QUERIES ON GROUP BY CLAUSE AND HAVING CLAUSE

1. Query the dept_id and number of employees of the department having highest number of employees
    - Here you can retrieve dept_id, number of employees of the department using group by clause
    - Here you also need the highest number of employees so you will be using order by clause along with group by.
    - In that it is required to fetch only 1 data which is highest from the table for that we need to make use of limit keyword

```
SELECT
  dept_id, COUNT(emp_id) as cn
FROM
  employee
GROUP BY
  dept_id
ORDER by cn DESC
LIMIT 1;
```

Output:

dept_id	cn
20	2

2. Write a query to display the department names, maximum salary, average salary paid to employees in each department in alphabetical order

    - Here let's make use of cases to get department names
    - Then MAX(), AVG() Function to get maximum and average salary of employee and grouped by department
    - Next retriev in alphabetical order using order by clause

```
SELECT
CASE dept_id
WHEN 20 THEN 'Sales'
```

```
WHEN 30 THEN 'EXE'
WHEN 40 THEN 'SHP'
WHEN 50 THEN 'MRK'
ELSE 'IT'
END as dept,
MAX(salary), AVG(salary)
FROM employee GROUP BY dept_id
ORDER BY dept;
```

Output:

dept	MAX(salary)	AVG(salary)
IT	84200	84200.0000
IT	78000	60100.0000
MRK	98200	98200.0000
Sales	124200	104200.0000
SHP	64200	53200.0000

As you can see from the above table dept column in sorted in alphabetical order

3. Query the total salary, average salary of all employees with average salary greater than 60000 in each department

```
SELECT
  SUM(salary), AVG(salary) as av
FROM
  employee
WHERE
  av > 60000
GROUP BY
  dept_id;
```

Output:

0	3	12:06: 35	SELECT SUM(salary), AVG(salary) as av FROM sql_notes.employee WHERE av > 60000 GROUP BY dept_id LIMIT 0, 1000	Error Code: 1054. Unknown column 'av' in 'where clause'	0.00 0 sec

Here you are getting error it is because where clause cannot be used with aggregate functions so to work with aggregate function we can make use of **HAVING CLAUSE**

HAVING CLAUSE:

The HAVING Clause enables you to specify conditions that filter which group results appear in the results.

The WHERE clause places conditions on the selected columns, whereas the HAVING clause places conditions on groups created by the GROUP BY clause.

Syntax:
SELECT
FROM
WHERE
GROUP BY
HAVING
ORDER BY

```
SELECT
  SUM(salary), AVG(salary) as av
FROM
  employee
GROUP BY
  dept_id
HAVING
  av > 60000;
```

Output:

SUM(salary)	av
208400	104200.0000
98200	98200.0000
84200	84200.0000
120200	60100.0000

4. Query the dept_id, total salary, average salary of all employees with average salary greater than 60000 in each department and order by dept_id

```
SELECT
  dept_id, SUM(salary), AVG(salary) as av
FROM
  employee
GROUP BY
  dept_id
HAVING
  AVG(salary) > 60000
ORDER BY
  dept_id;
```

Output:

dept_d	**SUM(salary)**	**av**
20	208400	104200.0000
50	98200	98200.0000

70	84200	84200.0000
80	120200	60100.0000

5. Query the average salary of all employees in each department having at least two employees in each department and average salary in the range of 50000 to 60000 in descending order of average salary

```
SELECT
  dept_id, SUM(salary), AVG(salary) as av
FROM
  employee
GROUP BY
  dept_id
HAVING
  COUNT(emp_id) >1 AND
  AVG(salary) BETWEEN 50000 AND 60000
ORDER BY
  AVG(salary) DESC;
```

Output:

dept_id	SUM(salary)	av
40	106400	53200.0000

6. Write a query to display dept id, average salary of all employees in each department with dept_id > 20, having average salary > 40000 and sort in descending order with respect to dept id

```
SELECT
  dept_id, AVG(salary) as av
FROM
  employee
GROUP BY
  dept_id
HAVING
  dept_id > 20
```

```
AND
  AVG(salary) > 40000
ORDER BY
  dept_id DESC;
```

Output:

dept_id	av
80	60100.0000
70	84200.0000
50	98200.0000
40	53200.0000

As you can see from the above output dept_id is sorted in descending order