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# SQL Window Functions

Notes, roadmaps and practice material, curated by the Uncodemy trainer team.



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# Quick answer



A window function calculates across a set of related rows while keeping every row in the result. The key syntax is a function followed by OVER with optional PARTITION BY and ORDER BY.



## Clear concepts

Short, plain-language explanations



## Hands-on practice

Examples and exercises to try yourself



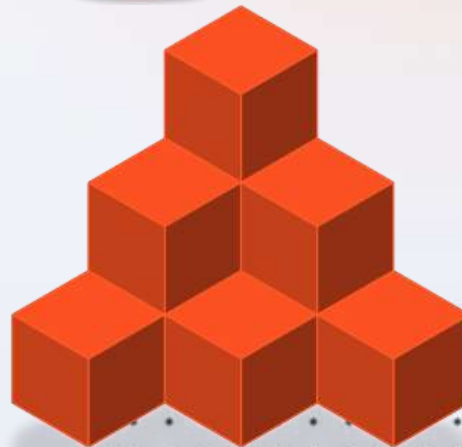
## Job-focused prep

Questions and checklists for interviews

# What is a window function?



A normal aggregate with GROUP BY collapses rows. A window function does not: each row stays, and the function looks at a defined window of related rows. This makes ranking, running totals, comparisons with the previous row and share-of-total calculations possible in one query.



# Main families

| Family    | Functions                           | Used for                                        |
|-----------|-------------------------------------|-------------------------------------------------|
| Ranking   | ROW_NUMBER, RANK, DENSE_RANK, NTILE | Top N per group, percentiles                    |
| Offset    | LAG, LEAD, FIRST_VALUE              | Change from previous row, first in group        |
| Aggregate | SUM, AVG, COUNT with OVER           | Running totals, moving averages, share of total |

# Ranking and ties (tested)

Tied salaries show how the three ranking functions differ:

example

```
1 SELECT name, salary,
2     ROW_NUMBER() OVER (ORDER BY salary DESC) AS rn,
3     RANK() OVER (ORDER BY salary DESC) AS rk,
4     DENSE_RANK() OVER (ORDER BY salary DESC) AS drk
5 FROM employees;
6 -- ROW_NUMBER never repeats; RANK repeats and skips (1,2,2,4);
7 -- DENSE_RANK repeats without gaps (1,2,2,3).
```

# Running total, previous value and share of total (tested)

Three common analyst patterns:

example

```
1 SELECT order_id, order_date, amount,  
2        SUM(amount) OVER (ORDER BY order_date, order_id) AS running_total,  
3        LAG(amount) OVER (ORDER BY order_date, order_id) AS previous_amount,  
4        ROUND(amount * 100.0 / SUM(amount) OVER (), 1) AS pct_of_total  
5 FROM orders;
```

# A moving window with a frame (tested)

A three-row moving sum uses a frame clause:

example

```
1 SELECT order_date, amount,  
2     SUM(amount) OVER (  
3         ORDER BY order_date  
4         ROWS BETWEEN 2 PRECEDING AND CURRENT ROW  
5     ) AS moving_sum_3  
6 FROM orders;
```

# How to use these PDFs



## STEP 1

### Read the roadmap

Start at the stage that matches your level.



## STEP 2

### Practise each topic

Try it yourself instead of only reading.



## STEP 3

### Revise key concepts

Use the tables before an interview or exam.



## STEP 4

### Move to the next stage

Go on when you can explain this one in your own words.

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# Frequently asked questions



## What is a window function in SQL?

A window function performs a calculation across a set of related rows while keeping each row in the result, using the OVER clause.



## What is the difference between RANK and DENSE\_RANK?

Both give tied rows the same rank. RANK skips numbers after ties (1, 2, 2, 4) and DENSE\_RANK does not (1, 2, 2, 3).



## How do I calculate a running total in SQL?

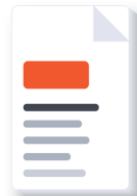
Use SUM(column) OVER (ORDER BY ordering\_column). Add PARTITION BY to restart the total for each group.

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