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Lab 5
190905104

DDL + Data Dump

```
CREATE TABLE EMPLOYEE (
Fname VARCHAR(20),
Minit CHAR(1),
Lname VARCHAR(20),
Ssn CHAR(9),
Bdate DATE,
Address VARCHAR(30),
Sex CHAR(1),
Salary NUMBER(5),
Super_Ssn CHAR(9),
Dno NUMBER(1),
PRIMARY KEY (Ssn),
FOREIGN KEY (Super_ssn) REFERENCES EMPLOYEE (Ssn)
);

INSERT INTO EMPLOYEE VALUES ('James', 'E', 'Justin', '123456789', DATE '1937-11-10', '450
Stone, Houston, TX', 'M', 55000, NULL, 1);
INSERT INTO EMPLOYEE VALUES ('Jennifer', 'S', 'Tonanis', '987654321', DATE '1941-06-20',
'291 Berry, Bellaire, Tx', 'F', 37000, '123456789', 2);
INSERT INTO EMPLOYEE VALUES ('Franklin', 'T', 'George', '333445555', DATE '1955-12-08',
'638 Voss, Houston, TX', 'M', 40000, '987654321', 3);
INSERT INTO EMPLOYEE VALUES ('John', 'B', 'Smith', '123412341', DATE '1965-01-09', '731
Fondren, Houston, TX', 'M', 30000, '333445555', 2);
INSERT INTO EMPLOYEE VALUES ('Alicia', 'J', 'Keys', '123412342', DATE '1968-01-19', '3321
castle, Spring, TX', 'F', 25000, '987654321', 3);


CREATE TABLE DEPARTMENT(
Dname VARCHAR(20),
Dnumber NUMBER(1),
Mgr_ssn CHAR(9),
Mgr_start_date DATE,
PRIMARY KEY (Dnumber),
FOREIGN KEY (Mgr_ssn) REFERENCES EMPLOYEE (Ssn)
);

INSERT INTO DEPARTMENT VALUES ('Research', 1, '333445555', DATE '1988-05-22');
```

```
INSERT INTO DEPARTMENT VALUES ('Administration', 2, '987654321', DATE '1995-01-01');
INSERT INTO DEPARTMENT VALUES ('Headquarters', 3, '123456789', DATE '1981-06-19');

ALTER TABLE EMPLOYEE ADD FOREIGN KEY (Dno) REFERENCES
DEPARTMENT(Dnumber);

CREATE TABLE DEPT_LOCATIONS (
Dnumber NUMBER(1),
Dlocation VARCHAR(20),
PRIMARY KEY (Dnumber, Dlocation),
FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber)
);

INSERT INTO DEPT_LOCATIONS VALUES (1, 'Houston');
INSERT INTO DEPT_LOCATIONS VALUES (2, 'Stanford');
INSERT INTO DEPT_LOCATIONS VALUES (3, 'Bellaire');
INSERT INTO DEPT_LOCATIONS VALUES (2, 'Sugarland');
INSERT INTO DEPT_LOCATIONS VALUES (3, 'Austin');

CREATE TABLE PROJECT (
Pname VARCHAR(20),
Pnumber NUMBER(2),
Plocation VARCHAR(20),
Dnum NUMBER(1),
PRIMARY KEY (Pnumber),
FOREIGN KEY (Dnum) REFERENCES DEPARTMENT(Dnumber)
);

INSERT INTO PROJECT VALUES ('ProductX', 1, 'Bellaire', 1);
INSERT INTO PROJECT VALUES ('ProductY', 2, 'Sugarland', 2);
INSERT INTO PROJECT VALUES ('ProductZ', 3, 'Houston', 3);
INSERT INTO PROJECT VALUES ('Computerization', 10, 'Stanford', 1);
INSERT INTO PROJECT VALUES ('Reorganization', 20, 'Houston', 2);
INSERT INTO PROJECT VALUES ('Newbenefits', 30, 'Stanford', 2);

CREATE TABLE WORKS_ON (
Essn CHAR(9),
Pno NUMBER(2),
Hours NUMBER(3,1),
PRIMARY KEY (Essn, Pno),
FOREIGN KEY (Essn) REFERENCES EMPLOYEE (Ssn),
FOREIGN KEY (Pno) REFERENCES PROJECT(Pnumber)
);
```

```
INSERT INTO WORKS_ON VALUES ('123456789', 1, 32.0);
INSERT INTO WORKS_ON VALUES ('123456789', 2, 8.0);
INSERT INTO WORKS_ON VALUES ('987654321', 1, 20.0);
INSERT INTO WORKS_ON VALUES ('987654321', 2, 20.0);
INSERT INTO WORKS_ON VALUES ('333445555', 3, 5.0);
INSERT INTO WORKS_ON VALUES ('333445555', 10, 10.0);
INSERT INTO WORKS_ON VALUES ('333445555', 20, 10.0);
INSERT INTO WORKS_ON VALUES ('333445555', 30, 5.0);
INSERT INTO WORKS_ON VALUES ('123412341', 30, 30.0);
INSERT INTO WORKS_ON VALUES ('123412341', 10, 10.0);
INSERT INTO WORKS_ON VALUES ('123412342', 30, 20.0);
INSERT INTO WORKS_ON VALUES ('123412342', 20, 15.0);

CREATE TABLE DEPENDENT(
Essn CHAR(9),
Dependent_name VARCHAR(20),
Sex CHAR(1),
Bdate DATE,
Relationship VARCHAR(10),
PRIMARY KEY (Essn, Dependent_name),
FOREIGN KEY (Essn) REFERENCES EMPLOYEE (Ssn)
);

INSERT INTO DEPENDENT VALUES ('333445555', 'Alice', 'F', DATE '1986-04-05', 'Daughter');
INSERT INTO DEPENDENT VALUES ('333445555', 'Theodore', 'M', DATE '1983-10-25', 'Son');
INSERT INTO DEPENDENT VALUES ('333445555', 'Joy', 'F', DATE '1958-05-03', 'Spouse');
INSERT INTO DEPENDENT VALUES ('123412341', 'Abner', 'M', DATE '1988-01-04', 'Son');
INSERT INTO DEPENDENT VALUES ('123412341', 'Jennifer', 'F', DATE '1988-01-04',
'Daughter');
INSERT INTO DEPENDENT VALUES ('123456789', 'John', 'M', DATE '1988-02-28', 'Son');
INSERT INTO DEPENDENT VALUES ('123456789', 'Alice', 'F', DATE '1988-12-30', 'Daughter');
INSERT INTO DEPENDENT VALUES ('123456789', 'Elizabeth', 'F', DATE '1967-05-05',
'Spouse');
INSERT INTO DEPENDENT VALUES ('123412342', 'Joyce', 'F', DATE '1990-04-05', 'Daughter');
```

1. Retrieve the birth date and address of the employee(s) whose name is ‘John B. Smith’.
Retrieve the name and address of all employees who work for the ‘Research’
Department.

```
Select bdate,address
```

```
from employee
where fname='John'
and minit='B'
and lname='Smith';

Select fname,minit,lname,address
from employee
natural join department
where dname='Research';
```

2. For every project located in ‘Stanford’, list the project number, the controlling department number, and the department manager’s last name, address, and birth date.

```
Select dname, lname, address, bdate, dnumber
from department natural join project,employee
where employee.ssn=mgr_ssn and plocation=’Stanford’;
```

3. Find all distinct salaries of employees.

```
Select distinct(salary) from employee;
```

4. For each employee, retrieve the employee’s first and last name and the first and last name of his or her immediate supervisor.

```
Select T.lname,T.fname,S.lname,S.fname
from employee T,employee S where T.ssn=S.super_ssn;
```

5. Make a list of all project numbers for projects that involve an employee whose last name is ‘Smith’, either as a worker or as a manager of the department that controls the Project.

```
Select pnumber from employee,works_on,project
where lname='Smith'
and employee.ssn=works_on.essn and works_on.pno=project.pnumber;
```

6. Retrieve all employees who reside is in Houston, Texas.

```
Select * from employee
where address like '%Houston, TX%';
```

7. Show the resulting salaries if every employee working on the ‘ProductX’ project is given a 10 percent raise.

```
Update employee set salary=1.1*salary where employee.ssn in
```

(Select essn from works_on,project
where works_on.pno=project.pnumber and pname='ProductX');

select salary from employee where employee.ssn in
(select essn from works_on, project
where works_on.pno=project.pnumber and pname='ProductX');

8. Retrieve all employees in department 5 whose salary is between 30,000 and 40,000.

Select fname from department,employee where dnumber=5 and salary between 30000 and 40000 and employee.dno=department.dnumber;

9. Retrieve a list of employees and the projects they are working on, ordered by department and, within each department, ordered alphabetically by last name, then first Name.

Select fname,lname from employee,project,works_on
where works_on.pno=project.pnumber and works_on.essn=employee.ssn
order by pnumber,fname,lname;

10. Retrieve the names of all employees who do not have supervisors.

Select fname,lname from employee where super_ssn is NULL;

11. Retrieve the name of each employee who has a dependent with the same first name and is the same sex as the employee.

Select lname,fname from employee,dependent where
employee.fname=dependent.dependent_name and employee.sex=dependent.sex;

12. Retrieve the names of employees who have no dependents.

Select distinct(fname) from employee,dependent where employee.ssn not in (Select essn from dependent);

13. List the names of managers who have at least one dependent.

select fname, lname from employee
where (select count(*) from dependent where ssn=essn) >= 1;

14. Retrieve the Social Security numbers of all employees who work on project numbers 1, 2, or 3.
select distinct(essn) from works_on where pno in (1, 2, 3);

15. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary.

```
select sum(salary),max(salary),min(salary),avg(salary) from employee;
```

16. Find the sum of the salaries of all employees of the ‘Research’ department, as well as the maximum salary, the minimum salary, and the average salary in this department.

```
Select sum(salary),max(salary),min(salary),avg(salary) from employee, department
where employee.dno=department.dnumber and dname='Research';
```

17. For each project, retrieve the project number, the project name, and the number of employees who work on that project.

```
select pnumber, pname, count(*) from project, works_on
where pnumber=pno group by pnumber, pname;
```

18. For each project on which more than two employees work, retrieve the project number, the project name, and the number of employees who work on the project.

```
select pnumber, pname, count(*) as total from project, works_on
where pnumber=pno group by pnumber, pname
having count(*)>=2;
```

19. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than 40,000.

```
select dno, count(*) from department, employee
where dno=dnumber and salary > 40000 and
dno in (select dno from employee group by dno having count(*) > 5)
group by dno;
```