

## 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: Genomic Intervals

### Interpreting Complicated SQL

```
SELECT x.strain, x.chr, x.region as snp_region, x.start_bp as snp_start_bp
, x.end_bp as snp_end_bp, w.start_bp as nc_start_bp, w.end_bp as nc_end_bp
, w.category as nc_category
, CASE WHEN (x.start_bp >= w.start_bp AND x.end_bp <= w.end_bp)
      THEN x.end_bp - x.start_bp + 1
      WHEN (x.start_bp <= w.start_bp AND w.start_bp <= x.end_bp)
      THEN x.end_bp - w.start_bp + 1
      WHEN (x.start_bp <= w.end_bp AND w.end_bp <= x.end_bp)
      THEN w.end_bp - x.start_bp + 1
      END AS len_overlap

FROM hotspots_deserts x
INNER JOIN table_noncoding_positions w
ON x.chr = w.chr
WHERE (x.start_bp >= w.start_bp AND x.end_bp <= w.end_bp)
OR (x.start_bp <= w.start_bp AND w.start_bp <= x.end_bp)
OR (x.start_bp <= w.end_bp AND w.end_bp <= x.end_bp)
ORDER BY x.strain, x.chr ASC, x.start_bp ASC
```

▶ 🔊 0:04 / 6:32

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English ▾

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0:00 [MUSIC] So here's another example.

0:06 The same thing, the first step is to look at the from clause and see what you see, and here we see two tables and there's this keyword, inner join. Now the join is explicit and the join condition here is this, where we have some sort of ID and some sort of other ID. By the way, one of the other things I wanted to do here is to show that you can analyze the structure of a SQL statement to understand what's going on, even if you have no idea what the data's all about. And in fact, it's kind of helpful to do so. This is something you'll be presented with in a data science context. If