MIT World Peace University

Database Management Systems
Second Year B. Tech, Semester 4

# Learning SQL DCL and DDL Commands

*Data Definition Language and Data Control Language*

Assignment No. 2

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# Contents

# 1 Aim

Design and Develop SQL DDL statements for different system.

# 2 Objectives

To study DDL, DCL commands.

# 3 Problem Statement

# 4 Theory

## 4.1 SQL Data Definition Language (DDL)

### 4.1.1 What is Data Definition Language?

*Data Definition Language (DDL) is a computer language used to define the database schema. It includes commands to create, modify and drop database objects in the database. It is used to define the database structure or schema. It is also used to define the access permissions on the data, or the views that are presented to different users.*

### 4.1.2 DDL Commands

The following are the Commands that are used in DDL:

1. CREATE - Creates a new database or a new table in a database.
2. ALTER - Modifies a database or a table.
3. DROP - Deletes a database or a table.
4. TRUNCATE - Deletes all the records from a table, including all spaces allocated for the records are removed.
5. COMMENT - Adds comments to the data dictionary.
6. RENAME - Renames an object.

### 4.1.3 DDL Command Syntax and Examples

1. CREATE TABLE - Creates a new database table.

```
CREATE TABLE table_name constraints
(
Column_name datatype(size) constraints default '',
Column_name datatype(size),
constraint(column_name)
);
```

2. ALTER TABLE - Changes in columns and stuff.

```
ALTER TABLE table_name
ADD column_name datatype;
```

3. DROP TABLE - Deletes a table from the database.

   ```
   DROP TABLE table_name;
   ```

4. RENAME TABLE - Renames a table.

   ```
   RENAME TABLE old_name TO new_name;
   ```

5. TRUNCATE TABLE - Deletes all the records from a table.

   ```
   TRUNCATE TABLE table_name;
   ```

6. COMMENT ON - Adds comments to the data dictionary.

   ```
   COMMENT ON TABLE table_name IS 'comment';
   ```

### 4.2 SQL Data Control Language (DCL)

#### 4.2.1 What is Data Control Language?

*Data Control Language (DCL) is a computer language used to define the access permissions on the data, or the views that are presented to different users. It includes commands to grant and deny privileges on database objects to users.*

#### 4.2.2 DCL Commands

The following are the Commands that are used in DCL:

1. GRANT - Gives the specified privileges to the specified user.
2. REVOKE - Takes back the specified privileges from the specified user.

### 4.3 DCL Command Syntax and Examples

1. GRANT - Gives the specified privileges to the specified user.

   ```
   GRANT privileges ON object_name TO user_name;
   ```

2. REVOKE - Takes back the specified privileges from the specified user.

   ```
   REVOKE privileges ON object_name FROM user_name;
   ```

## 5 Platform

**Operating System**: Arch Linux x86-64
**IDEs or Text Editors Used**: Draw.io for Drawing the ER diagram.

## 6 Input

Given Database from the Problem Statement for the Assignment for our batch. (A1 PA 20)

## 7 Output

```
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 3
Server version: 10.11.2-MariaDB Arch Linux

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)]> show databases;
+--------------------+
| Database           |
+--------------------+
| class              |
| class_stuff        |
| dbms_lab           |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
| test               |
| test_libreoffice   |
+--------------------+
9 rows in set (0.004 sec)

MariaDB [(none)]> use dbms_lab
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [dbms_lab]> show tables;
+--------------------+
| Tables_in_dbms_lab |
+--------------------+
| books              |
| course             |
| new_book_master    |
| newauthor          |
| newbook_master     |
+--------------------+
5 rows in set (0.001 sec)

MariaDB [dbms_lab]> create table Hotel (HotelNo int Primary Key, Name varchar(50),
    City varchar(50));
Query OK, 0 rows affected (0.020 sec)

MariaDB [dbms_lab]> describe Hotel;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| HotelNo | int(11)     | NO   | PRI | NULL    |       |
```

```
| Name    | varchar(50) | YES  |     | NULL    |       |
| City    | varchar(50) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
3 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table Room (RoomNo int Primary Key, HotelNo int, Type
    varchar(50), Price int, foreign key(HotelNo) references Hotel(HotelNo));
Query OK, 0 rows affected (0.014 sec)

MariaDB [dbms_lab]> describe Room;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| RoomNo  | int(11)     | NO   | PRI | NULL    |       |
| HotelNo | int(11)     | YES  | MUL | NULL    |       |
| Type    | varchar(50) | YES  |     | NULL    |       |
| Price   | int(11)     | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
4 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table Booking (HotelNo int, GuestNo int, DateFrom date,
     DateTo date, RoomNo int, foreign key(HotelNo) references Hotel(HotelNo),
    foreign key(RoomNo) references Room(RoomNo));
Query OK, 0 rows affected (0.011 sec)

MariaDB [dbms_lab]> describe Booking;
+----------+---------+------+-----+---------+-------+
| Field    | Type    | Null | Key | Default | Extra |
+----------+---------+------+-----+---------+-------+
| HotelNo  | int(11) | YES  | MUL | NULL    |       |
| GuestNo  | int(11) | YES  |     | NULL    |       |
| DateFrom | date    | YES  |     | NULL    |       |
| DateTo   | date    | YES  |     | NULL    |       |
| RoomNo   | int(11) | YES  | MUL | NULL    |       |
+----------+---------+------+-----+---------+-------+
5 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table Guest(GuestNo int primary key, GuestName varchar
    (50), GuessAddress varchar(50));
Query OK, 0 rows affected (0.007 sec)

MariaDB [dbms_lab]> alter table Booking add constraint foreign key(GuestNo)
    references Guest(GuestNo);
Query OK, 0 rows affected (0.022 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [dbms_lab]> describe Booking;
+----------+---------+------+-----+---------+-------+
| Field    | Type    | Null | Key | Default | Extra |
+----------+---------+------+-----+---------+-------+
| HotelNo  | int(11) | YES  | MUL | NULL    |       |
| GuestNo  | int(11) | YES  | MUL | NULL    |       |
| DateFrom | date    | YES  |     | NULL    |       |
| DateTo   | date    | YES  |     | NULL    |       |
| RoomNo   | int(11) | YES  | MUL | NULL    |       |
+----------+---------+------+-----+---------+-------+
5 rows in set (0.004 sec)

MariaDB [dbms_lab]> describe Guest;
```

```
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| GuestNo      | int(11)     | NO   | PRI | NULL    |       |
| GuestName    | varchar(50) | YES  |     | NULL    |       |
| GuessAddress | varchar(50) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
3 rows in set (0.001 sec)

MariaDB [dbms_lab]> describe Room;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| RoomNo  | int(11)     | NO   | PRI | NULL    |       |
| HotelNo | int(11)     | YES  | MUL | NULL    |       |
| Type    | varchar(50) | YES  |     | NULL    |       |
| Price   | int(11)     | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
4 rows in set (0.002 sec)

MariaDB [dbms_lab]> describe Hotel;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| HotelNo | int(11)     | NO   | PRI | NULL    |       |
| Name    | varchar(50) | YES  |     | NULL    |       |
| City    | varchar(50) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
3 rows in set (0.002 sec)

ariaDB [dbms_lab]> create table emp(eno int primary key, ename varchar(50), zip
    int check(zip in (400110, 400111)), hdate date unique);
Query OK, 0 rows affected (0.009 sec)

MariaDB [dbms_lab]> describe emp;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| eno   | int(11)     | NO   | PRI | NULL    |       |
| ename | varchar(50) | YES  |     | NULL    |       |
| zip   | int(11)     | YES  |     | NULL    |       |
| hdate | date        | YES  | UNI | NULL    |       |
+-------+-------------+------+-----+---------+-------+
4 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table parts(pno int primary key, pname varchar(50),
    qty_on_hand int not null, price int);
Query OK, 0 rows affected (0.007 sec)

MariaDB [dbms_lab]> describe parts;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| pno         | int(11)     | NO   | PRI | NULL    |       |
| pname       | varchar(50) | YES  |     | NULL    |       |
| qty_on_hand | int(11)     | NO   |     | NULL    |       |
| price       | int(11)     | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.002 sec)
```

```
MariaDB [dbms_lab]> create table customer(cno primary key, cname varchar(50),
    street varchar(50), Zip int not null, phone int not null unique);
ERROR 4161 (HY000): Unknown data type: 'primary'
MariaDB [dbms_lab]> create table customer(cno int primary key, cname varchar(50),
    street varchar(50), Zip int not null, phone int not null unique);
Query OK, 0 rows affected (0.009 sec)

MariaDB [dbms_lab]> describe customer;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| cno    | int(11)     | NO   | PRI | NULL    |       |
| cname  | varchar(50) | YES  |     | NULL    |       |
| street | varchar(50) | YES  |     | NULL    |       |
| Zip    | int(11)     | NO   |     | NULL    |       |
| phone  | int(11)     | NO   | UNI | NULL    |       |
+--------+-------------+------+-----+---------+-------+
5 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table Orders(ono int primary key, cno int, receivedDate
    date, shippedDate date, foreign key(cno) references customer(cno));
Query OK, 0 rows affected (0.010 sec)

MariaDB [dbms_lab]> describe Orders;
+--------------+---------+------+-----+---------+-------+
| Field        | Type    | Null | Key | Default | Extra |
+--------------+---------+------+-----+---------+-------+
| ono          | int(11) | NO   | PRI | NULL    |       |
| cno          | int(11) | YES  | MUL | NULL    |       |
| receivedDate | date    | YES  |     | NULL    |       |
| shippedDate  | date    | YES  |     | NULL    |       |
+--------------+---------+------+-----+---------+-------+
4 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table odetails(ono int, pno int, qty int, foreign key(
    ono) references Orders(ono));
Query OK, 0 rows affected (0.009 sec)

MariaDB [dbms_lab]> describe odetails;
+-------+---------+------+-----+---------+-------+
| Field | Type    | Null | Key | Default | Extra |
+-------+---------+------+-----+---------+-------+
| ono   | int(11) | YES  | MUL | NULL    |       |
| pno   | int(11) | YES  |     | NULL    |       |
| qty   | int(11) | YES  |     | NULL    |       |
+-------+---------+------+-----+---------+-------+
3 rows in set (0.002 sec)

MariaDB [dbms_lab]> create table zipcode(zip int primary key, city varchar(50) not
    null check(city in ('Pune', 'Mumbai')));
Query OK, 0 rows affected (0.008 sec)

MariaDB [dbms_lab]> describe zipcode;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| zip   | int(11)     | NO   | PRI | NULL    |       |
| city  | varchar(50) | NO   |     | NULL    |       |
```

```
+-------+-------------+------+-----+---------+-------+
2 rows in set (0.002 sec)
```

# 8 Conclusion

Thus, we have learned DDL and DCL commands thoroughly.

# 9 FAQ

1. *How to drop a column from a table?*

   ```
   ALTER TABLE table_name
   DROP COLUMN column_name;
   ```

2. *How to add a primary key in an already existing table?*

   ```
   ALTER TABLE table_name
   ADD PRIMARY KEY (column_name);
   ```

3. *How to create a new user in MySQL?*

   ```
   CREATE USER 'username'@'localhost' IDENTIFIED BY 'password';
   ```