4.1

虽然该查询语法上是正确的，但由于name既是course的属性，也是teaches的属性，所以并不能计算出预期的答案。自然连接的结果是，只有当教师在自己的系里教授课程时，才会显示结果。

4.7

```sql
CREATE TABLE EMPLOYEE (

    ID INTEGER,

    PERSON_NAME VARCHAR(50),

    STREET VARCHAR(50),

    CITY VARCHAR(50),

    PRIMARY KEY (ID)

);


CREATE TABLE COMPANY (

    COMPANY_NAME VARCHAR(50),

    CITY VARCHAR(50),

    PRIMARY KEY(COMPANY_NAME)

);


CREATE TABLE WORKS (

    ID INTEGER,

    COMPANY_NAME VARCHAR(50),

    SALARY NUMERIC(10, 2),

    PRIMARY KEY(ID),

    FOREIGN KEY (ID) REFERENCES EMPLOYEE(ID),

    FOREIGN KEY (COMPANY_NAME) REFERENCES COMPANY(COMPANY_NAME)
```

```
);

CREATE TABLE MANAGES (

    ID INTEGER,

    MANAGER_ID INTEGER,

    PRIMARY KEY (ID),

    FOREIGN KEY (ID) REFERENCES EMPLOYEE (ID),

    FOREIGN KEY (MANAGER_ID) REFERENCES EMPLOYEE (ID)

);
```

4.9

该manager的所有各级员工的元组也会被删除。这需要经过一系列步骤。最初的删除会触发与manager的直接employee相对应的所有元组的删除。这些删除又会导致二级employee元组的删除，以此类推，直到所有直接和间接employee元组都被删除。

4.15

```
WITH Q1 AS (

    SELECT

        *

    FROM

        SECTION

        NATURAL JOIN CLASSROOM

), Q2 AS (

    SELECT

        C.BUILDING,

        C.ROOM_NUMBER,

        COURSE_ID,

        SEC_ID,

        SEMESTER,
```

```sql
        YEAR,

        TIME_SLOT_ID,

        CAPACITY

    FROM

        SECTION

        INNER JOIN CLASSROOM C

        USING (BUILDING,

        ROOM_NUMBER)
)
SELECT

    NOT EXISTS ( (

        SELECT

            *

        FROM

            Q1

    ) EXCEPT (

        SELECT

            *

        FROM

            Q2

    ) )

    AND NOT EXISTS ( (

        SELECT

            *

        FROM

            Q2
```

```sql
) EXCEPT (

    SELECT

        *

    FROM

        Q1

) );
```

4.20

```sql
CREATE VIEW TOT_CREDITS(

    YEAR,

    NUM_CREDITS

) AS (

    SELECT

        YEAR,

        SUM(CREDITS)

    FROM

        TAKES

        NATURAL JOIN COURSE

    GROUP BY

        YEAR

    ORDER BY

        YEAR ASC

);
```