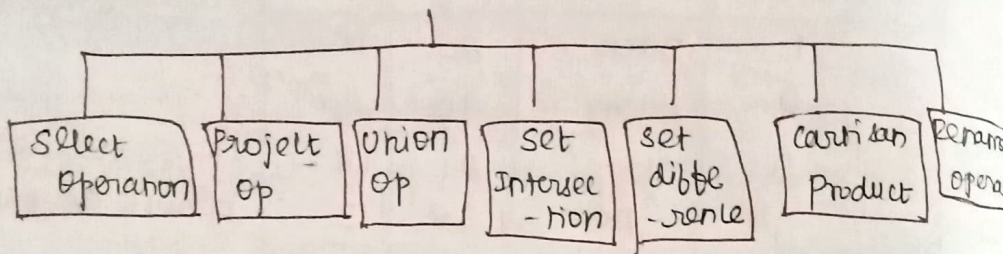


RELATIONAL ALGEBRA

It is the procedural query language. This is the step by step process to obtain result of query.

Types - Relational operations



Select operation

-> selects tuples according to the given condition.

-> denoted by sigma (σ).

-> $\sigma_P(r)$ σ - selection prediction

r - relation

P - propositional logic formula.

Ex:

$\sigma_{\text{Branch-name} = \text{"Perrybridge"}}(\text{loan})$.

Project operation: shows list of operators and attributes. It is denoted by " π ".

$\pi_{\text{name, city}}(\text{customer})$

Union operation:

Suppose if there are two tuples 'R' and 'S'.

Union operation contains all tuples that are either in R or S.

RUS

Example:

Depositor relation:

customer-name	Acc-no
Johnson	A101
Smith	A121
Turner	A176
Jones	A472

Borrow relation:

customer-name	loan-no
Jones	L17
Smith	L23
Hayes	L15
Williams	L17

$\Pi_{\text{customer-name}}(\text{Borrower}) \cup \Pi_{\text{customer-name}}(\text{Depositor})$

o/p:

customer-name
Johnson
Smith
Turner
Jones
Smith
Hayes
Williams

Set intersection:

Suppose there are two tuples R and S. Intersection contains the record which present in both R and S.

Ex: $\Pi_{\text{customer-name}}(\text{Borrower}) \cap \Pi_{\text{customer-name}}(\text{loan})$

o/p

customer Name
Smith
Jones

Cartesian Product

Combine each row in a table with each row in another table. This is also called as "cross product".

R x S

Example:

Emp_id	name	dept
1	John	A
2	Smith	C
3	Harry	B
4	Jones	D

Dept_no	Dept_name
A	Marketing
B	Sales
C	Legal

Op: R x S \Rightarrow Employee X Department

Emp_id	name	dept	dept_no	Dept_name
1	John	A	A	marketing
2	John	A	B	Sales
1	John	A	C	legal
2	Smith	C	A	marketing
2	Smith	C	B	Sales
2	Smith	C	C	legal
3	Harry	B	A	marketing
3	Harry	B	B	Sales
3	Harry	B	C	legal

Rename Operation:

- \rightarrow Used to rename the output relation.
- \rightarrow denoted by $\rho(p)$

Ex: $\rho(\text{Student 1}, \text{Student})$.

here student relation is renamed to student 1.

Join operations

It combines related tuples from different relations.

It is denoted by \bowtie .

Ex: Employee

Emp_code	name
101	A
102	B

salary

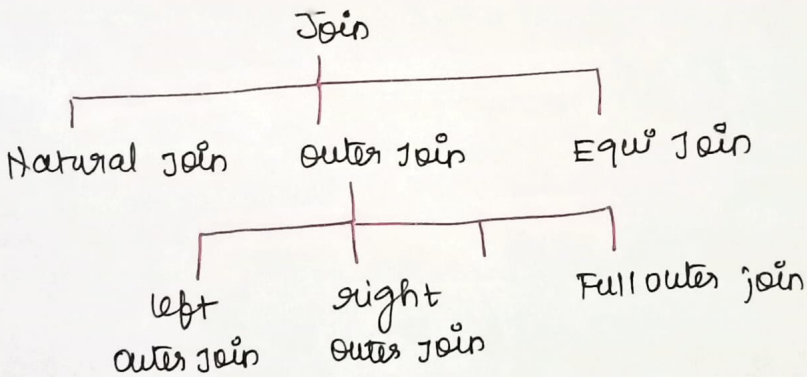
Emp_code	salary
101	50000
102	35000

operation: Employee \bowtie salary.

o/p:

Emp_code	name	salary
101	A	50000
102	B	35000

Types of join operations:



Natural join ::

Π Emp_name, salary (Employee \bowtie salary).

outer join ::

This deals with missing information.

left :: Employee \bowtie Fac-workers.

Right :: Employee \bowtie Fac-workers.

Full :: Employee \bowtie Fac-workers.