

Lesson 6: Principles of Data Manipulation and Management

Lesson 7: Relational Algebra

Lesson 8: SQL for Data Science

▶ **Video:** From SQL to RA
6 min

▶ **Video:** Thinking in RA: Logical Query Plans
4 min

▶ **Video:** Practical SQL: Binning Timeseries
5 min

▶ **Video:** Practical SQL: Genomic Intervals
6 min

▶ **Video:** User-Defined Functions
3 min

▶ **Video:** Support for User-Defined Functions
4 min

Lesson 9: Key Principles of Relational Databases

Assignment 2: SQL

Practical SQL: Binning Timeseries

Interpreting Complicated SQL

```
SELECT binid,
       round(avg(cast(Fluo as float)),3) as Fluo,
       round(avg(cast(Oxygen as float)),3) as Oxygen,
       round(avg(cast(Nitrate_uM as float)),3) as Nitrate_uM,
       round(avg(cast(longitude as float)),3) as longitude,
       round(avg(cast(latitude as float)),3) as latitude
FROM (
  SELECT *, cast(floor(ts) +
                floor((ts - floor(ts))*24*60/binsize) *
                binsize / (24*60) as datetime) as binid
  FROM (
    SELECT *, cast(timestamp as float) as ts, 5.0 as binsize
    FROM Tokyo_4_merged_data_time
  ) x
) bins
GROUP BY binid
ORDER BY binid asc
```

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[MUSIC] So now, I wanna talk about how to interpret, or give some examples of how to interpret SQL statements. Sort of, in terms of relation algebra. We're not gonna actually write out the plans. But I wanna give you some experience staring at what may seem sort of complicated. And kind of teasing out what's actually going on here. And so, for people that have spent a lot of time around database and SQL, these may or may not seem particularly complicated, but if you're just starting out, they probably do. So in this first example, what do we see here? Well, what you wanna look for, when you're sort of staring at something that may seem sort of hairy, is look for the FROM clause here. And so in this case, it's a little funny, right? Because we see, oops. We see that the