

Database HW3 邓鹏宇 A10515003 二资工三

1.

```
CREATE TABLE student(  
    NAME VARCHAR(255) NOT NULL,  
    Student_number INT NOT NULL,  
    Class INT NOT NULL,  
    Major VARCHAR(255) NOT NULL,  
    PRIMARY KEY(Student_number)  
);
```

```
INSERT  
INTO  
    Student  
VALUES('Smith', 17, 1, 'CS');  
INSERT  
INTO  
    Student  
VALUES('Brown', 8, 2, 'CS');
```

```
CREATE TABLE course(  
    Course_name VARCHAR(255) NOT NULL,  
    Course_number VARCHAR(255) NOT NULL,  
    Credit_hours INT NOT NULL,  
    Department VARCHAR(255) NOT NULL  
);
```

```
INSERT  
INTO  
    course  
VALUES(  
    'Intro to Computer Science',  
    'CS1310',  
    4,  
    'CS'
```

```

);
INSERT
INTO
    course
VALUES('Data Structures', 'CS3320', 4, 'CS');
INSERT
INTO
    course
VALUES(
    'Discrete Mathematics',
    'MATH2410',
    3,
    'MATH'
);
INSERT
INTO
    course
VALUES('Database', 'CS3380', 3, 'CS');

CREATE TABLE section(
    Section_identifier INT NOT NULL,
    Course_number VARCHAR(255) NOT NULL,
    Semester VARCHAR(255) NOT NULL,
    YEAR VARCHAR(255) NOT NULL,
    Instructor VARCHAR(255) NOT NULL,
    PRIMARY KEY(Section_identifier)
);

INSERT
INTO
    section
VALUES(85, 'MATH2410', 'Fall', '07', 'King');
INSERT
INTO
    section
VALUES(92, 'CS1310', 'Fall', '07', 'Anderson');

```

```
INSERT
INTO
    section
VALUES(102, 'CS3320', 'Spring', '08', 'Knuth');
INSERT
INTO
    section
VALUES(112, 'MATH2410', 'Fall', '08', 'Chang');
INSERT
INTO
    section
VALUES(119, 'CS1310', 'Fall', '08', 'Anderson');
INSERT
INTO
    section
VALUES(135, 'CS3380', 'Fall', '08', 'Stone');
```

```
CREATE TABLE grade_report(
    Student_number INT NOT NULL,
    Section_identifier INT NOT NULL,
    Grade VARCHAR(10) NOT NULL
);
```

```
INSERT
INTO
    grade_report
VALUES(17, 112, 'B');
INSERT
INTO
    grade_report
VALUES(17, 119, 'C');
INSERT
INTO
    grade_report
VALUES(8, 85, 'A');
INSERT
```

```

INTO
    grade_report
VALUES(8, 92, 'A');
INSERT
INTO
    grade_report
VALUES(8, 102, 'B');
INSERT
INTO
    grade_report
VALUES(8, 135, 'A');

```

```

CREATE TABLE prerequisite(
    Course_number VARCHAR(255) NOT NULL,
    Prerequisite_number VARCHAR(255) NOT NULL
);

```

```

INSERT
INTO
    prerequisite
VALUES('CS3380', 'CS3320');
INSERT
INTO
    prerequisite
VALUES('CS3380', 'MATH2410');
INSERT
INTO
    prerequisite
VALUES('CS3320', 'CS1310');

```

2.

```

CREATE TABLE employee(
    Fname VARCHAR(255) NOT NULL,
    Minit VARCHAR(10) NOT NULL,
    Lname VARCHAR(255) NOT NULL,
    Ssn INT NOT NULL,

```

```
Bdate DATE NOT NULL,  
Address VARCHAR(255) NOT NULL,  
Sex VARCHAR(10) NOT NULL,  
Salary INT NOT NULL,  
Super_ssn INT,  
Dno INT NOT NULL,  
PRIMARY KEY(Ssn)  
);
```

INSERT

INTO

employee

VALUES(

'John',

'B',

'Smith',

123456789,

'1965-01-09',

'731 Fondren,

Houston, TX',

'M',

30000,

333445555,

5

);

INSERT

INTO

employee

VALUES(

'Franklin',

'T',

'Wong',

333445555,

'1955-12-08',

'638 Voss,

Houston, TX',

```
'M',
40000,
888665555,
5
);
INSERT
INTO
employee
VALUES(
'Alicia',
'J',
'Zelaya',
999887777,
'1968-01-19',
'3321 Castle,
Spring, TX',
'F',
25000,
987654321,
4
);
INSERT
INTO
employee
VALUES(
'Jennifer',
'S',
'Wallace',
987654321,
'1941-06-20',
'291 Berry,
Bellaire, TX',
'F',
43000,
888665555,
4
```

```
);  
INSERT  
INTO  
    employee  
VALUES(  
    'Ramesh',  
    'K',  
    'Narayan',  
    666884444,  
    '1962-09-15',  
    '975 Fire  
Oak, Humble, TX',  
    'M',  
    38000,  
    333445555,  
    5  
);
```

```
INSERT  
INTO  
    employee  
VALUES(  
    'Joyce',  
    'A',  
    'English',  
    453453453,  
    '1972-07-30',  
    '5631 Rice,  
Houston, TX',  
    'F',  
    25000,  
    333445555,  
    5  
);
```

```
);  
INSERT  
INTO  
    employee
```

VALUES(

'Ahmad',

'V',

'Jabbar',

987987987,

'1969-03-29',

'980 Dallas,

Houston, TX',

'M',

25000,

987654321,

4

);

INSERT

INTO

employee

VALUES(

'James',

'E',

'Borg',

888665555,

'1937-11-10',

'450 Stone,

Houston, TX',

'M',

55000,

NULL,

1

);

ALTER TABLE

employee ADD FOREIGN KEY(Super_ssn) REFERENCES employee(Ssn);

CREATE TABLE department(

Dname VARCHAR(255) NOT NULL,

Dnumber INT NOT NULL,


```
    Mgr_ssn INT NOT NULL,  
    Mgr_start_date DATE NOT NULL,  
    PRIMARY KEY(Dnumber)  
);
```

```
INSERT  
INTO  
    department  
VALUES(  
    'Research',  
    5,  
    333445555,  
    '1988-05-22'
```

```
);  
INSERT  
INTO  
    department  
VALUES(  
    'Administration',  
    4,  
    987654321,  
    '1995-01-01'
```

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

```
);
```

```
CREATE TABLE dept_locations(  
    Dnumber INT NOT NULL,  
    Dlocation VARCHAR(255) NOT NULL,
```

```
    FOREIGN KEY(Dnumber) REFERENCES department(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, 'Houston');
```

```
CREATE TABLE works_on(
```

```
    Essn INT NOT NULL,
```

```
    Pno INT NOT NULL,
```

```
    Hours FLOAT NULL,
```

```
    FOREIGN KEY(Essn) REFERENCES employee(Ssn)
```

```
);
```

```
INSERT
```

```
INTO
```

```
    works_on
```

```
VALUES(123456789, 1, 32.5);
```

```
INSERT
```

INTO

works_on

VALUES(123456789, 2, 7.5);

INSERT

INTO

works_on

VALUES(666884444, 3, 40.0);

INSERT

INTO

works_on

VALUES(453453453, 1, 20.0);

INSERT

INTO

works_on

VALUES(453453453, 2, 20.0);

INSERT

INTO

works_on

VALUES(333445555, 2, 10.0);

INSERT

INTO

works_on

VALUES(333445555, 3, 10.0);

INSERT

INTO

works_on

VALUES(333445555, 10, 10.0);

INSERT

INTO

works_on

VALUES(333445555, 20, 10.0);

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, NULL);
```

```
CREATE TABLE dependent(
    Essn INT NOT NULL,
    Dependent_name VARCHAR(255) NOT NULL,
    Sex VARCHAR(10) NOT NULL,
    Bdate DATE NOT NULL,
    Relationship VARCHAR(255) NOT NULL,
    FOREIGN KEY(Essn) REFERENCES employee(Ssn)
);
```

```
INSERT
```

```
INTO
    dependent
```

```
VALUES(  
    333445555,  
    'Alice',  
    'F',  
    '1986-04-05',  
    'Daughter'  
);
```

```
INSERT
```

```
INTO
```

```
    dependent
```

```
VALUES(  
    333445555,  
    'Theodore',  
    'M',  
    '1983-10-25',  
    'Son'  
);
```

```
INSERT
```

```
INTO
```

```
    dependent
```

```
VALUES(  
    333445555,  
    'Joy',  
    'F',  
    '1958-05-03',  
    'Spouse'  
);
```

```
INSERT
```

```
INTO
```

```
    dependent
```

```
VALUES(  
    987654321,  
    'Abner',  
    'M',  
    '1942-02-28',  
    'Spouse'
```

```
);  
INSERT  
INTO  
    dependent  
VALUES(  
    123456789,  
    'Michael',  
    'M',  
    '1988-01-04',  
    'Son'  
);
```

```
INSERT  
INTO  
    dependent  
VALUES(  
    123456789,  
    'Alice',  
    'F',  
    '1988-12-30',  
    'Daughter'
```

```
);  
INSERT  
INTO  
    dependent  
VALUES(  
    123456789,  
    'Elizabeth',  
    'F',  
    '1967-05-05',  
    'Spouse'  
);
```

```
CREATE TABLE project(  
    Pname VARCHAR(255) NOT NULL,  
    Pnumber INT NOT NULL,  
    Plocation VARCHAR(255) NOT NULL,
```

```
Dnum INT NOT NULL,  
PRIMARY KEY(Pnumber)  
);
```

```
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);
```

3. 6.10

a.

```
CREATE TABLE 6_10_a AS(  
SELECT DISTINCT  
employee.Fname,  
employee.Dno  
FROM
```

```
employee,  
works_on  
WHERE  
works_on.Hours > 10 AND works_on.Essn = employee.Ssn AND Dno =(  
SELECT DISTINCT  
employee.Dno  
FROM  
project,  
employee  
WHERE  
project.Pname = 'productX' AND project.Dnum = employee.Dno  
)  
);
```

b.

```
CREATE TABLE 6_10_b AS(  
SELECT DISTINCT  
employee.Fname  
FROM  
employee,  
dependent  
WHERE  
dependent.Dependent_name = employee.Fname  
);
```

c.

```
CREATE TABLE 6_10_c AS(  
SELECT  
Fname  
FROM  
employee  
WHERE  
Super_ssn =(  
SELECT  
Ssn  
FROM  
employee  
WHERE
```



```
        Fname = 'Franklin'  
    )  
);
```

4. 6.11

a.

INSERT

INTO

employee

VALUES(

'Robert',

'F',

'Scott',

'943775543',

'1972-06-21',

'2365

Newcastle Rd,Bellaire,TX',

'M',

58000,

'888665555',

1

);

b.

INSERT

INTO

project

VALUES('ProductA', 4, 'Bellaire', 2);

c.

INSERT

INTO

department

VALUES(

'Production',

4,

'943775543',

```
'2007-10-01'  
);  
#1062 - Duplicate entry '4' for key 'PRIMARY'
```

d.

INSERT

INTO

works_on

VALUES('677678989', NULL, '40.0');

#1048 - Column 'Pno' cannot be null

e.

INSERT

INTO

dependent

VALUES(

'453453453',

'John',

'M',

'1990-12-12',

'spouse'

);

f.

DELETE

FROM

works_on

WHERE

Essn = "333445555";

g.

DELETE

FROM

employee

WHERE

Ssn = "987654321";

h.

DELETE

FROM

project

WHERE

Pname = "ProductX";

i.

UPDATE

department

SET

Mgr_ssn = '123456789',

Mgr_start_date = '2007-10-01'

WHERE

Dnumber = 5;

j.

UPDATE

employee

SET

Super_ssn = '943775543'

WHERE

Ssn = '999887777';

k.

UPDATE

works_on

SET

Hours = '5.0'

WHERE

Essn = '999887777' AND Pno = 10;

5. 6.12

a.

CREATE TABLE 6_12_a AS(

SELECT NAME

FROM

student

WHERE

Major = 'CS'

);

b.

CREATE TABLE 6_12_b AS(

SELECT

```
Course_name
FROM
    course,
    section
WHERE
    Instructor = 'King' AND course.Course_number = section.Course_number
);
```

c.

```
CREATE TABLE 6_12_c AS(
SELECT
    Course_number,
    semester,
    YEAR,
    Student_number
FROM
    section,
    grade_report
WHERE
    section.Instructor = 'King' AND section.Section_identifier =
grade_report.Section_identifier
);
```

d.

```
CREATE TABLE 6_12_d AS(
SELECT
    student.name,
    Course_name,
    course.Course_number,
    Credit_hours,
    semester,
    YEAR,
    grade
FROM
    student,
    section,
    grade_report,
    course
```

WHERE

```
student.Student_number = grade_report.Student_number AND  
section.Section_identifier = grade_report.Section_identifier AND  
course.Course_number = section.Course_number  
);
```

6. 6.13

a.

INSERT

INTO

```
student  
VALUES('Johnson', 25, 1, 'Math');
```

b.

UPDATE

```
student  
SET  
class = 2
```

WHERE NAME

```
= 'Smith';
```

c.

INSERT

INTO

```
course  
VALUES(  
    'Konwledge Engineering',  
    'CS4390',  
    '3',  
    'CS'  
);
```

d.

DELETE

FROM

```
student  
WHERE NAME  
= 'Smith' AND Student_number = 17;
```

7. 7.5

a.

```
CREATE TABLE 7_5_a AS(
SELECT
    Dname,
    COUNT(Fname)
FROM
    employee,
    department
WHERE
    employee.Salary > 30000 AND employee.Dno = department.Dnumber
GROUP BY
    Dname
);
```

b.

```
CREATE TABLE 7_5_b AS(
SELECT
    Dname,
    COUNT(Fname)
FROM
    employee,
    department
WHERE
    employee.Salary > 30000 AND employee.Dno = department.Dnumber AND
employee.sex = 'M'
GROUP BY
    Dname
);
```