Query: List projects (PNO) that are common to emp 1234 and emp 3334

works-ON: 1, 2

2, 3, 10, 20

PNO
2

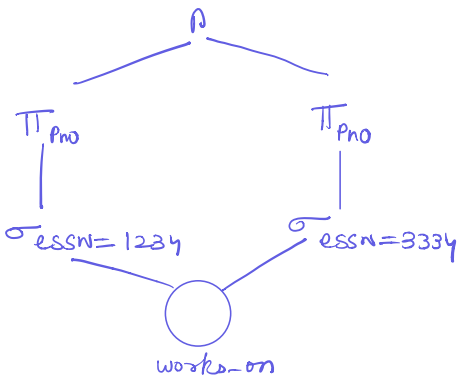
I $\pi_{Pno}(\sigma_{essn=1234 \text{ or } essn=3334}) works\text{-}on$ ✗

1, 2, 3, 10, 20

II $\pi_{Pno}(\sigma_{essn=1234 \wedge essn=3334}) works\text{-}on$ ✗

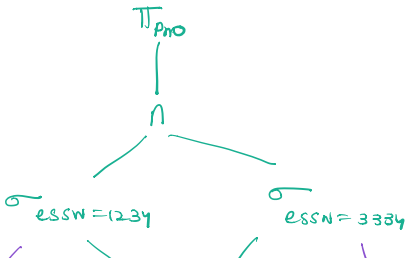
No output

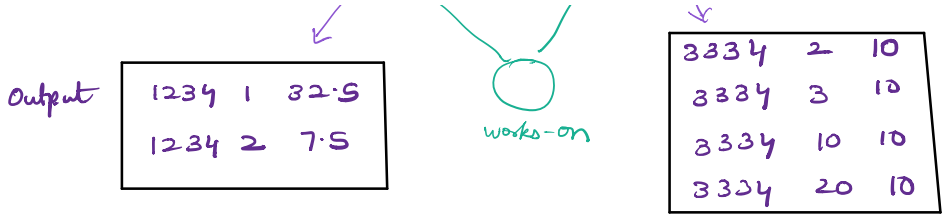
III $\pi_{PNO}(\sigma_{essn=1234}(workson)) \cap \pi_{PNO}(\sigma_{essn=3334}(workson))$ ✓



IV $\pi_{PNO}(\sigma_{essn=1234}(workson) \cap \sigma_{essn=3334}(workson))$ ✗

empty table





Query: List SSN of all employees who either work in dep 5 or supervise an emp who works in dep 5.

$$\Pi_{SSN}(\sigma_{dno=5}(Emp)) \cup \rho_{(SSN)}(\Pi_{super\_SSN}(\sigma_{dno=5}(Emp)))$$

Query: List names of emp along with names of dependents.

↑ a new table with attributes from Emp → Fname & Dependent → Dep_name

Cross-Product ×

A: {1, 2, 3} B: {a, b}

$A \times B = \{ (1,a)\ (1,b)\ (2,a)\ (2,b)\ (3,a)\ (3,b) \}$

$B \times A = \{ (a,1)\ (a,2)\ (a,3)\ (b,1)\ (b,2)\ (b,3) \}$

n_A : number of tuples in A

n_B : number of tuples in B

$n_A * n_B$ = number of tuples in $A \times B$

C_A : # of columns in A

C_B : # of columns in B

$(C_A + C_B)$ = # of columns in $A \times B$

EMP : 8 rows, 10 col $8 * 7 = 56$ rows

DEPENDENT : 7 rows, 5 col $10 + 5 = 15$ columns

EMP

SSN	Name
1234	Mary
5678	Ann
9111	Joe
8888	Jack

DEP

ESSN	Child
1234	Adam
1234	Sue
9111	Joe Jr

RESULT

Emp Name	Children
Mary	Adam
Mary	Sue
Joe	Joe Jr

EMP × DEP : 12 rows
4 columns

EMP × DEP

SSN	Name	ESSN	Child
1234	Mary	1234	Adam
1234	Mary	1234	Sue
1234	Mary	9111	Joe Jr
5678	Ann	1234	Adam
5678	Ann	1234	Sue
5678	Ann	9111	Joe Jr
9111	Joe	1234	Adam
9111	Joe	1234	Sue
9111	Joe	9111	Joe Jr
8888	Jack	1234	Adam
8888	Jack	1234	Sue
8888	Jack	9111	Joe Jr

$$\pi_{name,\ child}\left(\sigma_{SSN = ESSN}\left(EMP \times DEP\right)\right)$$

Query: List names of dependents of female emp.