

One possible database state for the COMPANY relational database schema.

EMPLOYEE

Fname	Minit	Lname	Ssn	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	Dnumber	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

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

WORKS_ON

Essn	Pno	Hours
123456789	1	32.5
123456789	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

Pname	Pnumber	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

Essn	Dependent_name	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

CLIENT

CName	Pno
Snap	1
QTC	2
LinkedIn	3
JPL	10
Google	20
JPL	30

Specify the following queries on the COMPANY relational database schema shown in above Figure, using the relational operators discussed in this chapter. Also show the result of each query as it would apply to the database state of Figure 3.6.

- (1) Retrieve the names of employees in department 5 who work more than 10 hours per week on the 'ProductX' project.
- (2) List the names of employees who have a dependent with the same first name as themselves.
- (3) Find the names of employees that are directly supervised by 'Franklin Wong'.
- (4) For each project, list the project name and the total hours per week (by all employees) spent on that project.
- (5) Retrieve the names of employees who work on every project of JPL.
- (6) Retrieve the names of employees who do not work on any project.
- (7) For each department, retrieve the department name, and the average salary of employees working in that department.
- (8) Retrieve the average working hour of all female employees.
- (9) Find the names and addresses of employees who work on at least one project located in Houston but whose department has no location in Houston.
- (10) List the last names of department managers who have no dependents.
- (11) List the managers who are controlling more than 2 projects.
- (12) Retrieve the names of the departments that only located in 'Houston'.
- (13) List the names of employees all of whose dependents were born before 1960.
- (14) List the names of departments managed by the direct subordinator of the manager of 'Headquarters' department.
- (15) Retrieve the average salary of male employees who work totally no less than 50 hours on projects.