

10 Complex SQL Queries Every

every

Developers

Should Master!



Level up your **SQL**

skills with queries designed to solve real-world problems and improve your database expertise!



Introduction to SQL Complexity

Why Master Complex SQL Queries?

- Simplify the most challenging data retrieval tasks.
- Optimize database performance and query efficiency.
- Gain an edge in data-intensive developer roles.

What You'll Learn

These 10 queries tackle advanced concepts like joins, window functions, subqueries, and more. Perfect for interviews and real-world applications.

Query 1

Find Duplicate Records

Problem: Identify duplicate rows in a table

Query

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

Use Case : Find repeated orders, duplicate entries, or redundant data.

Query 2

Top N Records per Group

Problem: Retrieve the top N records for each category.

Query

```
SELECT *
FROM (
    SELECT column1, column2,
           RANK() OVER (PARTITION BY category_column ORDER BY value_column DESC) AS rank
    FROM table_name
) ranked
WHERE rank <= N;
```

Use Case : List top-performing products or highest revenue regions

Query 3

Detect Missing Data

Problem: Find gaps in sequential data.

Query

```
SELECT t1.id + 1 AS missing_id  
FROM table_name t1  
LEFT JOIN table_name t2 ON t1.id + 1 = t2.id  
WHERE t2.id IS NULL;
```

Use Case : Identify missing invoice numbers or skipped entries in a series

Query 4

Find Second Highest Value

Problem: Retrieve the second highest value from a column.

Query

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

Use Case : Get the runner-up in sales, performance, or rankings

Query 5

Pivot Data

Problem: Transform rows into columns for reporting.

Query

```
SELECT category,  
       SUM(CASE WHEN year = '2023' THEN value ELSE 0 END) AS "2023",  
       SUM(CASE WHEN year = '2022' THEN value ELSE 0 END) AS "2022"  
FROM table_name  
GROUP BY category;
```

Use Case : Summarize annual sales data by category.

Query 6

Calculate Running Totals

Problem: Compute cumulative totals.

Query

```
SELECT column1, column2,  
       SUM(value_column) OVER (PARTITION BY category_column ORDER BY date_column) AS running_total  
  FROM table_name;
```

Use Case : Track cumulative sales, expenses, or inventory

Query 7

Retrieve Employees by Hierarchy

Problem: Fetch hierarchical data (e.g., employees and managers).

Query

```
WITH RECURSIVE EmployeeCTE AS (
    SELECT id, name, manager_id
    FROM employees
    WHERE manager_id IS NULL
    UNION ALL
    SELECT e.id, e.name, e.manager_id
    FROM employees e
    INNER JOIN EmployeeCTE cte ON e.manager_id = cte.id
)
SELECT * FROM EmployeeCTE;
```

Use Case : Visualize organizational structures or dependency trees

Query 8

Complex Joins

Problem: Retrieve data using multiple joins

Query

```
SELECT t1.*, t2.*, t3.*  
FROM table1 t1  
INNER JOIN table2 t2 ON t1.id = t2.foreign_id  
LEFT JOIN table3 t3 ON t2.id = t3.foreign_id;
```

Use Case : Combine related data across multiple tables for comprehensive reports

Query 9

Percentage Contribution

Problem: Calculate each item's percentage contribution

Query

```
SELECT column_name,  
       value_column,  
       ROUND((value_column * 100.0 / SUM(value_column) OVER()), 2) AS percentage  
FROM table_name;
```

Use Case : Calculate sales contribution by region or product

Query 10

Identify Overlapping Ranges

Problem: Detect overlapping time ranges

Query

```
SELECT t1.*  
FROM table_name t1, table_name t2  
WHERE t1.start_date < t2.end_date  
AND t1.end_date > t2.start_date  
AND t1.id != t2.id;
```

Use Case : Identify schedule conflicts or overlapping reservations

Real-World Application of Complex Queries

What You've Learned:

- Advanced SQL concepts for efficient problem-solving.
- Real-world applications of queries like reporting, analytics, and data cleaning.

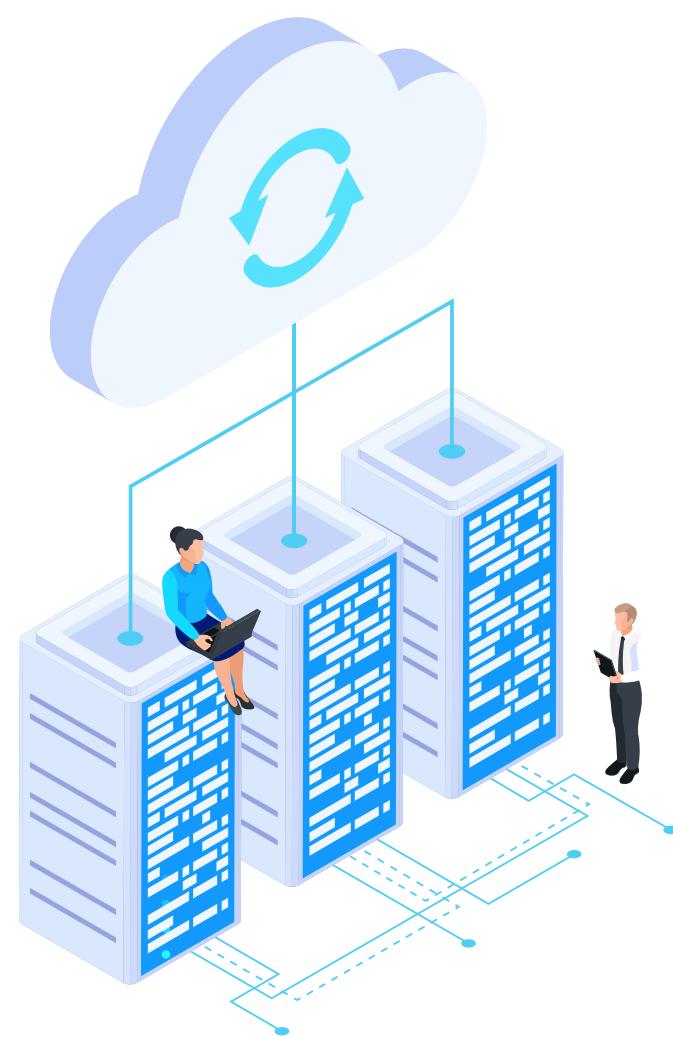
Pro Tip: Combine these queries with database indexing and optimization techniques for better performance.

Start Writing Complex SQL Queries Today!

Master these queries to enhance your data analysis skills. Build efficient, scalable database solutions.

Become the go-to SQL expert in your team!

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