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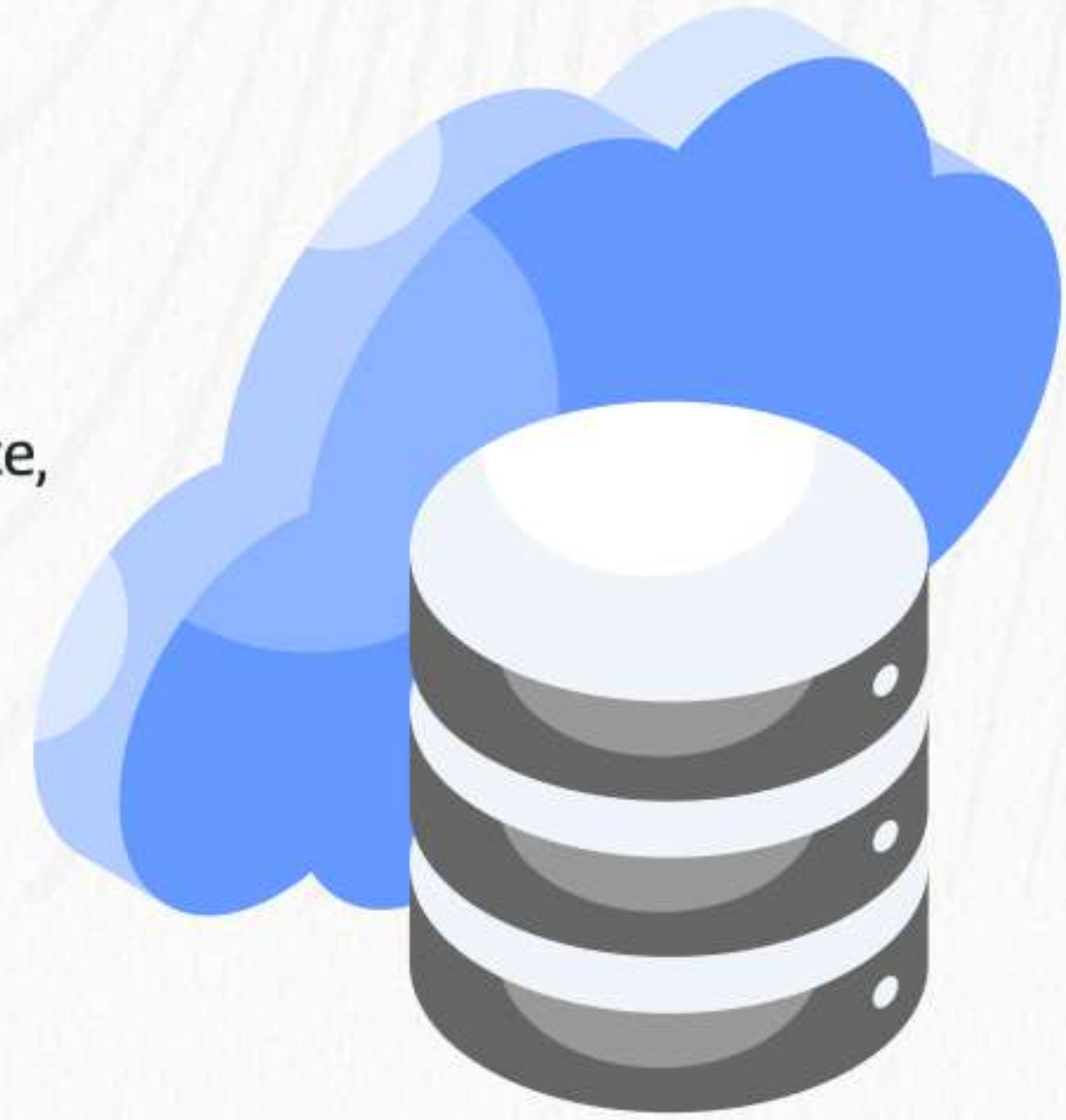
10 Essential SQL Queries Every Developer Should Know

Boost your database skills with queries that tackle real-world challenges, optimize performance, and prepare you for technical interviews!



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Why Master Advanced SQL?

The Power of SQL in Development

- Helps you extract meaningful insights from massive datasets.
- Essential for backend development, analytics, and data engineering.
- Optimized queries improve application speed and efficiency.

What This Guide Covers:

A collection of must-know SQL queries that enhance problem-solving and performance tuning.

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Query 1

Finding Duplicate Records

Problem: Identify duplicate values in a table.

Query

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

Use Case : Spot redundant customer records, duplicate transactions, or repeated logins.

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Query 2

Top N Items in Each Category

Problem: Retrieve the top-performing items per category.

Query

```
SELECT * FROM (
  SELECT column1, column2,
         RANK() OVER (PARTITION BY category_column ORDER BY value_column DESC) AS rank
  FROM table_name
```

Use Case : List best-selling products in each category or top-ranked employees per department.

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Query 3

Finding Missing Data Gaps

Problem: Detect gaps in a numerical sequence.

Query

```sql
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, skipped registrations, or unfilled survey responses.

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Query 4

Getting the Second Highest Value

Problem: Fetch the second-highest value in a column.

Query

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

Use Case : Find the runner-up in sales, exam scores, or employee performance

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Query 5

Pivoting Rows into Columns

Problem: Transform row-based data into column-based summaries.

Query

```sql
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 : Convert transactional data into yearly financial reports.

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Query 6

Running Totals Calculation

Problem: Compute cumulative sums dynamically.

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 revenue over time.

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Query 7

Hierarchical Data Retrieval

Problem: Retrieve employees based on their reporting structure.

Query

```sql
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, dependency trees, or menu hierarchies.

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Query 8

Combining Data from Multiple Tables

Problem: Retrieve information using complex 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 : Merge order details, customer profiles, and product information in e-commerce.

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Query 9

Calculating Percentage Contribution

Problem: Find each item's share of the total.

Query

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

Use Case : Analyze revenue contributions per product, region, or team.

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Query 10

Detecting Overlapping Time Ranges

Problem: Identify conflicts in scheduling.

Query

```sql
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 : Find overlapping meeting times, double-booked reservations, or conflicting shifts.

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Real-World SQL Applications

What You've Learned:

- Advanced SQL techniques for solving complex data challenges.
- Query patterns that improve reporting, analytics, and database performance.

Pro Tip: Use indexing and query optimization strategies to speed up execution time.

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Start Writing Complex SQL Queries Today!

Practice these queries, refine your skills, and optimize performance.

Enhance your problem-solving ability and take your database knowledge to the next level!

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