

Lesson 6: Principles of Data Manipulation and Management

Lesson 7: Relational Algebra

✓ **Video:** Algebraic Optimization Overview
6 min

✓ **Video:** Relational Algebra Overview
4 min

✓ **Video:** Relational Algebra Operators: Union, Difference, Selection
6 min

✓ **Video:** Relational Algebra Operators: Projection, Cross Product
4 min

✓ **Video:** Relational Algebra Operators: Cross Product cont'd, Join
6 min

✓ **Video:** Relational Algebra Operators: Outer Join
4 min


▶ **Video:** Relational Algebra Operators: Theta-Join
4 min

Lesson 8: SQL for Data Science

Lesson 9: Key Principles of Relational Databases

Assignment 2: SQL

Algebraic Optimization Overview


UNIVERSITY of WASHINGTON

Key Idea: Algebraic Optimization

$$N = ((z*2)+((z*3)+0))/1$$

Algebraic Laws:

1. (+) identity: $x+0 = x$
2. (/) identity: $x/1 = x$
3. (*) distributes: $(n*x+n*y) = n*(x+y)$
4. (*) commutes: $x*y = y*x$




Apply rules **1, 3, 4, 2**:

$$N = (2+3)*z$$

two operations instead of five, no division operator

Same idea works with the Relational Algebra!

4/7/2013
Bill Howe, eScience Institute
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0:00 [MUSIC] When I'm giving a talk and describing using this slide, well I'll ask is how many people have heard of algebraic optimization. And typically, very few have, even if they're computer scientists,

0:13 unless it's a room full of database people. But the thing is, that you already understand what this is. Right, you don't have to know databases to know what this is. This is just something you learned in high school, in Algebra class. Okay. So, forget tables for a second, just think about integers.