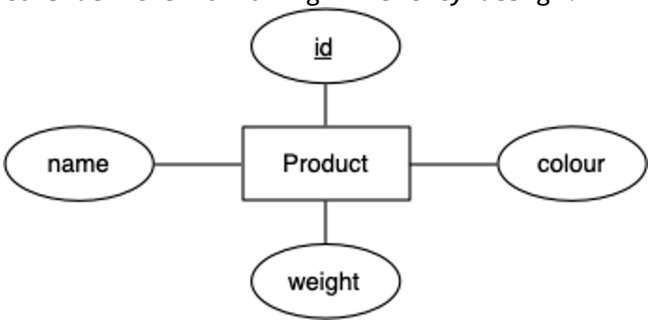
Quiz2

本quiz重要课件：
https://cgi.cse.unsw.edu.au/~cs3311/20T3/lectures/er-sql-mapping/slides.html#s10

Question 1 (1 mark)
Consider the following ER entity design:



Assuming the existence of a domain for colours, called ColourType, and **assuming that every product has a name and colour, but we may not know its weight** (measured in whole milligrams), which of the following SQL table definitions most accurately represents the above design.

(a)
```
create table Products (
    id     integer ,
    name   text not null,
    colour ColourType not null,
    weight integer
);
```

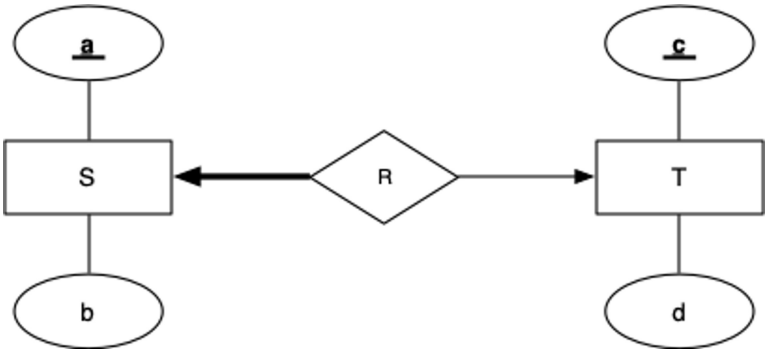
(b)
```
create table Products (
    id     integer primary key,
    name   text not null,
    colour ColourType,
    weight integer
);
```

(c)
```
create table Products (
    id     integer primary key,
    name   text not null,
    colour ColourType not null,
    weight integer not null
);
```

(d)
```
create table Products (
    id     integer primary key,
    name   text not null,
    colour ColourType not null,
    weight integer
);
```

(e) None of the above is accurate

Question 2 (1 mark)
Which of the SQL schemas below gives the most accurate and space efficient translation of the following ER diagram:



Assume that all attributes are of type integer.

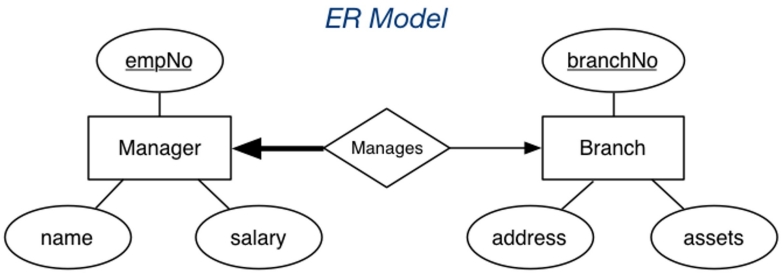
(a)
```
create table S (
     a integer primary key,
     b integer, R integer not null references T(c)
);
create table T (
     c integer primary key,
     d integer,
     R integer references S(a)
);
```

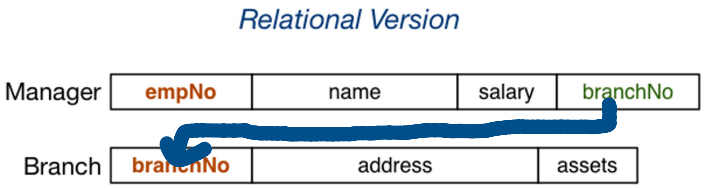
(b)
```
create table S (
     a integer primary key,
     b integer
);
create table T (
     c integer primary key,
     d integer,
     R integer references S(a)
     );
```

(c)
```
create table S (
     a integer primary key,
     b integer,
     R integer not null references T©
);
create table T (
     c integer primary key,
     d integer
);
```

(d)
```
create table S (
     a integer primary key,
     b integer
);
create table T (
     c integer primary key,
     d integer,
     R integer references S(a)
);
create table R (
     s integer not null references S(a),
     t integer references T(c),
     primary key (s,t)
);
```

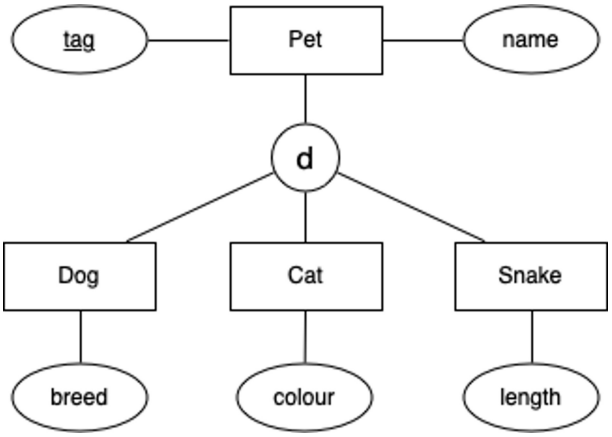
(e) None of the above is accurate *and* space efficient






```
create table Branches (
    branchNo serial primary key,
    address  text not null,
    assets   currency          -- a new branch
);                             --    may have no accounts
create table Managers (
    empNo    serial primary key,
    name     text not null,
    salary   currency not null, -- when first employed,
                                --    must have a salary
    manages  integer not null,  -- total participation
    foreign key (manages) references Branches(branchNo)
);
```

Question 3 (1 mark)
Consider the following ER class hierarchy:



Which of the following SQL schema most accurately represents an ER-style mapping of the class hierarchy into SQL?

(a)
```
create table Pets(
     tag integer primary key,
     name text
);
create table Dogs(
     tag integer primary key,
     breed text
     foreign key???
);
     create table Cats(
     tag integer primary key,
     colour text
);
create table Snakes
(
    tag    integer primary key,
    length float
);
```

(b)
```
create table Pets
(
    tag  integer primary key,
    name text
);
create table Dogs
(
    tag   integer primary key,
    breed text,
    foreign key (tag) references Pets (tag)
);
create table Cats
(
    tag    integer primary key,
    colour text,
    foreign key (tag) references Pets (tag)
);
create table Snakes
(
    tag    integer primary key,
    length float,
    foreign key (tag) references Pets (tag)
);
```

(c)
```
create table Pets
(
    tag  integer primary key,
    name text
);
```

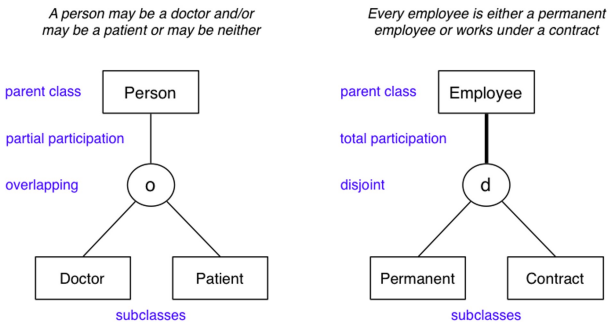
```
create table Dogs
(
    tag   integer primary key,
    name  text,
    breed text
);
create table Cats
(
    tag    integer primary key,
    name   text,
    colour text
);
create table Snakes
(
    tag    integer primary key,
    name   text,
    length float
);
```

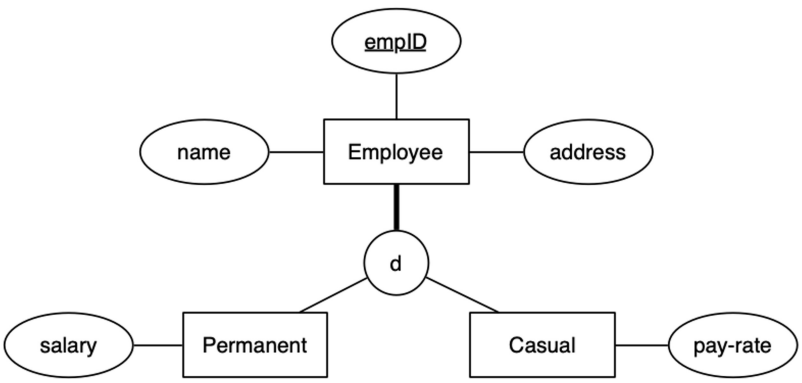
(d)

```
create table Pets
(
    tag    integer primary key,
    name   text,
    breed  text,
    colour text,
    length float
);
```


❖ Subclasses and Inheritance (cont)

Example:





❖ Mapping Subclasses (cont)

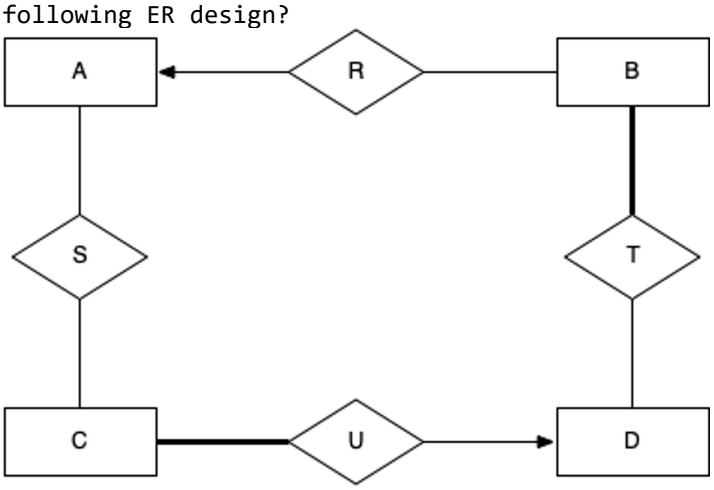
ER-style mapping to SQL schema:

```
create table Employees (
    empID   serial primary key,
    name    text not null,
    address text not null
);
create table Permanents (
    employee_id integer primary key,
    salary      currency not null,
    foreign key (employee_id) references Employees(empID)
);
create table Casuals (
    employee_id integer primary key,
    pay_rate    currency not null,
    foreign key (employee_id) references Employees(empID)
);
```

Does *not* capture either participation or disjoint-ness constraints!

Would need to program a solution to this e.g web-form that requires user to enter both Employee and subclass info

Question 4 (1 mark)
What is the minimum number of SQL tables that would be needed to accurately represent the following ER design?



(a) 10
(b) 8
(c) 6
(d) 4
(e) None of the above

解析:

ER -> RDM 七步法:

- 第一步，把所有的强实体转换
- 第二步，把所有的弱实体转换
- 第三步，**1对1 关系 转换**
- 第四步，**1对N 关系 转换**
- 第五步，**N对M关系 转换**
- 第六步，多值属性转换
- 第七步，多元关系转换，同第五步

A

A_id		

B

B_id	A	

C

C_id	D	

D

D_id		

S

A	C

T

B	D