Relational Algebra

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Algebra

Algebra: operands (values) and operators (ways of generating new values from old).

Example: Arithmetic algebra

Operands:

Numbers

Operators:

Unary: Sign change

Binary: Addition, subtraction, multiplication, division.

Expressions: $4 \cdot (-(2 \cdot (3 + 5)))$

Can be viewed as expression trees.

Relational algebra

Operands:

Relations

Operators:

Unary: Selection (σ), projection (π), renaming (ρ)

Binary: Set operations ($\cap$, $\cup$, $\backslash$), cross product ($\times$), various joins ($\bowtie$), division ($/$)

Again: Expressions and expression trees.

Query in relational model = expression of relational algebra.

SQL (query part) based very much on relational algebra.