

LAB 5**Schema:**

Employee(Fname,Minit,Lname,Ssn,Bdate,Address,sex,Salary,SuperSsn,Dno)

Department(DName,DNumber,MgrSsn,Mgr-Start-date)

Dept_Locations(DNumber,Dlocation)

Project(PName,PNumber,Plocation,DNum)

Works_on(Essn,PNo,Hours)

Dependent(Essn,Dependent-name,sex,BDate,Relationship)

DDL AND POPULATE

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 ('Mohammad', 'D', 'Eqbal', '888665555', DATE '1937-11-10', '450 Stone, Houston, TX', 'M', 55000, NULL, 1);

INSERT INTO EMPLOYEE VALUES ('Jennifer', 'S', 'Wallace', '987654321', DATE '1941-06-20', '291 Berry, Bellaire, Tx', 'F', 37000, '888665555', 4);

INSERT INTO EMPLOYEE VALUES ('Franklin', 'T', 'Wong', '333445555', DATE '1955-12-08', '638 Voss, Houston, TX', 'M', 40000, '888665555', 5);

INSERT INTO EMPLOYEE VALUES ('John', 'B', 'Smith', '123456789', DATE '1965-01-09', '731 Fondren, Houston, TX', 'M', 30000, '333445555', 5);

INSERT INTO EMPLOYEE VALUES ('Alicia', 'J', 'Zelaya', '999887777', DATE '1968-01-19', '3321 castle, Spring, TX', 'F', 25000, '987654321', 4);

INSERT INTO EMPLOYEE VALUES ('Ramesh', 'K', 'Narayan', '666884444', DATE '1920-09-15', '975 Fire Oak, Humble, TX', 'M', 38000, '333445555', 5);

INSERT INTO EMPLOYEE VALUES ('Joyce', 'A', 'English', '453453453', DATE '1972-07-31', '5631 Rice, Houston, TX', 'F', 25000, '333445555', 5);

INSERT INTO EMPLOYEE VALUES ('Ahmad', 'V', 'Jabbar', '987987987', DATE '1969-03-29', '980 Dallas, Houston, TX', 'M', 22000, '987654321', 4);

INSERT INTO EMPLOYEE VALUES ('Melissa', 'M', 'Jones', '808080808', DATE '1970-07-10', '1001 Western, Houston, TX', 'F', 27500, '333445555', 5);

INSERT INTO EMPLOYEE VALUES ('Tofik', 'M', 'Khan', '333495555', DATE '2001-08-24', 'Ranchi, JH', 'M', 50000, '888665555', 5);

CREATE TABLE DEPARTMENT_EMP(
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_EMP VALUES ('Research', 5, '333445555', DATE '1988-05-22');

INSERT INTO DEPARTMENT_EMP VALUES ('Administration', 4, '987654321', DATE '1995-01-01');

```
INSERT INTO DEPARTMENT_EMP VALUES ('Headquarters', 1, '888665555', DATE  
'1981-06-19');
```

this alter is needed to allow PROJECT and DEPARTMENT to reference each other

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

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

```
INSERT INTO DEPT_LOCATIONS VALUES (1, 'Houston');  
INSERT INTO DEPT_LOCATIONS VALUES (4, 'Stafford');  
INSERT INTO DEPT_LOCATIONS VALUES (5, 'Bellaire');  
INSERT INTO DEPT_LOCATIONS VALUES (5, 'Sugarland');  
INSERT INTO DEPT_LOCATIONS VALUES (5, 'Austin');
```

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

```
INSERT INTO PROJECT VALUES ('ProductX', 1, 'Bellaire', 5);
```

```
INSERT INTO PROJECT VALUES ('ProductY', 2, 'Sugarland', 5);
INSERT INTO PROJECT VALUES ('ProductZ', 3, 'Houston', 5);
INSERT INTO PROJECT VALUES ('Computerization', 10, 'Stafford', 4);
INSERT INTO PROJECT VALUES ('Reorganization', 20, 'Houston', 1);
INSERT INTO PROJECT VALUES ('Newbenefits', 30, 'Stafford', 4);
```

```
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 ('453453453', 1, 20.0);
INSERT INTO WORKS_ON VALUES ('453453453', 2, 20.0);
INSERT INTO WORKS_ON VALUES ('333445555', 1, 10.0);
INSERT INTO WORKS_ON VALUES ('333445555', 2, 10.0);
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 ('999887777', 30, 30.0);
INSERT INTO WORKS_ON VALUES ('999887777', 10, 10.0);
INSERT INTO WORKS_ON VALUES ('987987987', 10, 35.0);
INSERT INTO WORKS_ON VALUES ('987987987', 30, 5.0);
INSERT INTO WORKS_ON VALUES ('987654321', 30, 20.0);
```

INSERT INTO WORKS_ON VALUES ('987654321', 20, 15.0);

INSERT INTO WORKS_ON VALUES ('888665555', 20, 10.0);

```
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 ('987654321', 'Abner', 'M', DATE '1988-01-04',
'Son');

INSERT INTO DEPENDENT VALUES ('987654321', '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 ('453453453', 'Joyce', 'F', DATE '1990-04-05',
'Daughter');

LAB EXERCISE

1)

```
select bdate,address from employee where fname='John' and minit='B' and lname='Smith';
```

```
select fname,minit,lname,address from (employee natural join department_emp) where  
dname='Research';
```

2)

```
select p.pnumber,d.dnumber,e.lname,e.address,e.bdate from (department_emp d inner join  
project p on (d.dnumber=p.dnum) inner join employee e on (d.mgr_ssn=e.ssn));
```

3)

```
select distinct salary from employee;
```

4)

```
select e.fname,e.lname,s.fname,s.lname from (employee e inner join employee s on  
(e.super_ssn=s.ssn));
```

5)

```
select pnumber from project where pnumber in (select pno from (employee e inner join  
works_on w on (e.ssn=w.ssn)) where e.lname='Smith') or pnumber in (select p.pnumber  
from (department_emp d inner join project p on (d.dnumber=p.dnum) inner join employee e  
on (d.mgr_ssn=e.ssn)) where e.lname='Smith');
```

6)

```
select * from employee where address='Houston, Texas';
```

7)

```
select e.fname,e.salary*1.10 from (employee e inner join works_on w on (e.ssn=w.ssn)  
inner join project p on (p.pnumber=w.pno)) where p.pname='ProductX';
```

8)

```
select fname,lname from employee where dno=5 and salary between 30000 and 40000;
```

9)

```
select e.fname,e.lname,p.pname,e.dno from (employee e inner join works_on w on  
(e.ssn=w.essn) inner join project p on (p.pnumber=w.pno)) order by e.dno,e.fname,e.lname;
```

10)

```
select fname,lname from employee where super_ssn is null;
```

11)

```
select e.fname,e.lname from (employee e inner join dependent d on (e.ssn=d.essn)) where  
e.fname=d.dependent_name and e.sex=d.sex;
```

12)

```
select fname,lname from employee where ssn not in (select essn from dependent);
```

13)

```
select fname,lname from employee where ssn in (select mgr_ssn from department_emp) and  
ssn in (select essn from dependent);
```

14)

```
select ssn from (employee e inner join works_on w on (e.ssn=w.essn)) where pno<=3;
```

15)

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

16)

```
select min(salary),max(salary),avg(salary),sum(salary) from (employee natural join  
department_emp) where dname='Research';
```

17)

```
select pnumber,pname,count(w.essn) from (project p inner join works_on w on  
(w.pno=p.pnumber)) group by p.pnumber,p.pname;
```

18)

```
with pr_cnt(pnum,pname,cnt) as (select pnumber,pname,count(w.essn) from (project p inner
join works_on w on (w.pno=p.pnumber)) group by p.pnumber,p.pname) select * from pr_cnt
where cnt>2;
```

19)

```
with req_dno(dno) as(select dno from employee group by dno having count(ssn)>=5) ,
req_tab as (select * from (employee e natural join req_dno rd) where salary>40000) select
dno,count(ssn) from req_tab group by dno;
```