Sipna College of Engineering & Technology, Amravati.
Department of Computer Science & Engineering
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Branch :- Computer Sci. & Engg.
Subject :- DBMS

Class :- III Year
Sem :- V

<u>Teacher Manual</u>

PRACTICAL NO 2

AIM: Study and implement DDL Commands. (Along with necessary integrity constraints).
S/W REQUIRED: MYSQL

Sample Database Considered is of University as folows:
1. classroom(<u>building, room_number</u>, capacity)
2. department(<u>dept_name</u>, building, budget)
3. course(<u>course_id</u>, title, dept name, credits)
4. instructor(<u>inst_id</u>, name, dept name, salary)
5. section(<u>course_id, sec id, semester, year</u>, building, room number, time slot_id)
6. teaches(<u>inst_id, course_id, sec-id, semester, year</u>)
7. student(<u>stu_id</u>, name, dept_name, tot_cred)
8. takes(<u>stu_id, course_id, sec-id, semester, year</u>, grade)
9. advisor(<u>s_id, i_id</u>)
10. prereq(<u>course_id, prereq_id</u>)

Theory
Data Definition Language (DDL) statements are used to define the database structure or schema. Various DDL Commands are:
CREATE – to create objects in the database
ALTER - alters the structure of the database
DROP - delete objects from the database
TRUNCATE - remove all records from a table, including all spaces allocated for the records are removed

SQL Commands:
<u>Creating the table:</u>

mysql> create database univeristy;
Query OK, 1 row affected (0.00 sec)
mysql> use university;
Database changed

MariaDB [university]> CREATE TABLE `department` (`dept_name` varchar(20), `building` varchar(15), `budget` int(11), PRIMARY KEY (`dept_name`));

MariaDB [university]> describe department;

Field	Type	Null	Key	Default	Extra
dept_name	varchar(20)	NO	PRI	NULL	
building	varchar(15)	YES		NULL	
budget	int(11)	YES		NULL	

3 rows in set (0.733 sec)

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Inserting data

```
insert into department values('Biology', 'Watson', 90000);
insert into department values('Comp_Sci', 'Taylor', 100000);
insert into department values('Elec_Engg', 'Taylor', 85000);
insert into department values('Finance', 'Painter', 120000);
insert into department values('Music', 'Packard', 50000);
insert into department values('Physics', 'Watson', 78000);
insert into department values('History', 'Painter', 50000);
```

```
MariaDB [university]> CREATE TABLE `course` ( `course_id` varchar(15) NOT NULL, `course_name`
varchar(20) DEFAULT NULL, `dept_name` varchar(20) DEFAULT NULL, `credits` int(11) DEFAULT
NULL, PRIMARY KEY (`course_id`), KEY `dept_name` (`dept_name`), CONSTRAINT
`course_ibfk_1` FOREIGN KEY (`dept_name`) REFERENCES `department` (`dept_name`)) ;
```

```
MariaDB [university]> describe course;
```

Field	Type	Null	Key	Default	Extra
course_id	int(11)	NO	PRI	NULL	
course_name	varchar(20)	YES		NULL	
dept_name	varchar(20)	YES	MUL	NULL	
credits	int(11)	YES		NULL	

4 rows in set (0.666 sec)

Inserting data

```
insert into coursevalues('BIO-101', 'Intro. to Biology', 'Biology', 4);
insert into coursevalues('CS-101', 'DBMS', 'Comp_Sci', 4);
insert into coursevalues('BIO-301', 'Genetics', 'Biology', 3);
insert into coursevalues('CS-190', 'Python for DS', 'Comp_Sci', 4);
insert into coursevalues('MU-199', 'Music Video Production', 'Music', 3);
insert into coursevalues('PHY-101', 'Physics Principles', 'Physics', 4);
insert into coursevalues('HIS-351', 'World History', 'History', 3);
insert into coursevalues('EE-181', 'Intoduction to digital systems', 'Elec_Engg', 3);
```

```
MariaDB [university]> create table instructor (inst_id varchar(5), inst_name varchar(20) not null,
dept_name varchar(20), salary int, primary key(inst_id), foreign key (dept_name) references
department(dept_name));
```

Query OK, 0 rows affected (2.174 sec)

MariaDB [university]> describe instructor;

```
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| inst_id   | varchar(5)  | NO   | PRI | NULL    |       |
| inst_name | varchar(20) | NO   |     | NULL    |       |
| dept_name | varchar(20) | YES  | MUL | NULL    |       |
| salary    | int(11)     | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
```

4 rows in set (0.268 sec)

Inserting data

insert into instructor values('10101', 'Srinivasan', 'Comp_Sci', 65000);
insert into instructor values('12121', 'Wu', 'Finance', 90000);
insert into instructor values('22222', 'Einstain', 'Physics', 950000);
insert into instructor values('32343', 'EI Said', 'History', 60000);
insert into instructor values('45565', 'Katz', 'Comp_Sci', 75000);
insert into instructor values('98345', 'Kim', 'Elec_Engg', 80000);
insert into instructor values('76766', 'Crick', 'Biology', 72000);
insert into instructor values('15151', 'Mozart', 'Music', 80000);

MariaDB [university]> create table section(course_id varchar(15), sec_id varchar(8), semester varchar(6), year int, building` varchar(15), primary key(course_id, sec_id, semester, year), foreign key (course_id) references course(course_id));
Query OK, 0 rows affected (0.587 sec)

MariaDB [university]> describe section;

```
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| course_id | int(11)     | NO   | PRI | NULL    |       |
| sec_id    | varchar(8)  | NO   | PRI | NULL    |       |
| semester  | varchar(6)  | NO   | PRI | NULL    |       |
| year      | int(11)     | NO   | PRI | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
```

4 rows in set (0.096 sec)

Inserting data

insert into section values('BIO-101', '1', 'Summer', 2009, 'Painter');
insert into section values('BIO-301', '1', 'Summer', 2010, 'Painter');
insert into section values('CS-101', '1', 'Fall', 2009, 'Packard');
insert into section values('CS-101', '1', 'Spring', 2010, 'Packard');
insert into section values('CS-190', '1', 'Spring', 2009, 'Taylor');
insert into section values('CS-190', '2', 'Spring', 2009, 'Taylor');
insert into section values('EE-181', '1', 'Spring', 2009, 'Taylor');
insert into section values('MU-199', '1', 'Spring', 2010, 'Packard');

```
insert into section values('PHY-101', '1', 'Fall', 2009, 'Watson');
insert into section values('HIS-351', '1', 'Spring', 2010, 'Painter');
```

```
MariaDB [university]> create table teaches (inst_id varchar(5), course_id varchar(15), sec_id varchar(8),
semester varchar(6), year int, primary key (inst_id, course_id, sec_id, semester, year), foreign key(inst_id)
references instructor(inst_id));
Query OK, 0 rows affected (0.460 sec)
```

```
MariaDB [university]> describe teaches;
```

Field	Type	Null	Key	Default	Extra
inst_id	varchar(5)	NO	PRI	NULL	
course_id	int(11)	NO	PRI	NULL	
sec_id	varchar(8)	NO	PRI	NULL	
semester	varchar(6)	NO	PRI	NULL	
year	int(11)	NO	PRI	NULL	

5 rows in set (0.208 sec)

Inserting data

```
insert into teaches values('10101','CS-101','1','Fall',2009);
insert into teaches values('12121','FIN-201','1','Spring',2010);
insert into teaches values('15151','MU-199','1','Spring',2010);
insert into teaches values('22222','PHY-101','1','Fall',2009);
insert into teaches values('32343','HIS-351','1','Spring',2010);
insert into teaches values('98345','EE-181','1','Spring',2009);
insert into teaches values('76766','BIO-301','1','Summer',2010);
```

```
MariaDB [university]> create table student (stud_id varchar(5), stu_name varchar(10), dept_name
varchar(20), tot_credit int, primary key (stud_id), foreign key (dept_name) references
department(dept_name));
Query OK, 0 rows affected (0.505 sec)
```

```
MariaDB [university]> describe student;
```

Field	Type	Null	Key	Default	Extra
stud_id	int(11)	NO	PRI	NULL	
stu_name	varchar(10)	YES		NULL	
dept_name	varchar(20)	YES	MUL	NULL	
tot_credita	int(11)	YES		NULL	

4 rows in set (0.030 sec)

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ting data

```
sert into student values('12345','Shankar','Comp_Sci',32);
nsert into student values('19991','Brandt','History',80);
insert into student values('23121','Chavez','Finance',110);
insert into student values('45678','Levy','Physics',46);
insert into student values('55739','Sanchez','Music',38);
insert into student values('76653','Aoi','Elec_Engg',60);
insert into student values('98988','Tanaka','Biology',120);
```

```
MariaDB [university]> create table takes(stud_id  varchar(5), course_id  varchar(15), sec_id varchar(8),
semester varchar(6), year int, grade int, primary key(stud_id, course_id, sec_id, semester,year), foreign key
(stud_id) references student(stud_id),foreign key (course_id, sec_id, semester,year) references
section(course_id, sec_id, semester, year));
Query OK, 0 rows affected (1.063 sec)
```

```
MariaDB [university]> describe takes;
```

Field	Type	Null	Key	Default	Extra
stud_id	int(11)	NO	PRI	NULL	
course_id	int(11)	NO	PRI	NULL	
sec_id	varchar(8)	NO	PRI	NULL	
semester	varchar(6)	NO	PRI	NULL	
year	int(11)	NO	PRI	NULL	
grade	int(11)	YES		NULL	

```
6 rows in set (0.030 sec)
```

Alter Command

1. **adding the column:**

```
mysql> create table student_test(rollno int,name varchar(15));
Query OK, 0 rows affected (0.08 sec)
```

```
mysql> alter tablestudent_test add address varchar(20);
Query OK, 0 rows affected (0.14 sec)
```

2. **deleting the column:**

```
mysql> alter table student_test drop address;
Query OK, 0 rows affected (0.14 sec)
```

3. **changing datatype/width of the fields:**

```
mysql> alter table student_test modify address varchar(25);
Query OK, 0 rows affected (0.15 sec)
```
Or
```
mysql> alter tablestudent_test change address address varchar(25);
```

Query OK, 0 rows affected (0.15 sec)

4. renaming column/table name

```
mysql> alter table student_test rename  rollno to roll_no;
Query OK, 0 rows affected (0.15 sec)
```

Or

```
mysql> alter table student rename column rollno to roll_no;
Query OK, 0 rows affected (0.15 sec)

mysql> alter table student_test rename  to student_data;
Query OK, 0 rows affected (0.15 sec)
```

5. adding/dropping primary key:

```
mysql> alter table student_test add primary key(rollno);
Query OK, 0 rows affected (0.14 sec)

mysql> alter table student_test drop primary key;
Query OK, 0 rows affected (0.15 sec)
```

6. adding foreign key:

```
mysql> create table dept_test(dept_no int,dept_name varchar(15),primary key(dept_name));
Query OK, 0 rows affected (0.05 sec)

mysql> alter table student_test add dept_name varchar(15);
Query OK, 0 rows affected (0.14 sec)

mysql> alter table student_test add foreign key(dept_name) references dept_test(dept_name);
Query OK, 0 rows affected (0.15 sec)
```

Truncate and drop commands

```
SQL>  create table test(id number,name char(15));
```

Table created.

```
SQL> describe test;
```

Name	Null?	Type
ID		NUMBER
NAME		CHAR(15)

```
SQL> insert into test values(20,' Ashwini ');
```
1 row created.

```
SQL> select * from test;
```

```
        ID    NAME
        --    ----
        20    ASHWINI

SQL> truncate table test;

Table truncated.

SQL> describe test;
 Name                    Null?          Type
 ----                    -----          ----
 ID                                     NUMBER
 NAME                                   CHAR(15)

SQL> select * from test;

no rows selected

SQL> drop table test;

Table dropped.

SQL> describe test;
ERROR:
ORA-04043: object test does not exist


SQL> select * from test;
select * from test
       *
ERROR at line 1:
ORA-00942: table or view does not exist
```

CONCLUSION: Thus DDL commands are studied and executed.

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