Natural-Join Operation

- Notation srbe relations on schemas R and S respectively. Then, $r \bowtie s$ is a relation on schema $R \cup S$ obtained as follows:
 - \square Consider each pair of tuples t_r from r and t_s from s.
 - If t_r and t_s have the same value on each of the attributes in $R \cap S$, add a tuple t to the result, where
 - \Box . . . t has the same value as t_{r} on r
 - \Box thas the same value as t_S on s

Example:

$$R = (A, B, C, D)$$

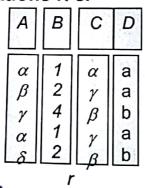
S = (E, B, D)

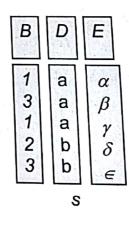
- Result schema = (A, B, C, D, E)
- \sqsupset $r \bowtie s$ is defined as:

 $\prod_{r.A, r.B, r.C, r.D, s.E} (\sigma_{r.B} = s.B \wedge r.D = s.D (r \times s))$

Natural Join Operation - Example

Relations r. s:





 $r \bowtie s$

A	В	С	D	Ε
α α α α	1 1 1 1 2	$\begin{bmatrix} \alpha \\ \alpha \\ \gamma \\ \gamma \\ \alpha \end{bmatrix}$	a a a a b	$\begin{bmatrix} \alpha \\ \gamma \\ \alpha \\ \gamma \end{bmatrix}$

OUTER JOIN:

OUTER outer join operation is an extension of the join operation to deal with missing information.

There are three forms of outer join

- > left outer join
- > right outer join
- > full outer join

employee:

Empname Street Coyote T	City
Rabbit	Hollywood
Smith	carrot
William	Death valley
Seaview	Seattle

Ft_works:

Empname	Branch name	Salary	
Coyote	Mesa	1500	
Rabbit	Mesa	1300	
Gates	Redmond	5300	
William	Redmond	1500	

Employee ⋈ ft_works

Empname	Street	City	Branch	Salary
			name	
Coyote	Toon	Hollywood	Mesa	1500
Rabbit	Tunnel	carrot	Mesa	1300
William	Seaview	Seattle	Redmond	1500

Left outer join:

It takes all tuples in the left relation that did not match with any tuple in the right relation, pads the tuples with null values for all other attributes. The right relation and adds them to the result of the natural join. In tuple (smith, Revolcer, Death valley, null, null) is such a tuple. All information from the left relation is present in the result of the left outer join.

Empname	Street	City	Branch	Salary
			name	
Coyote	Toon	Hollywood	Mesa	1500
Rabbit	Tunnel	carrot	Mesa	1300
William	Seaview	Seattle	Redmond	1500
Smith	Revolver	Death valley	Null	null

Right outer join:

It is symmetric with the left outer join. It pads tuples from the right relation that did not match any from the left relation with nulls and adds them to the result of the natural join. tuple(Gates,null,null,Redmond,5300) is such a tuple. Thus, all information from the right relation is present in the result of the right outer join.

Empname	Street	City	Branch	Salary
			name	
Coyote	Toon	Hollywood	Mesa	1500
Rabbit	Tunnel	carrot	Mesa	1300
William	Seaview	Seattle	Redmond	1500
gates	Null	null	Redmond	5300

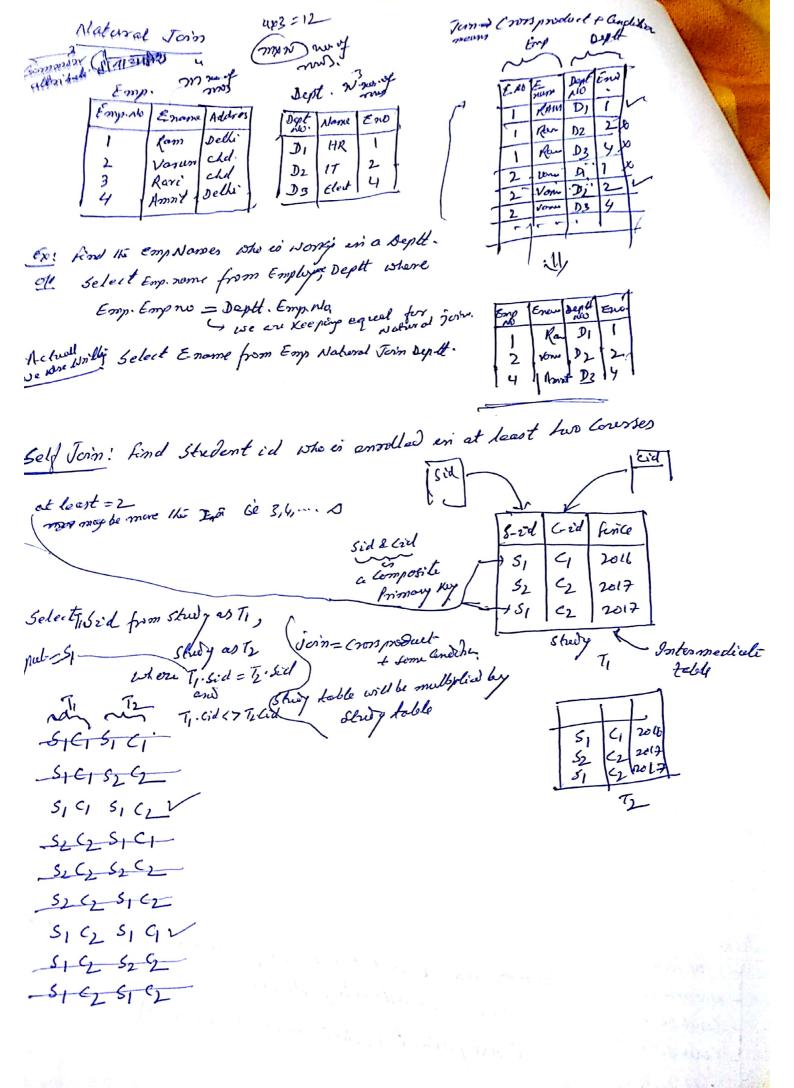
Full outer join:

It does both of those operations, padding tuples from the left relation that did not match any from the right relation, as well as tuples from the right relation that did not match any from the left relation, and adding them to the result of the join. Figure 3.35 shows the result of a full outer join.

Since outer join operations may generate results containing null values, we need to specify how the different relation-algebra operations deal with null values. It is interesting to note that the outer join operations can be expressed by the basic relational algebra operations. For instance the left outer join operation

Employee ft_works

Empname	Street	City	Branch	Salary
			name	
Coyote	Toon	Hollywood	Mesa	1500
Rabbit	Tunnel	carrot	Mesa	1300
William	Seaview	Seattle	Redmond	
gates	Null	null		1500
		Hull	Redmond	5300



find the Emp name who worked in a department having lector Sense as this address ? D, Delli 10 I RAM Delhi Dept. Dop no locals to no Enon Adibo LRAM Delli the lune L Rom Del De Patria 4 1 RAM Dethat DI Delli Varus che 2 2 Verun che Dr Delle 1 Pune 2 Keri che 3 De fant 2 De Patral 4 _2 Vener che Amn'el Delhi 2 Vonen cho D3 Polma 4 1 Jellit - 3 Rave chil Select Ename from Employee, Depth where 3 Ravi chil 12 Pane 2 Eng. Eno = Dept. Eno onel 3 Raxi chel D3 Patro 4 fadf=f .4 Amn't selli D. selli 1 Emp. Address = Dept. Location -4 Amrit Balli 12 Por Z ordput = RAM - 4 Ammit Delle D3 Kto 4 Left outer Join! It gives the matching rows and its gives the nows which are in lef table but not in right table. Dept. no Deplace D-ran Loc. Varier DI Delhi 17

Amnit

Ravi Nitin

Ocin = Cross product + Condition

Equi Join

Hyd-

HR