**Interview Questions**

1. How do you group data by month and year?

To group data by month and year in SQL, you can use the GROUP BY clause along with date functions like YEAR() and MONTH(). These functions extract the year and month from a date column, allowing you to aggregate data (like sums or counts) for each month-year combination. For example, if you have sales data with a date column, you can group transactions by month and year to see trends over time. Some databases also support DATE\_TRUNC() or FORMAT() for cleaner grouping.

1. What's the difference between COUNT(\*) and COUNT(DISTINCT col)?

* COUNT(\*) counts all rows in a table, including duplicates and rows with NULL values. It gives the total number of records.
* COUNT(DISTINCT col) counts only the unique (non-duplicate) values in a specific column, and it ignores NULL values. For example, if you want to count how many unique customers placed orders, you’d use COUNT(DISTINCT customer\_id).

1. How do you calculate monthly revenue?

To calculate monthly revenue, you need to:

1. Sum the revenue column (e.g., SUM(amount)).
2. Group the results by year and month using YEAR(date\_column) and MONTH(date\_column).
3. Optionally, format the output for readability.

Example:

SELECT

YEAR(order\_date) AS year,

MONTH(order\_date) AS month,

SUM(revenue) AS monthly\_revenue

FROM sales

GROUP BY YEAR(order\_date), MONTH(order\_date)

ORDER BY year, month;

1. What are aggregate functions in SQL?

Aggregate functions perform calculations across multiple rows and return a single result. They are often used with GROUP BY to summarize data. Common aggregate functions include:

* SUM() – Adds up all values in a column.
* AVG() – Calculates the average of values.
* COUNT() – Counts the number of rows (or non-NULL values).
* MIN()**/**MAX() – Finds the smallest or largest value.
* GROUP\_CONCAT()**/**STRING\_AGG() (in some databases) – Combines text values.

1. How to handle NULLs in aggregate functions?

Most aggregate functions (like SUM, AVG, MAX, MIN) automatically ignore NULL values. For example, SUM(revenue) will only add non-NULL revenue values. However:

* COUNT(col) counts only non-NULL values in that column.
* If you want NULLs to be treated as zeros, use COALESCE(col, 0) (e.g., SUM(COALESCE(revenue, 0))).
* COUNT(\*) counts all rows, even if some columns are NULL.

1. What’s the role of ORDER BY and GROUP BY?

* GROUP BY groups rows that share the same values (e.g., the same month or category) and lets you apply aggregate functions (like SUM or COUNT) to each group.
* ORDER BY sorts the final results in ascending (ASC) or descending (DESC) order. For example, you can group sales by month and then sort by revenue to see the highest-earning months first.

1. How do you get the top 3 months by sales?

To find the top 3 months with the highest sales:

1. Group sales by month and year.
2. Sum the sales amount for each group.
3. Sort the results in descending order by total sales.
4. Limit the output to 3 rows.

Example:

SELECT

YEAR(order\_date) AS year,

MONTH(order\_date) AS month,

SUM(sales\_amount) AS total\_sales

FROM transactions

GROUP BY YEAR(order\_date), MONTH(order\_date)

ORDER BY total\_sales DESC

LIMIT 3;