Relational Algebra: Basic Operators

Computing on Data

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Kevin C.C. Chang, Professor
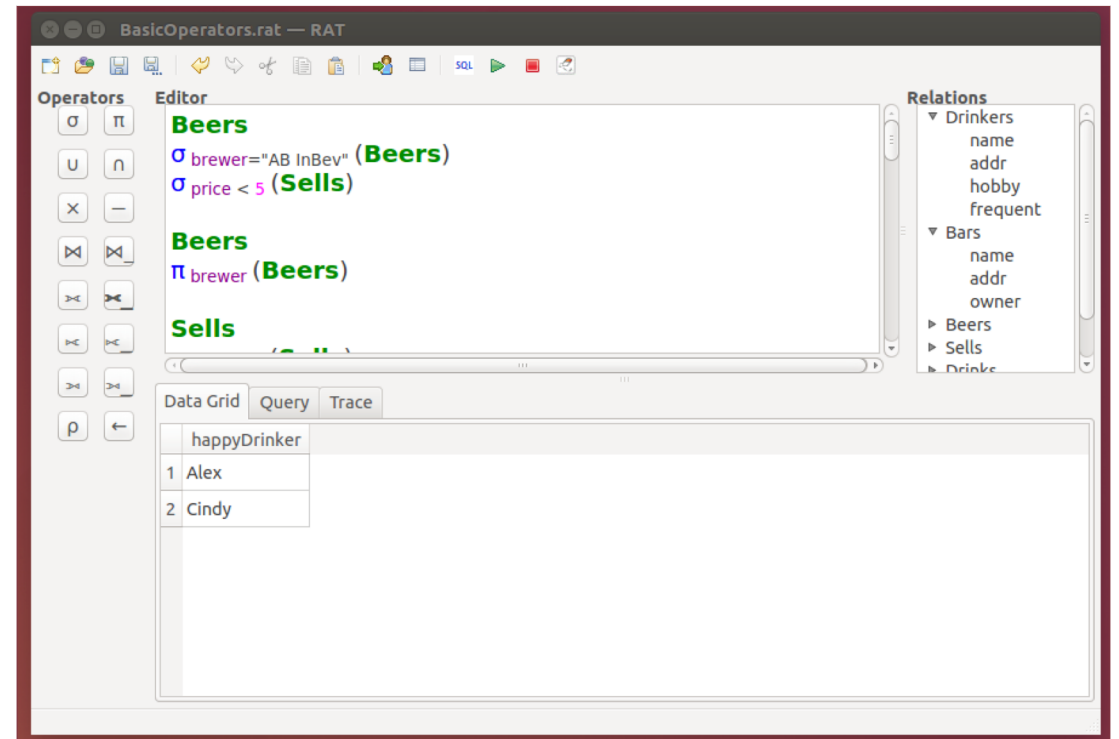
Computer Science @ Illinois

Learning Objectives

By the end of this video, you will be able to:

- Describe the operators and operands of relational algebra.
- Write a very simple relational algebra expression.
- State the general purposes of basic operations.
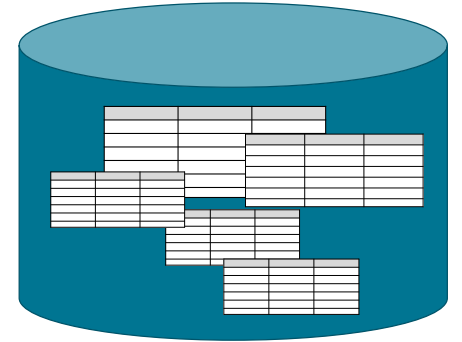- Meet our new best friend RASQL!

Introducing RASQL

- One of the few softwares that speaks Relation Algebra (and SQL).
- Created by alumni of this class.
- Available at

https://github.com/forward-uiuc/rasql

- We will use it to learn/demo RA!

Operators Operate upon Operands

- Relational algebra computes on relations.
- We refer to a relation as operand by its name.

- A relation name is an operand, and a RA expression.

Database is a set of tables

- What is the simplest relational algebra expression?

Basic Operators

- Reduction: *Make a table smaller.*
  - Selection σ
  - Projection π

- Combination: *Combine two tables.*
  - Set Union ∪
  - Set Difference —
  - Cartesian Product ×

- Renaming ρ: *Change attribute names.*

What is the major of Bugs Bunny?

Students

What courses are Bugs Bunny taking?

Students

Enrolls