Tajamul Khan

50 SQL Interview Questions

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1. Find duplicate records in a table.

```sql
SELECT column1, column2, COUNT(*)
FROM your_table
GROUP BY column1, column2
HAVING COUNT(*) > 1;
```

amazon

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2. Retrieve the second highest salary from the Employee table.

```sql
SELECT MAX(salary) AS SecondHighestSalary
FROM Employee
WHERE salary < (SELECT MAX(salary)
FROM Employee);
```

Microsoft

3. Find employees without department (Left Join usage)

```sql
SELECT e.*
FROM Employee e
LEFT JOIN Department d
ON e.department_id = d.department_id
WHERE d.department_id IS NULL;
```

Uber

4. Calculate the total revenue per product.

```sql
SELECT product_id,
SUM(quantity * price) AS total_revenue
FROM Sales
GROUP BY product_id;
```

PayPal

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5. Get the top 3 highest-paid employees.

```sql
SELECT TOP 3 *
FROM Employee
ORDER BY salary DESC;
```

Google

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6. Find customers who made purchases but never returned products.

```sql
SELECT DISTINCT c.customer_id
FROM Customers c
JOIN Orders o ON c.customer_id =
o.customer_id
WHERE c.customer_id NOT IN (
  SELECT customer_id FROM Returns
);
```

Walmart

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7. Show the count of orders per customer.

```sql
SELECT customer_id,
COUNT(*) AS order_count
FROM Orders
GROUP BY customer_id;
```

Meta

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8. Retrieve all employees who joined in 2023.

```sql
SELECT *
FROM Employee
WHERE YEAR(hire_date) = 2023;
```

amazon

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9. Calculate the average order value per customer.

```sql
SELECT customer_id,
AVG(total_amount) AS avg_order_value
FROM Orders
GROUP BY customer_id;
```

Microsoft

10. Get the latest order placed by each customer.

```sql
SELECT customer_id,
MAX(order_date) AS latest_order_date
FROM Orders
GROUP BY customer_id;
```

Uber

11. Find products never sold.

```sql
SELECT p.product_id
FROM Products p
LEFT JOIN Sales s
ON p.product_id = s.product_id
WHERE s.product_id IS NULL;
```

Adobe

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12. Identify the most selling product.

```sql
SELECT TOP 1 product_id,
SUM(quantity) AS total_qty
FROM Sales
GROUP BY product_id
ORDER BY total_qty DESC;
```

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13. Get the total revenue and the number of orders per region.

```sql
SELECT region,
SUM(total_amount) AS total_revenue,
COUNT(*) AS order_count
FROM Orders
GROUP BY region;
```

Meta

14. Count how many customers placed more than 5 orders.

```sql
SELECT COUNT(*) AS customer_count
FROM (
    SELECT customer_id FROM Orders
    GROUP BY customer_id
    HAVING COUNT(*) > 5
) AS subquery;
```

amazon

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15. Retrieve customers with orders above the average order value.

```sql
SELECT *
FROM Orders
WHERE total_amount >
(SELECT AVG(total_amount) FROM Orders);
```

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16. Find all employees hired on weekends.

```sql
SELECT *
FROM Employee
WHERE DATENAME(WEEKDAY, hire_date) IN
('Saturday', 'Sunday');
```

Google

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17. List employees whose salary is within a range

```sql
SELECT *
FROM Employee
WHERE salary BETWEEN 50000 AND 100000;
```

Microsoft

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18. Get monthly sales revenue and order count.

```sql
SELECT
FORMAT(order_date, 'yyyy-MM') AS month,
SUM(total_amount) AS total_revenue,
COUNT(order_id) AS order_count
FROM Orders
GROUP BY FORMAT(order_date, 'yyyy-MM');
```

Google

19. Rank employees by salary within each department.

```sql
SELECT
employee_id, department_id, salary,
RANK() OVER (PARTITION BY department_id
ORDER BY salary DESC) AS salary_rank
FROM Employee;
```

amazon

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20. Find customers who placed orders every month in 2023.

```sql
SELECT customer_id
FROM Orders
WHERE YEAR(order_date) = 2023
GROUP BY customer_id
HAVING COUNT(DISTINCT FORMAT(order_date,
'yyyy-MM')) = 12;
```

Meta

21. Find moving average of sales over the last 3 days.

```sql
SELECT order_date,
AVG(total_amount) OVER (ORDER BY
order_date ROWS BETWEEN 2 PRECEDING AND
CURRENT ROW) AS moving_avg
FROM Orders;
```

Microsoft

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22. Identify the first and last order date for each customer.

```sql
SELECT customer_id,
       MIN(order_date) AS first_order,
       MAX(order_date) AS last_order
FROM Orders
GROUP BY customer_id;
```

Uber

23. Show product sales distribution (percent of total revenue).

```sql
WITH TotalRevenue AS (
SELECT SUM(quantity * price) AS total FROM Sales)
SELECT
s.product_id,
SUM(s.quantity * s.price) AS revenue,
SUM(s.quantity * s.price) * 100.0 / t.total
AS revenue_pct
FROM Sales s
CROSS JOIN TotalRevenue t
GROUP BY s.product_id, t.total;
```

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24. Retrieve customers who made consecutive purchases (2 Days)

```sql
WITH cte AS (
SELECT customer_id, order_date,
LAG(order_date) OVER (PARTITION BY customer_id
ORDER BY order_date) AS prev_order_date
FROM Orders)
SELECT customer_id, order_date, prev_order_date
FROM cte
WHERE
DATEDIFF(DAY, prev_order_date, order_date) = 1;
```

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25. Find churned customers (no orders in the last 6 months).

```sql
SELECT customer_id
FROM Orders
GROUP BY customer_id
HAVING
MAX(order_date) < DATEADD(MONTH,-6,GETDATE());
```

amazon

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26. Calculate cumulative revenue by day.

```sql
SELECT order_date,
SUM(total_amount) OVER (ORDER BY order_date)
AS cumulative_revenue
FROM Orders;
```

Adobe

27. Identify top-performing departments by average salary.

```sql
SELECT department_id,
AVG(salary) AS avg_salary
FROM Employee
GROUP BY department_id
ORDER BY avg_salary DESC;
```

Google

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28. Find customers who ordered more than the average number of orders per customer.

```sql
WITH customer_orders AS (
SELECT customer_id, COUNT(*) AS order_count
FROM Orders
GROUP BY customer_id)
SELECT * FROM customer_orders
WHERE order_count > (SELECT AVG(order_count)
FROM customer_orders);
```

Meta

29. Calculate revenue generated from new customers (first-time orders).

```sql
WITH first_orders AS (
SELECT customer_id, MIN(order_date) AS
first_order_date FROM Orders
GROUP BY customer_id)
SELECT SUM(o.total_amount) AS new_cus_revenue
FROM Orders o JOIN first_orders f
ON o.customer_id = f.customer_id
WHERE o.order_date = f.first_order_date;
```

Microsoft

30. Find the percentage of employees in each department.

```sql
SELECT
  department_id,
  COUNT(*) AS emp_count, -- count
  COUNT(*) * 100.0 / (SELECT COUNT(*) FROM
Employee) AS pct -- percentage
FROM Employee
GROUP BY department_id;
```

Uber

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31. Retrieve the maximum salary difference within each department.

```sql
SELECT
department_id,
MAX(salary) - MIN(salary) AS salary_diff
FROM Employee
GROUP BY department_id;
```

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32. Find products that contribute to 80% of the revenue (Pareto Principle).

```sql
WITH sales_cte AS (
SELECT product_id, SUM(qty * price) AS revenue
FROM Sales GROUP BY product_id),
total_revenue AS (
SELECT SUM(revenue) AS total FROM sales_cte)
SELECT s.product_id, s.revenue,
SUM(s.revenue) OVER
(ORDER BY s.revenue DESC ROWS BETWEEN UNBOUNDED
PRECEDING AND CURRENT ROW) AS running_total
FROM sales_cte s, total_revenue t
WHERE SUM(s.revenue) OVER (ORDER BY s.revenue DESC ROWS
BETWEEN UNBOUNDED PRECEDING AND
CURRENT ROW) <= t.total * 0.8;
```

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33. Calculate average time between two purchases for each customer.

```sql
WITH cte AS (
SELECT customer_id, order_date,
LAG(order_date) OVER (PARTITION BY customer_id
ORDER BY order_date) AS prev_date
FROM Orders)
SELECT customer_id,
AVG(DATEDIFF(DAY, prev_date, order_date)) AS
avg_gap_days FROM cte
WHERE prev_date IS NOT NULL
GROUP BY customer_id;
```

Meta

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34. Show last purchase for each customer along with order amount.

```sql
WITH ranked_orders AS
(SELECT customer_id, order_id, total_amount,
ROW_NUMBER() OVER
(PARTITION BY customer_id ORDER BY order_date
DESC) AS rn FROM Orders)
SELECT customer_id, order_id, total_amount
FROM ranked_orders
WHERE rn = 1;
```

Google

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35. Calculate year-over-year growth in revenue.

```sql
SELECT FORMAT(order_date, 'yyyy') AS year,
SUM(total_amount) AS revenue,
SUM(total_amount) - LAG(SUM(total_amount))
OVER (ORDER BY FORMAT(order_date, 'yyyy'))
AS yoy_growth
FROM Orders
GROUP BY FORMAT(order_date, 'yyyy');
```

Microsoft

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36. Detect customers whose purchase amount is higher than their historical 90th percentile.

```sql
WITH ranked_orders AS (
SELECT customer_id, order_id, total_amount,
NTILE(10) OVER (PARTITION BY customer_id
ORDER BY total_amount) AS decile
FROM Orders)
SELECT customer_id, order_id, total_amount
FROM ranked_orders
WHERE decile = 10;
```

amazon

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37. Find continuous login streaks (e.g., users who logged in 3 or more consecutive days).

```sql
WITH cte AS (
SELECT user_id, login_date,
DATEDIFF(DAY, ROW_NUMBER() OVER
(PARTITION BY user_id ORDER BY login_date),
login_date) AS grp FROM Logins)
SELECT user_id, MIN(login_date) AS streak_start,
MAX(login_date) AS streak_end,
COUNT(*) AS streak_length
FROM cte
GROUP BY user_id, grp
HAVING COUNT(*) >= 3;
```

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38. Calculate customer retention by month (Cohort analysis).

```sql
WITH Cohorts AS ( SELECT customer_id,
MIN(DATEFROMPARTS(YEAR(order_date), MONTH(order_date), 1))
AS cohort_month FROM Orders
GROUP BY customer_id),
OrdersByMonth AS (
SELECT customer_id,
DATEFROMPARTS(YEAR(order_date), MONTH(order_date), 1)
AS order_month FROM Orders)
SELECT
c.cohort_month, o.order_month,
COUNT(DISTINCT o.customer_id) AS active_customers
FROM Cohorts c
JOIN OrdersByMonth o ON c.customer_id = o.customer_id
GROUP BY c.cohort_month, o.order_month;
```

Google

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39. Find products that are always sold together (Market basket analysis).

```sql
SELECT A.product_id AS product_A,
B.product_id AS product_B,
COUNT(*) AS count_together
FROM Order_Details A
JOIN Order_Details B ON A.order_id = B.order_id
AND
A.product_id < B.product_id
GROUP BY A.product_id, B.product_id
HAVING COUNT(*) > 10;
```

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40. Calculate income inequality (Gini coefficient).

```sql
WITH income_cte AS (
SELECT salary,
SUM(salary) OVER (ORDER BY salary) AS cum_incom,
COUNT(*) OVER() AS n,
ROW_NUMBER() OVER (ORDER BY salary) AS r
FROM Employee)
SELECT 1 - (2 * SUM((cum_income) / (SUM(salary)
OVER ())) * (1.0 / n)) ) AS gini_coefficient
FROM income_cte;
```

Uber

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41. Compute the day when cumulative revenue first exceeded 50% of total revenue (median sales day).

```sql
WITH cte AS ( SELECT order_date,
SUM(total_amount) AS daily_rev
FROM Orders GROUP BY order_date),
cum_cte AS (
SELECT order_date, daily_rev, SUM(daily_rev) OVER
(ORDER BY order_date) AS cum_rev, SUM(daily_rev)
OVER() AS total_rev FROM cte)
SELECT TOP 1 order_date FROM cum_cte
WHERE cum_rev >= total_rev / 2
ORDER BY order_date;
```

Adobe

42. Find percentiles (25th, 50th, 75th) of employee salaries.

```sql
SELECT
(SELECT PERCENTILE_CONT(0.25) WITHIN GROUP
(ORDER BY salary) OVER () FROM Employee) AS p25,
(SELECT PERCENTILE_CONT(0.50) WITHIN GROUP
(ORDER BY salary) OVER () FROM Employee) AS p50,
(SELECT PERCENTILE_CONT(0.75) WITHIN GROUP
(ORDER BY salary) OVER () FROM Employee) AS p75;
```

Walmart

43. Retrieve customers with increasing order amounts over their last 3 orders.

```sql
WITH cte AS (
SELECT customer_id, order_date, total_amount,
LAG(total_amount, 2) OVER (PARTITION BY customer_id
ORDER BY order_date) AS amt_t_minus_2,
LAG(total_amount, 1) OVER (PARTITION BY customer_id
ORDER BY order_date)  AS amt_t_minus_1
FROM Orders)
SELECT customer_id, order_date, total_amount
FROM cte
WHERE amt_t_minus_2 < amt_t_minus_1
AND amt_t_minus_1 < total_amount;
```

Google

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44. Calculate conversion funnel between different stages (e.g., visits → signups → purchases).

```sql
SELECT
SUM(CASE WHEN stage = 'visit' THEN 1
ELSE 0 END) AS visits,
SUM(CASE WHEN stage = 'sign_up' THEN 1
ELSE 0 END) AS sign_ups,
SUM(CASE WHEN stage = 'purchase' THEN 1
ELSE 0 END) AS purchases
FROM Funnel;
```

Microsoft

45. Find the percentage of total sales contributed by the top 10% of customers.

```sql
WITH cte AS (SELECT customer_id,
SUM(total_amount) AS revenue
FROM Orders GROUP BY customer_id),
ranked AS (SELECT *, NTILE(10) OVER
(ORDER BY revenue DESC) AS decile FROM cte)
SELECT
SUM(revenue) * 100.0 / (SELECT SUM(revenue)
FROM cte) AS pct_top_10
FROM ranked
WHERE decile = 1;
```

Google

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46. Calculate weekly active users

```sql
SELECT DATEPART(YEAR, login_date) AS year,
DATEPART(WEEK, login_date) AS week,
COUNT(DISTINCT user_id) AS wau
FROM Logins
GROUP BY DATEPART(YEAR, login_date),
DATEPART(WEEK, login_date);
```

Uber

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47. Find employees with salary higher than department average.

```sql
WITH dept_avg AS (
SELECT department_id, AVG(salary) AS
avg_salary
FROM Employee
GROUP BY department_id)
SELECT e.* FROM Employee e JOIN dept_avg d
ON e.department_id = d.department_id
WHERE e.salary > d.avg_salary;
```

amazon

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48. Calculate time between user signup and their first purchase.

```sql
WITH first_purchase AS (
SELECT user_id, MIN(purchase_date) AS
first_purchase_date FROM Purchases
GROUP BY user_id)
SELECT u.user_id,
DATEDIFF(DAY, u.signup_date,
f.first_purchase_date) AS days_to_purchase
FROM Users u JOIN first_purchase f
ON u.user_id = f.user_id;
```

Meta

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49. Retrieve the longest gap between orders for each customer.

```sql
WITH cte AS (
SELECT customer_id, order_date,
LAG(order_date) OVER (PARTITION BY
customer_id ORDER BY order_date) AS
prev_order_date FROM Orders)
SELECT customer_id, MAX(DATEDIFF(DAY,
prev_order_date, order_date)) AS max_gap
FROM cte
WHERE prev_order_date IS NOT NULL
GROUP BY customer_id;
```

amazon

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50. Identify customers with revenue below the 10th percentile.

```sql
WITH cte AS (
SELECT customer_id, SUM(total_amount) AS
total_revenue
FROM Orders
GROUP BY customer_id)
SELECT customer_id, total_revenue
FROM cte
WHERE total_revenue <
(SELECT PERCENTILE_CONT(0.1) WITHIN GROUP
(ORDER BY total_revenue) FROM cte);
```

Google

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