Database System Practicum

Modul 4 – Data Definition Language (DDL)

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PRACTICE

1. Access MySQL via Command Prompt

```
Microsoft Windows [Version 10.0.18363.720]
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C:\Users\Win10>cd\

C:\>cd C:\xampp\mysql\bin

C:\xampp\mysql\bin>mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 10
Server version: 10.4.11-MariaDB mariadb.org binary distribution

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

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

2. Create Perbankan database

```
MariaDB [(none)]> create database perbankan;
Query OK, 1 row affected (0.003 sec)

MariaDB [(none)]> use perbankan;
Database changed
```

3. Create Nasabah table

```
MariaDB [perbankan]> CREATE TABLE nasabah(
    -> id_nasabah INTEGER PRIMARY KEY,
    -> nama_nasabah VARCHAR(45) NOT NULL,
    -> alamat_nasabah VARCHAR(255) NOT NULL
    -> );
Query OK, 0 rows affected (0.169 sec)
```

4. Create cabang_bank table

```
MariaDB [perbankan]> CREATE TABLE cabang_bank(
    -> kode_cabang VARCHAR(20) PRIMARY KEY,
    -> nama_cabang VARCHAR(45) UNIQUE NOT NULL,
    -> alamat_cabang VARCHAR(255) NOT NULL
    -> );
Query OK, 0 rows affected (0.144 sec)
```

5. Create rekening table

```
MariaDB [perbankan]> CREATE TABLE rekening(
    -> no_rekening INTEGER PRIMARY KEY,
    -> kode_cabangFK VARCHAR(20) REFERENCES cabang_bank(kode_cabang)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> pin VARCHAR(20) DEFAULT '1234' NOT NULL,
    -> saldo INTEGER DEFAULT 0 NOT NULL
    -> );
Query OK, 0 rows affected (0.190 sec)
```

6. Create transaksi table

```
MariaDB [perbankan]> CREATE TABLE transaksi(
    -> no_transaksi SERIAL PRIMARY KEY,
    -> id_nasabahFK INTEGER REFERENCES nasabah(id_nasabah)
    -> ON DELETE SET NULL ON UPDATE CASCADE,
    -> no_rekeningFK INTEGER REFERENCES rekening(no_rekening)
    -> ON DELETE SET NULL ON UPDATE CASCADE,
    -> jenis_transaksi VARCHAR(20) DEFAULT'debit'NOT NULL,
    -> tanggal DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP,
    -> jumlah INTEGER NOT NULL CHECK(jumlah>=20000)
    -> );
Query OK, 0 rows affected (0.227 sec)
```

7. Create nasabah_has_rekening table

```
MariaDB [perbankan]> CREATE TABLE nasabah_has_rekening(
    -> id_nasabahFK INTEGER REFERENCES nasabah(id_nasabah)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> no_rekeningFK INTEGER REFERENCES rekening(no_rekening)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> PRIMARY KEY(id_nasabahFK, no_rekeningFK)
    -> );
Query OK, 0 rows affected (0.181 sec)
```

8. Checking the result

```
MariaDB [perbankan]> show tables;
+----------------------+
| Tables_in_perbankan  |
+----------------------+
| cabang_bank          |
| nasabah              |
| nasabah_has_rekening |
| rekening             |
| transaksi            |
+----------------------+
5 rows in set (0.001 sec)
```

9. Look at the table structure

```
MariaDB [perbankan]> describe nasabah;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| id_nasabah    | int(11)     | NO   | PRI | NULL    |       |
| nama_nasabah  | varchar(45) | NO   |     | NULL    |       |
| alamat_nasabah| varchar(255)| NO   |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
3 rows in set (0.021 sec)

MariaDB [perbankan]> describe cabang_bank;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| kode_cabang  | varchar(20) | NO   | PRI | NULL    |       |
| nama_cabang  | varchar(45) | NO   | UNI | NULL    |       |
| alamat_cabang| varchar(255)| NO   |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.085 sec)

MariaDB [perbankan]> describe nasabah_has_rekening;
+--------------+---------+------+-----+---------+-------+
| Field        | Type    | Null | Key | Default | Extra |
+--------------+---------+------+-----+---------+-------+
| id_nasabahFK | int(11) | NO   | PRI | NULL    |       |
| no_rekeningFK| int(11) | NO   | PRI | NULL    |       |
+--------------+---------+------+-----+---------+-------+
2 rows in set (0.104 sec)
```

```
MariaDB [perbankan]> describe rekening;
+--------------+------------+------+-----+---------+-------+
| Field        | Type       | Null | Key | Default | Extra |
+--------------+------------+------+-----+---------+-------+
| no_rekening  | int(11)    | NO   | PRI | NULL    |       |
| kode_cabangFK| varchar(20)| YES  |     | NULL    |       |
| pin          | varchar(20)| NO   |     | 1234    |       |
| saldo        | int(11)    | NO   |     | 0       |       |
+--------------+------------+------+-----+---------+-------+
4 rows in set (0.115 sec)

MariaDB [perbankan]> describe transaksi;
+----------------+--------------------+------+-----+--------------------+----------------+
| Field          | Type               | Null | Key | Default            | Extra          |
+----------------+--------------------+------+-----+--------------------+----------------+
| no_transaksi   | bigint(20) unsigned| NO   | PRI | NULL               | auto_increment |
| id_nasabahFK   | int(11)            | YES  |     | NULL               |                |
| no_rekeningFK  | int(11)            | YES  |     | NULL               |                |
| jenis_transaksi| varchar(20)        | NO   |     | debit              |                |
| tanggal        | datetime           | NO   |     | current_timestamp()|                |
| jumlah         | int(11)            | NO   |     | NULL               |                |
+----------------+--------------------+------+-----+--------------------+----------------+
6 rows in set (0.213 sec)

MariaDB [perbankan]>
```

ASSIGNMENT

Database School

```
Microsoft Windows [Version 10.0.18363.720]
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C:\Users\Win10>cd\

C:\>cd C:\xampp\mysql\bin

C:\xampp\mysql\bin>mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 22
Server version: 10.4.11-MariaDB mariadb.org binary distribution

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 school;
Query OK, 1 row affected (0.012 sec)

MariaDB [(none)]> use school;
Database changed
```

- Attribute :
    a. Student
        - NIM : nim mahasiswa (int)PK
        - Name_student : full name of student (varchar(45))
        - Address_student : address of student (varchar(255))

```
MariaDB [school]> CREATE TABLE student(
    -> nim INTEGER PRIMARY KEY,
    -> name_student VARCHAR(45) NOT NULL,
    -> address_student VARCHAR(255) NOT NULL
    -> );
Query OK, 0 rows affected (0.407 sec)
```

    b. Lecturer
        - NIP : NIP of lecturer (int)PK
        - Name_lect : full name of lecturer (varchar(45))
        - Position : position of lecturer (varchar(45))

```
MariaDB [school]> CREATE TABLE lecturer(
    -> nip INTEGER PRIMARY KEY,
    -> name_lect VARCHAR(45) NOT NULL,
    -> position VARCHAR(45) NOT NULL
    -> );
Query OK, 0 rows affected (0.246 sec)
```

    c. Courses
        - Code_courses : code of courses (int)PK
        - Name_courses : name of courses (varchar(20))
        - totalSKS : total of SKS (int)

```
MariaDB [school]> CREATE TABLE courses(
    -> code_courses INTEGER PRIMARY KEY,
    -> name_courses VARCHAR(20) NOT NULL,
    -> totalSKS INTEGER NOT NULL
    -> );
Query OK, 0 rows affected (0.186 sec)
```

d. Room
   - Code_room : code of the room (varchar(20))PK
   - Location : location of the room (varchar(255))
   - Capacity : capacity of the room (int)

```
MariaDB [school]> CREATE TABLE room(
    -> code_room VARCHAR(20) PRIMARY KEY,
    -> location VARCHAR(255) NOT NULL,
    -> capacity INTEGER NOT NULL
    -> );
Query OK, 0 rows affected (0.181 sec)
```

- Relationship

	S	L	C	R
S	-	m:n	m:n	-
L		-	m:n	-
C			-	m:n
R				-

a. Room used courses
   - First table : room, courses
   - Second table : room_used_courses
   - Relationship : m:n
   - Connecting attribute : code_room, code_courses (FK code_room, code_courses in room_used_courses)

```
MariaDB [school]> CREATE TABLE room_used_courses(
    -> code_roomFK VARCHAR(20) REFERENCES room(code_room)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> code_coursesFK INTEGER REFERENCES courses(code_courses)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> PRIMARY KEY(code_roomFK, code_coursesFK)
    -> );
Query OK, 0 rows affected (0.186 sec)
```

b. Lecturer teach courses
   - First table : lecturer, courses
   - Second table : lecturer_teach_courses
   - Relationship : m:n
   - Connecting attribute : nip, code_courses (FK nip, code_courses in lecturer_teach_courses)

```
MariaDB [school]> CREATE TABLE lecturer_teach_courses(
    -> nipFK INTEGER REFERENCES lecturer(nip)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> code_coursesFK INTEGER REFERENCES courses(code_courses)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> PRIMARY KEY(nipFK, code_coursesFK)
    -> );
Query OK, 0 rows affected (1.590 sec)
```

c. Student take courses
   - First table : student, courses
   - Second table : student_take_courses
   - Relation : m:n
   - Connecting attribute : nim, code_courses (FK nim, code_courses in student_take_courses)

```
MariaDB [school]> CREATE TABLE student_take_courses(
    -> nimFK INTEGER REFERENCES student(nim)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> code_coursesFK INTEGER REFERENCES courses(codr_courses)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> PRIMARY KEY(nimFK, code_coursesFK)
    -> );
Query OK, 0 rows affected (0.532 sec)
```

d. Lecturer teach student
   - First table : lecturer, student
   - Second table : lecturer_teach_student
   - Relation : m:n
   - Connecting attribute : nip, nim (FK nip, nim in lecturer_teach_student)

```
MariaDB [school]> CREATE TABLE lecturer_teach_student(
    -> nipFK INTEGER REFERENCES lecturer(nip)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> nimFK INTEGER REFERENCES student(nim)
    -> ON DELETE CASCADE ON UPDATE CASCADE,
    -> PRIMARY KEY(nipFK, nimFK)
    -> );
Query OK, 0 rows affected (0.154 sec)
```

- Checking the result

```
MariaDB [school]> show tables;
+------------------------+
| Tables_in_school       |
+------------------------+
| courses                |
| lecturer               |
| lecturer_teach_courses |
| lecturer_teach_student |
| room                   |
| room_used_courses      |
| student                |
| student_take_courses   |
+------------------------+
8 rows in set (0.026 sec)
```

- Look at the table structure

```
MariaDB [school]> describe courses;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| code_courses | int(11)     | NO   | PRI | NULL    |       |
| name_courses | varchar(20) | NO   |     | NULL    |       |
| totalSKS     | int(11)     | NO   |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.245 sec)

MariaDB [school]> describe lecturer;
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| nip       | int(11)     | NO   | PRI | NULL    |       |
| name_lect | varchar(45) | NO   |     | NULL    |       |
| position  | varchar(45) | NO   |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
3 rows in set (0.072 sec)

MariaDB [school]> describe lecturer_teach_courses;
+----------------+---------+------+-----+---------+-------+
| Field          | Type    | Null | Key | Default | Extra |
+----------------+---------+------+-----+---------+-------+
| nipFK          | int(11) | NO   | PRI | NULL    |       |
| code_coursesFK | int(11) | NO   | PRI | NULL    |       |
+----------------+---------+------+-----+---------+-------+
2 rows in set (0.104 sec)

MariaDB [school]> describe lecturer_teach_student;
+-------+---------+------+-----+---------+-------+
| Field | Type    | Null | Key | Default | Extra |
+-------+---------+------+-----+---------+-------+
| nipFK | int(11) | NO   | PRI | NULL    |       |
| nimFK | int(11) | NO   | PRI | NULL    |       |
+-------+---------+------+-----+---------+-------+
2 rows in set (0.042 sec)
```

```
MariaDB [school]> describe room;
+-----------+--------------+------+-----+---------+-------+
| Field     | Type         | Null | Key | Default | Extra |
+-----------+--------------+------+-----+---------+-------+
| code_room | varchar(20)  | NO   | PRI | NULL    |       |
| location  | varchar(255) | NO   |     | NULL    |       |
| capacity  | int(11)      | NO   |     | NULL    |       |
+-----------+--------------+------+-----+---------+-------+
3 rows in set (0.162 sec)

MariaDB [school]> describe room_used_courses;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| code_roomFK   | varchar(20) | NO   | PRI | NULL    |       |
| code_coursesFK | int(11)    | NO   | PRI | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
2 rows in set (0.461 sec)

MariaDB [school]> describe student;
+----------------+--------------+------+-----+---------+-------+
| Field          | Type         | Null | Key | Default | Extra |
+----------------+--------------+------+-----+---------+-------+
| nim            | int(11)      | NO   | PRI | NULL    |       |
| name_student   | varchar(45)  | NO   |     | NULL    |       |
| address_student | varchar(255) | NO   |     | NULL    |       |
+----------------+--------------+------+-----+---------+-------+
3 rows in set (0.087 sec)

MariaDB [school]> describe student_take_courses;
+----------------+---------+------+-----+---------+-------+
| Field          | Type    | Null | Key | Default | Extra |
+----------------+---------+------+-----+---------+-------+
| nimFK          | int(11) | NO   | PRI | NULL    |       |
| code_coursesFK | int(11) | NO   | PRI | NULL    |       |
+----------------+---------+------+-----+---------+-------+
2 rows in set (0.034 sec)
```