```sql
select * from employee

--1) find duplicates
select emp_id,count(*) from employee
group by emp_id
having count(*)>1

--2) How to delete duplicates
with cte as(
select *,
row_number() over(partition by emp_id order by emp_id) rn
from employee)
delete from cte
where rn>1
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	rn
1	1	Ankit	100	10000	4	39	1985-11-27	1
2	2	Mohit	100	15000	5	48	1976-11-27	1
3	3	Vikas	100	10000	4	37	1987-11-27	1
4	4	Rohit	100	5000	2	16	2008-11-27	1
5	5	Mudit	200	12000	6	55	1969-11-27	1
6	6	Agam	200	12000	2	14	2010-11-27	1
7	7	Sanjay	200	9000	2	13	2011-11-27	1
8	8	Ashish	200	5000	2	12	2012-11-27	1
9	9	Mukesh	300	6000	6	51	1973-11-27	1
10	10	Rakesh	500	7000	6	50	1974-11-27	1

```sql
-- 3) Details which are not present in dept table
select e.*,d.* from
employee e
left join dept d on d.dep_id = e.dept_id
where d.dep_id is null
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	dep_id	dep_name
1	10	Rakesh	500	7000	6	50	1974-11-27	NULL	NULL

```sql
--4) Second highest salary in each department
with cte as(
select *,
DENSE_RANK() over(partition by dept_id order by salary desc) rk
from employee)
select * from cte
where rk = 2
```

121 %

Results Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	rk
1	3	Vikas	100	10000	4	37	1987-11-27	2
2	1	Ankit	100	10000	4	39	1985-11-27	2
3	7	Sanjay	200	9000	2	13	2011-11-27	2

With correlated subquery (it will compare each internal query with outer query rows)

```sql
--4) Second highest salary in each department

select e1.dept_id, max(salary) as salary
from employee e1
where salary < (select max(salary) as max_salary
                from employee e2
                where e1.dept_id = e2.dept_id)
group by dept_id
```

121 %

Results Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	1	Ankit	100	10000	4	39	1985-11-27
2	2	Mohit	100	15000	5	48	1976-11-27
3	3	Vikas	100	10000	4	37	1987-11-27
4	4	Rohit	100	5000	2	16	2008-11-27
5	5	Mudit	200	12000	6	55	1969-11-27
6	6	Agam	200	12000	2	14	2010-11-27
7	7	Sanjay	200	9000	2	13	2011-11-27
8	8	Ashish	200	5000	2	12	2012-11-27
9	9	Mukesh	300	6000	6	51	1973-11-27
10	10	Rakesh	500	7000	6	50	1974-11-27

	dept_id	salary
1	100	10000
2	200	9000

With self join

```sql
--4) Second highest salary in each department

select e1.*, e2.*
from employee e1
join employee e2 on e1.dept_id = e2.dept_id
```

121 %

Results Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
3	3	Vikas	100	10000	4	37	1987-11-27
4	4	Rohit	100	5000	2	16	2008-11-27
5	5	Mudit	200	12000	6	55	1969-11-27
6	6	Agam	200	12000	2	14	2010-11-27
7	7	Sanjay	200	9000	2	13	2011-11-27
8	8	Ashish	200	5000	2	12	2012-11-27
9	9	Mukesh	300	6000	6	51	1973-11-27
10	10	Rakesh	500	7000	6	50	1974-11-27

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	1	Ankit	100	10000	4	39	1985-11-27	1	Ankit	100	10000	4	39	1985-11-27
2	2	Mohit	100	15000	5	48	1976-11-27	1	Ankit	100	10000	4	39	1985-11-27
3	3	Vikas	100	10000	4	37	1987-11-27	1	Ankit	100	10000	4	39	1985-11-27
4	4	Rohit	100	5000	2	16	2008-11-27	1	Ankit	100	10000	4	39	1985-11-27
5	1	Ankit	100	10000	4	39	1985-11-27	2	Mohit	100	15000	5	48	1976-11-27
6	2	Mohit	100	15000	5	48	1976-11-27	2	Mohit	100	15000	5	48	1976-11-27

```sql
--4) Second highest salary in each department

select e1.*, e2.*
from employee e1
join employee e2 on e1.dept_id = e2.dept_id and e1.salary < e2.salary
```

121 %

Results Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	4	Rohit	100	5000	2	16	2008-11-27	1	Ankit	100	10000	4	39	1985-11-27
2	4	Rohit	100	5000	2	16	2008-11-27	2	Mohit	100	15000	5	48	1976-11-27
3	1	Ankit	100	10000	4	39	1985-11-27	2	Mohit	100	15000	5	48	1976-11-27
4	3	Vikas	100	10000	4	37	1987-11-27	2	Mohit	100	15000	5	48	1976-11-27
5	4	Rohit	100	5000	2	16	2008-11-27	3	Vikas	100	10000	4	37	1987-11-27
6	8	Ashish	200	5000	2	12	2012-11-27	5	Mudit	200	12000	6	55	1969-11-27
7	7	Sanjay	200	9000	2	13	2011-11-27	5	Mudit	200	12000	6	55	1969-11-27
8	8	Ashish	200	5000	2	12	2012-11-27	6	Agam	200	12000	2	14	2010-11-27
9	7	Sanjay	200	9000	2	13	2011-11-27	6	Agam	200	12000	2	14	2010-11-27
10	8	Ashish	200	5000	2	12	2012-11-27	7	Sanjay	200	9000	2	13	2011-11-27

```sql
select e1.dept_id, max(e1.salary) as second_highest_salary
from employee e1
join employee e2 on e1.dept_id = e2.dept_id and e1.salary < e2.salary
group by e1.dept_id
```

121 %

Results Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	4	Rohit	100	5000	2	16	2008-11-27	1	Ankit	100	10000	4	39	1985-11-27
2	4	Rohit	100	5000	2	16	2008-11-27	2	Mohit	100	15000	5	48	1976-11-27
3	1	Ankit	100	10000	4	39	1985-11-27	2	Mohit	100	15000	5	48	1976-11-27
4	3	Vikas	100	10000	4	37	1987-11-27	2	Mohit	100	15000	5	48	1976-11-27
5	4	Rohit	100	5000	2	16	2008-11-27	3	Vikas	100	10000	4	37	1987-11-27
6	8	Ashish	200	5000	2	12	2012-11-27	5	Mudit	200	12000	6	55	1969-11-27
7	7	Sanjay	200	9000	2	13	2011-11-27	5	Mudit	200	12000	6	55	1969-11-27
8	8	Ashish	200	5000	2	12	2012-11-27	6	Agam	200	12000	2	14	2010-11-27
9	7	Sanjay	200	9000	2	13	2011-11-27	6	Agam	200	12000	2	14	2010-11-27
10	8	Ashish	200	5000	2	12	2012-11-27	7	Sanjay	200	9000	2	13	2011-11-27

```sql
select e1.dept_id, e1.salary,e2.salary
from employee e1
join employee e2 on e1.dept_id = e2.dept_id and e1.salary < e2.salary
group by e1.dept_id
having COUNT(DISTINCT e2.salary) >= 2 --ensures that there are at least two distinct salaries in the department.
```

121 %

Results | Messages

	dept_id	salary	salary
1	100	5000	10000
2	100	5000	15000
3	100	10000	15000
4	100	10000	15000
5	100	5000	10000
6	200	5000	12000
7	200	9000	12000
8	200	5000	12000
9	200	9000	12000
10	200	5000	9000

```sql
--4) Second highest salary in each department

select e1.dept_id, max(e1.salary) as second_highest_salary
from employee e1
join employee e2 on e1.dept_id = e2.dept_id and e1.salary < e2.salary
group by e1.dept_id
having COUNT(DISTINCT e2.salary) >= 2 --ensures that there are at least two distinct salaries in the department.
```

121 %

Results | Messages

	dept_id	second_highest_salary
1	100	10000
2	200	9000

```sql
--5) Find the employees with highest salary in each department
with cte as(
select *, DENSE_RANK() over(partition by dept_id order by salary desc) rk
from employee)
select * from cte
where rk = 1
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	rk
1	2	Mohit	100	15000	5	48	1976-11-27	1
2	5	Mudit	200	12000	6	55	1969-11-27	1
3	6	Agam	200	12000	2	14	2010-11-27	1
4	9	Mukesh	300	6000	6	51	1973-11-27	1
5	10	Rakesh	500	7000	6	50	1974-11-27	1

With self join

```sql
--5) Find the employees with highest salary in each department

select e1.*, e2.*
from employee e1
left join employee e2 on e1.dept_id = e2.dept_id and e1.salary < e2.salary
where e2.salary is null
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	1	Ankit	100	10000	4	39	1985-11-27	2	Mohit	100	15000	5	48	1976-11-27
2	2	Mohit	100	15000	5	48	1976-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
3	3	Vikas	100	10000	4	37	1987-11-27	2	Mohit	100	15000	5	48	1976-11-27
4	4	Rohit	100	5000	2	16	2008-11-27	1	Ankit	100	10000	4	39	1985-11-27
5	4	Rohit	100	5000	2	16	2008-11-27	2	Mohit	100	15000	5	48	1976-11-27
6	4	Rohit	100	5000	2	16	2008-11-27	3	Vikas	100	10000	4	37	1987-11-27
7	5	Mudit	200	12000	6	55	1969-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
8	6	Agam	200	12000	2	14	2010-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
9	7	Sanjay	200	9000	2	13	2011-11-27	5	Mudit	200	12000	6	55	1969-11-27
10	7	Sanjay	200	9000	2	13	2011-11-27	6	Agam	200	12000	2	14	2010-11-27
11	8	Ashish	200	5000	2	12	2012-11-27	5	Mudit	200	12000	6	55	1969-11-27
12	8	Ashish	200	5000	2	12	2012-11-27	6	Agam	200	12000	2	14	2010-11-27

```sql
--5) Find the employees with highest salary in each department

select e1.*, e2.*
from employee e1
left join employee e2 on e1.dept_id = e2.dept_id and e1.salary < e2.salary
where e2.salary is null
```

21 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	2	Mohit	100	15000	5	48	1976-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
2	5	Mudit	200	12000	6	55	1969-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
3	6	Agam	200	12000	2	14	2010-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
4	9	Mukesh	300	6000	6	51	1973-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL
5	10	Rakesh	500	7000	6	50	1974-11-27	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```sql
--5) Find the employees with highest salary in each department

select e1.*
from employee e1
where salary = (select max(salary) from employee e2 where e1.dept_id = e2.dept_id)
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	10	Rakesh	500	7000	6	50	1974-11-27
2	9	Mukesh	300	6000	6	51	1973-11-27
3	5	Mudit	200	12000	6	55	1969-11-27
4	6	Agam	200	12000	2	14	2010-11-27
5	2	Mohit	100	15000	5	48	1976-11-27

```sql
--6) Find the 2nd highest salary in emplyoee table
select * from
(select *, dense_rank() over(order by salary desc) rk
from employee) t
where rk =2
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	rk
1	5	Mudit	200	12000	6	55	1969-11-27	2
2	6	Agam	200	12000	2	14	2010-11-27	2

```sql
--6) Find the 2nd highest salary in emplyoee table
select top 1 * from
(select top 2 *
from employee
order by salary desc) t
order by salary asc
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	5	Mudit	200	12000	6	55	1969-11-27

In this case same salary not going to handle

```sql
--6) Find the 2nd highest salary in emplyoee table
SELECT salary
FROM employee
WHERE salary = (
    SELECT MAX(salary)
    FROM employee
    WHERE salary < (
        SELECT MAX(salary)
        FROM employee
    )
)
```

121 %

Results | Messages

	salary
1	12000
2	12000

```sql
--6) Find the 2nd highest salary in emplyoee table
SELECT MAX(salary) AS second_highest_salary
FROM employee
WHERE salary < (SELECT MAX(salary) FROM employee);
```

121 %

Results | Messages

	second_highest_salary
1	12000

```sql
--7) Department with highest number of employees

SELECT top 1 dept_id, count(emp_id) cn
FROM employee
group by dept_id
order by cn desc
```

121 %

Results | Messages

	dept_id	cn
1	200	4

```sql
--8) employees of salary greater than average emp salary

SELECT *
FROM employee
where salary > (select AVG(salary) from employee)
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	1	Ankit	100	10000	4	39	1985-11-27
2	2	Mohit	100	15000	5	48	1976-11-27
3	3	Vikas	100	10000	4	37	1987-11-27
4	5	Mudit	200	12000	6	55	1969-11-27
5	6	Agam	200	12000	2	14	2010-11-27

```sql
--8) employees salary greater than manager salary

SELECT e1.*,e2.*
FROM employee e1
join employee e2 on e1.manager_id = e2.emp_id
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	1	Ankit	100	10000	4	39	1985-11-27	4	Rohit	100	5000	2	16	2008-11-27
2	2	Mohit	100	15000	5	48	1976-11-27	5	Mudit	200	12000	6	55	1969-11-27
3	3	Vikas	100	10000	4	37	1987-11-27	4	Rohit	100	5000	2	16	2008-11-27
4	4	Rohit	100	5000	2	16	2008-11-27	2	Mohit	100	15000	5	48	1976-11-27
5	5	Mudit	200	12000	6	55	1969-11-27	6	Agam	200	12000	2	14	2010-11-27
6	6	Agam	200	12000	2	14	2010-11-27	2	Mohit	100	15000	5	48	1976-11-27
7	7	Sanjay	200	9000	2	13	2011-11-27	2	Mohit	100	15000	5	48	1976-11-27
8	8	Ashish	200	5000	2	12	2012-11-27	2	Mohit	100	15000	5	48	1976-11-27
9	9	Mukesh	300	6000	6	51	1973-11-27	6	Agam	200	12000	2	14	2010-11-27
10	10	Rakesh	500	7000	6	50	1974-11-27	6	Agam	200	12000	2	14	2010-11-27

```sql
--8) employees salary greater than manager salary

SELECT e1.*,e2.*
FROM employee e1
join employee e2 on e1.manager_id = e2.emp_id
where e1.salary > e2.salary
```

121 %

Results | Messages

	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob	emp_id	emp_name	dept_id	salary	manager_id	emp_age	dob
1	1	Ankit	100	10000	4	39	1985-11-27	4	Rohit	100	5000	2	16	2008-11-27
2	2	Mohit	100	15000	5	48	1976-11-27	5	Mudit	200	12000	6	55	1969-11-27
3	3	Vikas	100	10000	4	37	1987-11-27	4	Rohit	100	5000	2	16	2008-11-27

```sql
--10) total salary by each department

SELECT dept_id, sum(salary) total_salary
FROM employee
group by dept_id
```

121 %

Results | Messages

	dept_id	total_salary
1	100	40000
2	200	38000
3	300	6000
4	500	7000