5) what are subqueries?
↳ Sub-queries are combination of two queries
↳ one is inner query
↳ Another one is outer query.

→ what is order of execution in sub queries?
↳ in subqueries the innerquery Executes first
↳ And then the outer query will Execute

→ what are the types of Sub queries?

There are two main Types:

(i) Single Row Subqueries.

(ii) multiple Row Subqueries.

→ Single Row Sub queries:

⊙ Single row (Sub-queries) will return only (one-row)

(which means (one-value) (or) (one-record)

⊙ So we use >, =, < → Along with

where condition .

→ Coding implementation for single row sub queries ?

```
select * from employees;

 * mysql+pymysql://root:***@localhost/subqueries
15 rows affected.
```

[10]:
emp_id	name	dept_id	join_date	gender	designation
1	Lavanya	101	2020-03-15	F	Manager
2	Jaanu	102	2019-06-20	F	Analyst
3	Lakshith	101	2021-01-10	M	Developer
4	Dakshith	103	2018-09-05	M	Senior Developer
5	Janani	102	2022-09-01	F	Intern
6	Neha	103	2017-11-11	F	Senior Developer
7	Rahul	101	2019-01-25	M	Developer
8	Priya	102	2023-03-01	F	Business Analyst
9	Karthik	103	2022-07-15	M	QA Engineer
10	Aarav	101	2021-05-30	M	HR Executive
11	Aanya	102	2024-02-20	F	Data Scientist

department table

```
select * from department;

 * mysql+pymysql://root:***@localhost/subqueries
3 rows affected.
```

dept_id	dept_name	location
101	HR	New York
102	IT	San Francisco
103	Engineering	Chicago

salary table

```
select * from salary;

 * mysql+pymysql://root:***@localhost/subqueries
75 rows affected.
```

emp_id	salary	salary_date
1	80000.00	2024-10-01
1	80000.00	2024-09-01
1	80000.00	2024-08-01
1	80000.00	2024-07-01
1	80000.00	2024-06-01
2	70000.00	2024-10-01
2	70000.00	2024-09-01
2	70000.00	2024-08-01
2	70000.00	2024-07-01
2	70000.00	2024-06-01

```
%%sql  →  Query
select dept_id,emp_id, name, gender, designation from employees where dept_id =
(select dept_id from department where dept_name = 'HR');

 * mysql+pymysql://root:***@localhost/subqueries
5 rows affected.
```

dept_id	emp_id	name	gender	designation
101	1	Lavanya	F	Manager
101	3	Lakshith	M	Developer
101	7	Rahul	M	Developer
101	10	Aarav	M	HR Executive
101	13	Meera	F	HR Specialist

display employee details for All employees in [HR] department?

here the subquery will return single value

```
select dept_id from department where dept_name = 'HR';

 * mysql+pymysql://root:***@localhost/subqueries
1 rows affected.
```

dept_id
101

So once the subquery execute The whole query becomes

```
select dept_id,emp_id, name, gender, designation from employees where dept_id = (101);
```

Now this outer query will Execute

Example 2

---------> single row subquery use (<,=,>) ---------->display the employee details of department otherthan HR

%%sql → Query

```sql
select dept_id,emp_id, name, gender, designation from employees where dept_id >
(select dept_id from department where dept_name = 'HR');
```

10 rows affected.

dept_id	emp_id	name	gender	designation
102	2	Jaanu	F	Analyst
102	5	Janani	F	Intern
102	8	Priya	F	Business Analyst
102	11	Aanya	F	Data Scientist
102	14	Vikram	M	Software Engineer
103	4	Dakshith	M	Senior Developer
103	6	Neha	F	Senior Developer
103	9	Karthik	M	QA Engineer
103	12	Rohan	M	Project Manager
103	15	Sneha	F	Product Manager

```sql
select dept_id from department where dept_name = 'HR';
```

dept_id
101

↳ After execution of subquery
The whole Query become.

Select dept-id, emp-id, name, gender, designation
from employees where dept-id > (101);

------> display the employee detals who joined after lavanya

```sql
select emp_id,name,join_date from employees where join_date >
(select join_date from employees where name = 'Lavanya');
```

10 rows affected.

emp_id	name	join_date
3	Lakshith	2021-01-10
5	Janani	2022-09-01
8	Priya	2023-03-01
9	Karthik	2022-07-15
10	Aarav	2021-05-30
11	Aanya	2024-02-20
12	Rohan	2020-12-10
13	Meera	2021-08-01
14	Vikram	2024-03-05
15	Sneha	2022-11-20

```sql
select join_date from employees where name = 'Lavanya';
```

1 rows affected.

join_date
2020-03-15

Once the Subquery executed, the whole query Becomes,

```sql
select emp_id,name,join_date from employees where join_date > ('2020-03-15');
```
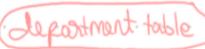
→ multiple row subqueries?

└→ multiple row subqueries returns morethan (one - value) (or) (one-record) as The output.

└→ so we must use (IN) or (NOT IN) in the (where condition).

→ coding implementation for multiple row sub queries ?

employees table

```
select * from employees;

 * mysql+pymysql://root:***@localhost/subqueries
15 rows affected.
```

[10]:

emp_id	name	dept_id	join_date	gender	designation
1	Lavanya	101	2020-03-15	F	Manager
2	Jaanu	102	2019-06-20	F	Analyst
3	Lakshith	101	2021-01-10	M	Developer
4	Dakshith	103	2018-09-05	M	Senior Developer
5	Janani	102	2022-09-01	F	Intern
6	Neha	103	2017-11-11	F	Senior Developer
7	Rahul	101	2019-01-25	M	Developer
8	Priya	102	2023-03-01	F	Business Analyst
9	Karthik	103	2022-07-15	M	QA Engineer
10	Aarav	101	2021-05-30	M	HR Executive
11	Aanya	102	2024-02-20	F	Data Scientist

department table

```
select * from department;

 * mysql+pymysql://root:***@localhost/subqueries
3 rows affected.
```

dept_id	dept_name	location
101	HR	New York
102	IT	San Francisco
103	Engineering	Chicago

salary table

```
select * from salary;

 * mysql+pymysql://root:***@localhost/subqueries
75 rows affected.
```

emp_id	salary	salary_date
1	80000.00	2024-10-01
1	80000.00	2024-09-01
1	80000.00	2024-08-01
1	80000.00	2024-07-01
1	80000.00	2024-06-01
2	70000.00	2024-10-01
2	70000.00	2024-09-01
2	70000.00	2024-08-01
2	70000.00	2024-07-01
2	70000.00	2024-06-01

→ **example 1** :-

-------> multiple row sub queries use (in) or (not in) ------> display all the employees in hr and it department

```
select * from employees where dept_id in
(
select dept_id from department where dept_name in('HR','IT')
);
```

10 rows affected.

emp_id	name	dept_id	join_date	gender	designation
1	Lavanya	101	2020-03-15	F	Manager
3	Lakshith	101	2021-01-10	M	Developer
7	Rahul	101	2019-01-25	M	Developer
10	Aarav	101	2021-05-30	M	HR Executive
13	Meera	101	2021-08-01	F	HR Specialist
2	Jaanu	102	2019-06-20	F	Analyst
5	Janani	102	2022-09-01	F	Intern
8	Priya	102	2023-03-01	F	Business Analyst
11	Aanya	102	2024-02-20	F	Data Scientist
14	Vikram	102	2024-03-05	M	Software Engineer

Sub query (or) inner query

```
select dept_id,dept_name from department where dept_name in('HR','IT');
```

2 rows affected.

dept_id	dept_name
101	HR
102	IT

once the Subquery is executed the whole query Becomes

```
select * from employees where dept_id in(101,102);
```

example 2 :-

-------> multiple row sub queries use (in) or (not in) ------> display all the employees not in the hr and it department

```sql
select * from employees where dept_id in
(
select dept_id from department where dept_name not in('HR','IT')
);
```

5 rows affected.

emp_id	name	dept_id	join_date	gender	designation
4	Dakshith	103	2018-09-05	M	Senior Developer
6	Neha	103	2017-11-11	F	Senior Developer
9	Karthik	103	2022-07-15	M	QA Engineer
12	Rohan	103	2020-12-10	M	Project Manager
15	Sneha	103	2022-11-20	F	Product Manager