

Back-End Development



# Exploration

# Database

- A **database** is *an organized collection of data*.
- The **main purpose** of database is to operate large amount of information by storing, retrieving and managing.
- There are many dynamic websites on the world wide web nowadays which are handled through databases. For example, a model to checks the availability of rooms in a hotel. It is an example of dynamic website that uses database.



# RDBMS

- **RDBMS** (*Relational Database Management Systems*) is database relational model based, introduced by E.F. Codd (1970s).
- In RDBMS, data is represented in terms of tuples (rows). It contains number of tables and each table has its own primary key.
- All modern database management systems like SQL, MS SQL Server, IBM DB2, ORACLE, My-SQL and Microsoft Access are based on RDBMS.

# SQL

- **SQL** (*Structured Query Language*) is used to communicate with a database. It's the standard language for relational database management systems. SQL statements are used to perform tasks such as update data on a database, or retrieve data from a database.
- Some common relational database management systems that use SQL are: Oracle, Sybase, Microsoft SQL Server, Access, Ingres, etc.
- The standard SQL commands such as "Select", "Insert", "Update", "Delete", "Create", and "Drop" can be used to accomplish almost everything that one needs to do with a database.



# MySQL

*MySQL* is the world's most popular open source database. With its proven performance, reliability and ease-of-use, MySQL has become the leading database choice for web-based applications, used by high profile web properties including Facebook, Twitter, YouTube, Yahoo and many more.

MySQL has been developed by MySQL AB & Oracle Corporation since 23<sup>rd</sup> May 1995, written in C and C++.



# MySQL Ranking

## 2<sup>nd</sup> All DB-engines

341 systems in ranking, March 2018

| Rank     |          |          | DBMS                   | Database Model    | Score    |          |          |
|----------|----------|----------|------------------------|-------------------|----------|----------|----------|
| Mar 2018 | Feb 2018 | Mar 2017 |                        |                   | Mar 2018 | Feb 2018 | Mar 2017 |
| 1.       | 1.       | 1.       | Oracle +               | Relational DBMS   | 1289.61  | -13.67   | -109.89  |
| 2.       | 2.       | 2.       | MySQL +                | Relational DBMS   | 1228.87  | -23.60   | -147.21  |
| 3.       | 3.       | 3.       | Microsoft SQL Server + | Relational DBMS   | 1104.79  | -17.25   | -102.70  |
| 4.       | 4.       | 4.       | PostgreSQL +           | Relational DBMS   | 399.35   | +10.97   | +41.71   |
| 5.       | 5.       | 5.       | MongoDB +              | Document store    | 340.52   | +4.10    | +13.59   |
| 6.       | 6.       | 6.       | DB2 +                  | Relational DBMS   | 186.66   | -3.31    | +1.75    |
| 7.       | 7.       | 7.       | Microsoft Access       | Relational DBMS   | 131.95   | +1.88    | -0.99    |
| 8.       | 8.       | ↑ 10.    | Redis +                | Key-value store   | 131.22   | +4.21    | +18.22   |
| 9.       | 9.       | ↑ 11.    | Elasticsearch +        | Search engine     | 128.54   | +3.23    | +22.32   |
| 10.      | 10.      | ↓ 8.     | Cassandra +            | Wide column store | 123.49   | +0.71    | -5.70    |

<https://db-engines.com/en/ranking>



# MySQL Ranking

## 2<sup>nd</sup> RDBMS DB-engines

137 systems in ranking, March 2018

| Rank     |          |          | DBMS                   | Database Model  | Score    |          |          |
|----------|----------|----------|------------------------|-----------------|----------|----------|----------|
| Mar 2018 | Feb 2018 | Mar 2017 |                        |                 | Mar 2018 | Feb 2018 | Mar 2017 |
| 1.       | 1.       | 1.       | Oracle +               | Relational DBMS | 1289.61  | -13.67   | -109.89  |
| 2.       | 2.       | 2.       | MySQL +                | Relational DBMS | 1228.87  | -23.60   | -147.21  |
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| 4.       | 4.       | 4.       | PostgreSQL +           | Relational DBMS | 399.35   | +10.97   | +41.71   |
| 5.       | 5.       | 5.       | DB2 +                  | Relational DBMS | 186.66   | -3.31    | +1.75    |
| 6.       | 6.       | 6.       | Microsoft Access       | Relational DBMS | 131.95   | +1.88    | -0.99    |
| 7.       | 7.       | 7.       | SQLite +               | Relational DBMS | 114.81   | -2.46    | -1.37    |
| 8.       | 8.       | 8.       | Teradata               | Relational DBMS | 72.46    | -0.53    | -1.07    |
| 9.       | ↑ 10.    | ↑ 12.    | MariaDB +              | Relational DBMS | 63.10    | +1.45    | +16.22   |
| 10.      | ↓ 9.     | ↓ 9.     | SAP Adaptive Server +  | Relational DBMS | 62.62    | -0.87    | -7.51    |

<https://db-engines.com/en/ranking>



# Primary Key

- The ***Primary keys*** constraint uniquely identifies each record in a database table.
- Primary keys must contain UNIQUE values, and cannot contain NULL values.
- A table can have only one primary key, which may consist of single or multiple fields.
- Example: *No\_KTP, product\_key, ID\_sidikjari*



# Composite Key

- A ***composite key*** is a combination of two or more columns in a table that can be used to uniquely identify each row in the table when the columns are combined uniqueness is guaranteed, but when it taken individually it does not guarantee uniqueness.
- Columns that make up the composite key can be of different data types.
- Example: *nama & tglLahir, ID\_prod & prod\_date*

# Foreign Key

- A ***foreign key*** is a field or a column that is used to establish a link between two tables. In simple words you can say that, a foreign key in one table used to point primary key in another table.



# Foreign Key

First table:

| S_Id | LastName | FirstName | CITY      |
|------|----------|-----------|-----------|
| 1    | MAURYA   | AJEET     | ALLAHABAD |
| 2    | JAISWAL  | RATAN     | GHAZIABAD |
| 3    | ARORA    | SAUMYA    | MODINAGAR |

Second table:

| O_Id | OrderNo  | S_Id |
|------|----------|------|
| 1    | 99586465 | 2    |
| 2    | 78466588 | 2    |
| 3    | 22354846 | 3    |
| 4    | 57698656 | 1    |

The "S\_Id" column in the 1st table is the **PRIMARY KEY** in the 1st table.  
The "S\_Id" column in the 2nd table is a **FOREIGN KEY** in the 2nd table.



# Getting Started

Download & install MySQL  
from its official site **or** XAMPP!



**MySQL Installer**

[www.mysql.com/  
downloads/](http://www.mysql.com/downloads/)

**On Windows, it needs  
.NET Framework**

[www.microsoft.com/net/  
download/windows](http://www.microsoft.com/net/download/windows)



# XAMPP

**XAMPP Bundle**

[apachefriends.org](http://apachefriends.org)



# #1 With MySQL Installer

## Installation: Server Config

### MySQL. Installer

MySQL Server 5.7.21

Type and Networking

Type and Networking

Accounts and Roles

Windows Service

Plugins and Extensions

Apply Configuration

## Type and Networking

### Server Configuration Type

Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.

Config Type:

### Connectivity

Use the following controls to select how you would like to connect to this server.

☒ TCP/IP Port Number:

☒ Open Firewall port for network access

☐ Named Pipe Pipe Name:

☐ Shared Memory Memory Name:

### Advanced Configuration

Select the checkbox below to get additional configuration page where you can set advanced options for this server instance.

☐ Show Advanced Options

< Back


Next >

Cancel



# #1 With MySQL Installer

## Installation: Accounts & Roles

**MySQL. Installer**  
MySQL Server 5.7.21

Type and Networking

Type and Networking

**Accounts and Roles**

Windows Service

Plugins and Extensions

Apply Configuration

### Accounts and Roles


**Root Account Password**  
Enter the password for the root account. Please remember to store this password in a secure place.

MySQL Root Password:

Repeat Password:

Password strength: **Weak**

**MySQL User Accounts**  
Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.

|   | MySQL Username | Host | User Role |   |
|---|----------------|------|-----------|---|
|  | lintang        | %    | DB Admin  | <div><div>Add User</div><div>Edit User</div><div>Delete</div></div> |

< Back

Next >

Cancel



# #1 With MySQL Installer

Setup Database Server

Via Command Prompt, go to *mysql.exe* directory  
***C:\Program Files\MySQL\MySQL Server 5.7\bin***  
then execute:

```
$ mysql.exe --user=root --password=12345
```

***or***

```
$ mysql.exe -u lintang -p12345
```

```
C:\Program Files\MySQL\MySQL Server 5.7\bin>mysql.exe --user=lintang --password=12345
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 19
Server version: 5.7.21-log MySQL Community Server (GPL)

Copyright (c) 2000, 2018, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> █
```



## #2 With XAMPP

Activate Apache & MySQL Server

XAMPP Control Panel v3.2.2 [ Compiled: Nov 12th 2015 ]

**XAMPP Control Panel v3.2.2**

| Service                             | Module    | PID(s)       | Port(s) | Actions                 |
|-------------------------------------|-----------|--------------|---------|-------------------------|
| <input checked="" type="checkbox"/> | Apache    | 2560<br>5696 | 80, 443 | Stop Admin Config Logs  |
| <input checked="" type="checkbox"/> | MySQL     | 5764         | 3307    | Stop Admin Config Logs  |
| <input type="checkbox"/>            | FileZilla |              |         | Start Admin Config Logs |
| <input type="checkbox"/>            | Mercury   |              |         | Start Admin Config Logs |
| <input type="checkbox"/>            | Tomcat    |              |         | Start Admin Config Logs |

Config Netstat Shell Explorer Services Help Quit

13:32:27 [mysql] entire log window on the forums  
13:34:05 [mysql] Problem detected!  
13:34:05 [mysql] Port 3306 in use by ""C:\Program Files\MySQL\MySQL Server 5.7\bin\mysqld.exe"  
13:34:05 [mysql] MySQL WILL NOT start without the configured ports free!  
13:34:05 [mysql] You need to uninstall/disable/reconfigure the blocking application  
13:34:05 [mysql] or reconfigure MySQL and the Control Panel to listen on a different port  
13:34:05 [mysql] Attempting to start MySQL app...  
13:34:05 [mysql] Status change detected: running





## #2 With XAMPP

### Setup Database Server

Via Command Prompt, go to *mysql.exe* directory

***C:\xampp\mysql\bin*** then execute:

```
$ mysql.exe --user=root --password=12345
```

***or***

```
$ mysql.exe --user=lintang --password=12345
```

```
C:\xampp\mysql\bin>mysql.exe --user=root --password=12345
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 32
Server version: 5.7.21-log MySQL Community Server (GPL)

Copyright (c) 2000, 2017, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]>
```

# How to Work With MySQL Database



# Create Database

Menampilkan daftar database yang ada:

```
$ SHOW databases;
```

Membuat database bernama “toko”:

```
$ CREATE database toko;
```

```
$ CREATE database IF NOT EXISTS toko;
```

Menghapus database “toko”:

```
$ DROP database toko;
```



# Create Table

Menggunakan/mengaktifkan database “toko”:

```
$ USE toko;
```

Menampilkan tabel dalam database “toko”:

```
$ SHOW tables;
```

```
$ SHOW FULL tables;
```

Membuat tabel “tes” berisi 1 kolom “NoID”:

```
$ CREATE TABLE tes (NoID INT);
```

Lihat struktur tabel “tes”:

```
$ DESCRIBE tes;
```

Hapus tabel “tes”:

```
$ DROP TABLE tes;
```

# Create Table

```
$ CREATE TABLE karyawan (  
-> No INT NOT NULL AUTO_INCREMENT,  
-> Nama VARCHAR(30) NOT NULL,  
-> Usia TINYINT,  
-> Berat FLOAT(3,1),  
-> Kota TEXT,  
-> Th YEAR,  
-> Data_In TIMESTAMP,  
-> PRIMARY KEY (No)  
-> );
```



# Insert Data

```
$ INSERT INTO karyawan VALUES(  
-> NULL,  
-> 'Andi Santosa',  
-> 42,  
-> 78.2,  
-> 'Jakarta',  
-> 2001,  
-> NULL  
-> );
```

Lihat semua data pada tabel karyawan:

```
$ SELECT * FROM karyawan;
```



```
$ CREATE TABLE tim_sales (  
-> No INT NOT NULL AUTO_INCREMENT,  
-> Nama VARCHAR(30) NOT NULL,  
-> Usia SMALLINT,  
-> Sex SET('Pria','Wanita'),  
-> Area ENUM('Jkt','Bdg','Sby'),  
-> Kode VARCHAR(8) NOT NULL UNIQUE,  
-> Gaji INT DEFAULT 3000000,  
-> PRIMARY KEY (No)  
-> );
```

*//coba insert data*



# Insert Data

```
mysql> select * from karyawan;
```

| No | Nama           | Usia | Berat | Kota       | Th   | Data_In             |
|----|----------------|------|-------|------------|------|---------------------|
| 1  | Andi Santosa   | 42   | 78.2  | Jakarta    | 2001 | 2018-02-17 21:36:33 |
| 2  | Budi Permana   | 32   | 88.1  | Jakarta    | 1999 | 2018-02-17 21:36:33 |
| 3  | Cecep Sutisna  | 35   | 68.9  | Bandung    | 2000 | 2018-02-17 21:36:33 |
| 4  | Dedi Hartanto  | 32   | 71.3  | Salatiga   | 1998 | 2018-02-17 21:36:33 |
| 5  | Eva Soraya     | 32   | 48.1  | Medan      | 2015 | 2018-02-17 21:36:33 |
| 6  | Farah Naimah   | 29   | 52.3  | Surabaya   | 2010 | 2018-02-17 21:36:33 |
| 7  | Gianti Safitri | 22   | 51.6  | Bandung    | 2017 | 2018-02-17 21:36:33 |
| 8  | Hamzah Syah    | 34   | 66.0  | Yogyakarta | 2008 | 2018-02-17 21:36:33 |
| 9  | Irene Sukindar | 25   | 49.3  | Jakarta    | 2016 | 2018-02-17 21:36:33 |
| 10 | Joni Saputra   | 28   | 69.8  | Yogyakarta | 2000 | 2018-02-17 21:36:33 |

10 rows in set (0.06 sec)



# Insert Multiple Data

```
$ INSERT INTO karyawan VALUES  
(NULL, 'Andi Santosa', 42, 78.2, 'Jakarta', 2001, NULL),  
(NULL, 'Budi Permana', 32, 88.1, 'Jakarta', 1999, NULL),  
(NULL, 'Cecep Sutisna', 35, 68.9, 'Bandung', 2000, NULL),  
(NULL, 'Dedi Hartanto', 32, 71.3, 'Salatiga', 1998, NULL),  
(NULL, 'Eva Soraya', 32, 48.1, 'Medan', 2015, NULL),  
(NULL, 'Farah Naimah', 29, 52.3, 'Surabaya', 2010, NULL),  
(NULL, 'Gianti Safitri', 22, 51.6, 'Bandung', 2017, NULL),  
(NULL, 'Hamzah Syah', 34, 66.0, 'Yogyakarta', 2008, NULL),  
(NULL, 'Irene Sukindar', 25, 49.3, 'Jakarta', 2016, NULL),  
(NULL, 'Joni Saputra', 28, 69.8, 'Yogyakarta', 2000, NULL)  
;
```



# Insert Data

Pada tabel “karyawan” di database “toko”,  
Insert data hanya ke kolom Nama & Usia:

```
$ INSERT INTO karyawan (Nama, Usia) VALUES  
-> ('Budi Raharja', 52);
```

Insert multiple data ke kolom Nama:

```
$ INSERT INTO karyawan (Nama) VALUES  
-> ('Caca'), ('Dedi');
```

# Update Data

Update data untuk semua isi kolom tertentu:

```
$ UPDATE karyawan SET Th = 2010;
```

Update data untuk baris data tertentu:

```
$ UPDATE karyawan SET Nama = "Anisa Safitri"  
-> WHERE No = 1;
```

```
$ UPDATE karyawan SET  
    Nama = "Anisa Safitri", Usia = 28,  
    Kota = "Medan", Job = "Programmer"  
-> WHERE No = 1;
```

# Delete Data

Delete semua data pada tabel:

```
$ DELETE FROM karyawan;
```

Delete baris data tertentu di tabel:

```
$ DELETE FROM karyawan  
-> WHERE No = 4;
```



# Insert Column

Lihat struktur tabel

```
$ DESCRIBE karyawan;
```

Add kolom Gaji:

```
$ ALTER TABLE karyawan  
-> ADD COLUMN Gaji INT;
```

Add kolom Gaji setelah kolom Tahun:

```
$ ALTER TABLE karyawan  
-> ADD COLUMN Gaji INT AFTER Th;
```

Hapus kolom:

```
$ ALTER TABLE karyawan  
-> DROP COLUMN Gaji;
```

Lihat semua isi data pada tabel:

```
$ SELECT * FROM karyawan;
```

Lihat data pada atribut/kolom tertentu:

```
$ SELECT Nama, Kota FROM karyawan;
```

Lihat 5 data pertama:

```
$ SELECT * FROM karyawan LIMIT 5;
```

Lihat 5 data setelah data ke-3:

```
$ SELECT * FROM karyawan LIMIT 3,5;
```

Lihat additional data di luar tabel.

\*Tampilkan setengah Berat Badan:

```
$ SELECT Nama, Berat,  
-> 0.5 * Berat AS separoBB  
-> FROM karyawan;
```

\*Berapa tahun lagi waktu pensiun:

```
$ SELECT Nama, Usia,  
-> 55 - Usia AS jarakPensiun  
-> FROM karyawan;
```



# Order By

\*Urutkan Nama berdasarkan Usia:

```
$ SELECT Nama, Usia  
-> FROM karyawan ORDER BY Usia;
```

\*Urutan Descending Nama berdasar Usia:

```
$ SELECT Nama, Usia  
-> FROM karyawan ORDER BY Usia DESC;
```

\*Urutkan Nama berdasarkan Usia lalu Berat:

```
$ SELECT Nama, Usia, Berat  
-> FROM karyawan ORDER BY Usia, Berat;
```





# Order By Field

\*Urutkan Nama & kelompokkan Nama berdasarkan urutan Kota:

```
$ SELECT Nama, Kota  
-> FROM karyawan ORDER BY FIELD(Kota,  
-> 'Jakarta', 'Yogyakarta', 'Bandung',  
-> 'Salatiga', 'Medan', 'Surabaya');
```

```
$ SELECT Nama, Kota  
-> FROM karyawan ORDER BY FIELD(Kota,  
-> 'Jakarta', 'Yogyakarta', 'Bandung',  
-> 'Salatiga', 'Medan', 'Surabaya')  
-> DESC;
```

```
$ SELECT * FROM karyawan  
-> WHERE No > 2;
```

```
$ SELECT * FROM karyawan  
-> WHERE Berat BETWEEN 45 AND 55;
```

```
$ SELECT Nama FROM karyawan  
-> WHERE Usia < 25 OR Th > 2016;
```

```
$ SELECT Nama FROM karyawan  
-> WHERE Th IN (2010, 2017);
```

# Where Like

```
$ SELECT Nama FROM karyawan  
-> WHERE Nama LIKE 'a%';
```

```
$ SELECT Nama FROM karyawan  
-> WHERE Nama LIKE '%na';
```

```
$ SELECT Nama FROM karyawan  
-> WHERE Nama LIKE '%di%';
```

```
$ SELECT Nama FROM karyawan  
-> WHERE Nama NOT LIKE '%di%';
```

# Count, Min & Max

```
$ SELECT COUNT(*) FROM karyawan  
-> WHERE Kota = 'Jakarta';
```

```
$ SELECT COUNT(*) AS Banyaknya  
-> FROM karyawan  
-> WHERE Kota = 'Jakarta';
```

```
$ SELECT MIN(Usia) AS Termuda  
-> FROM karyawan;
```

```
$ SELECT MAX(Usia) AS Tertua  
-> FROM karyawan;
```

## Sum & Avg

```
$ SELECT SUM(Usia) FROM karyawan  
-> WHERE Kota = 'Yogyakarta';
```

```
$ SELECT SUM(Usia) AS Total_Usia  
-> FROM karyawan  
-> WHERE Kota = 'Yogyakarta';
```

```
$ SELECT AVG(Usia) AS Rata_Usia  
-> FROM karyawan  
-> WHERE Kota = 'Yogyakarta';
```

Hitung banyaknya karyawan di tiap kota:

```
$ SELECT Kota, COUNT(*) AS Karyawan  
-> FROM karyawan  
-> GROUP BY Kota;
```

Hitung rerata BB karyawan di tiap kota:

```
$ SELECT Kota, AVG(Berat) AS Rata_BB  
-> FROM karyawan  
-> GROUP BY Kota;
```

Rerata BB karyawan di tiap kota:

```
$ SELECT Kota, AVG(Berat) AS Rata_BB  
-> FROM karyawan  
-> GROUP BY Kota;
```

Tampilkan kota dg rerata BB kary < 65:

```
$ SELECT Kota, AVG(Berat) AS Rata_BB  
-> FROM karyawan  
-> GROUP BY Kota  
-> HAVING Rata_BB < 65;
```

Menampilkan nama & usia karyawan di Jakarta, yang usianya > rata-rata usia karyawan di Yogyakarta:

```
$ SELECT Nama, Usia FROM karyawan  
-> WHERE Kota = 'Jakarta' AND Usia > (  
-> SELECT AVG(Usia) FROM karyawan  
-> WHERE Kota = 'Yogyakarta');
```



# Subquery From

Menampilkan rata-rata usia dari:  
tabel nama & usia karyawan di Jakarta,  
yang usianya > rata-rata usia  
karyawan di Yogyakarta:

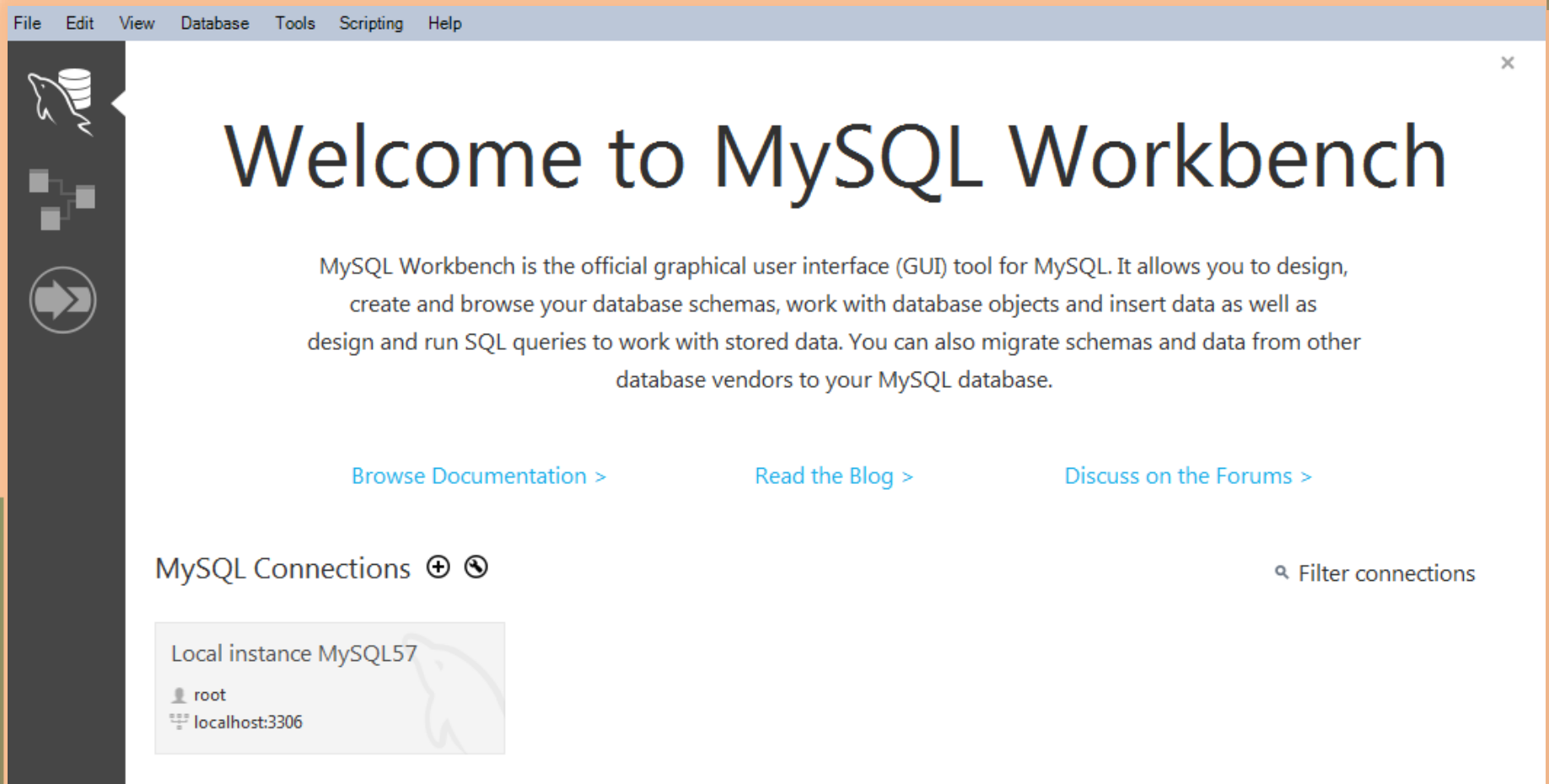
```
$ SELECT AVG(Usia) AS Rata_Usia FROM  
-> (SELECT Nama, Usia FROM karyawan  
-> WHERE Kota = 'Jakarta' AND Usia > (  
-> SELECT AVG(Usia) FROM karyawan  
-> WHERE Kota = 'Yogyakarta'));
```

# How to Work With MySQL GUI Tools



# Working with GUI

## #1 Installing MySQL Workbench





# Working with GUI

## #2 Activate MySQL & Connect to Workbench

MySQL Workbench

Local instance MySQL57

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

SCHEMAS

Filter objects

Not connected

Query 1 Administration - Server Status

Connection Name: Local instance MySQL57

Host: n/a  
Socket: n/a  
Port: n/a  
Version: n/a  
Compiled For: n/a (n/a)  
Configuration File: C:\Program Files\MySQL\MySQL Server 5.7\my.ini  
Running Since: n/a

Available Server Features

|                              |                           |                      |                           |
|------------------------------|---------------------------|----------------------|---------------------------|
| Performance Schema:          | <input type="radio"/> n/a | Password Validation: | <input type="radio"/> n/a |
| Thread Pool:                 | <input type="radio"/> n/a | Audit Log:           | <input type="radio"/> n/a |
| Memcached Plugin:            | <input type="radio"/> n/a | Firewall:            | <input type="radio"/> n/a |
| Semisync Replication Plugin: | <input type="radio"/> n/a | Firewall Trace:      | <input type="radio"/> n/a |
| SSL Availability:            | <input type="radio"/> Off |                      |                           |

Server Directories

|                         |                                     |
|-------------------------|-------------------------------------|
| Base Directory:         | <input type="radio"/> n/a           |
| Data Directory:         | <input type="radio"/> n/a           |
| Disk Space in Data Dir: | unable to retrieve                  |
| Plugins Directory:      | <input type="radio"/> n/a           |
| Tmp Directory:          | <input type="radio"/> n/a           |
| Error Log:              | <input type="radio"/> n/a           |
| General Log:            | <input checked="" type="radio"/> On |
| Slow Query Log:         | <input checked="" type="radio"/> On |

Connect to MySQL Server

Please enter password for the following service:

Service: Mysql@localhost:3306  
User: root  
Password: \*\*\*\*\*  
☐ Save password in vault

OK Cancel

Server Status: Stopped

CPU: ---

Connections: ---

Traffic: ---

Key Efficiency: ---

Selects per Second: ---

InnoDB Buffer Usage: ---

InnoDB Reads per Second: ---

InnoDB Writes per Second: ---

localhost (Online)

- MySQL57 - Running
- Manage Instance...
- SQL Editor...
- Actions

Start Stop Restart

Customize...

21:02 2/17/2018



# Working with GUI

## #3 Happy Querying!

MySQL Workbench

Local instance MySQL57 (sys) x Local instance MySQL57 (toko) x

File Edit View Query Database Server Tools Scripting Help

Query 1 x

Limit to 1000 rows

```
1 CREATE TABLE karyawan (  
2   No INT NOT NULL AUTO_INCREMENT,  
3   Nama VARCHAR(30) NOT NULL,  
4   Usia SMALLINT,  
5   Berat FLOAT(3,1),  
6   Kota TEXT,  
7   Th YEAR,  
8   Data_In TIMESTAMP,  
9   PRIMARY KEY (No)  
10 );  
11 SHOW tables;  
12 DESCRIBE karyawan;
```

Insert & execute query here!

Result Grid

| Field   | Type        | Null | Key | Default           | Extra                       |
|---------|-------------|------|-----|-------------------|-----------------------------|
| No      | int(11)     | NO   | PRI | <b>NULL</b>       | auto increment              |
| Nama    | varchar(30) | NO   |     | <b>NULL</b>       |                             |
| Usia    | smallint(6) | YES  |     | <b>NULL</b>       |                             |
| Berat   | float(3.1)  | YES  |     | <b>NULL</b>       |                             |
| Kota    | text        | YES  |     | <b>NULL</b>       |                             |
| Th      | year(4)     | YES  |     | <b>NULL</b>       |                             |
| Data In | timestamp   | NO   |     | CURRENT_TIMESTAMP | on update CURRENT_TIMESTAMP |

Result will be shown here.

Query 1 x

Limit to 1000 rows

```
1
2 • SELECT * FROM karyawan;
3
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell

| No   | Nama           | Usia | Berat | Kota       | Th   | Data_In             |
|------|----------------|------|-------|------------|------|---------------------|
| 1    | Andi Santosa   | 42   | 78.2  | Jak        | 2001 | 2018-02-17 21:36:33 |
| 2    | Budi Permana   | 32   | 88.1  | Jakarta    | 1999 | 2018-02-17 21:36:33 |
| 3    | Cecep Sutisna  | 35   | 68.9  | Bandung    | 2000 | 2018-02-17 21:36:33 |
| 4    | Dedi Hartanto  | 32   | 71.3  | Salatiga   | 1998 | 2018-02-17 21:36:33 |
| 5    | Eva Soraya     | 32   | 48.1  | Medan      | 2015 | 2018-02-17 21:36:33 |
| 6    | Farah Naimah   | 29   | 52.3  | Surabaya   | 2010 | 2018-02-17 21:36:33 |
| 7    | Gianti Safitri | 22   | 51.6  | Bandung    | 2017 | 2018-02-17 21:36:33 |
| 8    | Hamzah Syah    | 34   | 66.0  | Yogyakarta | 2008 | 2018-02-17 21:36:33 |
| 9    | Irene Sukindar | 25   | 49.3  | Jakarta    | 2016 | 2018-02-17 21:36:33 |
| 10   | Joni Saputra   | 28   | 69.8  | Yogyakarta | 2000 | 2018-02-17 21:36:33 |
| NULL | NULL           | NULL | NULL  | NULL       | NULL | NULL                |

**Click  
Then  
Edit!**

# Join Table

Buat 2 tabel dengan 1 kolom yang beririsan,  
dalam contoh kali ini yaitu kolom 'id'  
(nama kolom tidak harus sama).

*cabang*

| id | kota       |
|----|------------|
| 1  | Jakarta    |
| 2  | Bandung    |
| 3  | Surabaya   |
| 4  | Yogyakarta |

*member*

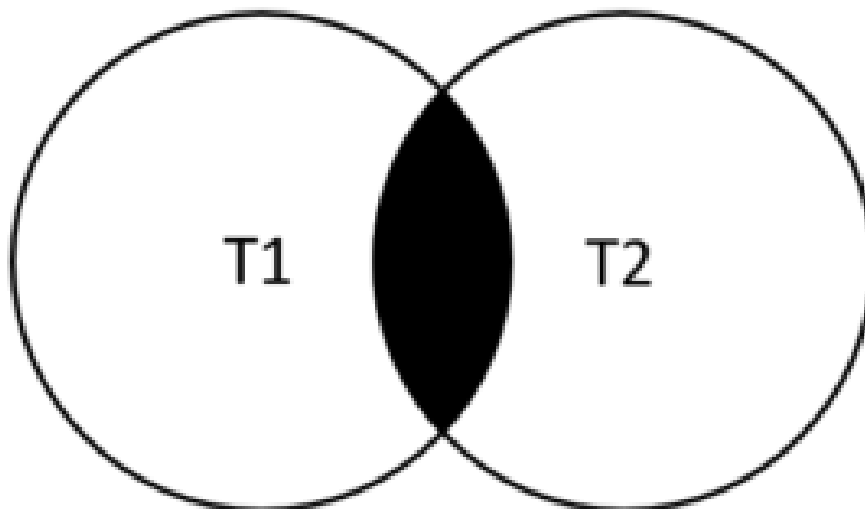
| nama | usia | id |
|------|------|----|
| Andi | 21   | 1  |
| Budi | 22   | 4  |
| Caca | 23   | 4  |
| Dedi | 24   | 4  |

Foreign Key

# #1 Inner Join

The MySQL INNER JOIN clause matches rows in one table with rows in other tables and allows you to query rows that contain columns from both tables.

The following Venn diagram illustrates how the INNER JOIN clause works. The rows in the result set must appear in both tables: t1 and t2 as shown in the intersection part of two circles.





# #1 Inner Join

*cabang*

| id | kota       |
|----|------------|
| 1  | Jakarta    |
| 2  | Bandung    |
| 3  | Surabaya   |
| 4  | Yogyakarta |

*member*

| nama | usia | id |
|------|------|----|
| Andi | 21   | 1  |
| Budi | 22   | 4  |
| Caca | 23   | 4  |
| Dedi | 24   | 4  |

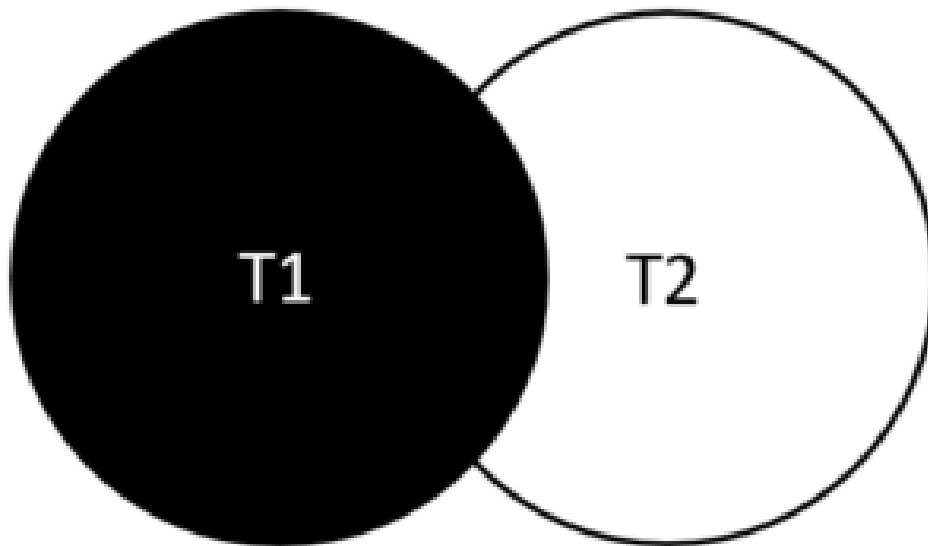
| nama | kota       |
|------|------------|
| Andi | Jakarta    |
| Budi | Yogyakarta |
| Caca | Yogyakarta |
| Dedi | Yogyakarta |

```
$ SELECT nama, kota FROM member  
-> INNER JOIN cabang ON  
-> member.id = cabang.id;
```

```
$ SELECT nama, kota FROM member  
-> JOIN cabang USING (id);
```

## #2 Left Join

The MySQL LEFT JOIN clause allows you to query data from two or more database tables. The following Venn diagram helps you visualize how the LEFT JOIN clause works. The intersection between two circles are rows that match in both tables, and the remaining part of the left circle are rows in the t1 table that do not have any matching row in the t2 table. Hence, all rows in the left table are included in the result set.





## #2 Left Join

*cabang*

| id | kota       |
|----|------------|
| 1  | Jakarta    |
| 2  | Bandung    |
| 3  | Surabaya   |
| 4  | Yogyakarta |

*member*

| nama | usia | id |
|------|------|----|
| Andi | 21   | 1  |
| Budi | 22   | 4  |
| Caca | 23   | 4  |
| Dedi | 24   | 4  |

| kota       | nama |
|------------|------|
| Jakarta    | Andi |
| Yogyakarta | Budi |
| Yogyakarta | Caca |
| Yogyakarta | Dedi |
| Bandung    | NULL |
| Surabaya   | NULL |

```
$ SELECT kota, nama FROM cabang  
-> LEFT JOIN member USING (id);
```



# View

*Virtual tabel yang didefinisikan dari query select & sifatnya identik dengan tabel.*

View daftar karyawan dengan BB > 60 :

```
CREATE VIEW jumbo AS  
-> SELECT Nama, Berat FROM karyawan  
-> WHERE Berat > 60;
```

Cek daftar tabel:

```
$ SHOW tables;  
$ SHOW FULL tables;
```

*\*Akan muncul tabel  
(view): jumbo*

Hapus view:

```
$ DROP view jumbo;
```

Cek data dalam view:

```
$ SELECT * from jumbo;
```

View daftar member di Yogyakarta:

```
CREATE VIEW mem_yk AS  
-> SELECT nama, kota FROM member  
-> JOIN cabang USING (id)  
-> WHERE kota = 'Yogyakarta';
```

Cek daftar tabel:

```
$ SHOW tables;  
$ SHOW FULL tables;
```

Hapus view:

```
$ DROP view mem_yk;
```

*\*Akan muncul tabel (view): mem\_yk*

# How to Work With MySQL Hosting



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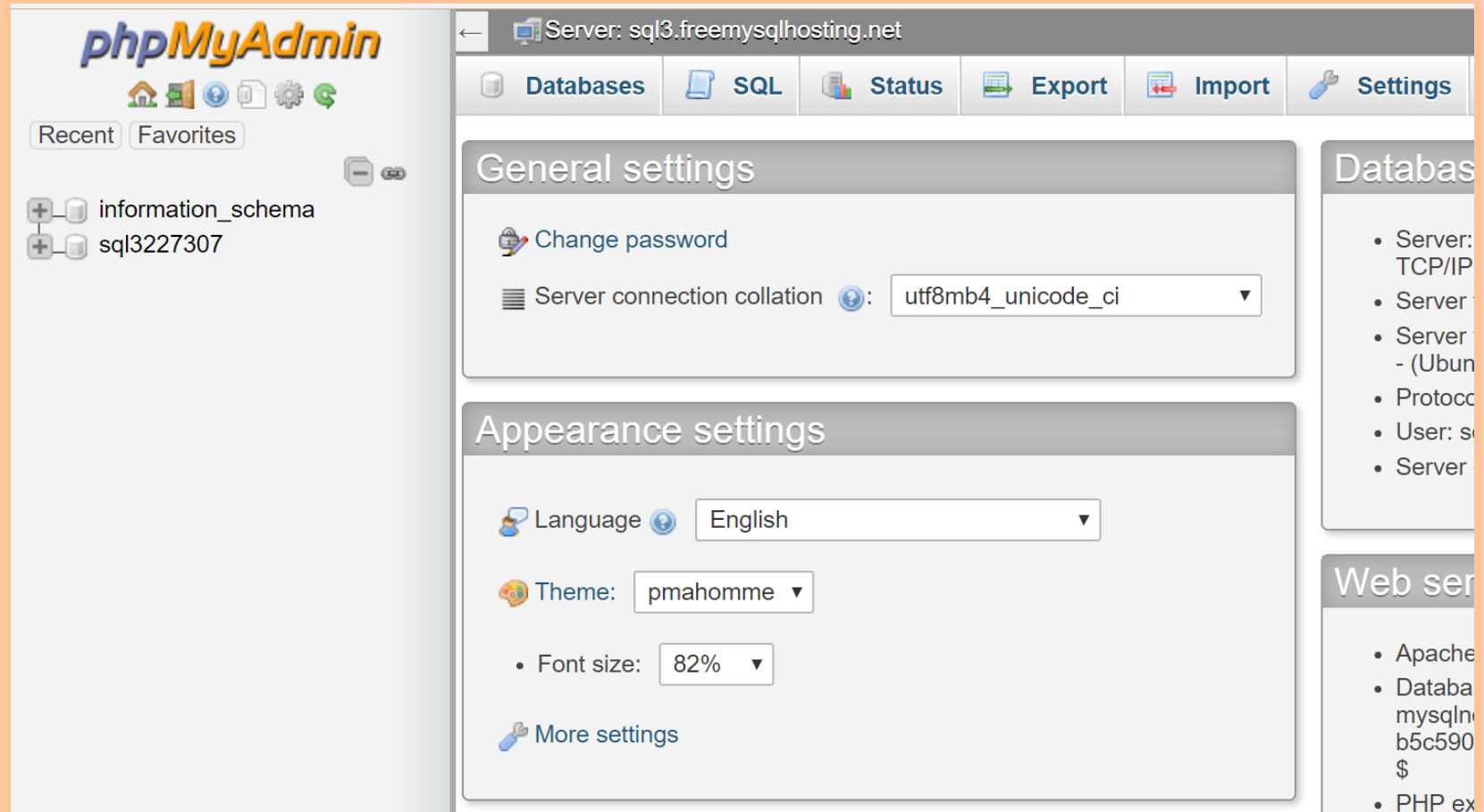
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*[freemysqlhosting.net/](https://freemysqlhosting.net/)*



The screenshot shows the phpMyAdmin web interface for a server at `sql3.freemysqlhosting.net`. The interface includes a top navigation bar with tabs for Databases, SQL, Status, Export, Import, and Settings. On the left, there is a sidebar with the phpMyAdmin logo, navigation icons, and a list of recent and favorite databases, including `information_schema` and `sql3227307`. The main content area displays the 'General settings' and 'Appearance settings' sections. The 'General settings' section includes a 'Change password' link and a 'Server connection collation' dropdown set to `utf8mb4_unicode_ci`. The 'Appearance settings' section includes a 'Language' dropdown set to 'English', a 'Theme' dropdown set to 'pmahomme', and a 'Font size' dropdown set to '82%'. A 'More settings' link is also present. On the right, there are partial views of the 'Databases' and 'Web server' sections.



Back-End Development



# Exploration