 ! will give 120
!!	factorial (prefix operator)	!! 5 will give 120

Entity Relationship Diagram

Antara tabel satu dengan tabel lainnya dapat memiliki hubungan

Hubungan antar tabell dalam dalam database dapat digambarkan dalam bentuk Entity



Create Database

A Collection of Data

id	jenis_kelamin	divisi	umur					
1	Laki-laki	Customer Service	34	17	Laki-laki	Software Engineer	23	
2	Laki-laki	Data Engineer	26	18	Laki-laki	Software Engineer	23	
3	Laki-laki	Software Engineer	28	19	Laki-laki	Customer Service	31	
4	Perempuan	Business Intelligence	21	20	Perempuan	Customer Service	23	
5	Perempuan	Software Engineer	21	21	Laki-laki	Software Engineer	30	
6	Laki-laki	Business Intelligence	28	22	Laki-laki	Customer Service	35	
7	Perempuan	Software Engineer	21	23	Perempuan	Software Engineer	34	
8	Laki-laki	Customer Service	22	24	Laki-laki	Software Engineer	28	
9	Perempuan	Business Intelligence	21	25	Perempuan	Data Engineer	32	
10	Laki-laki	Data Science	21	26	Laki-laki	Business Intelligence	34	
11	Perempuan	Marketing	25	27	Perempuan	Data Science	34	
12	Laki-laki	Customer Service	28	28	Laki-laki	Customer Service	34	
13	Laki-laki	Data Engineer	25	29	Laki-laki	Business Intelligence	32	
14	Laki-laki	Data Engineer	25	30	Laki-laki	Software Engineer	25	
15	Laki-laki	Data Engineer	33	31	Perempuan	Marketing	28	
16	Perempuan	Software Engineer	33	32	Laki-laki	Software Engineer	30	
17	Laki-laki	Software Engineer	23	33	Laki-laki	Software Engineer	26	

Berapa jumlah Divisi ?

Berapa jumlah Pegawai laki -laki ?

Berapa jumlah Pegawai Perempuan ?

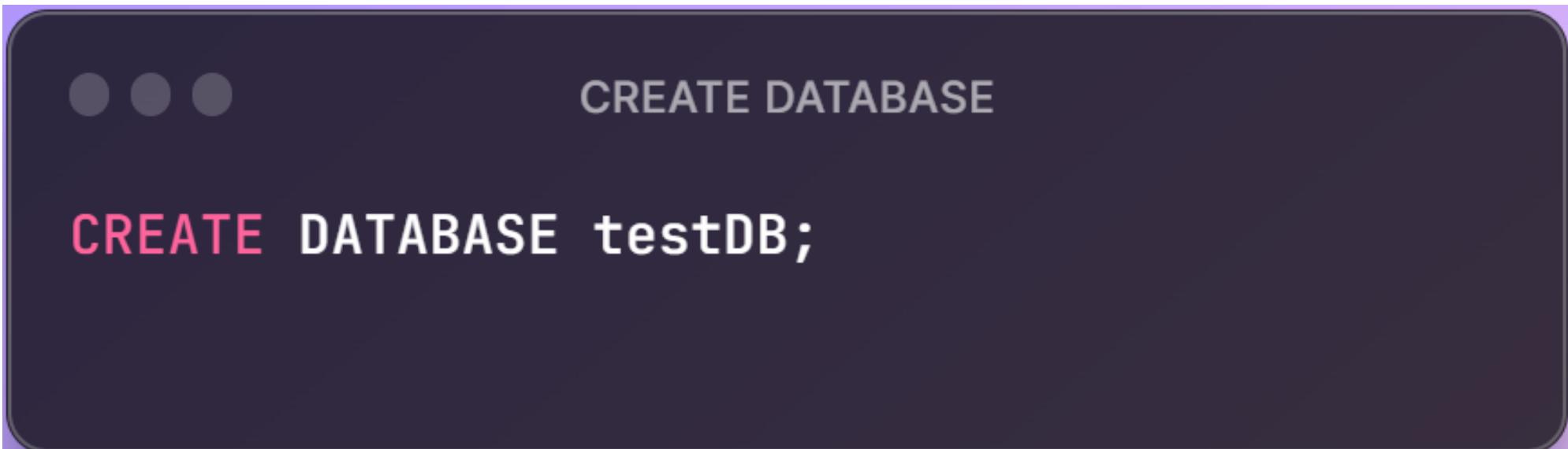
Berapa jumlah pegawai laki-laki di
divisi Data Engineer ?

Berapa jumlah pegawai Perempuan
di divisi Data Engineer diatas umur
25 Tahun ?

Create Database

Membuat Database baru

- Create Database
- Create User
- Set Privilege



Create Table

Membuat Tabel

- **CREATE TABLE**
- Data Types
- Primary Key

```
...  
CREATE TABLE  
  
CREATE TABLE table_name (  
    column1 datatype,  
    column2 datatype,  
    column3 datatype,  
    ....  
);
```

Create Table

Membuat Tabel

- CREATE TABLE
- Data Types
- Primary Key

TIPE DATA SQL

- Tipe Data Numerik
- Tipe Data Karakter
- Tipe Data Tanggal dan Waktu
- Tipe Data Biner
- Tipe Data Boolean
- Tipe Data Interval
- Tipe Data Array
- Tipe Data XML
- Tipe Data Spatial

Create Table

Membuat Tabel

- CREATE TABLE
- Data Types
- Primary Key

- Batasan PRIMARY KEY secara unik mengidentifikasi setiap record dalam tabel.
- Kunci utama harus berisi nilai UNIK, dan tidak boleh berisi nilai NULL.
- Sebuah tabel hanya dapat memiliki SATU kunci utama; dan di dalam tabel, kunci utama ini dapat terdiri dari satu atau beberapa kolom (field).

Create Table



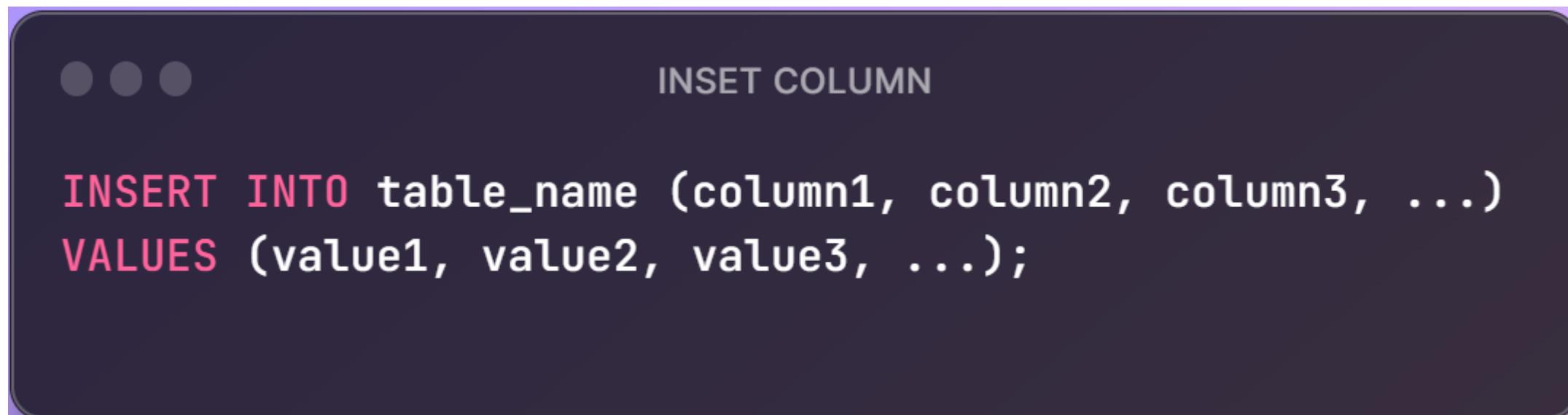
Create Table

```
CREATE TABLE siswa (
    id int NOT NULL,
    username varchar(255) NOT NULL,
    firstname varchar(255) NULL,
    last_name varchar(255) NULL,
    email varchar(255) NOT NULL,
    no_hp varchar(255) NULL,
    CONSTRAINT t_siswa_pkey PRIMARY KEY (id)
);
```

INSERT COLUMN

Menambah Data

- Pastikan jumlah kolom sesuai
- Pastikan tipe data sesuai



SQL Practice

Membuat Tabel

• • •

Tabel employee

```
CREATE TABLE employees (
    employeeid VARCHAR(20) PRIMARY KEY,
    firstname VARCHAR(50),
    lastname VARCHAR(50),
    gender VARCHAR(1),
    dateofbirth DATE,
    entryyear INT
);
```

• • •

Tabel gender

```
CREATE TABLE gender (
    genderid VARCHAR(1) PRIMARY KEY,
    gendername VARCHAR(10)
);
```

• • •

Tabel salary

```
CREATE TABLE salary (
    salaryid integer AUTO_INCREMENT PRIMARY KEY,
    employeeid VARCHAR(20),
    nominal DOUBLE
);
```

SQL Practice

Import dan Export Data

	A	B	C	D	E	F	G
1	employeeid	firstname	lastname	gender	dateofbirth	entryyear	
2	EID1	John	Doe	M	15/03/1990	2015	
3	EID10	Ava	Taylor	F	08/10/1986	2024	
4	EID11	Liam	Anderson	M	14/02/1995	2022	
5	EID12	Mia	Jackson	F	20/12/1997	2023	
6	EID13	Noah	White	M	03/04/1990	2021	
7	EID14	Charlotte	Harris	F	11/08/1998	2020	
8	EID15	James	Thomas	M	25/11/1988	2019	
9	EID16	Isabella	Martin	F	19/07/1992	2018	
10	EID17	Benjamin	Clark	M	07/09/1989	2017	
11	EID18	Abigail	Lewis	F	09/03/1991	2016	
12	EID19	Lucas	Hall	M	28/06/1993	2015	
13	EID2	Jane	Smith	F	22/07/1988	2016	
14	EID20	Lily	Walker	F	16/12/1994	2014	
15	EID3	Michael	Johnson	M	10/11/1992	2017	
16	EID4	Emily	Williams	F	03/05/1989	2018	
17	EID5	Daniel	Brown	M	28/09/1991	2019	
18	EID6	Olivia	Miller	F	12/01/1993	2020	
19	EID7	William	Davis	M	05/08/1987	2021	
20	EID8	Sophia	Wilson	F	18/04/1994	2022	
21	EID9	Ethan	Moore	M	30/06/1996	2023	
22							
23							

A1	B	C	D
A	B	C	D
1	genderid	gendername	
2	F	PEREMPUAN	
3	M	LAKI-LAKI	
4			
5			
6			
7			

C12	B	C	D
A	B	C	D
1	salaryid	employeeid	nominal
2	1 EID1		15000000
3	2 EID2		12500000
4	3 EID6		5000000
5	4 EID7		1500000
6	5 EID11		7800000
7	6 EID20		8300000
8			
9			
10			

SELECT COLUMN

Mengambil Data

- Bisa mengambil semua data
- Bisa memilih kolom mana yang akan ditampilkan
- Bisa diberikan ALIAS

```
...  
SELECT  
  
SELECT column1, column2, ...  
FROM table_name;
```

```
...  
SELECT  
  
SELECT * FROM table_name;
```

WHERE

Mengambil Data dengan Filter

- Filter sesuai kondisi yang diperintahkan
- Kondisi bisa lebih dari satu

```
... WHERE  
  
SELECT column1, column2, ...  
FROM table_name  
WHERE condition;
```

SQL Practice

Select Column

- Menampilkan semua data karyawan
- Menampilkan nama depan dan jenis kelamin karyawan
- Menampilkan karyawan yang memiliki jenis kelamin laki-laki
- Menampilkan karyawan yang masuk di tahun 2017

LOGICAL NOTATION

Manipulasi menggunakan beberapa kondisi

- AND
- OR
- IN
- Greater Than
- Less Than

Operator	Description	Example
=	Checks if the values of two operands are equal or not, if yes then condition becomes true.	(a = b) is not true.
!=	Checks if the values of two operands are equal or not, if values are not equal then condition becomes true.	(a != b) is true.
<>	Checks if the values of two operands are equal or not, if values are not equal then condition becomes true.	(a <> b) is true.
>	Checks if the value of left operand is greater than the value of right operand, if yes then condition becomes true.	(a > b) is not true.
<	Checks if the value of left operand is less than the value of right operand, if yes then condition becomes true.	(a < b) is true.
>=	Checks if the value of left operand is greater than or equal to the value of right operand, if yes then condition becomes true.	(a >= b) is not true.
<=	Checks if the value of left operand is less than or equal to the value of right operand, if yes then condition becomes true.	(a <= b) is true.

AND

Manipulasi menggunakan beberapa kondisi

- AND



AND LOGICAL NOTATION

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 AND condition2 AND
condition3 ...;
```

OR

Manipulasi menggunakan beberapa kondisi

- OR



OR LOGICAL NOTATION

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 OR condition2 OR
condition3 ...;
```

IN

Manipulasi menggunakan beberapa kondisi

- IN



IN LOGICAL NOTATION

```
SELECT column_name(s)
FROM table_name
WHERE column_name IN (value1, value2, ...);
```

ORDER BY

Mengambil Data dengan Urutan

- ASC urut dari nilai terkecil ke nilai terbesar
- DESC urut dari nilai terbesar ke nilai terkecil
- Bisa mengurutkan berdasarkan lebih dari satu kolom

```
...  
ORDER BY  
  
SELECT column1, column2, ...  
FROM table_name  
ORDER BY column1, column2, ... ASC|DESC;
```

SQL Practice

Select Column

- Menampilkan karyawan yang memiliki jenis kelamin Perempuan dan masuk di tahun 2010
- Menampilkan karyawan yang memiliki jenis kelamin Perempuan dan masuk di tahun 2015 atau 2016 atau 2017
- Menampilkan gaji dengan urutan paling rendah sampai paling tinggi

Aggregate Functions (COUNT)

Contoh Fungsi Agregasi

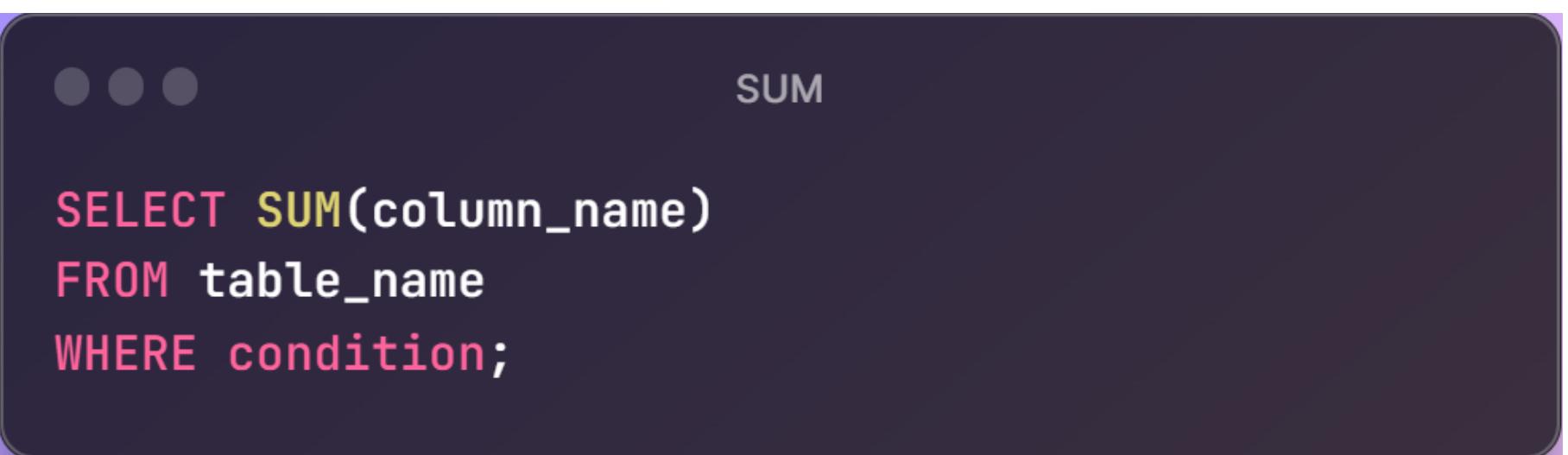
- COUNT
- SUM
- AVG

```
...          COUNT  
  
SELECT COUNT(column_name)  
FROM table_name  
WHERE condition;
```

Aggregate Functions (SUM)

Contoh Fungsi Agregasi

- COUNT
- SUM
- AVG



A dark-themed terminal window icon with three white dots at the top left and the word "SUM" at the top right.

```
SELECT SUM(column_name)
FROM table_name
WHERE condition;
```

Aggregate Functions (AVERAGE)

Contoh Fungsi Agregasi

- COUNT
- SUM
- AVG



AVERAGE

```
SELECT AVG(column_name)
FROM table_name
WHERE condition;
```

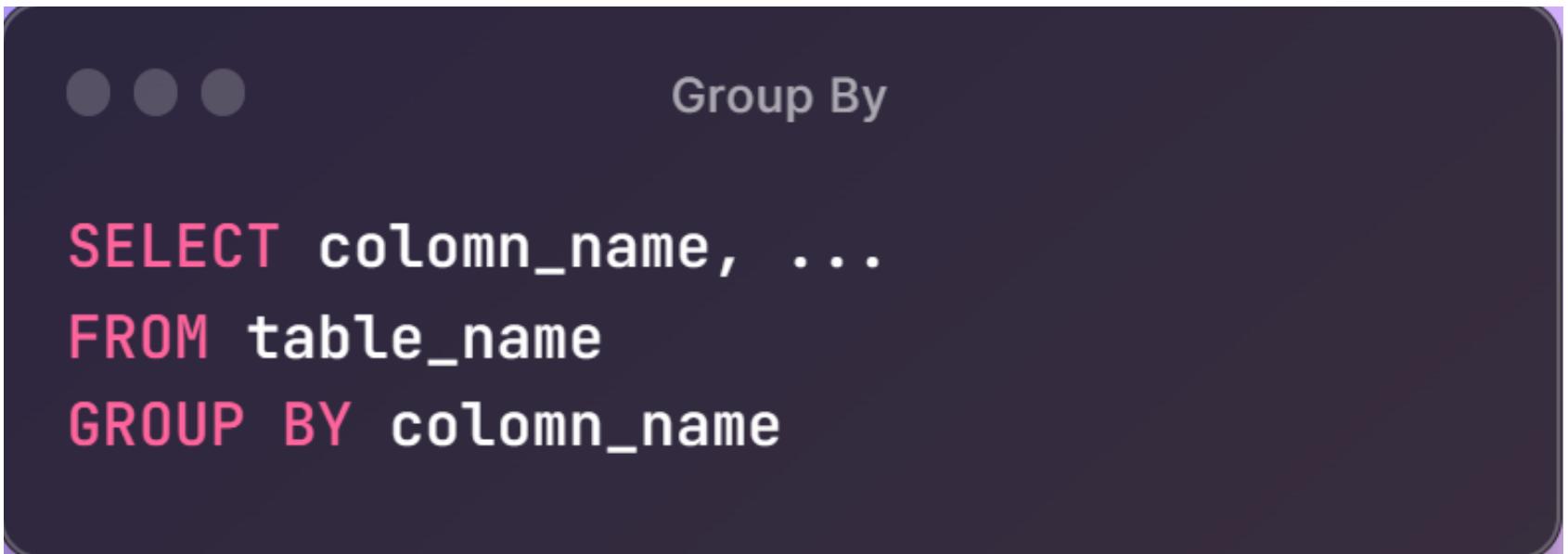
SQL Practice

Select Column

- Menampilkan jumlah karyawan keseluruhan
- Total Gaji yang harus dibayarkan perusahaan

Group By

- Group rows that have the same values
- often used with aggregate functions



Group By

```
SELECT column_name, ...
FROM table_name
GROUP BY column_name
```

Having

- WHERE keyword cannot be used with aggregate functions

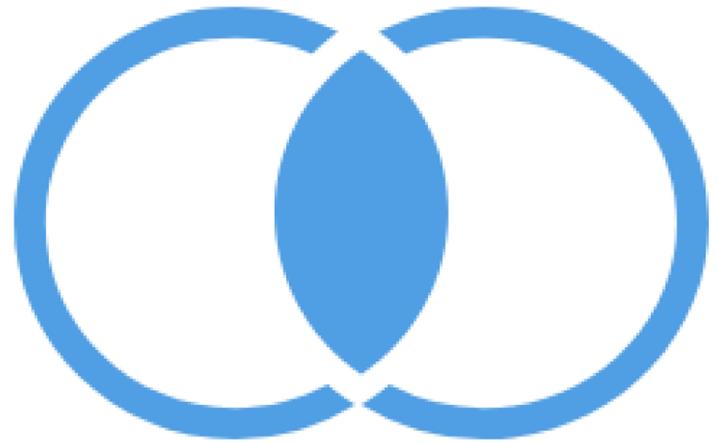
```
...          HAVING  
  
SELECT kota, sum(jumlah_penduduk) jumlah_penduduk  
FROM penduduk  
GROUP BY kota  
HAVING sum(jumlah_penduduk) < 1000
```

SQL Practice

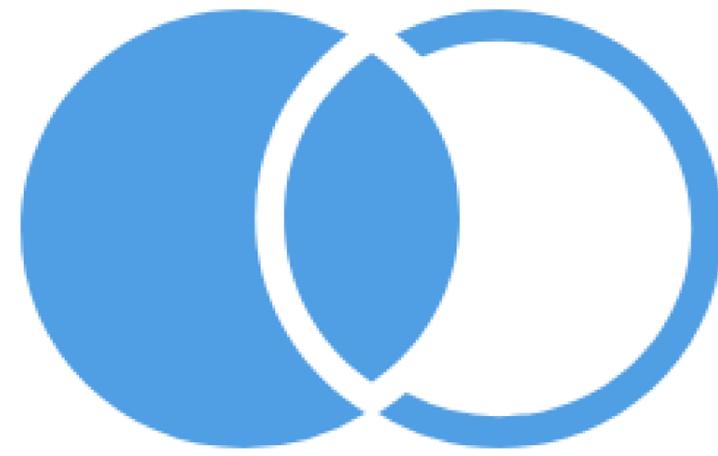
Select Column

- Menampilkan jumlah karyawan berdasarkan jenis kelamin
- Menampilkan jumlah karyawan yang masuk perusahaan tiap tahunnya
- Menampilkan rata-rata gaji karyawan dalam satu perusahaan

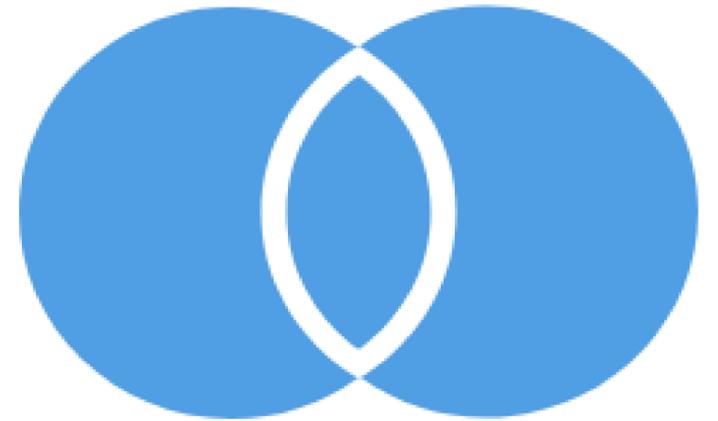
JOIN



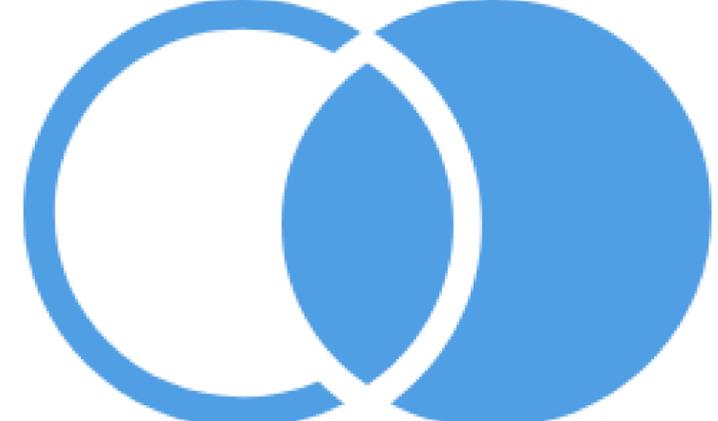
Inner join



Left outer join



Full outer join

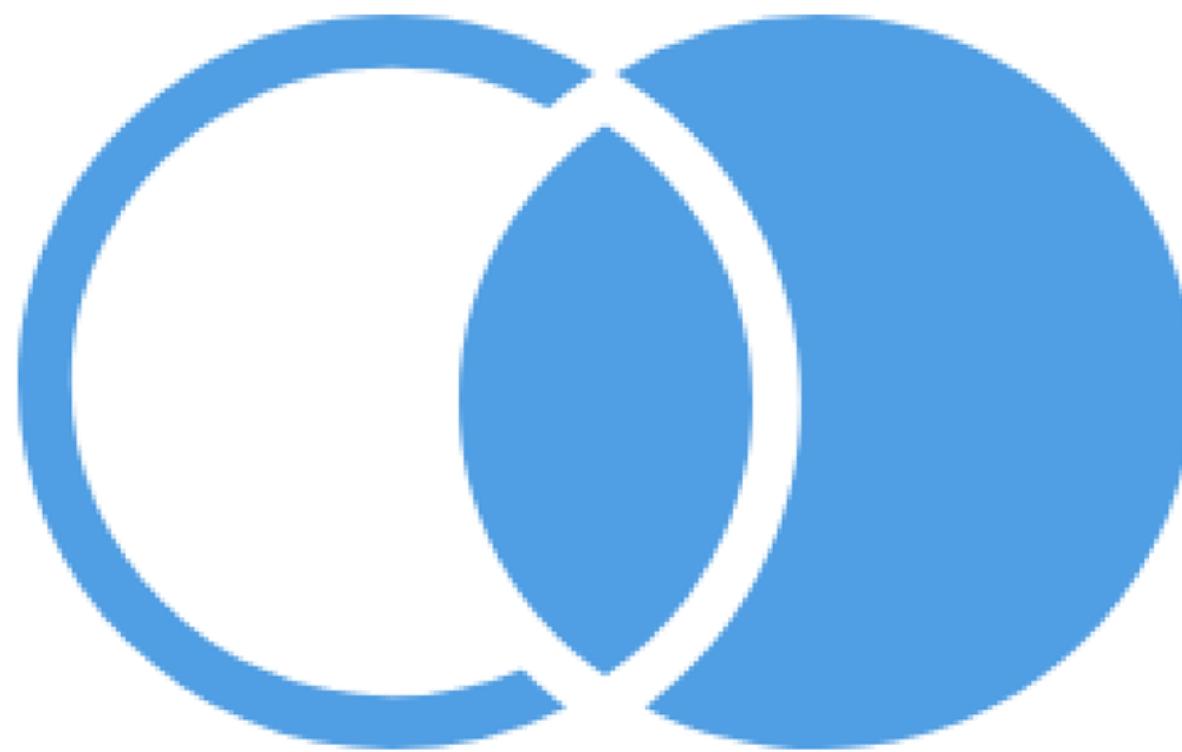


Right outer join

Mengambil data lebih dari 1 tabel

- INNER JOIN
- FULL JOIN
- LEFT JOIN
- RIGHT JOIN

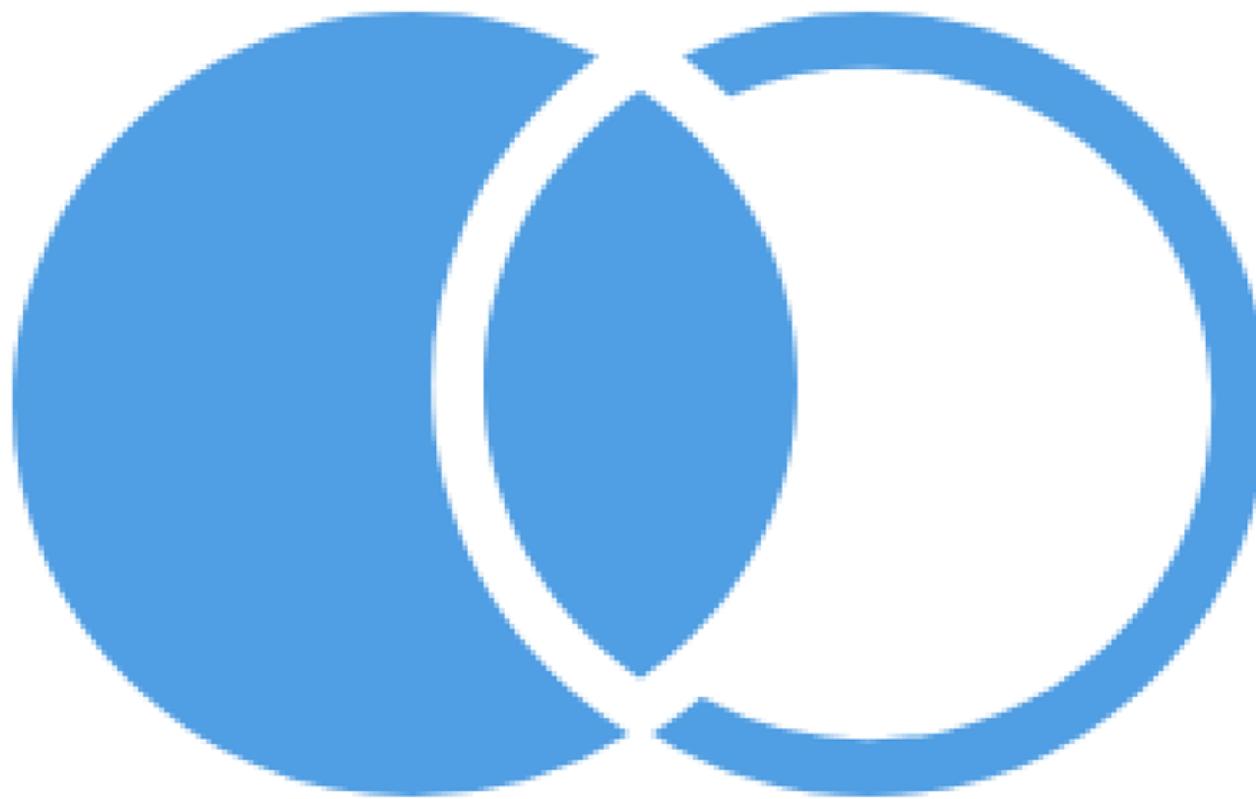
RIGHT JOIN



Right outer join

```
••• RIGHT JOIN  
  
SELECT column_name(s)  
FROM table1  
RIGHT JOIN table2  
ON table1.column_name = table2.column_name;
```

LEFT JOIN



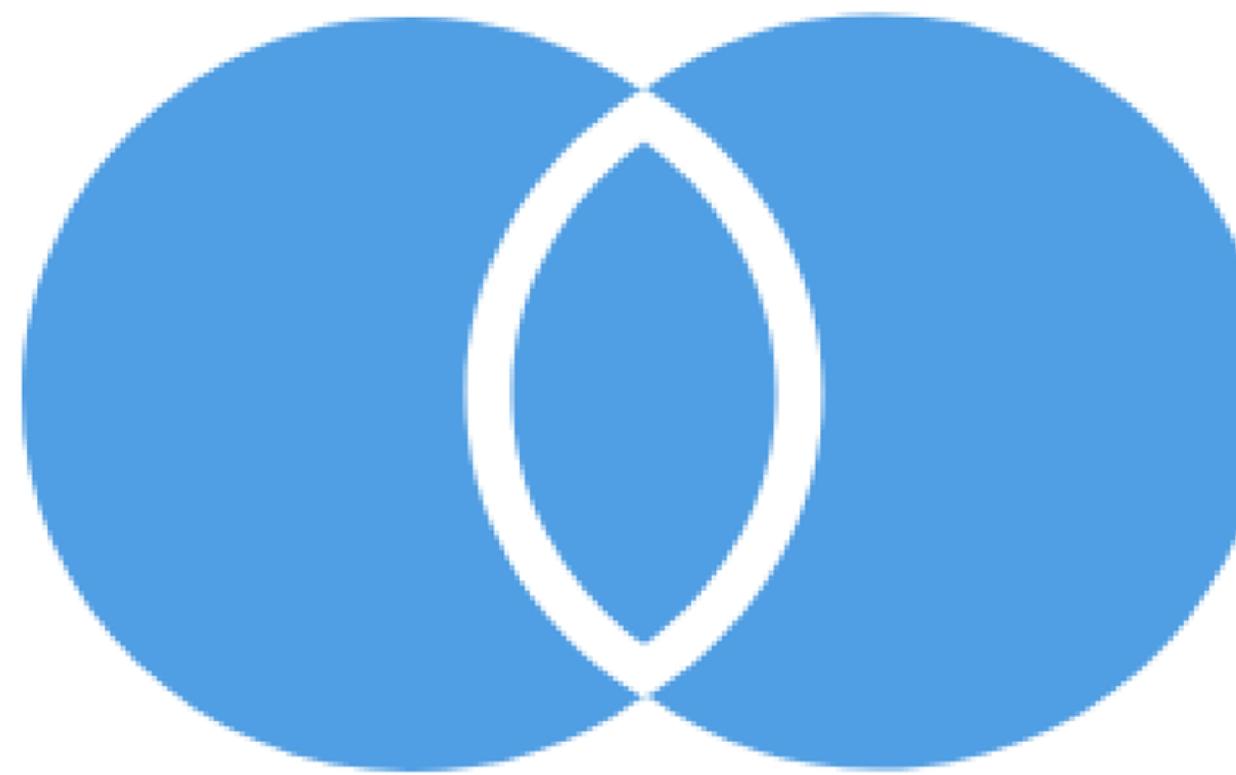
Left outer join

• • •

LEFT JOIN

```
SELECT column_name(s)
FROM table1
LEFT JOIN table2
ON table1.column_name = table2.column_name;
```

FULL JOIN



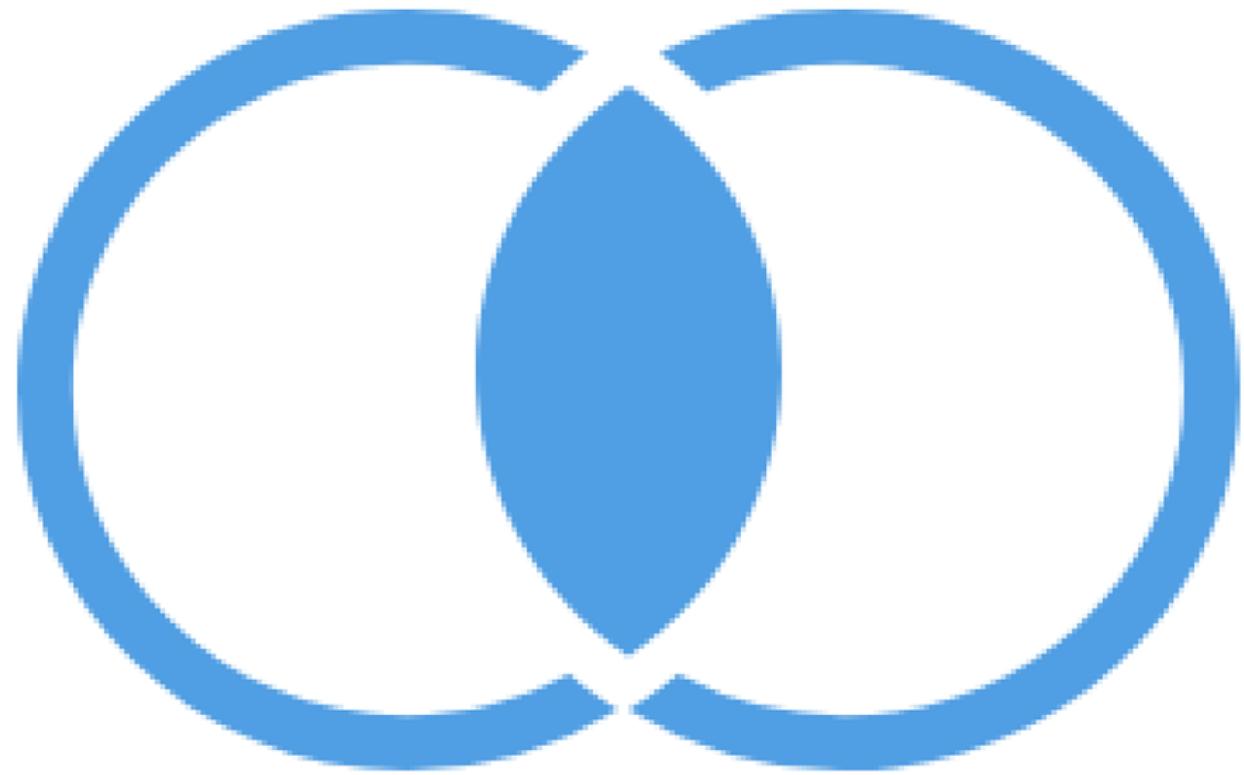
Full outer join



FULL OUTER JOIN

```
SELECT column_name(s)
FROM table1
FULL OUTER JOIN table2
ON table1.column_name = table2.column_name
WHERE condition;
```

INNER JOIN



Inner join

INNER JOIN

```
SELECT column_name(s)
FROM table1
INNER JOIN table2
ON table1.column_name = table2.column_name;
```

SQL Practice

Select Column

- Menampilkan nama karyawan dan gajinya
- Menampilkan nama karyawan dan gaji untuk karyawan wanita
- Menampilkan gaji rata-rata karyawan wanita dan pria

FUN PLAYGROUND

- Buat Database Siswa
- Buat tabel data siswa, tabel data pelajaran, table data nilai
- Isi masing-masing tabel dengan Data Dummy
- Buat query untuk menampilkan laporan rata-rata nilai setiap pelajaran
- Buat query untuk menampilkan laporan siapa siswa yang mendapatkan nilai tertinggi untuk setiap pelajaran



Thank You



Muslim Millenials Bootcamp

Build Your Future Career!



**DOMPET
DHUAFA**