

# SQL Analytics Functions PDF Page

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**Prepared:** 26 October 2026 · **Primary keyword:** sql analytics functions pdf · **Search volume:** not checked (keyword tool out of credits); verify in Search Console.

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### PART 1: Page plan

| Item                          | Decision                                                                                                                                                                   |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Final URL                     | <a href="https://uncodemy.com/sql-analytics-functions-pdf">https://uncodemy.com/sql-analytics-functions-pdf</a>                                                            |
| Intent (anti-cannibalisation) | BUSINESS METRIC RECIPES in SQL (growth, share, rank, Pareto). The mechanics of window functions are on the window functions page.                                          |
| Why not thin                  | Explainer-style sections, FAQs and cross-links make the page useful even without a download                                                                                |
| Schema                        | WebSite, Organization, Breadcrumb, CollectionPage, FAQPage (only FAQs visible on the page). PDF <code>ItemList</code> provided commented, to enable after titles are final |
| Share image                   | <a href="https://uncodemy.com/image/logo-og.jpg">https://uncodemy.com/image/logo-og.jpg</a> for now; custom 1200x630 card recommended                                      |

### PART 2: Page content (copy-paste ready)

**SEO Title** (38 chars):

SQL Analytics Functions PDF | Uncodemy

**Meta Description** (134 chars):

Download the SQL analytics functions PDF from Uncodemy: ranking, LAG and LEAD, running totals and moving averages with tested queries.

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**Byline:** Prepared by the Uncodemy trainer team [CONFIRM: author name and role] · Reviewed by [CONFIRM: reviewer name and role] · Last reviewed: [DATE]

#### Quick Answer

This page offers Uncodemy's SQL analytics functions guide as a PDF download. It is a cookbook of patterns that analysts use to answer business questions: growth over time, running totals, shares, rankings, top-N per group and a Pareto view of what drives revenue. Every pattern is shown with SQL you can run in SQLite.

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From functions to business questions

Learning that SUM, LAG and RANK exist is only the start. Analysts earn their keep by knowing which pattern answers which business question. How did revenue change from last month? Which products make up eighty percent of sales? Who are the top three customers in each city? What is the running total against target? Each of these questions has a standard recipe in SQL, built from aggregation, window functions and a CTE or two. This guide collects the most common recipes so that you can recognise them, adapt them and check them. The examples use these tables: customers(customer\_id, name, city, signup\_date), orders(order\_id, customer\_id, order\_date, status, order\_total), order\_items(order\_id, product\_id, quantity, unit\_price) and products(product\_id, product\_name, category). Dates are text in YYYY-MM-DD form, so the examples run in SQLite and need small changes in other databases.

Question-to-pattern map

| Business question                      | Pattern                | Key tools                            |
|----------------------------------------|------------------------|--------------------------------------|
| How did we change month on month?      | Growth rate            | GROUP BY month, LAG                  |
| How are we doing so far this year?     | Running total          | SUM() OVER (ORDER BY ...)            |
| What share does each item contribute?  | Percent of total       | SUM() OVER ()                        |
| Who are the top N in each group?       | Top-N per group        | ROW_NUMBER or RANK with PARTITION BY |
| Which items drive most of the revenue? | Pareto or ABC analysis | Cumulative share window              |
| Is performance smooth or noisy?        | Moving average         | AVG() OVER with a frame              |

Month-on-month growth

Monthly revenue and the percentage change from the previous month.

```
WITH monthly AS (  
  SELECT strftime('%Y-%m', order_date) AS month, SUM(order_total) AS revenue  
  FROM orders WHERE status <> 'cancelled'  
  GROUP BY strftime('%Y-%m', order_date)  
)  
SELECT month, revenue,  
  ROUND((revenue - LAG(revenue) OVER (ORDER BY month)) * 100.0  
    / LAG(revenue) OVER (ORDER BY month), 1) AS mom_pct  
FROM monthly  
ORDER BY month;
```

Running total and percent of total

Cumulative revenue by month and each month's share of the overall total.

```
WITH monthly AS (  
  SELECT strftime('%Y-%m', order_date) AS month, SUM(order_total) AS revenue  
  FROM orders WHERE status <> 'cancelled'  
  GROUP BY strftime('%Y-%m', order_date)  
)  
SELECT month, revenue,  
  SUM(revenue) OVER (ORDER BY month) AS running_total,  
  ROUND(revenue * 100.0 / SUM(revenue) OVER (), 1) AS pct_of_total  
FROM monthly  
ORDER BY month;
```

Top 3 customers in each city

ROW\_NUMBER gives a unique rank inside each partition. Use RANK instead if ties should share a place.

```
WITH customer_revenue AS (  
  SELECT c.city, c.customer_id, c.name, SUM(o.order_total) AS revenue  
  FROM customers c  
  JOIN orders o ON o.customer_id = c.customer_id AND o.status <> 'cancelled'  
  GROUP BY c.city, c.customer_id, c.name  
)  
SELECT *  
FROM (  
  SELECT cr.*,  
    ROW_NUMBER() OVER (PARTITION BY city ORDER BY revenue DESC) AS rn  
  FROM customer_revenue cr  
)  
WHERE rn <= 3  
ORDER BY city, rn;
```

Pareto analysis of products

Ranks products by revenue and shows the cumulative share, so you can see how few products produce most of the revenue.

```
WITH product_revenue AS (  
  SELECT p.product_name, SUM(oi.quantity * oi.unit_price) AS revenue  
  FROM order_items oi  
  JOIN products p ON p.product_id = oi.product_id  
  GROUP BY p.product_name  
)  
SELECT product_name, revenue,  
  ROUND(SUM(revenue) OVER (ORDER BY revenue DESC) * 100.0  
    / SUM(revenue) OVER (), 1) AS cumulative_pct
```

```
FROM product_revenue
ORDER BY revenue DESC;
```

## Three-month moving average

Smooths month-to-month noise using a window frame of the current and two previous months.

```
WITH monthly AS (
  SELECT strftime('%Y-%m', order_date) AS month, SUM(order_total) AS revenue
  FROM orders WHERE status <> 'cancelled'
  GROUP BY strftime('%Y-%m', order_date)
)
SELECT month, revenue,
  ROUND(AVG(revenue) OVER (ORDER BY month
    ROWS BETWEEN 2 PRECEDING AND CURRENT ROW), 1) AS moving_avg_3m
FROM monthly
ORDER BY month;
```

## Checks that keep recipes honest

- Confirm the grain before applying window functions: one row per month, per customer, and so on.
- Handle the first period, where LAG returns NULL.
- Watch ties: RANK, DENSE\_RANK and ROW\_NUMBER treat them differently.
- State the frame explicitly for moving averages.
- Reconcile totals with a simple GROUP BY query.

## Common mistakes

- **Applying a window function before aggregating**, so the result is per row, not per month.
- **Dividing integers** and getting zero; multiply by 1.0.
- **Forgetting PARTITION BY** so ranks run across all groups.
- **Treating a small sample** as a trend: check how many rows sit behind a percentage.

## Building your own cookbook

Keep a file of queries that you have written and tested, with a sentence about the question each answers and the grain of the result. Over time it becomes a reference that speeds up new work and helps you explain your approach in interviews.

## Choosing a window function

| Goal                            | Function                             |
|---------------------------------|--------------------------------------|
| Rank with ties and gaps         | RANK()                               |
| Rank with ties and no gaps      | DENSE_RANK()                         |
| Unique row number               | ROW_NUMBER()                         |
| Previous or next row value      | LAG() and LEAD()                     |
| Running total or moving average | SUM() or AVG() with OVER and a frame |
| Split into equal groups         | NTILE(n)                             |
| First or last value in a group  | FIRST_VALUE() and LAST_VALUE()       |

## Window function pitfalls

- You cannot filter on a window function in WHERE; use a CTE or subquery, then filter.
- Frames matter: the default frame with ORDER BY may not be the one you expect, so state it explicitly when it matters.
- Always include a tie-breaker in ORDER BY for repeatable results.

## Related Uncodemy resources

- [SQL Window Functions PDF](#)
- [SQL CTE Guide PDF](#)
- [SQL Cohort Analysis PDF](#)
- [Data Analytics KPI Guide PDF](#)

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- **Data Analytics course:** <https://uncodemy.com/course/data-analytics-training-course-in-noida>. URL verified on the live site.

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## Frequently Asked Questions

### What are SQL analytics functions?

They are SQL features, mainly window functions and aggregates, used to calculate running totals, rankings, growth and shares without collapsing

ROWS.

**How do I calculate month-on-month growth in SQL?**

Aggregate revenue by month in a CTE, then use LAG to get the previous month's value and compute the percentage difference.

**How do I get the top N rows per group?**

Use ROW\_NUMBER or RANK with PARTITION BY the group and ORDER BY the measure, then filter on the rank.

**What is a Pareto analysis in SQL?**

It ranks items by contribution and calculates the cumulative share, showing which few items drive most of the total.

**What is the difference between RANK and ROW\_NUMBER?**

ROW\_NUMBER gives every row a unique number, while RANK gives tied rows the same number and then skips values.

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