

Sample Database

"Company" - Employee, Department, Project, Workson, ^{Dependent}

"Premiere Products" - Customer, Rep, Order, OrderLine, Part

"Henry Books" - Book, Author, Publisher, Branch, Inventory

"Company Database" - DS:

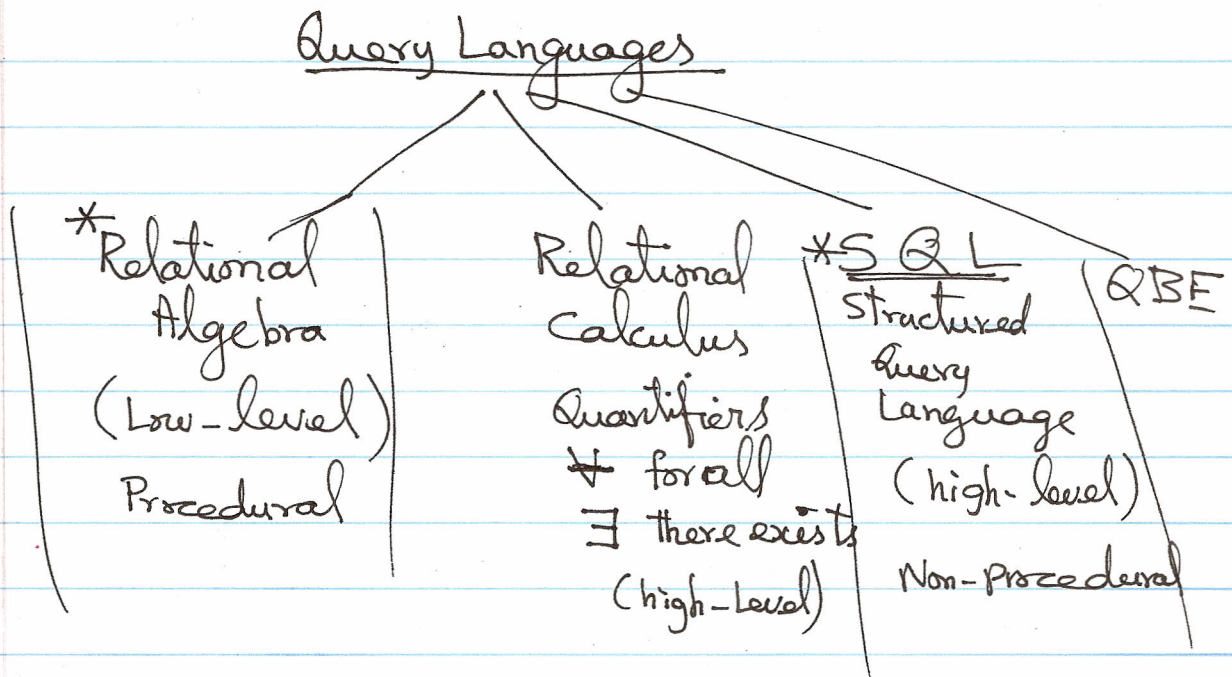


Figure 5.5 Schema diagram for the COMPANY relational database schema.

• **EMPLOYEE**

Fname	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
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• **DEPARTMENT**

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
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• **DEPT_LOCATIONS**

<u>Dnumber</u>	<u>Dlocation</u>
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• **PROJECT**

Pname	<u>Pnumber</u>	Plocation	Dnum
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• **WORKS_ON**

<u>Essn</u>	<u>Pno</u>	Hours
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• **DEPENDENT**

<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
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Figure 5.6 One possible database state for the COMPANY relational database schema.

EMPLOYEE

Fname	Minit	Lname	<u>Ssn</u>	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000	987654321	4
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	NULL	1

DEPARTMENT

Dname	<u>Dnumber</u>	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT_LOCATIONS

<u>Dnumber</u>	<u>Dlocation</u>
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

Figure 5.6 (continued) One possible database state for the COMPANY relational database schema.

WORKS_ON

<u>Essn</u>	<u>Pno</u>	Hours
1 23456789	1	32.5
1 23456789	2	7.5
666884444	3	40.0
453453453	1	20.0
453453453	2	20.0
333445555	2	10.0
333445555	3	10.0
333445555	10	10.0
333445555	20	10.0
999887777	30	30.0
999887777	10	10.0
987987987	10	35.0
987987987	30	5.0
987654321	30	20.0
987654321	20	15.0
888665555	20	NULL

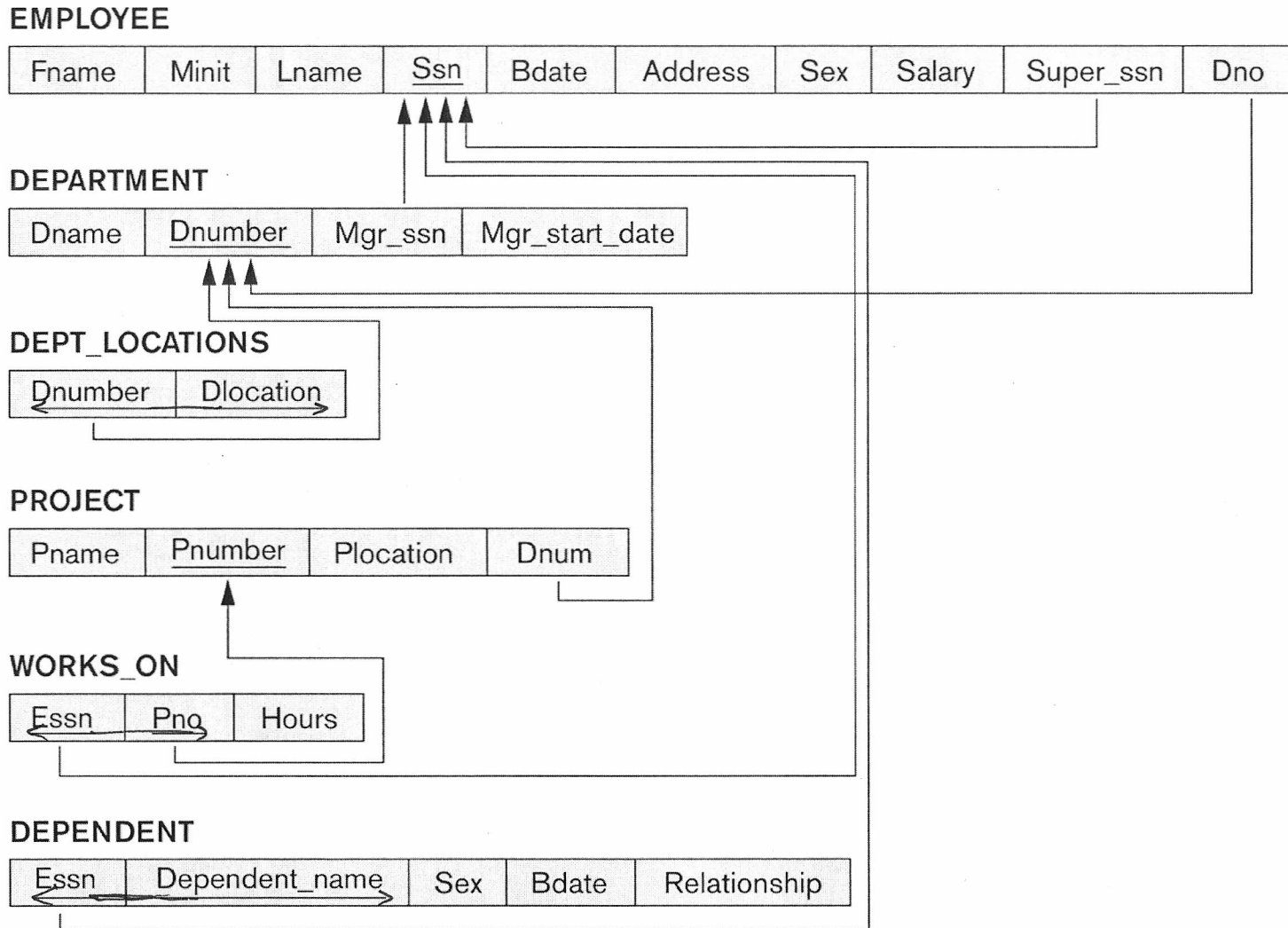
PROJECT

<u>Pname</u>	<u>Pnumber</u>	Plocation	Dnum
ProductX	1	Bellaire	5
ProductY	2	Sugarland	5
ProductZ	3	Houston	5
Computerization	10	Stafford	4
Reorganization	20	Houston	1
Newbenefits	30	Stafford	4

DEPENDENT

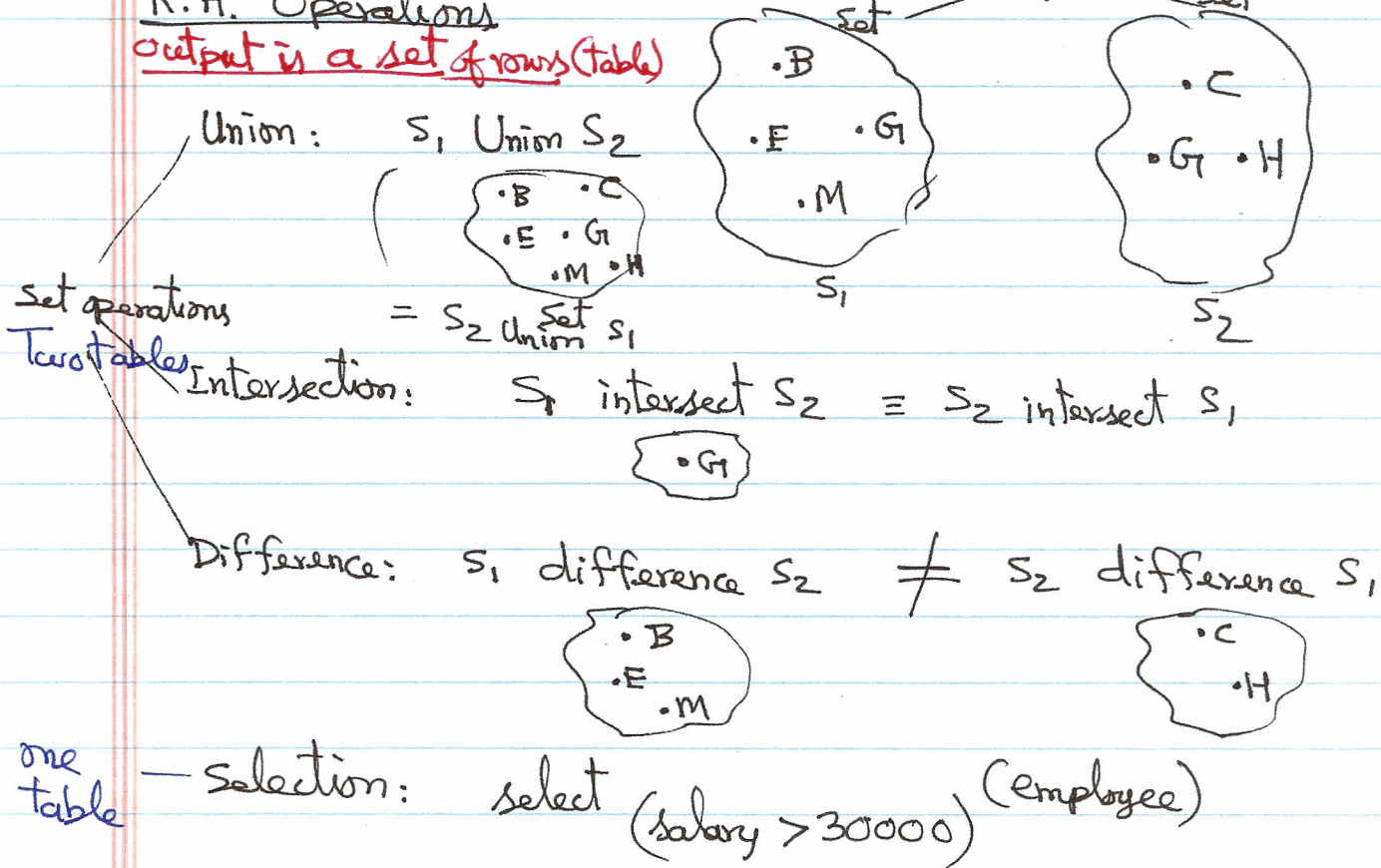
<u>Essn</u>	<u>Dependent_name</u>	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	Daughter
333445555	Theodore	M	1983-10-25	Son
333445555	Joy	F	1958-05-03	Spouse
987654321	Abner	M	1942-02-28	Spouse
123456789	Michael	M	1988-01-04	Son
123456789	Alice	F	1988-12-30	Daughter
123456789	Elizabeth	F	1967-05-05	Spouse

Figure 5.7 Referential integrity constraints displayed on the COMPANY relational database schema.



Relational Algebra (R.A.) (Sets of data)

R.A. Operations
output is a set of rows (table)

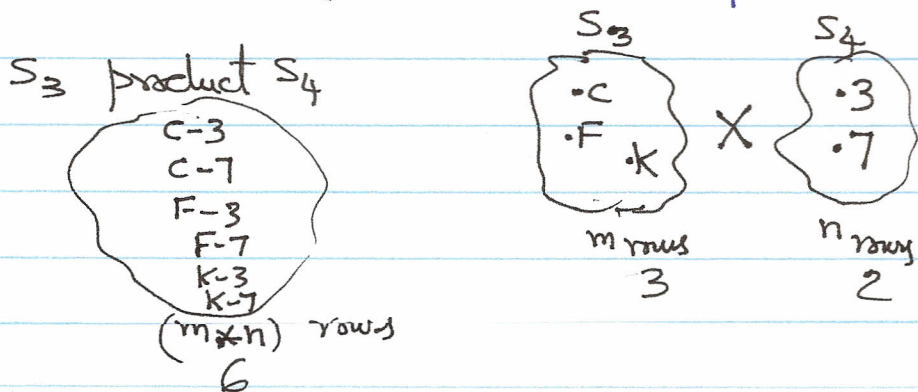


one table — projection: $\leftarrow \text{project } \text{Fname, Lname} (\text{employee})$
8 rows
(verb)

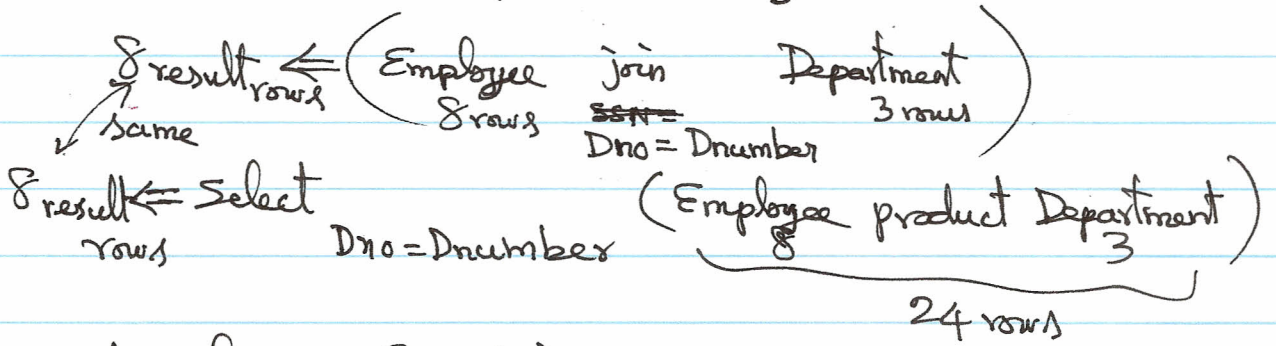
6 rows with salary values $\leftarrow \text{project } \text{salary} (\text{employee})$

The projected result table should not have duplicate rows.

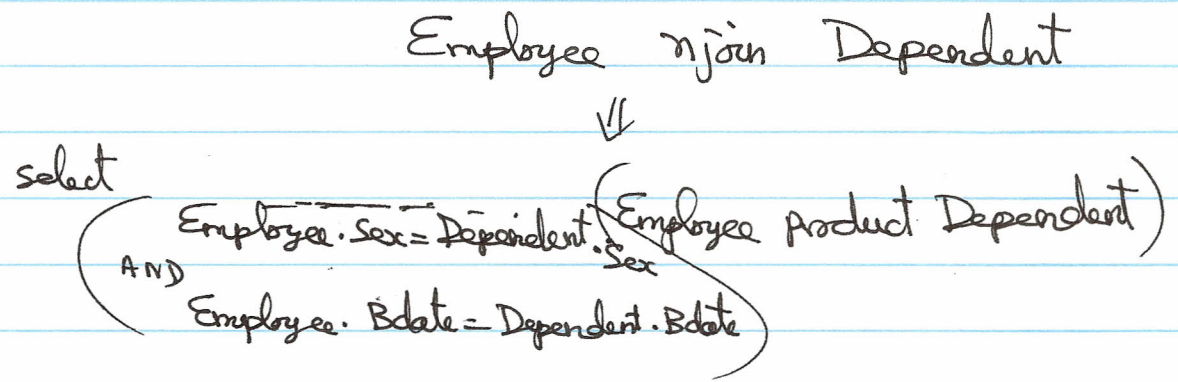
Two tables Product



join: Set_A join Set_B



Natural join (njoin)



Sample Databases

- Company
- Premiere
- EmployeeTraining
- Henry

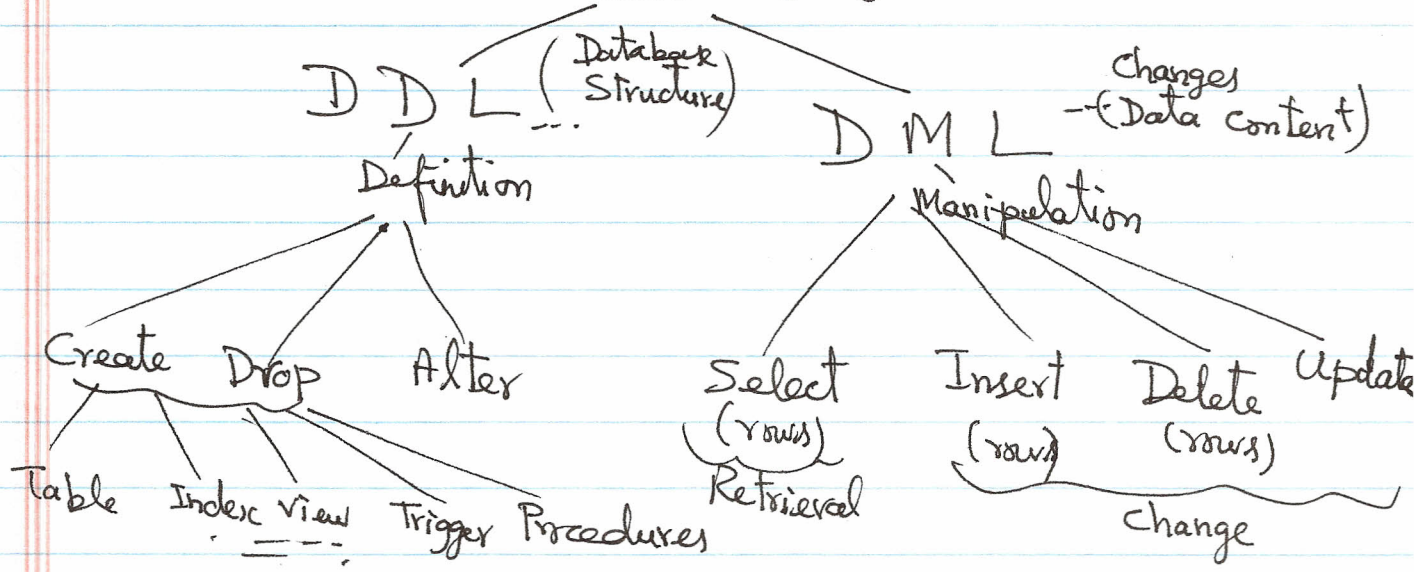
WinRDBI

- ✓ *.rdp — relational database file (text file)
- ✓ *.alg — algebra query file (text)
- ignore $\left[\begin{array}{l} *.drc — relational domain calculus query file \\ *.trc — " tuple calculus " " \\ *.sql — " sql " " \end{array} \right.$

Synonyms:

- Table - Relation
- Row - Record - Tuple
- Column - Attribute - Field

Structured Query Language (SQL)



SQL script - File contains a set of SQL statements