SQL LOGICAL EXECUTION ORDER (Simple & True)

1 **FROM** → Pick the table(s).
2 **WHERE** → Filter **rows** (before grouping).
3 **GROUP BY** → Group the remaining rows into buckets.
4 **HAVING** → Filter **groups** (after grouping).
5 **SELECT** → Calculate aggregates and choose what to show.
6 **ORDER BY** → Sort the final result.
7 **LIMIT / TOP** → Choose top N rows.

GOLDEN RULE (Always remember)

WHERE → filter rows
GROUP BY → group rows
HAVING → filter groups

This is 100% correct, and this is what interviewers expect.

✅ Diagram 1 — SQL Logical Execution Order

pgsql

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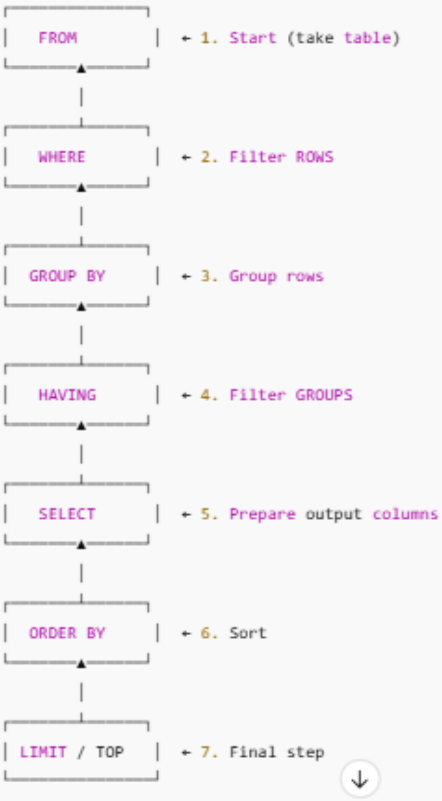

✅ Diagram 3 — How GROUP BY creates buckets

Example rows:

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```
City       Salary
------------------
Delhi      50000
Delhi      70000
Mumbai     45000
Chennai    48000
Mumbai     52000
```

GROUP BY city:

powershell Copy code

```
Delhi    ┐
Delhi    ┘ → GROUP 1
Mumbai   ┐
Mumbai   ┘ → GROUP 2
Chennai    → GROUP 3
```

✅ Diagram 5 — WHERE filters BEFORE grouping

pgsql

```
All rows  →  WHERE city='Delhi'  →  Remaining rows  → GROUP BY
```

WHERE removes rows *before* buckets are created.

✅ Diagram 6 — HAVING filters AFTER grouping

sql

```
Groups → HAVING COUNT(*) > 1 → Only groups with >1 row are kept
```

✅ Diagram 7 — Example flow: Count employees per city

Query:

```sql
SELECT city, COUNT(*)
FROM employees
GROUP BY city;
```

Flow:

```sql
FROM employees
↓
All rows
↓
WHERE (none)
↓
GROUP BY city
↓
Groups created
↓
HAVING (none)
↓
SELECT city, COUNT(*)
↓
Result
```

✅ Diagram 8 — WHERE + GROUP BY + HAVING combined

Query:

```sql
SELECT department, SUM(salary)
FROM employees
WHERE city = 'Delhi'
GROUP BY department
HAVING SUM(salary) > 1000000;
```

Flow:

```pgsql
Step 1: FROM employees
Step 2: WHERE city='Delhi'
        → remove all non-Delhi rows
Step 3: GROUP BY department
        → create groups only inside Delhi
Step 4: HAVING SUM(salary) > 1000000
        → remove groups that don't meet condition
Step 5: SELECT final columns
```

✅ Diagram 9 — Why SELECT comes after GROUP BY

Query:

```sql
SELECT city, COUNT(*)
FROM employees
GROUP BY city;
```

Execution:

```sql
Rows → group by city → then count(*) → then select → show result
```

SQL cannot SELECT before grouping because grouping determines the number of results.

✅ Diagram 10 — Complete visual map (All steps together)

pgsql

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