The Company Database

1. Overview

Most of the SQL examples are based on the company database, so you should study it carefully.

2. The Company Database

The company database keeps track of a company's employees, departments, and projects. Suppose that after the requirements collection and analysis phase, the database designers provide the following description of the mini world. The part of the company that will be represented in the database.

- The company is organized into departments. Each department has a unique name, a unique number, and a particular employee who manages the department. We keep track of the start date when that employee began managing the department. A department may have several locations.
- A department controls a number of projects, each of which has a unique name, a unique number, and a single location.
- The database will store each employee's name, Social Security number, address, salary, sex (gender), and birth date. An employee is assigned to one department, but may work on several projects, which are not necessarily controlled by the same department. It is required to keep track of the current number of hours per week that an employee works on each project, as well as the direct supervisor of each employee (who is another employee).
- The Social Security number, or SSN, is a unique nine-digit identifier assigned to each individual in the United States to keep track of his or her employment, benefits, and taxes. Other countries may have similar identification schemes, such as personal identification card numbers.
- The database will keep track of the dependents of each employee for insurance purposes, including each dependent's first name, sex, birth date, and relationship to the employee.

SCHEMA

EMPLOYEE (fname, minit, lname ,ssn , bdate, address, sex, salary, superssn, dno)

DEPARTMENT (dname, dnumber, mgrssn, mgrstartdate,)

PROJECT (pname, pnumber, plocation, dnum)

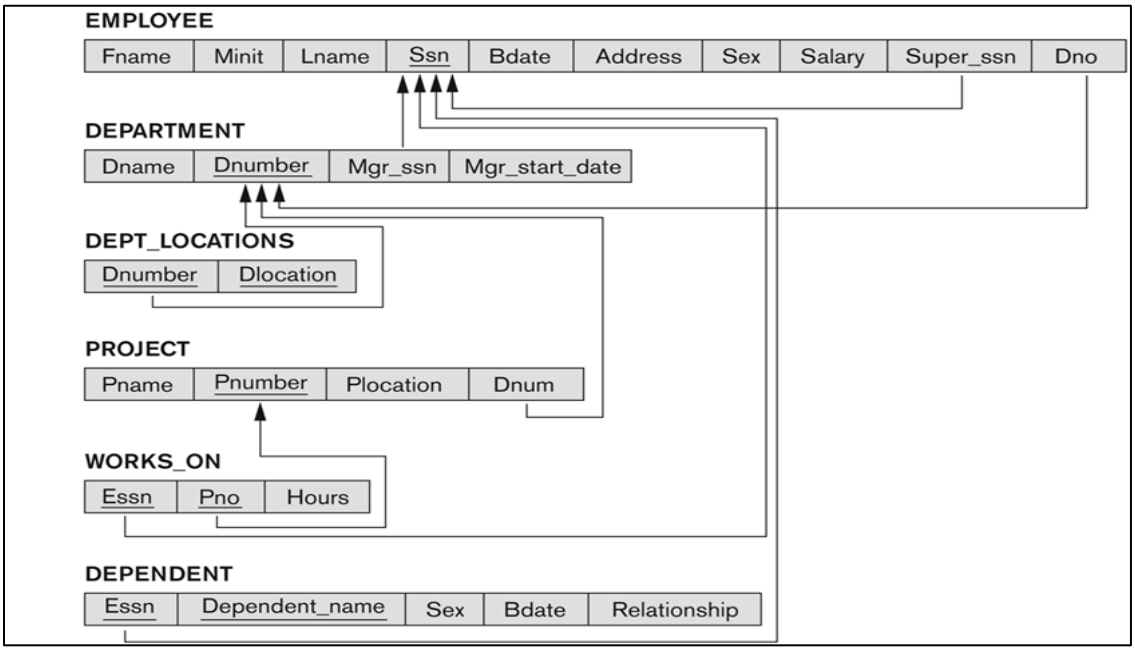
WORKS_ON (essn, pno, hours)

DEPT_LOCATIONS (dnumber , dlocation)

DEPENDENT (essn, dependent_name, sexr, bdate, relationship)

1. Full Schema

The full schema of the company database as used in the lab exercises.



2. Tables for the Company Database

Field	Type	Null	Key	Default	Extra
dname	varchar(25)	NO	UNI	NULL	
dnumber	int(4)	NO	PRI	NULL	
mgrssn	char(9)	NO	MUL	NULL	
mgrstartdate	datetime	YES		NULL	

Structure of the DEPARTMENT Table

Field	Type	Null	Key	Default	Extra
fname	varchar(15)	NO		NULL	
minit	varchar(1)	YES		NULL	
lname	varchar(15)	NO		NULL	
ssn	char(9)	NO	PRI	NULL	
bdate	datetime	YES		NULL	
address	varchar(50)	YES		NULL	
sex	char(10)	YES		NULL	
salary	decimal(10,2)	YES		NULL	
superssn	char(9)	YES	MUL	NULL	
dno	int(4)	YES		NULL	

Structure of the EMPLOYEE Table

Field	Type	Null	Key	Default	Extra
pname	varchar(25)	NO	UNI	NULL	
pnumber	int(4)	NO	PRI	NULL	
plocation	varchar(15)	YES		NULL	
dnum	int(4)	NO	MUL	NULL	

Structure of the PROJECT Table

Field	Type	Null	Key	Default	Extra
dnumber	int(4)	NO	PRI	NULL	
dlocation	varchar(15)	NO	PRI	NULL	

Structure of the DEPT_LOCATIONS Table

Field	Type	Null	Key	Default	Extra
essn	char(9)	NO	PRI	NULL	
pno	int(4)	NO	PRI	NULL	
hours	decimal(4,1)	YES		NULL	

Structure of the WORKS_ON Table

Field	Type	Null	Key	Default	Extra
essn	char(9)	NO	PRI	NULL	
dependent_name	varchar(15)	NO	PRI	NULL	
sex	char(1)	YES		NULL	
bdate	date	YES		NULL	
relationship	varchar(8)	YES		NULL	

Structure of the DEPENDENT Table

3. The Data Dictionary for the Company Database

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

The Data Dictionary for the Company Database

Table Name	EMPLOYEE		
Key Type	**Column Name**	**Data Type**	**Size**
	Fname	VARCHAR	15
	minit	VARCHAR	1
	lname	VARCHAR	15
pk	ssn	CHAR	9
	bdate	DATETIME	
	address	VARCHAR	50
	sex	CHAR(1)	1
	salary	DECIMAL	10,2
Fk (EMPLOYEE)	superssn	CHAR	9
	dno	INT	4

Table Name	DEPARTMENT		
Key Type	**Column Name**	**Data Type**	**Size**
pk - uk	dname	VARCHAR	25
	dnumber	INT	4
fk	mgrssn	CHAR	9
	mgrstartdate	DATETIME	

Table Name	PROJECT		
Key Type	**Column Name**	**Data Type**	**Size**
pk	pname		
uk	pnumber		
	plocation		

Table Name	**customers**		
Key Type	**Column Name**	**Data Type**	**Size**
pk	ctr_number		
uk	email		
	first_name		
	last_name		
	phone_number		
	current_balance		
	loyalty_card_number		
fk1	tem_id		
fk2	sre_id		

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	loyalty_card_number		
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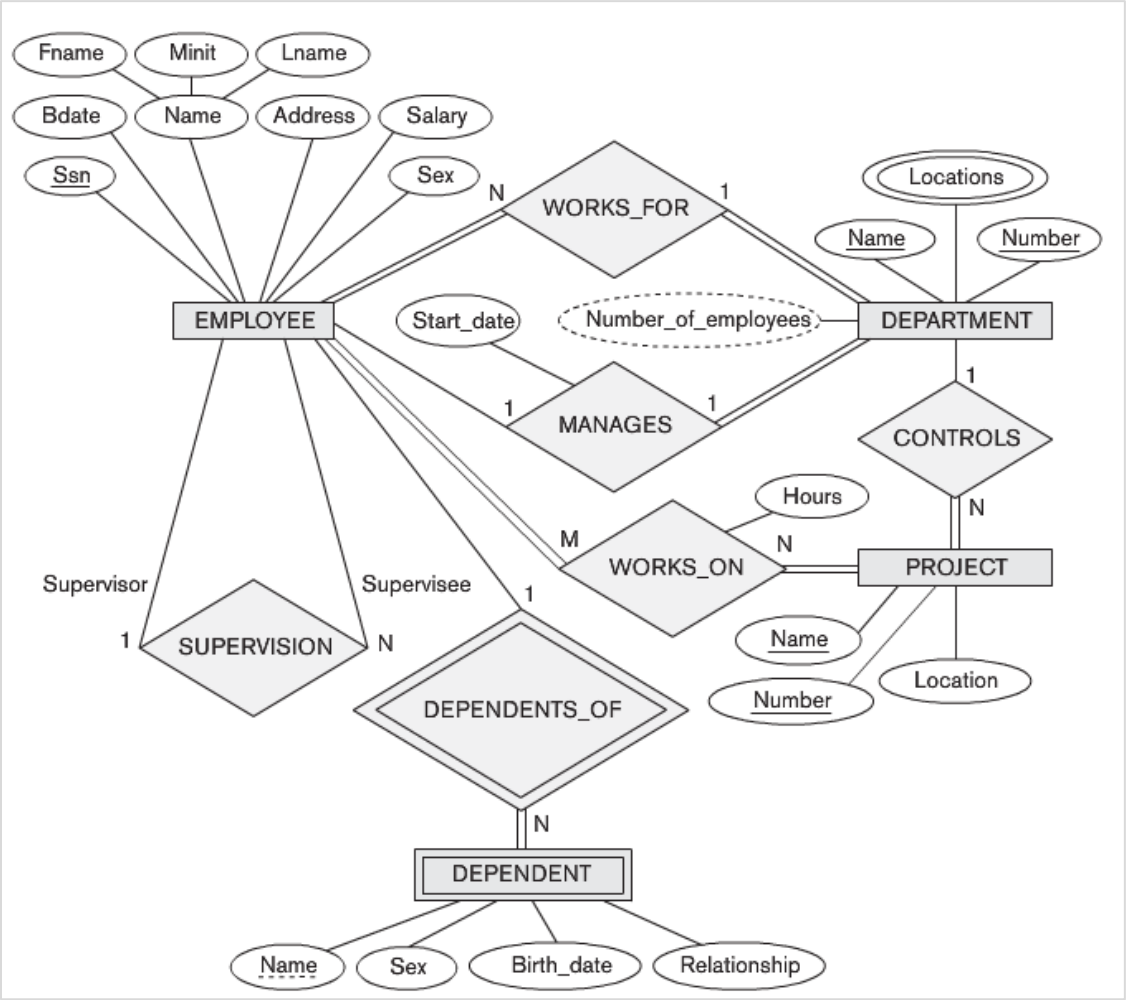
fk2	sre_id		

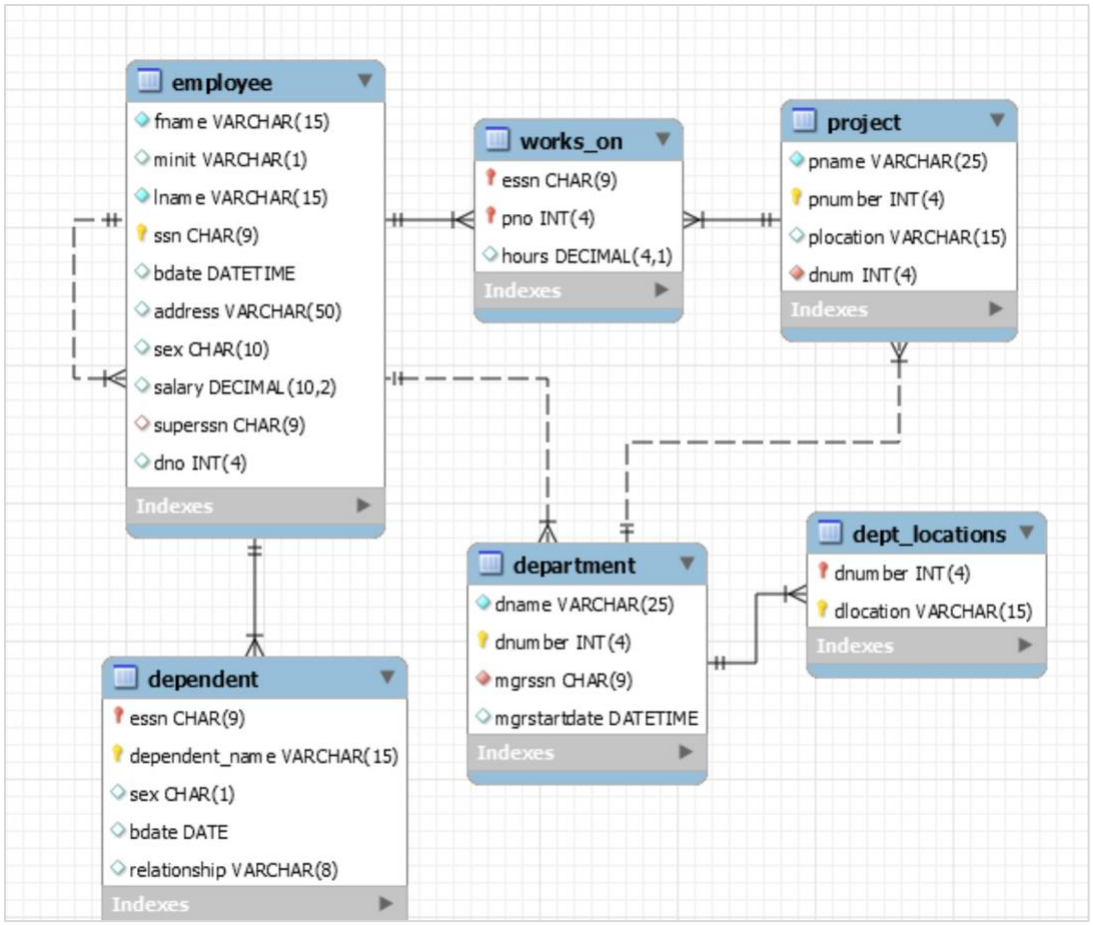
4. The E-R diagram

The next E-R diagram shows the relations between all the tables.



ER schema diagram for the company database

(from Fundamentals of Database Systems, Sixth Edition, 7th Edition, Ramez Elmasri)



ER schema diagram for the company Database