

## Assignment 4

Date of Completion: 16-9-20

### • Title:

Design atleast 10 SQL queries for all suitable database applications using SQL / DML statements. All types of Join, Sub-query & view.

### • Objective:

1. Types of joins
2. Subquery & its types
3. Complex views.

### • Theory:

#### → JOIN

SQL join is used to take data from two or more tables & then represent it as a single set of data. A table joining to itself is self join.

#### Types:-

##### 1) Cross Join:

It returns Cartesian product from the rows from table in join.

#### Syntax:

```
SELECT <column-namelist> from table1  
CROSS JOIN table 2;
```



## 2) Inner Join:

It is a simple join in which the result is based on matched data as per the equality condition specified in the query.

Syntax:-

```
SELECT <col-name-list>
```

```
FROM table1
```

```
INNER JOIN table2
```

```
where
```

```
table1.col-name = table2.col-name
```

## 3) Natural Join:-

It is a type of inner join which is based on column having same name & datatype present in both table to be joined.

Syntax:-

```
SELECT * from
```

```
table1
```

```
NATURAL JOIN
```

```
table2
```

## 4) Outer Join:-

### i) Left Outer Join =>

It returns a result table with matched data of two table then remaining rows of left table & null for right table column.



Syntax-

```
SELECT <col-name-list>
FROM table1
LEFT OUTER JOIN
table 2
on table1.col-name = table2.col-name.
```

ii) Right Outer Join:-

It returns result table with matched data of two table then remaining rows of right table & null from left table column.

Syntax:-

```
SELECT <col-name-list>
FROM table1
RIGHT OUTER JOIN
table 2
on table1.col-name = table2.colname.
```

iii) Full outer Join:

It returns a result table with matched data then remaining rows from both left & right tables.

Syntax:

```
SELECT <col-name-list>
From table1
FULL OUTER JOIN
table2
on table1.col-name = table2.col-name.
```



## \* Subquery:

- 1) A Subquery or inner query or a nested query is a query within another SQL query & embedded within a WHERE clause.
- 2) A Subquery is used to return data that will be used in main query as a condition to further restrict the data to be retrieved.

### Rules:

- 1) Must be inclosed with Paranthusis
- 2) Sub-query must have only 1 column unless the condition is related to more than 1 column
- 3) "ORDER BY" cannot be used in sub-query.
- 4) A sub-query cannot be immediatly enclosed in a Set Function.

## \* Conclusion:-

We learned about various Joins & their uses along with different operations on views & about Subqueries.

```
(base) pratt3000@pratts-laptop ~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.21-0ubuntu0.20.04.4 (Ubuntu)
```

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

```
mysql> use A1_professor_schema
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

```
mysql> #1. Find the professor details and department details using NATURAL JOIN.
```

```
mysql> select * from professor natural join department;
```

dept_id	prof_id	fname	lname	designation	salary	dob	email	phone	city	dept_name
1	1	Sarang	Joshi	Professor	100000	1976-02-12	sajoshi@pict.edu		Nashik	COMP
1	2	Rajesh	Ingle	Professor	50000	1970-08-21	ringle@pict.edu		Pune	COMP
1	3	Girish	Potdar	Associate Professor	40000	1974-09-16	gpotdar@pict.edu		Pune	COMP
1	8	Pralhad	kulkarni	Assistant Professor	90000	2015-01-01	pralhadk@pict.edu		pune	COMP
2	4	Khatri	Indraraj	Associate Professor	30000	1985-01-01	khatri@pict.edu		Pune	IT
2	7	dinesh	mehta	Assistant Professor	15000	2016-01-01	ronakm@pict.edu		mumbai	IT
2	9	shushil	Chandak	Professor	90000	1987-02-23	chandak@pict.edu		aurangabad	IT
3	5	Sunil	parasnese	Professor	15000	1971-02-23	sunilpp@pict.edu		mumbai	ENTC
3	6	arun	joshi	Assistant Professor	120000	1961-02-23	rrk@pict.edu		aurangabad	ENTC
3	10	Prashant	rathod	Professor	45000	1970-02-23	prashant@pict.edu		mumbai	ENTC

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
--+-----+-----+
10 rows in set (0.00 sec)
```

mysql> #2. Find the prof\_id, prof\_name and shift.

mysql> select professor.prof\_id, fname, lname, shift from professor join shift using(prof\_id);

```
+-----+-----+-----+-----+
| prof_id | fname  | lname  | shift |
+-----+-----+-----+-----+
| 6 | arun  | joshi  | 2 |
| 7 | dinesh | mehta  | 1 |
| 3 | Girish | Potdar  | 1 |
| 4 | Khatri | Indraraj | 2 |
| 8 | Pralhad | kulkarni | 1 |
| 10 | Prashant | rathod  | 1 |
| 2 | Rajesh | Ingle  | 2 |
| 1 | Sarang | Joshi  | 1 |
| 9 | shushil | Chandak | 1 |
| 5 | Sunil  | parasnese | 2 |
+-----+-----+-----+-----+
10 rows in set (0.01 sec)
```

mysql>

mysql>

mysql>

mysql>

mysql> #3. List all the department details and the corresponding names of professors in the same department.

mysql> select department.dept\_id, dept\_name, fname, lname from department left join professor on professor.dept\_id = department.dept\_id;

```
+-----+-----+-----+-----+
| dept_id | dept_name | fname  | lname  |
+-----+-----+-----+-----+
| 1 | COMP  | Sarang | Joshi  |
| 1 | COMP  | Rajesh | Ingle  |
| 1 | COMP  | Girish | Potdar  |
| 1 | COMP  | Pralhad | kulkarni |
| 2 | IT    | Khatri | Indraraj |
| 2 | IT    | dinesh | mehta  |
| 2 | IT    | shushil | Chandak |
| 3 | ENTC  | Sunil  | parasnese |
| 3 | ENTC  | arun  | joshi  |
| 3 | ENTC  | Prashant | rathod  |
+-----+-----+-----+-----+
10 rows in set (0.00 sec)
```

mysql>

mysql>

```
mysql>
mysql>
mysql>
mysql>
mysql> #4. List all the professors and the corresponding names of department.
mysql> select fname, lname, dept_name from department right join professor on professor.dept_id =
department.dept_id;
```

```
+-----+-----+-----+
| fname | lname | dept_name |
+-----+-----+-----+
| Sarang | Joshi | COMP      |
| Rajesh | Ingle | COMP      |
| Girish | Potdar | COMP      |
| Khatri | Indraraj | IT        |
| Sunil | parasnese | ENTC      |
| arun | joshi | ENTC      |
| dinesh | mehta | IT        |
| Pralhad | kulkarni | COMP      |
| shushil | Chandak | IT        |
| Prashant | rathod | ENTC      |
+-----+-----+-----+
10 rows in set (0.00 sec)
```

```
mysql>
mysql>
mysql>
mysql>
mysql>
mysql>
mysql>
mysql> #5. Display professor name, dept_name, shift, salary where prof_id = 101;
```

```
mysql> select fname, lname, dept_name, salary, shift from professor join department using(dept_id)
join shift on professor.prof_id = shift.prof_id where professor.prof_id = 1;
+-----+-----+-----+-----+-----+
| fname | lname | dept_name | salary | shift |
+-----+-----+-----+-----+-----+
| Sarang | Joshi | COMP      | 100000 | 1      |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

```
mysql>
mysql>
mysql>
mysql>
mysql>
mysql> #6. list the total number of professor in each department.
```

```
mysql> select professor.dept_id, dept_name, count(*) from professor left join department on
professor.dept_id = department.dept_id group by
dept_id;
```

```
+-----+-----+-----+
| dept_id | dept_name | count(*) |
+-----+-----+-----+
| 1 | COMP | 4 |
| 2 | IT | 3 |
| 3 | ENTC | 3 |
+-----+-----+-----+
3 rows in set (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 | 50000 | 1970-08-21 | ringle@pict.edu | 1814223456 | Pune |
| 3 | Girish | Potdar | 1 | Associate Professor | 40000 | 1974-09-16 | gpotdar@pict.edu | 7678223314 | Pune |
| 4 | Khatri | Indraraj | 2 | Associate Professor | 30000 | 1985-01-01 | khatri@pict.edu | 9999923231 | Pune |
| 5 | Sunil | parasnese | 3 | Professor | 15000 | 1971-02-23 | sunilpp@pict.edu | 1814223252 | mumbai |
| 6 | arun | joshi | 3 | Assistant Professor | 120000 | 1961-02-23 | rrk@pict.edu | 1814224252 | aurangabad |
| 7 | dinesh | mehta | 2 | Assistant Professor | 15000 | 2016-01-01 | ronakm@pict.edu | 9814224252 | mumbai |
| 8 | Pralhad | kulkarni | 1 | Assistant Professor | 90000 | 2015-01-01 | pralhadk@pict.edu | 9814224252 | pune |
| 9 | shushil | Chandak | 2 | Professor | 90000 | 1987-02-23 | chandak@pict.edu | 9814224322 | aurangabad |
| 10 | Prashant | rathod | 3 | Professor | 45000 | 1970-02-23 | prashant@pict.edu | 1814223452 | mumbai |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
--+-----+
10 rows in set (0.00 sec)
```

```
mysql>
mysql>
mysql>
```



mysql>

mysql> #7. List the prof\_id associated department and the dept\_name having name 'computer';

mysql> select prof\_id, fname, lname, dept\_name, department.dept\_id from professor join department  
using(dept\_id) where dept\_id = ( select dept\_id from department where dept\_name = 'COMP');

```
+-----+-----+-----+-----+-----+
| prof_id | fname  | lname  | dept_name | dept_id |
+-----+-----+-----+-----+-----+
| 1 | Sarang | Joshi  | COMP      | 1 |
| 2 | Rajesh | Ingle  | COMP      | 1 |
| 3 | Girish | Potdar | COMP      | 1 |
| 8 | Pralhad | kulkarni | COMP      | 1 |
+-----+-----+-----+-----+-----+
```

4 rows in set (0.00 sec)

mysql>

mysql>

mysql>

mysql>

mysql>

mysql>

mysql> #8. Find the names of all departments where the professors joined in year 2015 (or date of  
joining is 1-1-2015).

mysql> select dept\_name from department where dept\_id in(select dept\_id from professor where dob =  
'2015-01-01');

```
+-----+
| dept_name |
+-----+
| COMP      |
+-----+
```

1 row in set (0.00 sec)

mysql>

mysql>

mysql>

mysql>

mysql>

mysql>

mysql>

mysql> #9. Create view showing the professor and shift details.

mysql> create view ProfShift as select fname, lname, shift, working\_hrs from professor join shift  
using(prof\_id);

Query OK, 0 rows affected (0.02 sec)

mysql> select \* from ProfShift;

```
+-----+-----+-----+-----+-----+
```

fname	lname	shift	working_hrs
arun	joshi	2	8-9
dinesh	mehta	1	8-9
Girish	Potdar	1	9-3
Khatri	Indraraj	2	9-3
Pralhad	kulkarni	1	9-6
Prashant	rathod	1	9-5
Rajesh	Ingle	2	9-3
Sarang	Joshi	1	9-3
shushil	Chandak	1	9-5
Sunil	parasnese	2	8-9

10 rows in set (0.01 sec)

```
mysql>
mysql>
mysql>
mysql>
mysql>
mysql> #10. Perform Manipulation on simple view-Insert, update, delete, drop view.
mysql> create view ProfDetails as select prof_id, fname, lname, designation from professor;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> select * from ProfDetails;
```

prof_id	fname	lname	designation
1	Sarang	Joshi	Professor
2	Rajesh	Ingle	Professor
3	Girish	Potdar	Associate Professor
4	Khatri	Indraraj	Associate Professor
5	Sunil	parasnese	Professor
6	arun	joshi	Assistant Professor
7	dinesh	mehta	Assistant Professor
8	Pralhad	kulkarni	Assistant Professor
9	shushil	Chandak	Professor
10	Prashant	rathod	Professor

10 rows in set (0.00 sec)

```
mysql> insert into ProfDetails values(102, 'Pranjali', 'Joshi', 'Professor');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from ProfDetails;
```

prof_id	fname	lname	designation
---------	-------	-------	-------------

```

| 1 | Sarang | Joshi | Professor |
| 2 | Rajesh | Ingle | Professor |
| 3 | Girish | Potdar | Associate Professor |
| 4 | Khatri | Indraraj | Associate Professor |
| 5 | Sunil | parasnese | Professor |
| 6 | arun | joshi | Assistant Professor |
| 7 | dinesh | mehta | Assistant Professor |
| 8 | Pralhad | kulkarni | Assistant Professor |
| 9 | shushil | Chandak | Professor |
| 10 | Prashant | rathod | Professor |
| 102 | Pranjali | Joshi | Professor |
+-----+-----+-----+-----+
11 rows in set (0.00 sec)

```

```

mysql> update ProfDetails set designation = 'Professor' where prof_id = 10;
Query OK, 0 rows affected (0.00 sec)
Rows matched: 1 Changed: 0 Warnings: 0

```

```

mysql> select * from ProfDetails;
+-----+-----+-----+-----+
| prof_id | fname | lname | designation |
+-----+-----+-----+-----+
| 1 | Sarang | Joshi | Professor |
| 2 | Rajesh | Ingle | Professor |
| 3 | Girish | Potdar | Associate Professor |
| 4 | Khatri | Indraraj | Associate Professor |
| 5 | Sunil | parasnese | Professor |
| 6 | arun | joshi | Assistant Professor |
| 7 | dinesh | mehta | Assistant Professor |
| 8 | Pralhad | kulkarni | Assistant Professor |
| 9 | shushil | Chandak | Professor |
| 10 | Prashant | rathod | Professor |
| 102 | Pranjali | Joshi | Professor |
+-----+-----+-----+-----+
11 rows in set (0.00 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 | 50000 | 1970-08-21 | ringle@pict.edu | 1814223456 | Pune |
| 3 | Girish | Potdar | 1 | Associate Professor | 40000 | 1974-09-16 | gpotdar@pict.edu | 7678223314 | Pune |

```



4	Khatri	Indraraj	2	Associate Professor	30000	1985-01-01	khatri@pict.edu
9999923231	Pune						
5	Sunil	parasnese	3	Professor	15000	1971-02-23	sunilpp@pict.edu
1814223252	mumbai						
6	arun	joshi	3	Assistant Professor	120000	1961-02-23	rrk@pict.edu
1814224252	aurangabad						
7	dinesh	mehta	2	Assistant Professor	15000	2016-01-01	ronakm@pict.edu
9814224252	mumbai						
8	Pralhad	kulkarni	1	Assistant Professor	90000	2015-01-01	pralhadk@pict.edu
9814224252	pune						
9	shushil	Chandak	2	Professor	90000	1987-02-23	chandak@pict.edu
9814224322	aurangabad						
10	Prashant	rathod	3	Professor	45000	1970-02-23	prashant@pict.edu
1814223452	mumbai						
102	Pranjali	Joshi	NULL	Professor	NULL	NULL	NULL
NULL							

```

+-----+-----+-----+-----+-----+-----+-----+-----+
--+-----+

```

11 rows in set (0.00 sec)

```
mysql> delete from ProfDetails where prof_id = 102;
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from ProfDetails;
```

prof_id	fname	lname	designation
1	Sarang	Joshi	Professor
2	Rajesh	Ingle	Professor
3	Girish	Potdar	Associate Professor
4	Khatri	Indraraj	Associate Professor
5	Sunil	parasnese	Professor
6	arun	joshi	Assistant Professor
7	dinesh	mehta	Assistant Professor
8	Pralhad	kulkarni	Assistant Professor
9	shushil	Chandak	Professor
10	Prashant	rathod	Professor

```

+-----+-----+-----+-----+
10 rows in set (0.00 sec)

```

```
mysql> drop view if exists ProfDetails;
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> drop view if exists ProfShift;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql>
```