

TUGAS MODUL 2
PRAKTIKUM BASIS DATA
Data Definition Language (DDL)

Oleh:

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PROGRAM STUDI TEKNIK INFORMATIKA
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BAB I

TEORI DASAR

Data Definition Language (DDL)

DDL adalah singkatan dari Data Definition Language yaitu kumpulan perintah pada SQL untuk menggambarkan desain dari database secara menyeluruh, selain itu DDL (Data Definition Language) juga digunakan untuk membuat, merubah maupun menghapus struktur atau definisi tipe data dari objek yang ada pada database.

Berikut adalah perintah-perintah pada DDL (Data Definition Language) :

1. Perintah Create / Membuat

- Create database berfungsi untuk membuat database baru
- Create Table yaitu perintah yang digunakan untuk membuat tabel baru pada database

2. Perintah untuk merubah

Alter Table yaitu perintah yang digunakan untuk merubah struktur dari sebuah table

3. Perintah untuk menghapus / Drop

- Drop Database yaitu perintah yang berfungsi untuk menghapus database
- Drop Table yaitu perintah yang digunakan untuk menghapus tabel pada database

BAB II

PEMBAHASAN & ANALISIS

Cerita Soal:

Pak Andi adalah direktur perusahaan (Westinghouse) . Westinghouse adalah sebuah perusahaan yang menjual toko buku nasional. Dalam mendirikan perusahaan ini, Pak Andi ingin membuat sistem informasi terkait proses jual beli buku dikarenakan masa pandemi yang menyebabkan omset penjualan buku menurun. Pak Andi menugaskan anda sebagai seorang Database Administrator di perusahaan tersebut untuk membuat rancangan awal basis data dari sistem informasi yang diinginkan.

PEMBAHASAN

Buka Terminal untuk masuk kedalam database ketikan *Command line : mysql -u root -p*

The screenshot shows a web browser window with a Google Classroom assignment titled "[Modul 2] Pengumpulan Tugas Praktikum - RB - Mozilla Firefox". The assignment is due on March 18 and is worth 100 points. The instructions are in Indonesian, asking students to submit a report on a PDF file. The report should include a cover, introduction, discussion, analysis, conclusion, and bibliography. The deadline is Wednesday, March 30, 2022, at 23:59 WIB. The assignment is assigned to 060 Rafi Arya.

Overlaid on the browser window is a terminal window. The terminal shows the command `mysql -u root -p` being executed. The prompt is `root@kali:~`. The terminal output shows the MySQL command-line interface, including the welcome message, connection ID (48), and server version (10.5.12-MariaDB-1 Debian 11). The prompt is `MariaDB [(none)]>`.

1. Membuat database dengan nama “Westinghouse” dengan

Command line : create database Westinghouse;

The screenshot shows a terminal window on a Kali Linux system. The user is logged in as root. The terminal displays the following commands and output:

```
root@kali:~# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 46
Server version: 10.5.12-MariaDB-1 Debian 11

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MariaDB [(none)]> create database Westinghouse;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| Westinghouse |
+-----+
4 rows in set (0.001 sec)

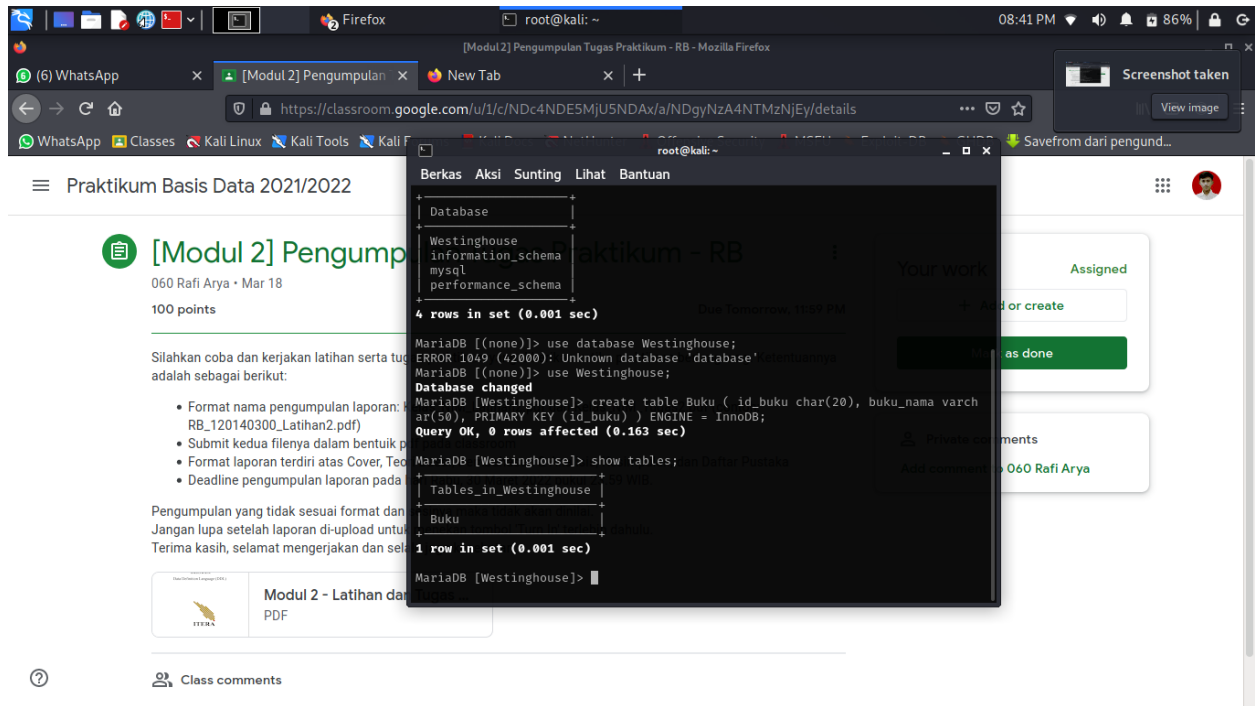
MariaDB [(none)]>
```

The terminal window is overlaid on a web browser showing a Google Classroom page. The page title is "Praktikum Basis Data 2021/2022" and the content is "[Modul 2] Pengumpulan Tugas Praktikum - RB - Mozilla Firefox". The page shows a list of assignments and a sidebar with a "Class comments" section.

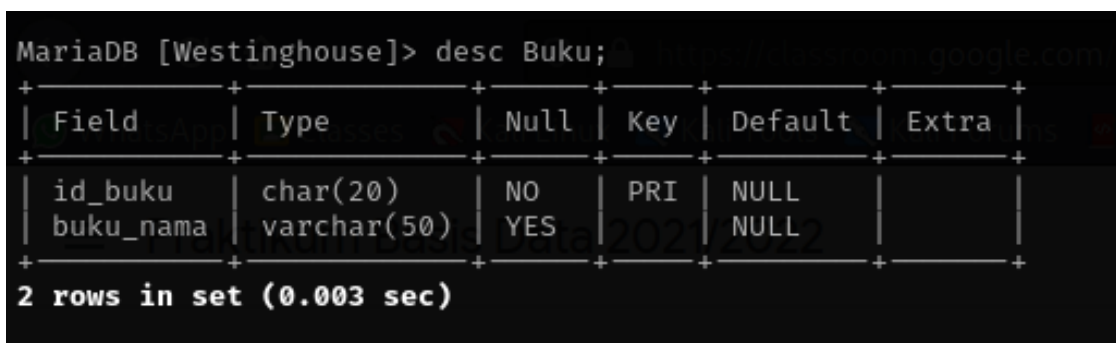
MEMBUAT TABEL

Membuat Tabel Buku (id_buku, buku_nama)

Command line : *create table Buku (id_buku char(20), buku_nama varchar(50), PRIMARY KEY (id_buku)) ENGINE = InnoDB;*



Command line : *desc Buku;*



Membuat Tabel Penerbit (id_penerbit , nama_penerbit , kontak_penerbit)

Command line : create table Penerbit (id_penerbit char(20), nama_penerbit varchar(50), kontak_penerbit int(20), PRIMARY KEY (id_penerbit)) ENGINE = InnoDB;

The screenshot shows a Google Classroom interface for a course titled "Praktikum Basis Data 2021/2022". The assignment is "[Modul 2] Pengumpulan Tugas Praktikum - RB - Mozilla Firefox" by user "060 Rafi Arya" on March 18, worth 100 points. The instructions ask students to complete exercises and upload reports. A terminal window is overlaid on the browser, showing the following MySQL commands and output:

```
MariaDB [Westinghouse]> create table Buku ( id_penerbit char(20), nama_penerbit varchar(50), kontak_penerbit int(20), PRIMARY KEY (id_penerbit) ) ENGINE = InnoDB;
1 row in set (0.001 sec)

MariaDB [Westinghouse]> create table Penerbit ( id_penerbit char(20), nama_penerbit varchar(50), kontak_penerbit int(20), PRIMARY KEY (id_penerbit) ) ENGINE = InnoDB;
ERROR 1050 (42S01): Table 'Buku' already exists

MariaDB [Westinghouse]> create table Penerbit ( id_penerbit char(20), nama_penerbit varchar(50), kontak_penerbit int(20), PRIMARY KEY (id_penerbit) ) ENGINE = InnoDB;
ERROR 1072 (42000): Key column 'id_penerbit' doesn't exist in table

MariaDB [Westinghouse]> create table Penerbit ( id_penerbit char(20), nama_penerbit varchar(50), kontak_penerbit int(20), PRIMARY KEY (id_penerbit) ) ENGINE = InnoDB;
Query OK, 0 rows affected (0.171 sec)

MariaDB [Westinghouse]> show tables;
+-----+
| Tables_in_Westinghouse |
+-----+
| Buku                    |
| Penerbit                 |
+-----+
2 rows in set (0.001 sec)

MariaDB [Westinghouse]>
```

Command line : desc Penerbit;

```
MariaDB [Westinghouse]> desc Penerbit;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_penerbit | char(20)  | NO   | PRI | NULL    |       |
| nama_penerbit | varchar(50) | YES  |     | NULL    |       |
| kontak_penerbit | int(20)   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.003 sec)
```

Membuat Tabel Pegawai (id_pegawai , pegawai_nama , jabatan, umur)

Command line : create table Pegawai (id_pegawai char(20), pegawai_nama varchar(50), jabatan varchar(20), umur int(10), PRIMARY KEY (id_pegawai)) ENGINE = InnoDB;

The screenshot shows a Google Classroom interface for a course titled 'Praktikum Basis Data 2021/2022'. The page lists a student '060 Rafi Arya' with a score of 100 points. Below the student information, there are instructions and a list of tasks for a submission. Overlaid on the right side of the browser is a terminal window from a Kali Linux machine. The terminal shows the following commands and output:

```
root@kali: ~  
MariaDB [Westinghouse]> show tables;  
+-----+  
| Tables_in_Westinghouse |  
+-----+  
| Buku                    |  
| Penerbit                |  
+-----+  
2 rows in set (0.001 sec)  
  
MariaDB [Westinghouse]> create table Pegawai ( id_pegawai char(20), pegawai_nama varchar(50), jabatan varchar(20), umur int(10), PRIMARY KEY (id_pegawai) ) ENGINE = InnoDB;  
Query OK, 0 rows affected (0.139 sec)  
  
MariaDB [Westinghouse]> show tables;  
+-----+  
| Tables_in_Westinghouse |  
+-----+  
| Buku                    |  
| Pegawai                 |  
| Penerbit                |  
+-----+  
3 rows in set (0.001 sec)  
  
MariaDB [Westinghouse]>
```

Command line : desc Pegawai;

```
MariaDB [Westinghouse]> desc Pegawai;  
+-----+  
| Field      | Type      | Null | Key | Default | Extra |  
+-----+  
| id_pegawai | char(20)  | NO   | PRI | NULL    |       |  
| pegawai_nama | varchar(50) | YES  |     | NULL    |       |  
| jabatan    | varchar(20) | YES  |     | NULL    |       |  
| umur       | int(10)   | YES  |     | NULL    |       |  
+-----+  
4 rows in set (0.003 sec)
```


Membuat Tabel Pembeli (id_pembeli , nama_pembeli , kontak_pembeli)

Command line : *create table Pembeli (id_pembeli char(20), nama_pembeli varchar(50), kontak_pembeli int(20), PRIMARY KEY (id_pembeli)) ENGINE = InnoDB;*

The screenshot shows a Google Classroom page for 'Praktikum Basis Data 2021/2022'. The page content includes a title '[Modul 2] Pengumpulan Tugas Praktikum - RB', a teacher '060 Rafi Arya', and a deadline of 'Mar 18'. Instructions in Indonesian ask students to submit a report. A terminal window is overlaid on the page, showing the following commands and output:

```
MariaDB [Westinghouse]> show tables;
+-----+
| Tables_in_Westinghouse |
+-----+
| Buku                    |
| Pegawai                 |
| Penerbit                 |
+-----+
3 rows in set (0.001 sec)

MariaDB [Westinghouse]> create table Pembeli ( id_pembeli char(20), nama_pembeli varchar(50), kontak_pembeli int(20), PRIMARY KEY (id_pembeli) ) ENGINE = InnoDB;
Query OK, 0 rows affected (0.129 sec)

MariaDB [Westinghouse]> show tables;
+-----+
| Tables_in_Westinghouse |
+-----+
| Buku                    |
| Pegawai                 |
| Pembeli                 |
| Penerbit                 |
+-----+
4 rows in set (0.001 sec)

MariaDB [Westinghouse]>
```

Command line : *desc Pembeli;*

The terminal window shows the output of the 'desc Pembeli;' command, displaying the table structure for the 'Pembeli' table:

```
MariaDB [Westinghouse]> desc Pembeli;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_pembeli | char(20) | NO | PRI | NULL | |
| nama_pembeli | varchar(50) | YES | | NULL | |
| kontak_pembeli | int(20) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.003 sec)
```

MENGUBAH STRUKTUR

a. Tabel Pegawai, ubah nama kolom “pegawai_nama” menjadi “nama_pegawai”.

Command line : ALTER TABLE Pegawai CHANGE pegawai_nama nama_pegawai varchar(50);

Command line : desc Pegawai;

The screenshot shows a Google Classroom interface for a course titled "Praktikum Basis Data 2021/2022". The main content is a post for "[Modul 2] Pengumpulan" by user "060 Rafi Arya" with a deadline of "Mar 18" and "100 points". The post includes instructions for submitting a PDF report and a list of requirements. A terminal window is overlaid on the page, showing the execution of SQL commands in MariaDB. The first command is `ALTER TABLE Pegawai CHANGE pegawai_nama nama_pegawai varchar(50);`, which is successful. The second command is `desc Pegawai;`, which displays the updated table structure.

Table Structure (Before Change):

Field	Type	Null	Key	Default	Extra
id_pegawai	char(20)	NO	PRI	NULL	
pegawai_nama	varchar(50)	YES		NULL	
jabatan	varchar(20)	YES		NULL	
umur	int(10)	YES		NULL	

Table Structure (After Change):

Field	Type	Null	Key	Default	Extra
id_pegawai	char(20)	NO	PRI	NULL	
nama_pegawai	varchar(50)	YES		NULL	
jabatan	varchar(20)	YES		NULL	
umur	int(10)	YES		NULL	

b. Tabel Pegawai, hapus kolom “umur”.

Command line : ALTER TABLE Pegawai DROP umur;

Command line : desc Pegawai;

The screenshot shows a Google Classroom interface for a course titled "Praktikum Basis Data 2021/2022". The assignment is "[Modul 2] Pengumpulan" by user "060 Rafi Arya" with a value of "100 points". The instructions ask students to complete exercises and submit a report in PDF format. A terminal window is overlaid on the page, showing the execution of SQL commands in a MariaDB environment.

Terminal Output:

```
MariaDB [Westinghouse]> desc Pegawai;
```

Field	Type	Null	Key	Default	Extra
id_pegawai	char(20)	NO	PRI	NULL	
nama_pegawai	varchar(50)	YES		NULL	
jabatan	varchar(20)	YES		NULL	
umur	int(10)	YES		NULL	UNSIGNED

4 rows in set (0.002 sec)

```
MariaDB [Westinghouse]> ALTER TABLE Pegawai DROP umur;
```

Query OK, 0 rows affected (0.072 sec)

Records: 0 Duplicates: 0 Warnings: 0

```
MariaDB [Westinghouse]> desc Pegawai;
```

Field	Type	Null	Key	Default	Extra
id_pegawai	char(20)	NO	PRI	NULL	
nama_pegawai	varchar(50)	YES		NULL	
jabatan	varchar(20)	YES		NULL	

3 rows in set (0.002 sec)

```
MariaDB [Westinghouse]>
```

c. Tabel Buku, ubah nama kolom “buku_nama” menjadi “nama_buku”

Command line : ALTER TABLE Buku CHANGE buku_nama nama_buku varchar(50);

Command line : desc Buku;

The screenshot shows a Google Classroom interface for a course titled "Praktikum Basis Data 2021/2022". The assignment is "[Modul 2] Pengumpulan Tugas Praktikum - RB" by user "060 Rafi Arya" with a deadline of "Mar 18" and "100 points". The instructions ask students to complete exercises and submit them as PDFs. A terminal window is overlaid on the page, showing the following commands and output:

```
MariaDB [Westinghouse]> desc Buku;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_buku | char(20) | NO | PRI | NULL | UNSIGNED |
| buku_nama | varchar(50) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+

2 rows in set (0.002 sec)

MariaDB [Westinghouse]> ALTER TABLE Buku CHANGE buku_nama nama_buku varchar(50);
Query OK, 0 rows affected (0.045 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [Westinghouse]> desc Buku;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_buku | char(20) | NO | PRI | NULL | UNSIGNED |
| nama_buku | varchar(50) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+

2 rows in set (0.002 sec)

MariaDB [Westinghouse]>
```

d. Tabel Buku, tambahkan kolom “jumlah_stok” setelah kolom “buku_nama” dan juga ubah “id_buku” menjadi “isbn”

Command line : *ALTER TABLE Buku ADD jumlah_stok int(10) AFTER nama_buku;*

Command line : *desc Buku;*

The screenshot shows a terminal window with the following commands and output:

```
MariaDB [Westinghouse]> desc Buku;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_buku | char(20) | NO | PRI | NULL |  |
| nama_buku | varchar(50) | YES |  | NULL |  |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.002 sec)

MariaDB [Westinghouse]> ALTER TABLE Buku ADD jumlah_stok int(10) AFTER nama_buku;
Query OK, 0 rows affected (0.057 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [Westinghouse]> desc Buku;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_buku | char(20) | NO | PRI | NULL |  |
| nama_buku | varchar(50) | YES |  | NULL |  |
| jumlah_stok | int(10) | YES |  | NULL |  |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.002 sec)
```

Command line : *ALTER TABLE Buku CHANGE id_buku isbn char(20);*

Command line : *desc Buku;*

The screenshot shows a terminal window with the following commands and output:

```
MariaDB [Westinghouse]> desc Buku;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| id_buku | char(20) | NO | PRI | NULL |  |
| nama_buku | varchar(50) | YES |  | NULL |  |
| jumlah_stok | int(10) | YES |  | NULL |  |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.002 sec)

MariaDB [Westinghouse]> ALTER TABLE Buku CHANGE id_buku isbn char(20);
Query OK, 0 rows affected (0.051 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [Westinghouse]> desc Buku;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| isbn | char(20) | NO | PRI | NULL |  |
| nama_buku | varchar(50) | YES |  | NULL |  |
| jumlah_stok | int(10) | YES |  | NULL |  |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.002 sec)
```

4. Tambahkan kolom “id_penerbit” ke dalam tabel Buku. Kemudian relasikan kolom “id_penerbit” di tabel Buku dengan kolom “id_penerbit” di tabel Penerbit .

Command line : ALTER TABLE Buku ADD FOREIGN KEY (id_penerbit) REFERENCES Penerbit (id_penerbit) ON DELETE RESTRICT ON UPDATE CASCADE;

Command line : desc Buku;

The screenshot shows a web browser window with a Google Classroom assignment titled "[Modul 2] Pengumpulan" by O60 Rafi Arya. The assignment is worth 100 points and has a deadline of March 18. The assignment instructions are in Indonesian, asking students to submit a report on a book collection. The report should be in PDF format and include a cover, table of contents, and a conclusion. The assignment is currently assigned to the user.

Overlaid on the browser window is a terminal window showing the execution of SQL commands in MariaDB. The first command is:

```
MariaDB [Westinghouse]> ALTER TABLE Buku ADD FOREIGN KEY (id_penerbit) REFERENCES Penerbit (id_penerbit) ON DELETE RESTRICT ON UPDATE CASCADE;
```

The output of this command is:

```
Query OK, 0 rows affected (0.364 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

The second command is:

```
MariaDB [Westinghouse]> desc Buku;
```

The output of this command is a table showing the structure of the 'Buku' table:

Field	Type	Null	Key	Default	Extra
isbn	char(20)	NO	PRI	NULL	
nama_buku	varchar(50)	YES		NULL	
jumlah_stok	int(10)	YES		NULL	
id_penerbit	char(20)	YES		NULL	

The terminal window also shows the output of the first command, indicating that the foreign key was successfully added to the 'Buku' table.

BAB III

KESIMPULAN

Kesimpulannya, DDL (Data Definition Language) digunakan untuk Database berbasis SQL dan dijalankan dengan CLI (Command Line Interface) atau Terminal, itu memberitahu kita bagaimana cara membuat Database dibelakang layar dan jika kita mempraktikkannya, kita akan tahu bagaimana sulitnya membuat Database secara Manual dari Terminal.

DAFTAR PUSTAKA

<https://www.media-info.id/2020/03/tutorial-mengubah-nama-kolom-field-pada-tabel-mysql.html>