Assignment operator (←)

Now we will see what is assignment operator in relation algebra.
Suppose you wish to assign result of an expression into a relation R. How would you denote it?
For such work, we use assignment operator (←).

Notation of Assignment Operator

Relational Variable ← Expression.

or,

R ← E.

Where,
R is relation,

r stands for relation variable.

E is Expression whose result we wish to assign to relation variable R.

The result of the expression to the right hand side of ← is assigned to relation variable on the left side of ←. The
relation variable may be used in subsequent expressions.

R1 ← πname(Customer)

R2 ← πname(Employee)

R = R1 – R2

Aggregate Function:

The aggregate functions are follows −

- max()
- min()
- sum()
- average()
- count()

It is very useful to apply a function to a collection of values to generate a single result ¨ Most common aggregate functions:

- Sum: sums the values in the collection
- Avg: computes average of values in the collection

- Count: counts number of elements in the collection
- Min: returns minimum value in the collection
- Max: returns maximum value in the collection

Aggregate functions work on multisets, not sets

¤ A value can appear in the input multiple times

Count():

Count(*): Returns total number of records .i.e 6.

Count(salary): Return number of Non Null values over the column salary. i.e 5.

Count(Distinct Salary): Return number of distinct Non Null values over the column salary .i.e 4

Sum():

sum(salary): Sum all Non Null values of Column salary i.e., 310

sum(Distinct salary): Sum of all distinct Non-Null values i.e., 250.

Avg():

Avg(salary) = Sum(salary) / count(salary) = 310/5

Avg(Distinct salary) = sum(Distinct salary) / Count(Distinct Salary) = 250/4

Min():

Min(salary): Minimum value in the salary column except NULL i.e., 40.

Max(salary): Maximum value in the salary i.e., 80.

"Find the total amount owed to the credit company."

$\mathcal{G}_{\mathbf{sum}(balance)}(credit\_acct)$

4275

cred_id	limit	balance
C-273	2500	150
C-291	750	600
C-304	15000	3500
C-313	300	25

credit_acct

"Find the maximum available credit of any account."

$\mathcal{G}_{\mathbf{max}(available\_credit)}(\Pi_{(limit - balance)\ \mathbf{as}\ available\_credit}(credit\_acct))$

11500

Generalized Projection:

- Extends the projection operation by allowing arithmetic functions to be used in the projection list.

$$\Pi_{F_1, F_2, \ldots, F_n}(E)$$

- E is any relational-algebra expression
- Each of F_1, F_2, …, F_n are are arithmetic expressions involving constants and attributes in the schema of E.
- Given relation *credit_info(customer_name, limit, credit_balance),* find how much more each person can spend:

$$\Pi_{customer\_name,\ limit - credit\_balance}\ (credit\_info)$$