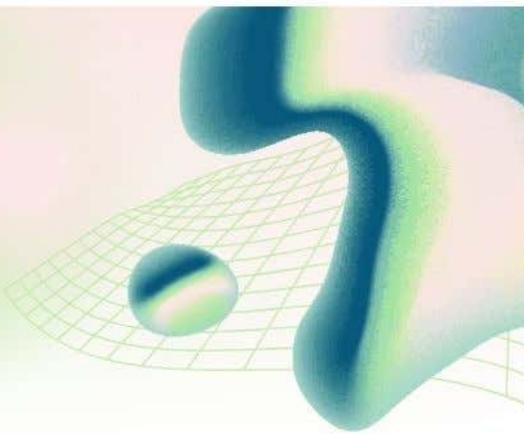


# 70 ADVANCED SQL QUESTIONS

Mostly asked in interviews



This document contains a curated list of 70 advanced SQL questions frequently encountered during technical interviews. It's designed to help candidates prepare for roles requiring in-depth SQL knowledge and problem-solving skills. Use this as a guide to solidify your understanding and showcase your expertise in SQL.

## Key Areas Covered

- Query Optimization
- Indexing Strategies
- Advanced Joins
- Window Functions
- Common Table Expressions (CTEs)
- Stored Procedures
- Triggers

**1. How to retrieve the second-highest salary of an employee?**

```
SELECT MAX(salary)
FROM employees
WHERE salary < (SELECT MAX(salary) FROM employees);
```

**2. How to get the nth highest salary in ?**

```
SELECT salary
FROM (SELECT salary, DENSE_RANK() OVER (ORDER BY salary DESC) AS rank
      FROM employees) AS ranked_salaries
WHERE rank = N;
```

**3. How do you fetch all employees whose salary is greater than the average salary?**

```
SELECT *
FROM employees
WHERE salary > (SELECT AVG(salary) FROM employees);
```

**4. Write a query to display the current date and time in .**

```
SELECT CURRENT_TIMESTAMP;
```

**5. How to find duplicate records in a table?**

```
SELECT column_name, COUNT(*)  
FROM table_name  
GROUP BY column_name  
HAVING COUNT(*) > 1;
```

**6. How can you delete duplicate rows in ?**

```
WITH CTE AS (  
    SELECT column_name,  
        ROW_NUMBER() OVER (PARTITION BY column_name ORDER BY  
        column_name) AS row_num  
    FROM table_name  
)  
DELETE FROM CTE WHERE row_num > 1;
```

**7. How to get the common records from two tables?**

```
SELECT *  
FROM table1  
INTERSECT  
SELECT *  
FROM table2;
```

**8. How to retrieve the last 10 records from a table?**

```
SELECT *  
FROM employees  
ORDER BY employee_id DESC  
LIMIT 10;
```

**9. How do you fetch the top 5 employees with the highest salaries?**

```
SELECT *  
FROM employees  
ORDER BY salary DESC  
LIMIT 5;
```

**10. How to calculate the total salary of all employees?**

```
SELECT SUM(salary)  
FROM employees;
```

**11. How to write a query to find all employees who joined in the year 2020?**

```
SELECT *  
FROM employees  
WHERE YEAR(join_date) = 2020;
```

**12. Write a query to find employees whose name starts with 'A'.**

```
SELECT *
```

```
FROM employees  
WHERE name LIKE 'A%';
```

**13. How can you find the employees who do not have a manager?**

```
SELECT *  
FROM employees  
WHERE manager_id IS NULL;
```

**14. How to find the department with the highest number of employees?**

```
SELECT department_id, COUNT(*)  
FROM employees  
GROUP BY department_id  
ORDER BY COUNT(*) DESC  
LIMIT 1;
```

**15. How to get the count of employees in each department?**

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

**16. Write a query to fetch employees having the highest salary in each department.**

```
SELECT department_id, employee_id, salary
```

```
FROM employees AS e  
WHERE salary = (SELECT MAX(salary)  
    FROM employees  
    WHERE department_id = e.department_id);
```

**17. How to write a query to update the salary of all employees by 10%?**

```
UPDATE employees
```

```
SET salary = salary * 1.1;
```

**18. How can you find employees whose salary is between 50,000 and 1,00,000?**

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

**19. How to find the youngest employee in the organization?**

```
SELECT *  
FROM employees  
ORDER BY birth_date DESC  
LIMIT 1;
```

**20. How to fetch the first and last record from a table?**

```
(SELECT * FROM employees ORDER BY employee_id ASC LIMIT 1)
```

UNION ALL

(SELECT \* FROM employees ORDER BY employee\_id DESC LIMIT 1);

**21. Write a query to find all employees who report to a specific manager.**

SELECT \*

FROM employees

WHERE manager\_id = ?;

**22. How can you find the total number of departments in the company?**

SELECT COUNT(DISTINCT department\_id)

FROM employees;

**23. How to find the department with the lowest average salary?**

SELECT department\_id, AVG(salary)

FROM employees

GROUP BY department\_id

ORDER BY AVG(salary) ASC

LIMIT 1;

**24. How to delete all employees from a department in one query?**

DELETE FROM employees

WHERE department\_id = ?;

**25. How to display all employees who have been in the company for more than 5 years?**

```
SELECT *
FROM employees
WHERE DATEDIFF(CURDATE(), join_date) > 1825;
```

**26. How to find the second-largest value from a table?**

```
SELECT MAX(column_name)
FROM table_name
WHERE column_name < (SELECT MAX(column_name) FROM table_name);
```

**27. How to write a query to remove all records from a table but keep the table structure?**

```
TRUNCATE TABLE table_name;
```

**28. Write a query to get all employee records in XML format.**

```
SELECT employee_id, name, department_id
FROM employees
FOR XML AUTO;
```

**29. How to get the current month's name from ?**

```
SELECT MONTHNAME(CURDATE());
```

**30. How to convert a string to lowercase in ?**

```
SELECT LOWER('STRING_VALUE');
```

**31. How to find all employees who do not have any subordinates?**

```
SELECT *
FROM employees
WHERE employee_id NOT IN (SELECT manager_id FROM employees WHERE
manager_id IS NOT NULL);
```

**32. Write a query to calculate the total sales per customer in a sales table.**

```
SELECT customer_id, SUM(sales_amount)
FROM sales
GROUP BY customer_id;
```

**33. How to write a query to check if a table is empty?**

```
SELECT CASE
WHEN EXISTS (SELECT 1 FROM table_name)
THEN 'Not Empty'
ELSE 'Empty'
END;
```

**34. How to find the second highest salary for each department?**

```
SELECT department_id, salary  
FROM (SELECT department_id, salary,  
       DENSE_RANK() OVER (PARTITION BY department_id ORDER BY salary  
DESC) AS rank  
    FROM employees) AS ranked_salaries  
WHERE rank = 2;
```

**35. Write a query to fetch employees whose salary is a multiple of 10,000.**

```
SELECT *  
FROM employees  
WHERE salary % 10000 = 0;
```

**36. How to fetch records where a column has null values?**

```
SELECT *  
FROM employees  
WHERE column_name IS NULL;
```

**37. How to write a query to find the total number of employees in each job title?**

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

**38. Write a query to fetch all employees whose names end with 'n'.**

```
SELECT *
FROM employees
WHERE name LIKE '%n';
```

**39. How to find all employees who work in both departments 101 and 102?**

```
SELECT employee_id
FROM employees
WHERE department_id IN (101, 102)
GROUP BY employee_id
HAVING COUNT(DISTINCT department_id) = 2;
```

**40. Write a query to fetch the details of employees with the same salary.**

```
SELECT *
FROM employees
WHERE salary IN (SELECT salary
                  FROM employees
                  GROUP BY salary
                  HAVING COUNT(*) > 1);
```

**41. How to update salaries of employees based on their department?**

```
UPDATE employees  
SET salary = CASE  
    WHEN department_id = 101 THEN salary * 1.10  
    WHEN department_id = 102 THEN salary * 1.05  
    ELSE salary  
END;
```

**42. How to write a query to list all employees without a department?**

```
SELECT *  
FROM employees  
WHERE department_id IS NULL;
```

**43. Write a query to find the maximum salary and minimum salary in each department.**

```
SELECT department_id, MAX(salary), MIN(salary)  
FROM employees  
GROUP BY department_id;
```

**44. How to list all employees hired in the last 6 months?**

```
SELECT *  
FROM employees  
WHERE hire_date > ADDDATE(CURDATE(), INTERVAL -6 MONTH);
```

**45. Write a query to display department-wise total and average salary.**

```
SELECT department_id, SUM(salary) AS total_salary, AVG(salary) AS avg_salary  
FROM employees  
GROUP BY department_id;
```

**46. How to find employees who joined the company in the same month and year as their manager?**

```
SELECT e.employee_id, e.name  
FROM employees e  
JOIN employees m ON e.manager_id = m.employee_id  
WHERE MONTH(e.join_date) = MONTH(m.join_date)  
AND YEAR(e.join_date) = YEAR(m.join_date);
```

**47. Write a query to count the number of employees whose names start and end with the same letter.**

```
SELECT COUNT(*)  
FROM employees  
WHERE LEFT(name, 1) = RIGHT(name, 1);
```

**48. How to retrieve employee names and salaries in a single string?**

```
SELECT CONCAT(name, ' earns ', salary) AS employee_info  
FROM employees;
```

**49. How to find employees whose salary is higher than their manager's salary?**

```
SELECT e.employee_id, e.name  
FROM employees e  
JOIN employees m ON e.manager_id = m.employee_id  
WHERE e.salary > m.salary;
```

**50. Write a query to get employees who belong to departments with less than 3 employees.**

```
SELECT *  
FROM employees  
WHERE department_id IN (SELECT department_id  
    FROM employees  
    GROUP BY department_id  
    HAVING COUNT(*) < 3);
```

**51. How to write a query to find employees with the same first name?**

```
SELECT *  
FROM employees  
WHERE first_name IN (SELECT first_name  
    FROM employees  
    GROUP BY first_name  
    HAVING COUNT(*) > 1);
```

**52. How to write a query to delete employees who have been in the company for more than 15 years?**

```
DELETE FROM employees
```

```
WHERE DATEDIFF(CURDATE(), join_date) > 5475;
```

**53. Write a query to list all employees working under the same manager.**

```
SELECT *
```

```
FROM employees
```

```
WHERE manager_id = ?;
```

**54. How to find the top 3 highest-paid employees in each department?**

```
SELECT *
```

```
FROM (SELECT *,
```

```
        DENSE_RANK() OVER (PARTITION BY department_id ORDER BY salary  
DESC) AS rank
```

```
        FROM employees) AS ranked_employees
```

```
WHERE rank <= 3;
```

**55. Write a query to list all employees with more than 5 years of experience  
in each department.**

```
SELECT *
```

```
FROM employees
```

```
WHERE DATEDIFF(CURDATE(), join_date) > 1825;
```

**56. How to list all employees in departments that have not hired anyone in the past 2 years?**

```
SELECT *
FROM employees
WHERE department_id IN (SELECT department_id
    FROM employees
    GROUP BY department_id
    HAVING MAX(hire_date) < ADDDATE(CURDATE(), INTERVAL -2
YEAR));
```

**57. Write a query to find all employees who earn more than the average salary of their department.**

```
SELECT *
FROM employees e
WHERE salary > (SELECT AVG(salary)
    FROM employees
    WHERE department_id = e.department_id);
```

**58. How to list all managers who have more than 5 subordinates?**

```
SELECT *
FROM employees
WHERE employee_id IN (SELECT manager_id
    FROM employees
```

```
        GROUP BY manager_id  
        HAVING COUNT(*) > 5);
```

**59. Write a query to display employee names and hire dates in the format "Name - MM/DD/YYYY".**

```
SELECT CONCAT(name, ' - ', DATE_FORMAT(hire_date, '%m/%d/%Y')) AS  
employee_info  
FROM employees;
```

**60. How to find employees whose salary is in the top 10%?**

```
SELECT *  
FROM employees  
WHERE salary >= (SELECT PERCENTILE_CONT(0.9)  
WITHIN GROUP (ORDER BY salary ASC)  
FROM employees);
```

**61. Write a query to display employees grouped by their age brackets (e.g., 20-30, 31-40, etc.).**

```
SELECT CASE  
        WHEN age BETWEEN 20 AND 30 THEN '20-30'  
        WHEN age BETWEEN 31 AND 40 THEN '31-40'  
        ELSE '41+'  
    END AS age_bracket,  
    COUNT(*)
```

```
FROM employees  
GROUP BY age_bracket;
```

**62. How to find the average salary of the top 5 highest-paid employees in each department?**

```
SELECT department_id, AVG(salary)  
FROM (SELECT department_id, salary,  
       DENSE_RANK() OVER (PARTITION BY department_id ORDER BY salary  
DESC) AS rank  
     FROM employees) AS ranked_employees  
WHERE rank <= 5  
GROUP BY department_id;
```

**63. How to calculate the percentage of employees in each department?**

```
SELECT department_id,  
       (COUNT(*) * 100.0 / (SELECT COUNT(*) FROM employees)) AS percentage  
FROM employees  
GROUP BY department_id;
```

**64. Write a query to find all employees whose email contains the domain '@example.com'.**

```
SELECT *  
FROM employees  
WHERE email LIKE '%@example.com';
```

**65. How to retrieve the year-to-date sales for each customer?**

```
SELECT customer_id, SUM(sales_amount)
FROM sales
WHERE sale_date BETWEEN '2024-01-01' AND CURDATE()
GROUP BY customer_id;
```

**66. Write a query to display the hire date and day of the week for each employee.**

```
SELECT name, hire_date, DAYNAME(hire_date) AS day_of_week
FROM employees;
```

**67. How to find all employees who are older than 30 years?**

```
SELECT *
FROM employees
WHERE DATEDIFF(CURDATE(), birth_date) / 365 > 30;
```

**68. Write a query to display employees grouped by their salary range (e.g., 0-20K, 20K-50K).**

```
SELECT CASE
    WHEN salary BETWEEN 0 AND 20000 THEN '0-20K'
    WHEN salary BETWEEN 20001 AND 50000 THEN '20K-50K'
    ELSE '50K+'
```

```
END AS salary_range,  
COUNT(*)  
FROM employees  
GROUP BY salary_range;
```

**69. How to list all employees who do not have a bonus?**

```
SELECT *  
FROM employees  
WHERE bonus IS NULL;
```

**70. Write a query to display the highest, lowest, and average salary for each job role.**

```
SELECT job_role, MAX(salary) AS highest_salary, MIN(salary) AS lowest_salary,  
AVG(salary) AS avg_salary  
FROM employees  
GROUP BY job_role;
```