SaaS Subscription Retention & Revenue Analysis (SQL-First)

Objective
Answer core SaaS business questions about retention and revenue using SQL only.

Dataset
ChartMogul sample invoice data (customers, invoices, invoice line items, transactions, subscription events).

Methodology (SQL)
- Defined paid invoices using successful payment transactions.
- Calculated revenue from invoice line items for paid invoices.
- Built cohort retention by acquisition month.
- Measured repeat rate and time to return using window functions.
- Generated monthly revenue with MoM changes.

Key Findings
- Revenue is concentrated among a small number of customers; top customer contributed $310.50 across 12 invoices.
- Cohort retention drops after month 0 and stabilizes at ~50% for the February 2025 cohort.
- Repeat purchase rate is 66.7% (14 of 21 customers with 2+ paid invoices).
- Typical time to second purchase is ~30–32 days, consistent with monthly billing, with some long-gap reactivations.
- Monthly revenue is volatile, indicating uneven acquisition or billing timing.

Business Implications
- Early-month activation is the highest-leverage retention opportunity.
- Revenue concentration increases risk; protecting top customers is critical.
- Long-gap returners suggest churn/reactivation behavior worth targeted lifecycle campaigns.

Tools & Techniques
DuckDB, SQL (CTEs, window functions, cohort logic), CSV outputs.

Outputs
Reproducible CSV tables in outputs/ generated via sql/06_export_outputs.sql.