

## Assignment 3

Date of Completion: 12-8-20

Date of Submission: 14-9-20

Title: Design at least 10 SQL queries for suitable database application using SQL.

### Problem Statement:

Design at least 10 SQL queries for suitable database application using SQL DML statements Insert, Select, Update, Delete with operators, functions & set operators.

### Objective:

1. To understand & implement various DML commands.
2. To understand database concepts like functions & set operators.

SW & H/W requirements: MySQL, i7 processor, 8 GB RAM.

### Theory:

#### 1. DML (Data Manipulation language)

It deals with data management & includes the most common SQL statements & is used to store, modify, retrieve, etc data in the database.



1) Select: To select entries

→ select col-name(s) from table-name

2) Insert: To insert entries

→ insert into table-name (... ) values (... )

3) Update: To update entries

→ update table-name set col1=val1,  
col2=val2, ... where someCol=someval.

4) Delete: To delete entries.

→ delete from table-name where someCol=someval

• Set operators:

1) Union:

Returns union of 2 select statements.

→ select \* from table1 UNION select \* from table2

2) Union all:

Similar, but returns the duplicate values too.

3) Minus: Set(A) - Set(B)

→ select \* from table1 minus  
select \* from table2

4) Intersect: Set(A)  $\cap$  Set(B)

→ select \* from table1 intersect  
select \* from table2



## Integrity Constraints:

- Set rules used to maintain quality of info.
- It ensures that data integrity is maintained
- Used as guard against damage to database.

### Types:-

#### 1) Domain Constraint:

Definition of a valid set of values for an attribute. The value of attribute must be in corresponding domain.

#### 2) Entity Integrity Constraints:

Primary key value can't be NULL & it should be unique.

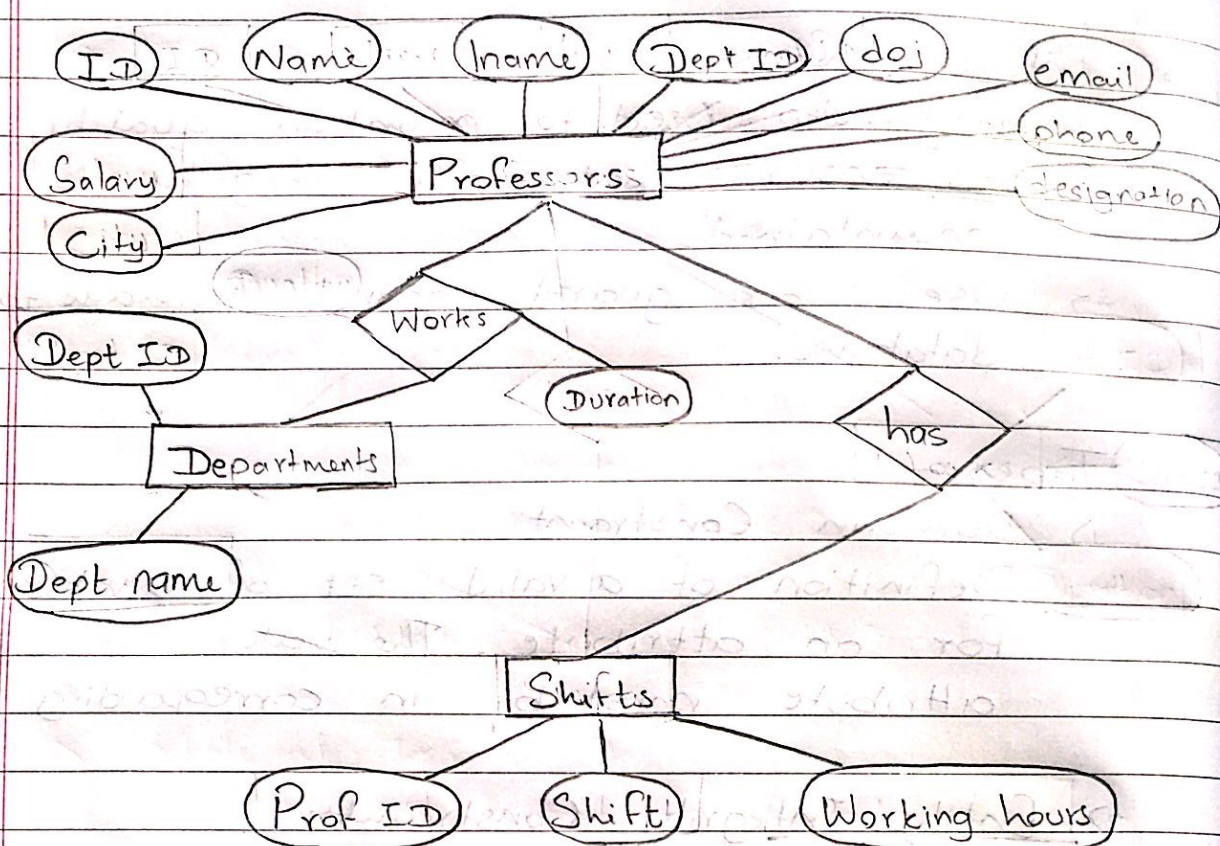
#### 3) Referential Integrity Constraints:

If a foreign key in table 1 refers to primary key in table 1 then every value of foreign key must be null or be in table 1.

#### 4) Key constraints:-

Keys are entity set that is used to identify an entity within its entity set uniquely.





### • Conclusion:

Hence we learnt how to create table & handle basic data manipulation in SQL.

```
mysql> use professor_schema;
Database changed
mysql> table list;
ERROR 1146 (42S02): Table 'professor_schema.list' doesn't exist
mysql> show tables;
Empty set (0.00 sec)
```

```
mysql> use professor_schema;
Database changed
mysql> create table department(dept_id int not null, dept_name varchar(20));
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> desc department;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| dept_id | int | NO | | NULL | |
| dept_name | varchar(20) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> drop table department;
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> show tables;
Empty set (0.00 sec)
```

```
mysql> create table department(dept_id int not null,dept_name varchar(10),primary key(dept_id));
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> create table professor(prof_id int not null,fname varchar(10),lname varchar(10),dept_id
int,designation varchar(10),salary varchar(15),dob varchar(15),email varchar(20),phone
varchar(20),city varchar(20),primary key(prof_id),foreign key(dept_id) references department(dept_id)
on delete cascade);
Query OK, 0 rows affected (0.04 sec)
```

```
mysql> desc professor;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| prof_id | int | NO | PRI | NULL | |
| fname | varchar(10) | YES | | NULL | |
| lname | varchar(10) | YES | | NULL | |
| dept_id | int | YES | MUL | NULL | |
| designation | varchar(10) | YES | | NULL | |
| salary | varchar(15) | YES | | NULL | |
| dob | varchar(15) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
```

email	varchar(20)	YES		NULL		
phone	varchar(20)	YES		NULL		
city	varchar(20)	YES		NULL		

10 rows in set (0.00 sec)

```
mysql> create table works(prof_id int,dept_id int,duration varchar(10),foreign key(prof_id) references
professor(prof_id),foreign key(dept_id) references department(dept_id));
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> create table shift(prof_id int,shift varchar(20),working_hrs varchar(20),foreign key(prof_id)
references professor(prof_id));
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> drop table shift;
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> drop table works;
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> create table shift( prof_id int, shift varchar(20), working_hrs varchar(20), foreign key(prof_id)
references professor(prof_id) on delete cascade );
Query OK, 0 rows affected (0.04 sec)
```

```
mysql> create table works( prof_id int, dept_id int, duration varchar(10), foreign key(prof_id)
references professor(prof_id) on delete cascade, foreign key(dept_id) references department(dept_id)
on delete cascade );
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> show tables;
+-----+
| Tables_in_professor_schema |
+-----+
| department                  |
| professor                   |
| shift                       |
| works                       |
+-----+
4 rows in set (0.00 sec)
```

```
mysql> alter table professor modify designation varchar(30);
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> alter table professor modify email varchar(30);
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> alter table professor modify fname varchar(30);
```

Query OK, 0 rows affected (0.04 sec)  
Records: 0 Duplicates: 0 Warnings: 0

mysql> alter table professor modify lname varchar(30);  
Query OK, 0 rows affected (0.04 sec)  
Records: 0 Duplicates: 0 Warnings: 0

mysql> desc professor;

Field	Type	Null	Key	Default	Extra
prof_id	int	NO	PRI	NULL	
fname	varchar(30)	YES		NULL	
lname	varchar(30)	YES		NULL	
dept_id	int	YES	MUL	NULL	
designation	varchar(30)	YES		NULL	
salary	varchar(15)	YES		NULL	
dob	varchar(15)	YES		NULL	
email	varchar(30)	YES		NULL	
phone	varchar(20)	YES		NULL	
city	varchar(20)	YES		NULL	

10 rows in set (0.00 sec)

mysql> insert into department values(1, "COMP");  
Query OK, 1 row affected (0.02 sec)

mysql> insert into department values(2, "IT");  
Query OK, 1 row affected (0.01 sec)

mysql> insert into department values(3, "ENTC");  
Query OK, 1 row affected (0.01 sec)

mysql> insert into professor values( 1, "Sarang", "Joshi", 1, "Professor", "100000", "1976-02-12",  
"sajoshi@pict.edu", "3244334321", "Nashik");  
Query OK, 1 row affected (0.01 sec)

mysql> insert into professor values( 2, "Rajesh", "Ingle", 1, "Professor", "100000", "1970-08-21",  
"ringle@pict.edu", "1814223456", "Pune");  
Query OK, 1 row affected (0.01 sec)

mysql> insert into professor values( 102, "Girish", "Potdar", 1, "Associate Professor", "76000", "1974-  
09-16", "gpotdar@pict.edu", "7678223314", "Pune");  
Query OK, 1 row affected (0.00 sec)

mysql> insert into professor values( 3, "Khatri", "Indraraj", 2, "Associate Professor", "73200", "1985-  
01-01", "khatri@pict.edu", "9999923231", "Pune");  
Query OK, 1 row affected (0.01 sec)

```
mysql> select * from professor;
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+
| prof_id | fname | lname | dept_id | designation | salary | dob | email | phone | city |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | Sarang | Joshi | 1 | Professor | 100000 | 1976-02-12 | sajoshi@pict.edu | 3244334321 | Nashik |
| 2 | Rajesh | Ingle | 1 | Professor | 100000 | 1970-08-21 | ringle@pict.edu | 1814223456 | Pune |
| 3 | Khatri | Indraraj | 2 | Associate Professor | 73200 | 1985-01-01 | khatri@pict.edu | 9999923231 | Pune |
| 102 | Girish | Potdar | 1 | Associate Professor | 76000 | 1974-09-16 | gpotdar@pict.edu | 7678223314 | Pune |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+
```

```
4 rows in set (0.00 sec)
```

```
mysql> show tables;
```

```
+-----+
| Tables_in_professor_schema |
+-----+
| department |
| professor |
| shift |
| works |
+-----+
```

```
4 rows in set (0.00 sec)
```

```
mysql> desc shift;
```

```
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| prof_id | int | YES | MUL | NULL | |
| shift | varchar(20) | YES | | NULL | |
| working_hrs | varchar(20) | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
```

```
3 rows in set (0.00 sec)
```

```
mysql> insert into shift values(1,"1","9-3");
```

```
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into shift values(2,"2","9-3");
```

```
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into shift values(102,"1","9-3");
```

```
Query OK, 1 row affected (0.01 sec)
```



```
mysql> insert into shift values(3,"2","9-3" );
Query OK, 1 row affected (0.01 sec)
```

```
mysql> desc works;
```

Field	Type	Null	Key	Default	Extra
prof_id	int	YES	MUL	NULL	
dept_id	int	YES	MUL	NULL	
duration	varchar(10)	YES		NULL	

3 rows in set (0.01 sec)

```
mysql> insert into works values(1,1,"6");
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into works values(3,2,"7");
Query OK, 1 row affected (0.02 sec)
```

```
mysql> insert into works values(2,1,"7");
Query OK, 1 row affected (0.00 sec)
```

```
mysql> insert into works values(102,2,"9");
Query OK, 1 row affected (0.01 sec)
```

```
mysql> show tables;
```

Tables_in_professor_schema
department
professor
shift
works

4 rows in set (0.00 sec)

```
mysql> desc department;
```

Field	Type	Null	Key	Default	Extra
dept_id	int	NO	PRI	NULL	
dept_name	varchar(10)	YES		NULL	

2 rows in set (0.00 sec)

```
mysql> desc professor;
```

Field	Type	Null	Key	Default	Extra
-------	------	------	-----	---------	-------

prof_id	int	NO	PRI	NULL	
fname	varchar(30)	YES		NULL	
lname	varchar(30)	YES		NULL	
dept_id	int	YES	MUL	NULL	
designation	varchar(30)	YES		NULL	
salary	varchar(15)	YES		NULL	
dob	varchar(15)	YES		NULL	
email	varchar(30)	YES		NULL	
phone	varchar(20)	YES		NULL	
city	varchar(20)	YES		NULL	

10 rows in set (0.01 sec)

```
mysql> desc shift;
```

Field	Type	Null	Key	Default	Extra
prof_id	int	YES	MUL	NULL	
shift	varchar(20)	YES		NULL	
working_hrs	varchar(20)	YES		NULL	

3 rows in set (0.01 sec)

```
mysql> desc works;
```

Field	Type	Null	Key	Default	Extra
prof_id	int	YES	MUL	NULL	
dept_id	int	YES	MUL	NULL	
duration	varchar(10)	YES		NULL	

3 rows in set (0.00 sec)