Theta-join

- Combines select (with a predicate) and Cartesian-product

$$r \boxtimes_\theta s = \sigma_\theta(r \times s)$$

Division Operation

- ÷, when query includes the phrase “for all”
  - Customers who have an account at all the branches in Brooklyn

branch_name	branch_city
Brighton	Brooklyn
Downtown	Brooklyn
Redwood	Rye
Hill	Palo Alto

Branch

customer_name	account_number
Hayes	A-102
Johnson	A-101
Johnson	A-201
Jones	A-217

Depositor

account_number	*branch_name*	*balance*
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

Account

Formal definition of Division

Expansion of Division operation

$$r \div s = \pi_{R-S}(r) - \pi_{R-S}((\pi_{R-S}(r) \times s) - \pi_{R-S,S}(r))$$

Assignment Operation

- Assign a relation expression to a variable

$$temp1 \leftarrow \pi_{R-S}(r)$$

$$temp2 \leftarrow \pi_{R-S}((temp1 \times s) - \pi_{R-S, S}(r))$$

$$result = temp1 - temp2$$

- Helps in writing sequential programs
- Difference from `rename` operation?