Introduction to
Database Systems
CMP202/N202

Fundamentals of Database Systems 6th ed.
**Chapter 5 More SQL: Complex Queries,
Triggers, Views, and Schema Modification**

Sheet 6
Fall 2019

5.5 Specify the following queries in SQL on the COMPANY relational database schema shown in Figure 3.5. Show the result of each query if it is applied to the COMPANY database in Figure 3.6.

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date

DEPT_LOCATIONS

Dnumber	Dlocation

PROJECT

Pname	Pnumber	Plocation	Dnum

WORKS_ON

Essn	Pno	Hours

DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship

Figure 3.5
Schema diagram for the COMPANY relational database schema.

(a) For each project, list the project name and the total hours per week (by all employees) spent on that project.

(b) Retrieve the names of employees who do not work on any project.

(c) Retrieve the names of employees who work on every project.

(d) For each department, retrieve the department name, and the average salary of employees working in that department.

(e) Retrieve the average salary of all female employees.

(f) 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.

(g) List the last names of department managers who have no dependents.

(h) For each department whose average employee salary is more than $30000, retrieve the department name and the number of employees working for that department.

(i) In part (h) above, suppose we want the number of **male** employees in each department rather than all employees .Can we specify this query in SQL? Why or why not?

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Sheet 6
Fall 2019

Figure 3.6
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

5.6. Specify the following queries in SQL on the database schema in Figure 1.2.

(a) Retrieve the names and major departments of all straight-A students (students who have a grade of A in all their courses).

(b) Retrieve the names and major departments of all students who do not have a grade of A in any of their courses.

5.7. In SQL, specify the following queries on the database in Figure 3.5 using the concept of nested queries and concepts described in this chapter.
(a) Retrieve the names of all employees who work in the department that has the employee with the highest salary among all employees.

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Fall 2019

    (b) Retrieve the names of all employees whose supervisor's supervisor has '888665555' for Ssn.

    (c) Retrieve the names of employees who make at least $10,000 more than the employee who is paid the least in the company.

5.8. Specify the following views in SQL on the COMPANY database schema shown in Figure 3.5

    (a) A view that has the department name, manager name, and manager salary for every department.

    (b) A view that has the employee name, supervisor name, and employee salary for each employee who works in the 'Research' department.

    (c) A view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project.

    (d) A view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project with more than one employee working on it.