Assignment 2: File/assignments/hw2RA

Join $\bowtie$ $\equiv$ $\times$ followed by σ

Natural Join $\bowtie$ $*$

Query: List Dname, Dnumber, Dlocation

$\pi_{Dname, Dnumber}(Department) \bowtie Dept\_Loc$

$\pi_{Dname, Dnumber, Dlocation}(Dept \bowtie Dept\_Loc)$ OR

$\pi_{Dname, Dnumber, Dlocation}(Dept * Dept\_Loc)$

$Dept.dnumber = Dept\_Loc.dnumber$

Query: List emp name & Dependent name.

$\pi_{Fname, dep\_name}(\sigma_{SSN=essn}(Emp \times Dependent))$

OR

$\pi_{Fname, dep\_name}(Emp \bowtie_{SSN=essn} Dependent)$

OR

$\pi_{Fname, depname}(Emp * (\rho_{SSN, Deprame}(\pi_{(essn, dependent)} Dependent)))$

Query: What is the output of:

$$\pi_{SSN,sex}(EMP) \bowtie \rho_{(SSN,SEX,depname)}(\pi_{essn,sex,depname}(Dependent))$$

SSN	sex	Dep-name
1234	m	Michael
3334	m	Theodore

Dependents who have the same sex as the parent emp.

$$\bowtie_{emp.SSN = dependent.SSN \;\wedge\; emp.sex = dependent.sex}$$

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

$$W1 \leftarrow \sigma_{ESSN='1234'}(works\text{-}on) \rightarrow 2$$

$$W2 \leftarrow \sigma_{ESSN=3334}(works\text{-}on) \rightarrow 4$$

$\pi_{w1.pno}\left(w1 \bowtie_{w1.pno = w2.pno} w2\right)$ $2 * 4 = 8$ rows

$w1 \leftarrow$ works-on — 16

$w2 \leftarrow$ works-on — 16

$\pi_{w1.pno}\left(w1 \bowtie_{\substack{w1.pno = w2.pno \\ \wedge \\ w1.essn = 1234 \\ \wedge \\ w2.essn = 8334}} w2\right)$

$16 * 16 = 256$ rows

Query: List SSN and names of emp who either work in dep = 5 or supervise an emp. who works in dep 5.

$\pi_{SSN, Fname}(\sigma_{dno=5} Emp) \cup \pi_{SSN, Fname}(\rho_{SSN, Fname}(\pi \ldots))$

Output

1234	John
3334	John

$A \leftarrow \pi_{superSSN}(\sigma_{dno=5}(EMP))$

$B \leftarrow EMP \bowtie_{SSN=superSSN} A$

$C \leftarrow \pi_{Fname, SSN}(B)$

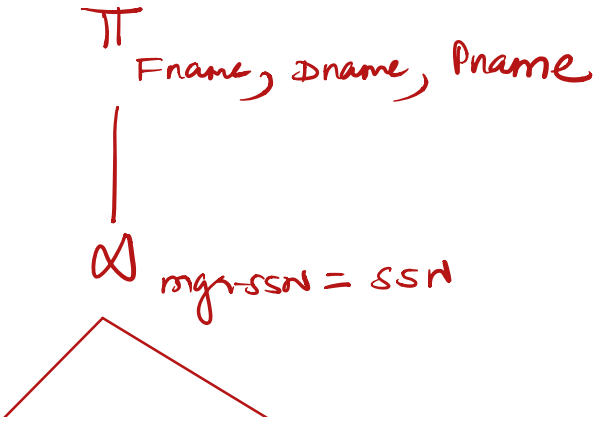
$D \leftarrow \pi_{Fname, SSN}(\sigma_{dno=5} EMP)$

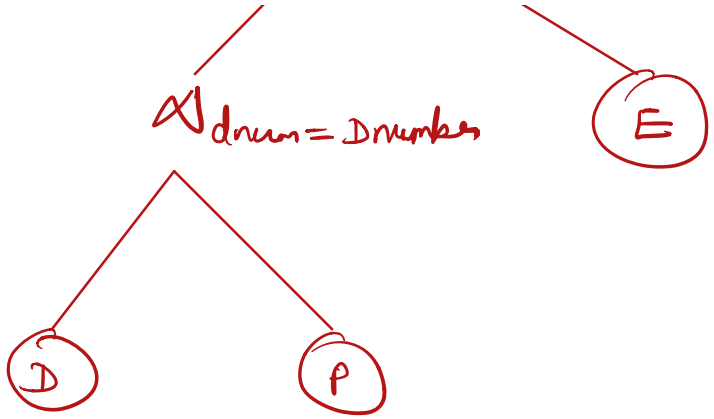
$Result \leftarrow C \cup D$

N- way join

Query: List each project name with its department manager's name.

$\pi_{\_}(Project \bowtie_{Dnum=Dnumber} Department \bowtie_{mgr\_SSN=SSN} Employee)$





Note : Order of joins does not matter, but RA solves from left to right like MATH.

Query: List the emp name along with employee's project name.

$$\pi_{Fname,\ Pname}\left(\left(Works \bowtie_{ESSN=SSN} Emp\right) \bowtie_{Pno=Pnumber} Project\right)$$

OR

$$\pi_{Fname,\ Pname}\left(Works \bowtie_{Pno=Pnumber} Project \bowtie_{ESSN=SSN} Emp\right)$$