

# Pengembangan Aplikasi Web

## Pertemuan Ke-5 (Sistem Basisdata dan Aplikasi *Web*)

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# Sub Pokok Bahasan

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- PHPMyAdmin

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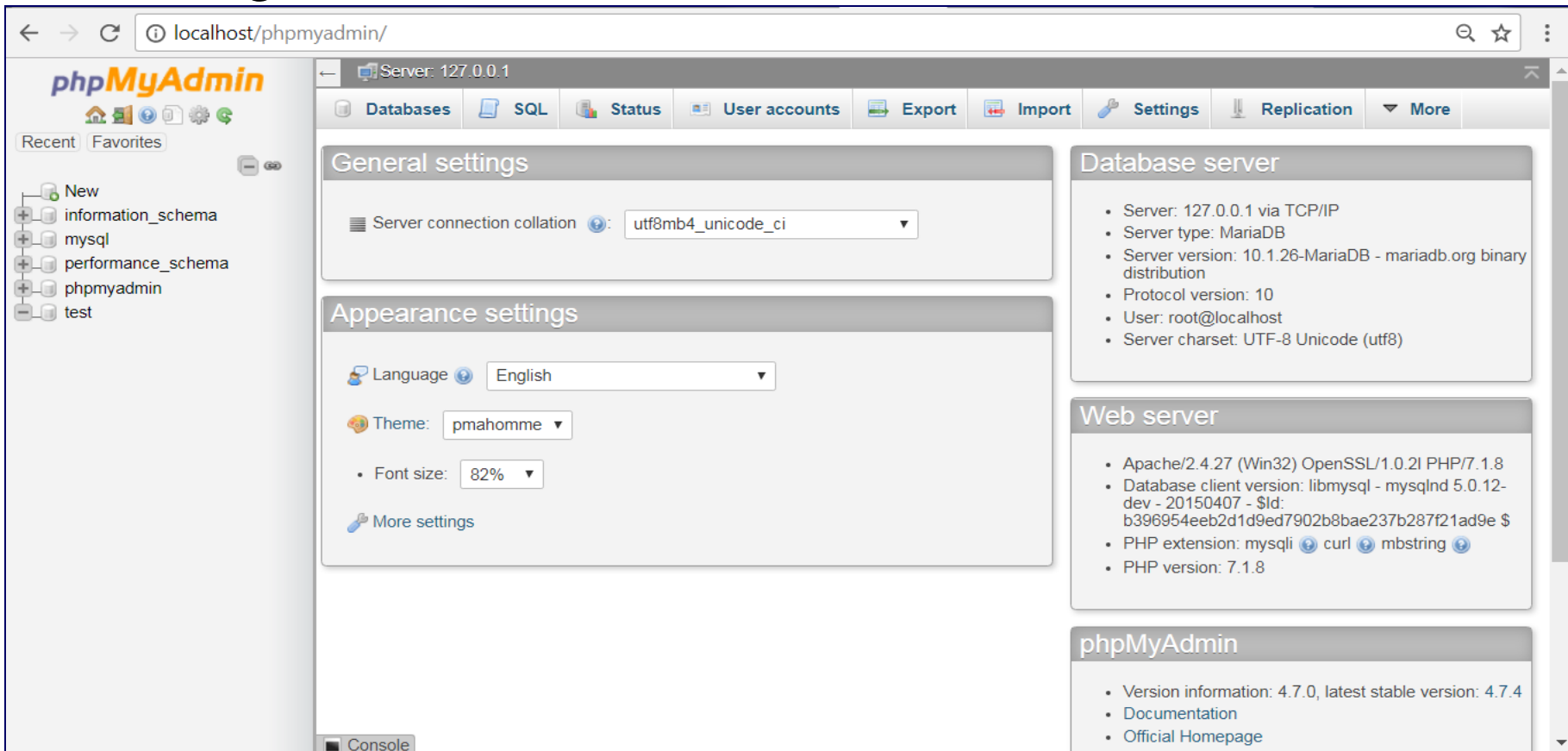
# Sistem Basisdata – MySQL/MariaDB



- Sistem basisdata *open source* yang paling populer
- Sejarah:
  - Dikembangkan oleh Michael Widenius & David Axmark pada tahun 1994
  - Diakuisisi oleh Sun (sekarang dikenal sebagai Oracle) pada tahun 2008 (<http://www.mysql.com/>)
- *Cross Platform*
  - (*Free*) untuk Windows, Linux, Mac dan Unix → *community edition*
  - *Supported version* → *commercial customers*

# PHPMyAdmin

- Dibuat khusus untuk mengelola basisdata MySQL/MariaDB
- Terintegrasi dalam instalasi XAMPP



# Membuat (*Create*) Basisdata

1. Klik link **New** untuk membuat basisdata
2. Tentukan nama basisdata
3. Tentukan jenis *collation* basisdata
4. Klik tombol **Create**

The screenshot shows the phpMyAdmin interface for a MySQL server (127.0.0.1). The left sidebar shows a tree of databases with 'New' highlighted. The main area shows the 'Create database' form with 'customerDB' in the name field, 'utf8\_bin' in the collation dropdown, and a 'Create' button. Below the form is a table of existing databases.

Database	Collation	Action
<input type="checkbox"/> information_schema	utf8_general_ci	<a href="#">Check privileges</a>
<input type="checkbox"/> mysql	latin1_swedish_ci	<a href="#">Check privileges</a>
<input type="checkbox"/> performance_schema	utf8_general_ci	<a href="#">Check privileges</a>
<input type="checkbox"/> phpmyadmin	utf8_bin	<a href="#">Check privileges</a>
<input type="checkbox"/> test	latin1_swedish_ci	<a href="#">Check privileges</a>
<b>Total: 5</b>	latin1_swedish_ci	

Below the table, there are checkboxes for 'Check all' and 'With selected: Drop'. A note at the bottom states: 'Note: Enabling the database statistics here might cause heavy traffic between the web server and the MySQL server.' There is also a link to 'Enable statistics'.

# Membuat (*Create*) Tabel

1. Pilih basisdata yang akan dibuatkan tabel

2. Tentukan nama tabel

3. Tentukan jumlah kolom dalam tabel

4. Klik tombol **Go**

The screenshot shows the phpMyAdmin interface for a database named 'customerdb'. The left sidebar shows a list of databases, with 'customerdb' selected and highlighted by a red box. A red arrow points from the instruction '1. Pilih basisdata yang akan dibuatkan tabel' to this box. The main panel shows the 'Create table' form. The 'Name' field contains 'Customer' and is highlighted by a red box, with a red arrow pointing from the instruction '2. Tentukan nama tabel'. The 'Number of columns' field contains '4' and is also highlighted by a red box, with a red arrow pointing from the instruction '3. Tentukan jumlah kolom dalam tabel'. A red arrow points from the instruction '4. Klik tombol Go' to the 'Go' button, which is also highlighted by a red box. The top of the interface shows the server and database information: 'Server: 127.0.0.1 » Database: customerdb'. The main panel also displays a message: 'No tables found in database.'

# Membuat (Create) Tabel [2]

Server: 127.0.0.1 » Database: customerdb » Table: Customer

Table name: Customer Add 1 column(s) Go

Name	Type	Length/Values	Default	Collation	Attributes	Null	Index	A_I	Comments
customerID	INT		None			<input type="checkbox"/>	PRIMARY	<input checked="" type="checkbox"/>	
firstname	VARCHAR	45	None			<input type="checkbox"/>	---	<input type="checkbox"/>	
address	VARCHAR	256	None			<input checked="" type="checkbox"/>	---	<input type="checkbox"/>	
balance	DECIMAL		None			<input type="checkbox"/>	---	<input type="checkbox"/>	

Table comments: Collation: Storage Engine: InnoDB

PARTITION definition: Partition by: ( Expression or column list ) Partitions:

Console Preview SQL Save

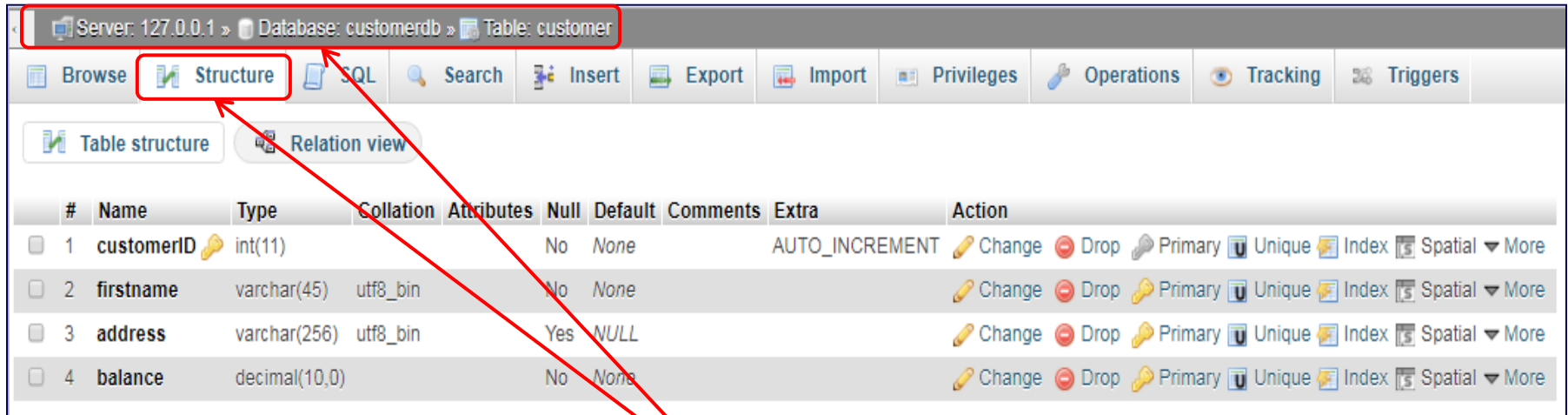
5. Lengkapi spesifikasi setiap kolom

7. Klik tombol **Save**

```
CREATE TABLE `customerdb`.`Customer`  
(`customerID` INT NOT NULL AUTO_INCREMENT,  
`firstname` VARCHAR(45) NOT NULL,  
`address` VARCHAR(256) NULL ,  
`balance` DECIMAL NOT NULL ,  
PRIMARY KEY (`customerID`)) ENGINE =InnoDB;
```

6. Cek skrip SQL pembuatan tabel

# Membuat (Create) Tabel [3]



Server: 127.0.0.1 » Database: customerdb » Table: customer

Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	customerID	int(11)			No	None		AUTO_INCREMENT	Change Drop Primary Unique Index Spatial More
2	firstname	varchar(45)	utf8_bin		No	None			Change Drop Primary Unique Index Spatial More
3	address	varchar(256)	utf8_bin		Yes	NULL			Change Drop Primary Unique Index Spatial More
4	balance	decimal(10,0)			No	None			Change Drop Primary Unique Index Spatial More

Struktur tabel **customer** dalam basisdata **customerdb**



# Memasukkan (*Insert*) Data Tabel

1. Aktifkan tab **Insert**

Column	Type	Function	Null	Value
customerID	int(11)			
firstname	varchar(45)			Amira
address	varchar(256)			Jl. Mawar No. 123, Surabaya
balance	decimal(10,0)			1000000

Go

2. Isikan data pada masing-masing kolom

3. Klik tombol **Go**

✓ 1 row inserted.  
Inserted row id: 1

```
INSERT INTO `customer` (`customerID`, `firstname`, `address`, `balance`) VALUES (NULL, 'Amira', 'Jl. Mawar No. 123, Surabaya', '1000000');
```

# Memasukkan (*Insert*) Data Tabel [2]

Server: 127.0.0.1 » Database: customerdb » Table: customer

**Browse** Structure SQL Search Insert Export Import

Showing rows 0 - 0 (1 total, Query took 0.0030 seconds.)

```
SELECT * FROM `customer`
```

Show all | Number of rows: 25 | Filter rows: Search this table

+ Options

customerID	firstname	address	balance
1	Amira	Jl. Mawar No. 123, Surabaya	1000000

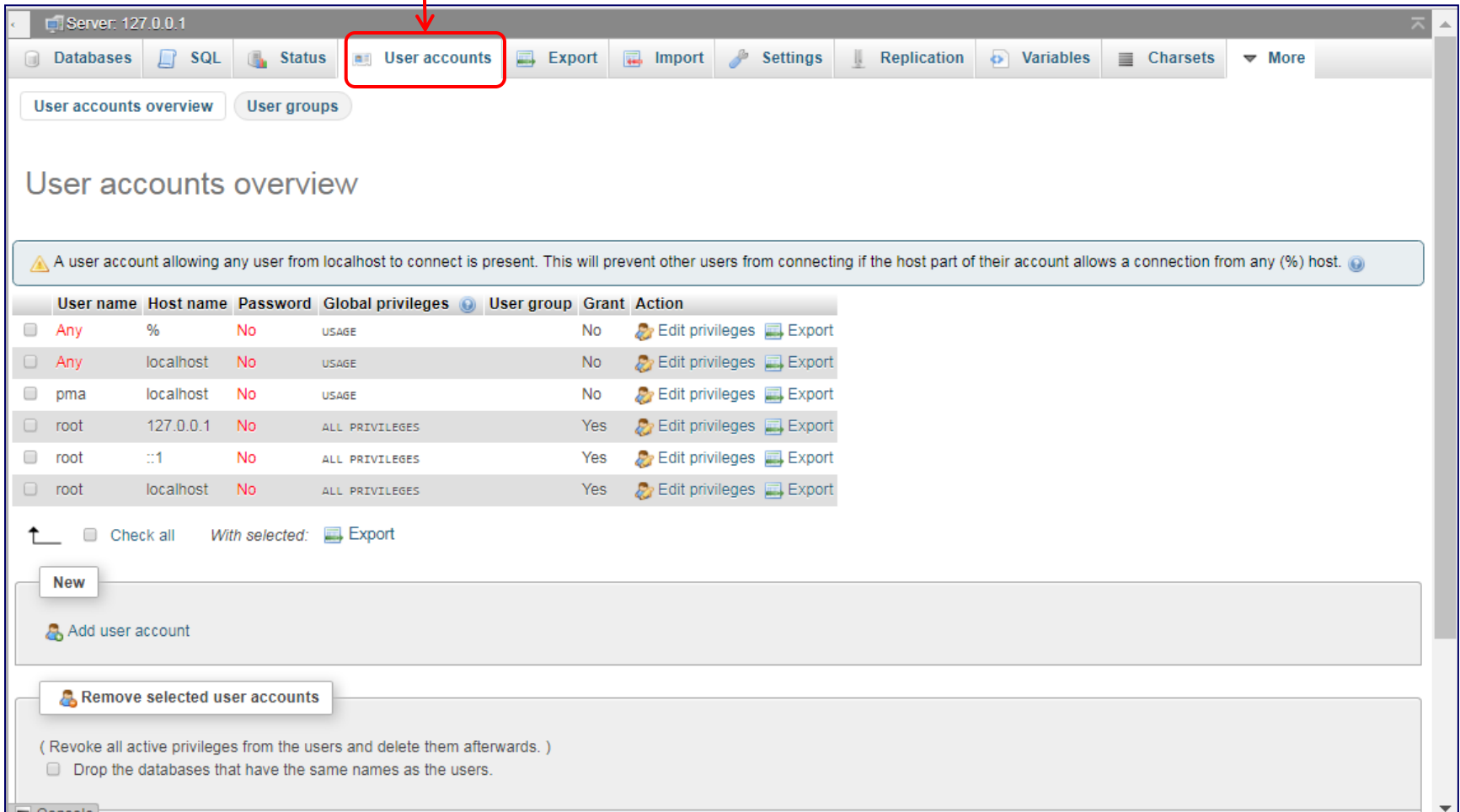
Check all | With selected: Edit Copy Delete Export

Show all | Number of rows: 25 | Filter rows: Search this table

Data tabel  
**customer**  
dalam  
basisdata  
**customerdb**

# Akun dan Hak Akses (*Priviledge*) User

Aktifkan tab **User accounts**



Server: 127.0.0.1

Databases SQL Status **User accounts** Export Import Settings Replication VariablesCharsets More

User accounts overview User groups

## User accounts overview

⚠ A user account allowing any user from localhost to connect is present. This will prevent other users from connecting if the host part of their account allows a connection from any (%) host. ⓘ

	User name	Host name	Password	Global privileges	User group	Grant	Action
<input type="checkbox"/>	Any	%	No	USAGE		No	Edit privileges  Export
<input type="checkbox"/>	Any	localhost	No	USAGE		No	Edit privileges  Export
<input type="checkbox"/>	pma	localhost	No	USAGE		No	Edit privileges  Export
<input type="checkbox"/>	root	127.0.0.1	No	ALL PRIVILEGES		Yes	Edit privileges  Export
<input type="checkbox"/>	root	::1	No	ALL PRIVILEGES		Yes	Edit privileges  Export
<input type="checkbox"/>	root	localhost	No	ALL PRIVILEGES		Yes	Edit privileges  Export

⬆ ☐ Check all With selected: Export

**New**

Add user account

Remove selected user accounts

( Revoke all active privileges from the users and delete them afterwards. )

☐ Drop the databases that have the same names as the users.

Console

# Structured Query Language (SQL)



✓ Showing rows 0 - 0 (1 total, Query took 0.0470 seconds.)

```
SELECT firstname, address FROM customer WHERE balance > 0
```

✓ 1 row affected. (Query took 0.0900 seconds.)

```
UPDATE customer SET balance = 4500000, firstname = 'Almira' WHERE customerID = 1
```

✓ 0 rows affected. (Query took 0.0210 seconds.)

```
DELETE FROM customer WHERE balance < 0
```

✓ 1 row inserted.  
Inserted row id: 2 (Query took 0.0110 seconds.)

```
INSERT INTO customer (firstname, address, balance) VALUES ('Baharudin', 'Jl. Mengkudu No. 456, Surabaya', 1200000)
```

# Structured Query Language (SQL) [2]

Server: 127.0.0.1 » Database: customerdb » Table: customer

Browse Structure SQL Search Insert Export Import Privileges More

✓ Showing rows 0 - 1 (2 total, Query took 0.0050 seconds.)

```
SELECT * FROM `customer`
```

☐ Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

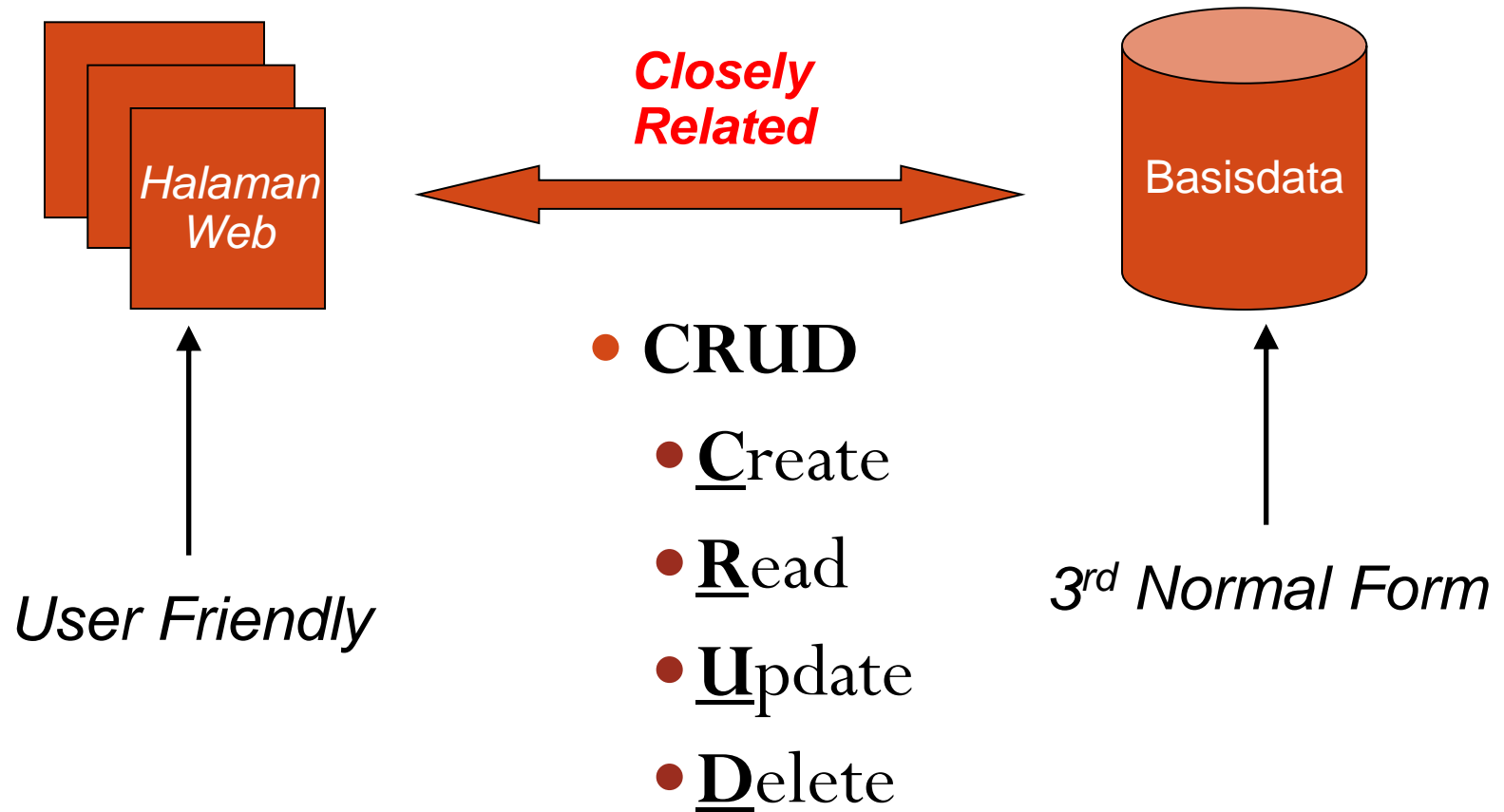
☐ Show all | Number of rows: 25 Filter rows: Search this table Sort by key: None

+ Options

	customerID	firstname	address	balance
<input type="checkbox"/> Edit Copy Delete	1	Almira	Jl. Mawar No. 123, Surabaya	4500000
<input type="checkbox"/> Edit Copy Delete	2	Baharudin	Jl. Mengkudu No. 456, Surabaya	1200000

↑ ☐ Check all With selected: Edit Copy Delete Export

# Aplikasi Web & Implementasi Basisdata



# PHP *Data Objects* (PDO)

<http://php.net/manual/en/book.pdo.php>

- Merupakan *Object-Oriented extension library* → tersedia pada PHP versi 5.1 dan seterusnya
- Digunakan untuk melakukan akses ke sistem basisdata

## PDO

PDO support	enabled
PDO drivers	mysql, sqlite

## pdo\_mysql

PDO Driver for MySQL	enabled
Client API version	mysqlnd 5.0.12-dev - 20150407 - \$Id: b396954eeb2d1d9ed7902b8bae237b287f21ad9e \$

# Koneksi Basisdata – Halaman Web

<http://id1.php.net/manual/en/pdo.connections.php>

```
1 <?php
2 $dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');
3
4 // Use the connection ...
5
6 ?>
```

Sistem Basisdata

Nama host

Nama basisdata

Username basisdata

Password



# PDO Query

<http://php.net/manual/en/pdo.query.php>

```
1 <?php
2     $dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');
3
4     $statement = $dbc->query("SELECT firstname, address FROM customer WHERE balance > 0");
5
6     foreach ($statement as $row)
7     {
8         echo "<h1>{$row['firstname']}</h1>";
9         echo "<p>{$row['address']}</p>";
10    }
11 ?>
```

**Almira**

Jl. Mawar No. 123, Surabaya

**Baharudin**

Jl. Mengkudu No. 456, Surabaya

# Serangan SQL Injection

← → ↻ ⓘ localhost/2017paw/Week05/form\_seranganSQLInjection.html

Customer ID:

← → ↻ ⓘ localhost/2017paw/Week05/seranganSQLInjection.php?customerID=2&find=Find

**Baharudin**

Jl. Mengkudu No. 456, Surabaya

```
1 <?php
2 $dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');
3
4 $statement = $dbc->query("SELECT firstname, address FROM customer WHERE customerID = {$_GET['customerID']}");
5
6 foreach ($statement as $row)
7 {
8     echo "<h1>{$row['firstname']}</h1>";
9     echo "<p>{$row['address']}</p>";
10 }
11 ?>
```




**SELECT firstname, address FROM customer WHERE customerID = 2 OR true**

# PDO Prepared Statement

<http://php.net/manual/en/pdo.prepared-statements.php>

```
1 <?php
2     $dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');
3
4     $statement = $dbc->prepare("SELECT * FROM customer WHERE firstname = :firstname");
5     $statement->bindValue(':firstname', $_GET['firstname']);
6     $statement->execute();
7
8     foreach ($statement as $customer)
9     {
10         echo "<p>{$customer['address']}</p>";
11     }
12 ?>
```



# PDO Prepared Statement: INSERT

## Customer Data

Firstname:

Address

```
<?php
```

```
$dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');

$stmt = $dbc->prepare("INSERT INTO customer (firstname, address, balance)
VALUES (:firstname, :address, :balance)");
$stmt->bindValue(':firstname', $_GET['firstname']);
$stmt->bindValue(':address', $_GET['address']);
$stmt->bindValue(':balance', 0);
$stmt->execute();
```

```
?>
```

+ Options

		customerID	firstname	address	balance
<input type="checkbox"/>	Edit  Copy  Delete	1	Almira	Jl. Mawar No. 123, Surabaya	4500000
<input type="checkbox"/>	Edit  Copy  Delete	2	Baharudin	Jl. Mengkudu No. 456, Surabaya	1200000
<input type="checkbox"/>	Edit  Copy  Delete	3	Citra	Jl. Cendana No. 17, Surabaya	0

# PDO *Prepared* Statement: UPDATE, DELETE

```
<?php
$dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');

$stmt = $dbc->prepare("UPDATE customer SET firstname = :firstname, address = :address
                        WHERE customerID = :customerID") ;
$stmt->bindValue(':firstname', $_GET['firstname']);
$stmt->bindValue(':address', $_GET['address']);
$stmt->bindValue(':customerID', $_GET['customerID']);
$stmt->execute();

?>
```

```
<?php
$dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');

$stmt = $dbc->prepare("DELETE FROM customer WHERE customerID = :customerID") ;
$stmt->bindValue(':customerID', $_GET['customerID']);
$stmt->execute();

?>
```

# Menampilkan Pesan *Error*

<http://php.net/manual/en/pdo.setattribute.php>

```
<?php
try
{
    $dbc = new PDO('mysql:host=localhost;dbname=customerdb','root','');

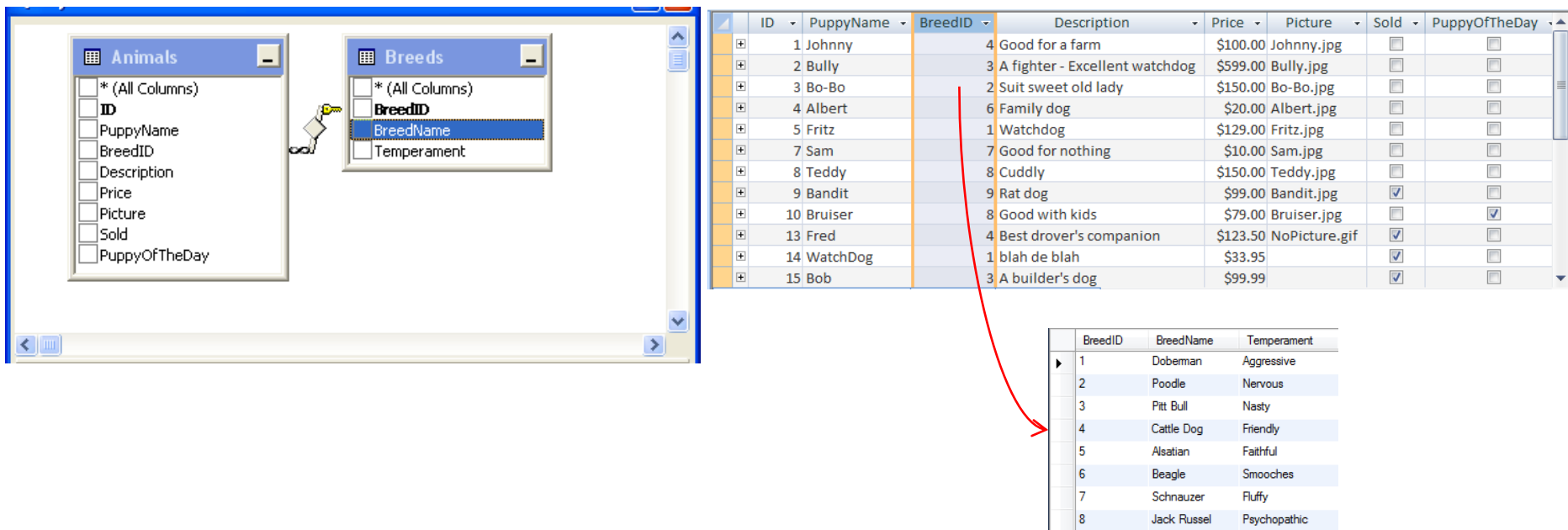
    $dbc->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

    $statement = $dbc->prepare("INERT IN ccustomer (fffirstname, aaaddress, bbbalance)
                                VALUES (:firstname, :address, :balance)");
    $statement->bindValue(':firstname', $_GET['firstname']);
    $statement->bindValue(':address', $_GET['address']);
    $statement->bindValue(':balance', 0);
    $statement->execute();
}
catch (PDOException $err)
{
    echo $err->getMessage();
}
?>
```

SQLSTATE[42000]: Syntax error or access violation: 1064 You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'INERT IN ccustomer (fffirstname, aaaddress, bbbalance) VALUES ('Fahra' at line 1

- PDO *Error Mode* secara *default* adalah **ERRMODE\_SILENT** (*silently ignore all database errors*)

# Menampilkan Data *Foreign Keys*



ID	PuppyName	BreedID	Description	Price	Picture	Sold	PuppyOfTheDay
1	Johnny	4	Good for a farm	\$100.00	Johnny.jpg	<input type="checkbox"/>	<input type="checkbox"/>
2	Bully	3	A fighter - Excellent watchdog	\$599.00	Bully.jpg	<input type="checkbox"/>	<input type="checkbox"/>
3	Bo-Bo	2	Suit sweet old lady	\$150.00	Bo-Bo.jpg	<input type="checkbox"/>	<input type="checkbox"/>
4	Albert	6	Family dog	\$20.00	Albert.jpg	<input type="checkbox"/>	<input type="checkbox"/>
5	Fritz	1	Watchdog	\$129.00	Fritz.jpg	<input type="checkbox"/>	<input type="checkbox"/>
7	Sam	7	Good for nothing	\$10.00	Sam.jpg	<input type="checkbox"/>	<input type="checkbox"/>
8	Teddy	8	Cuddly	\$150.00	Teddy.jpg	<input type="checkbox"/>	<input type="checkbox"/>
9	Bandit	9	Rat dog	\$99.00	Bandit.jpg	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Bruiser	8	Good with kids	\$79.00	Bruiser.jpg	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	Fred	4	Best drover's companion	\$123.50	NoPicture.gif	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14	WatchDog	1	blah de blah	\$33.95		<input checked="" type="checkbox"/>	<input type="checkbox"/>
15	Bob	3	A builder's dog	\$99.99		<input checked="" type="checkbox"/>	<input type="checkbox"/>

BreedID	BreedName	Temperament
1	Dobeman	Aggressive
2	Poodle	Nervous
3	Pitt Bull	Nasty
4	Cattle Dog	Friendly
5	Alsatian	Faithful
6	Beagle	Smooches
7	Schnauzer	Fluffy
8	Jack Russel	Psychopathic

- **Primary Key** atau **Foreign Key** biasanya tidak perlu ditampilkan, kecuali jika memang dianggap sangat penting untuk diketahui oleh *end-user*
- Terkadang operasi **JOIN** perlu dilakukan untuk menampilkan data **Foreign Key**

contoh: `SELECT PuppyName, Breed.BreedName, Picture, Sold  
FROM Animals, Breeds  
WHERE Animals.BreedID = Breeds.BreedID`

