



Tajamul Khan

50 SQL Interview Queries



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1. Find duplicate records in a table



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

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2. Retrieve the second highest salary from the Employee table



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



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3. Find employees without department (Left Join usage)



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

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4. Calculate the total revenue per product



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



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5. Get the top 3 highest-paid employees.



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

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6. Customers who made purchases but never returned products.



```
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
);
```



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7. Show the count of orders per customer.



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



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8. Retrieve all employees who joined in 2023.



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

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9. Calculate the average order value per customer.



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



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10. Get the latest order placed by each customer.



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

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11. Find products that were never sold.



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



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12. Identify the most selling product.



```
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.



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



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



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

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



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



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16. Find all employees hired on weekends.



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

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17. Find all employees hired on weekends.



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



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18. Get monthly sales revenue and order count.



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



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19. Rank employees by salary within each department.



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

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



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



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



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



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



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

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



```
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 / 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)



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



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



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

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26. Calculate cumulative revenue by day.



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



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27. Identify top-performing departments by average salary.



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

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



```
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);
```



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



```
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_revenue  
FROM Orders o JOIN first_orders f  
ON o.customer_id = f.customer_id  
WHERE o.order_date = f.first_order_date;
```



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30. Find the percentage of employees in each department.



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

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31. Retrieve the maximum salary difference within each department.



```
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).



```
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.



```
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;
```



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



```
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;
```

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



```
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');
```



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



```
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;
```

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



```
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).



```
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;
```



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



```
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).



```
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;
```

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



```
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;
```



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



```
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;
```



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



```
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;
```



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



```
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;
```



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



```
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;
```

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46. Calculate weekly active users



```
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);
```

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47. Find employees with salary higher than department average.



```
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;
```

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



```
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;
```



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



```
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;
```

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



```
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);
```

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