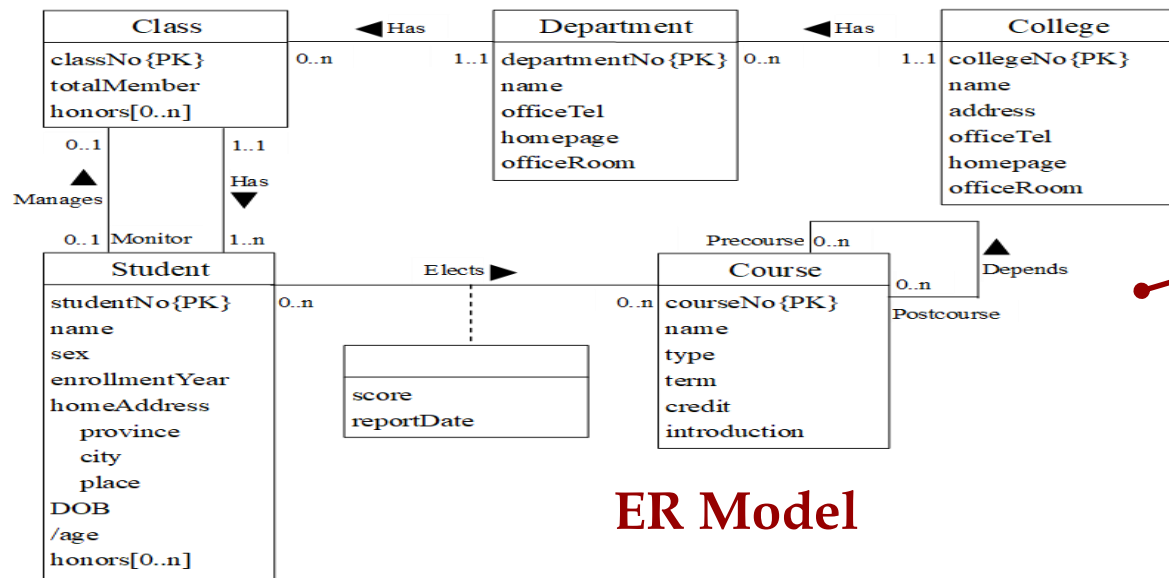
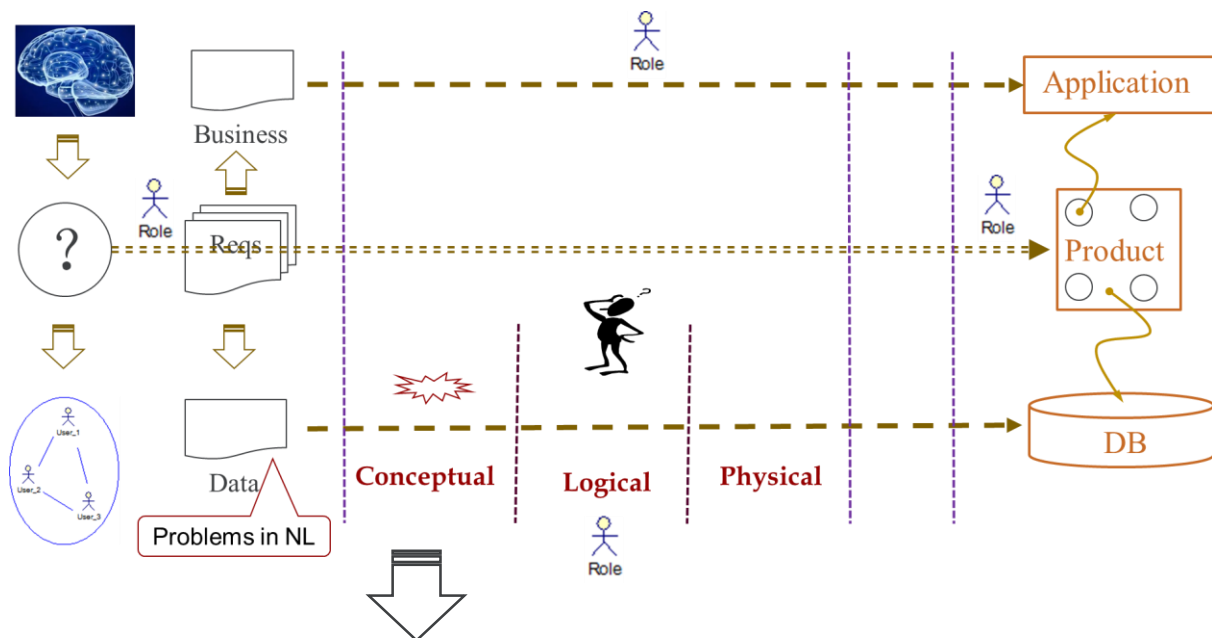


# ER模型向关系模型的映射

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讲解人：陆伟 教授

# 目标与任务

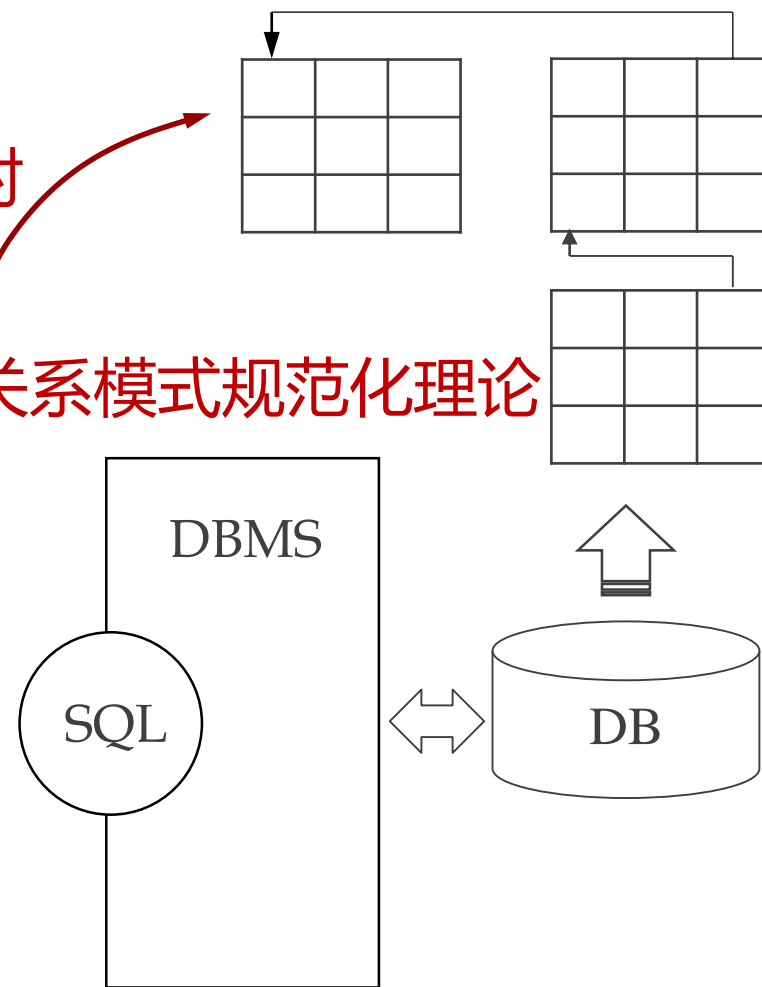


ER Model

映射

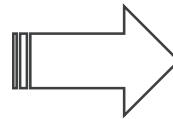
关系模式规范化理论

Relation Model



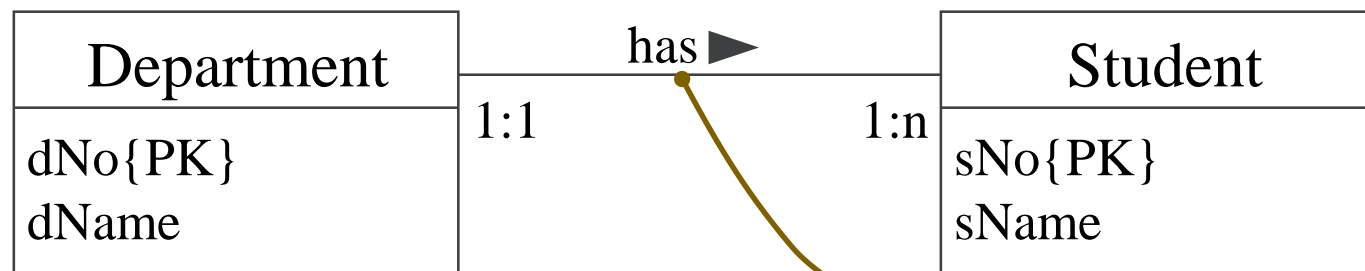
# 目标与任务

Elements in ER Model
entity
strong, weak
attribute
simple, composite, mutli-value
relationship
1:1, 1:N, M:N
N-ary
recursive
value set
key attribute



Elements in Relation Model
relation(table)
attribute(column)
foreign key
domain
primary key (alternate key)

## 一个简单案例的思考



D-1(dNo), D-2(dName), D-3(officeRoom), ...  
S-1(sNo), S-2(sName), S-3(sex), ...

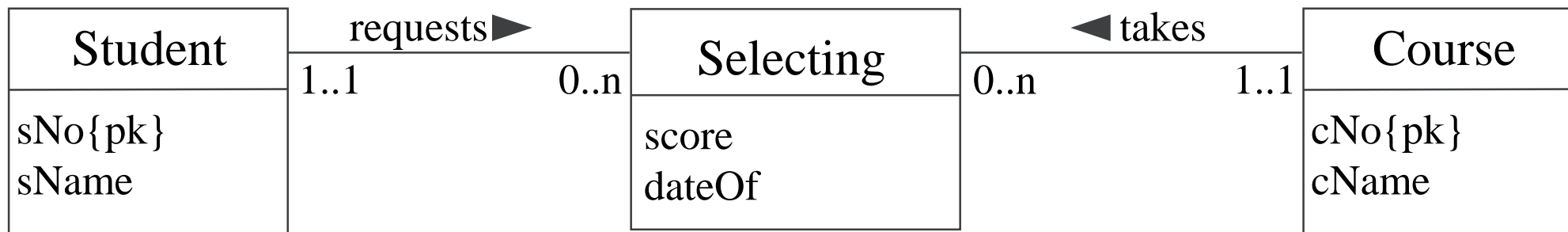
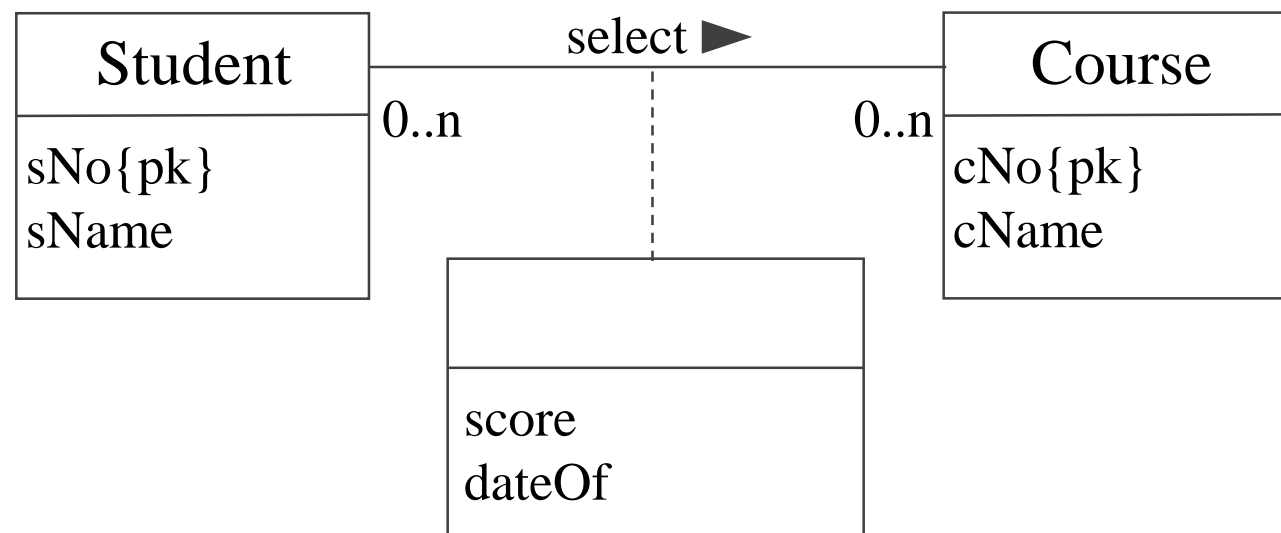
D-S(dNo, dName, officeRoom, homepage, sNo, sName, sex, email, age)

规范化

S(sNo, sName, sex, email, age, dNo)  
D(dNo, dName, officeRoom, homepage)

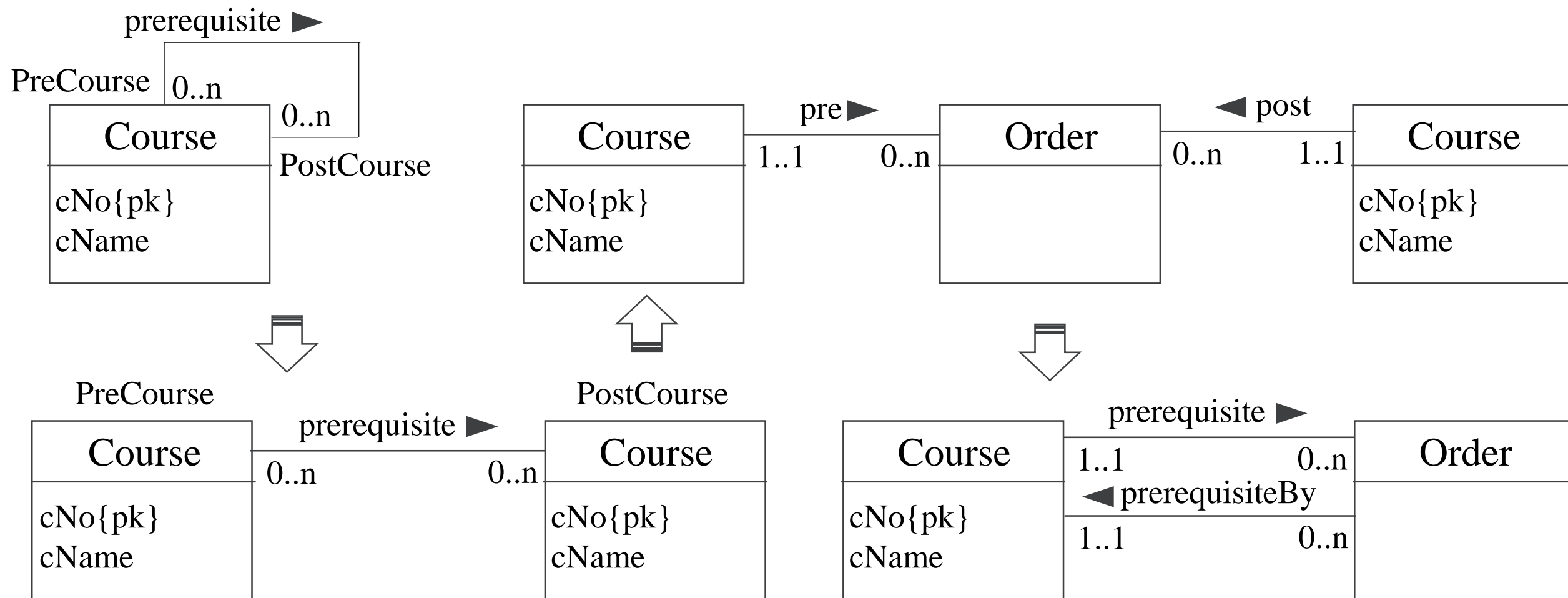
# ER模型向关系模型映射工程总结

## □ 多对多二元联系



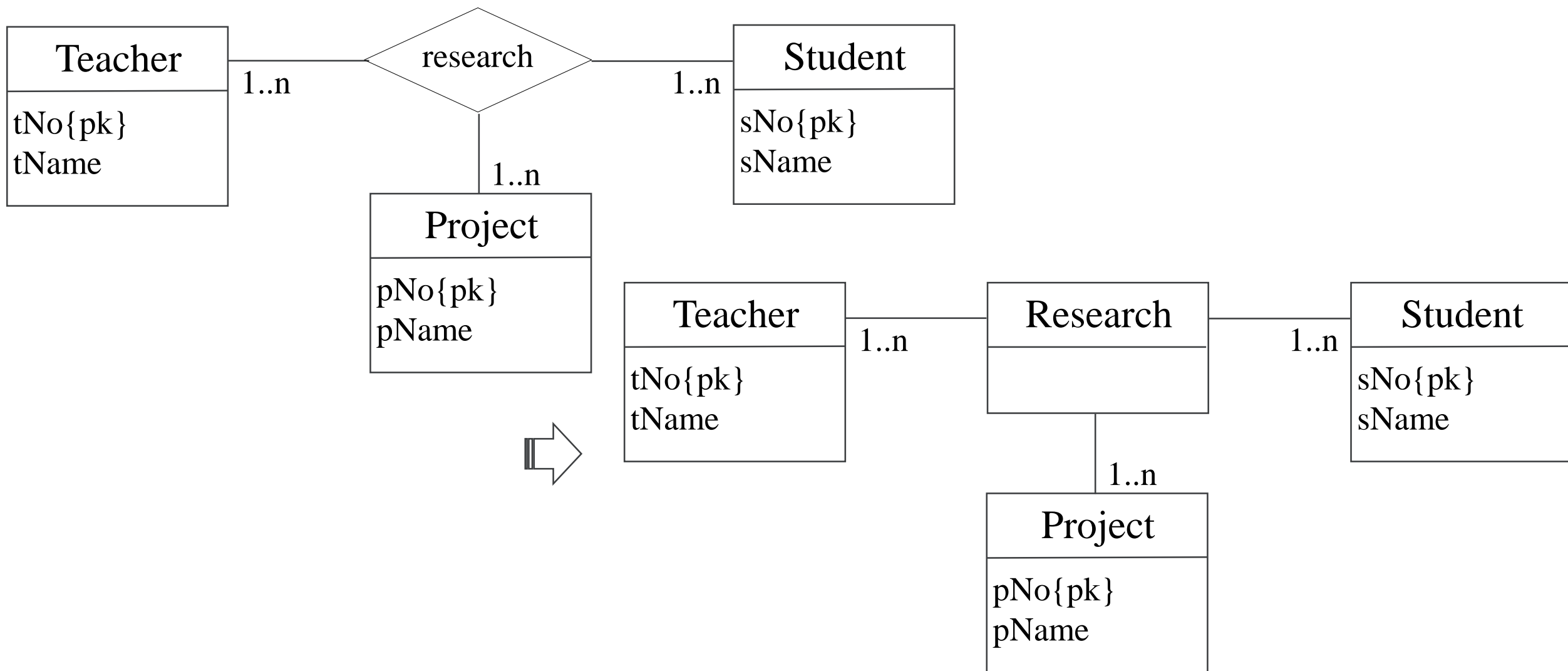
# ER模型向关系模型映射工程总结

## □ 多对多递归联系



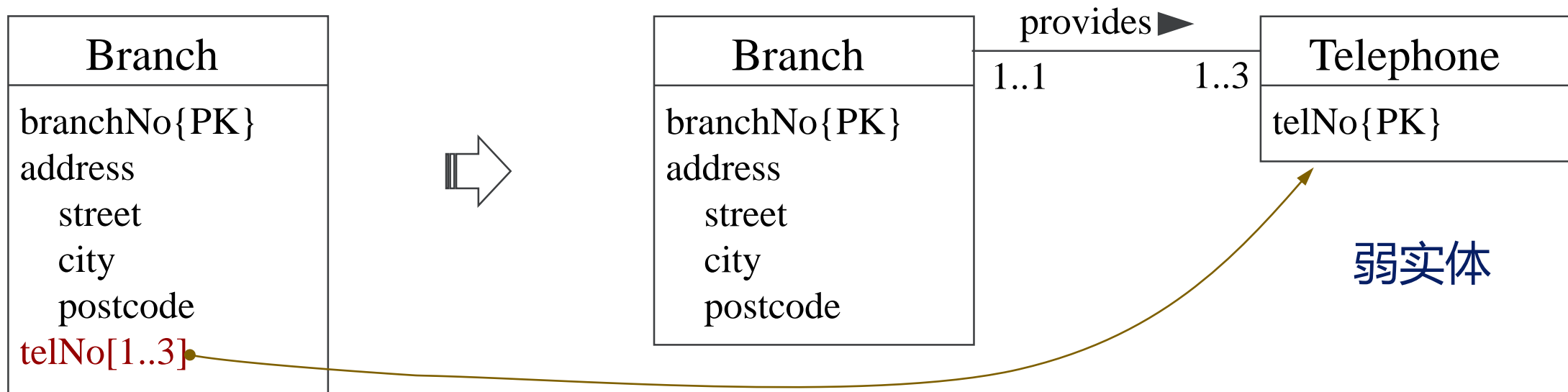
# ER模型向关系模型映射工程总结

## ❑ 复杂联系类型



# ER模型向关系模型映射工程总结

## □ 多值属性



弱实体

讨论：复合属性如何处理？



# ER模型向关系模型映射工程总结

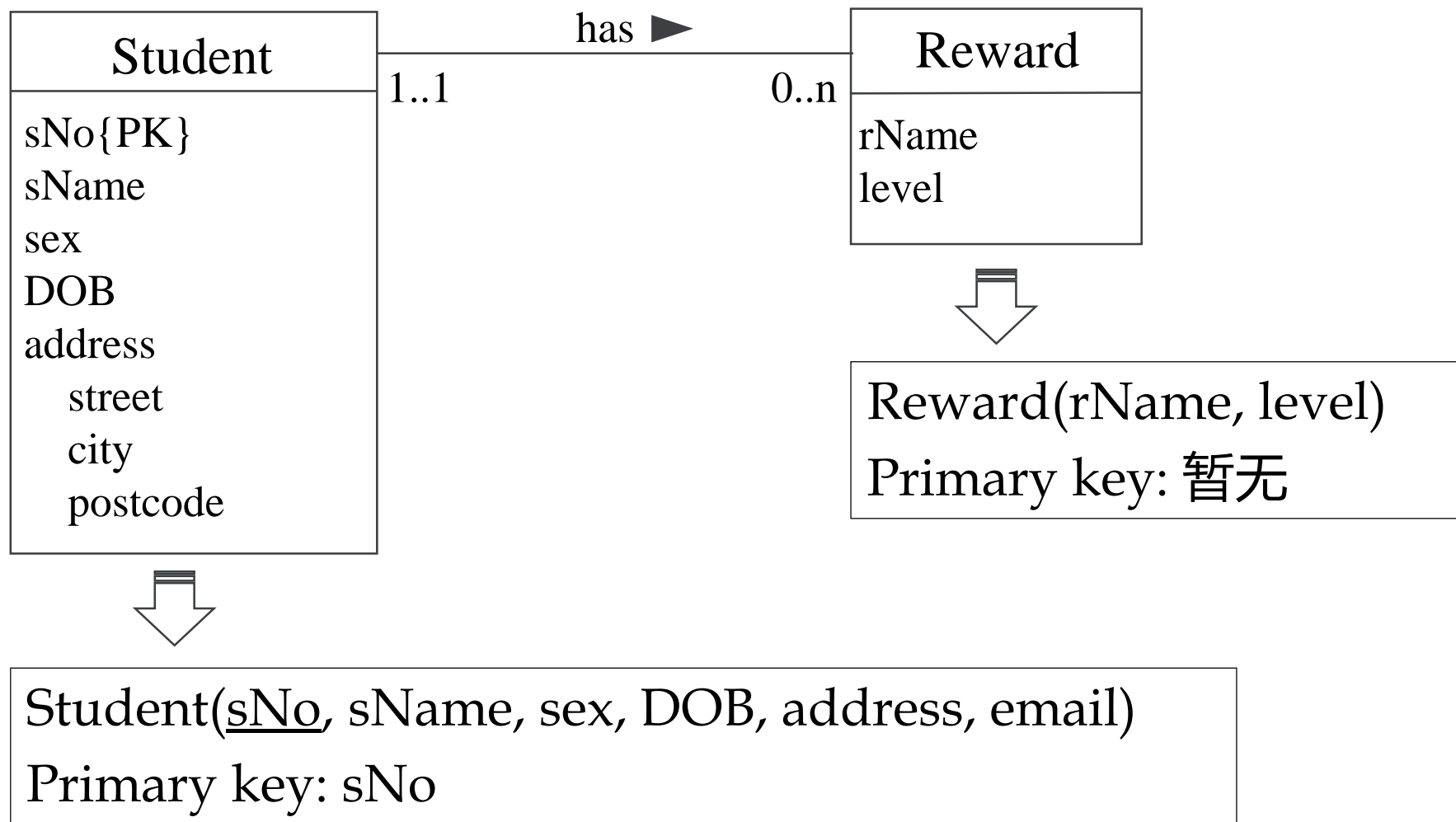
Elements in ER Model
entity
strong, weak
attribute
simple, composite, mutli-value
relationship
1:1, 1:N, M:N
N-ary
recursive
value set
key attribute



Elements in Relation Model
relation(table)
attribute(column)
foreign key
domain
primary key (alternate key)

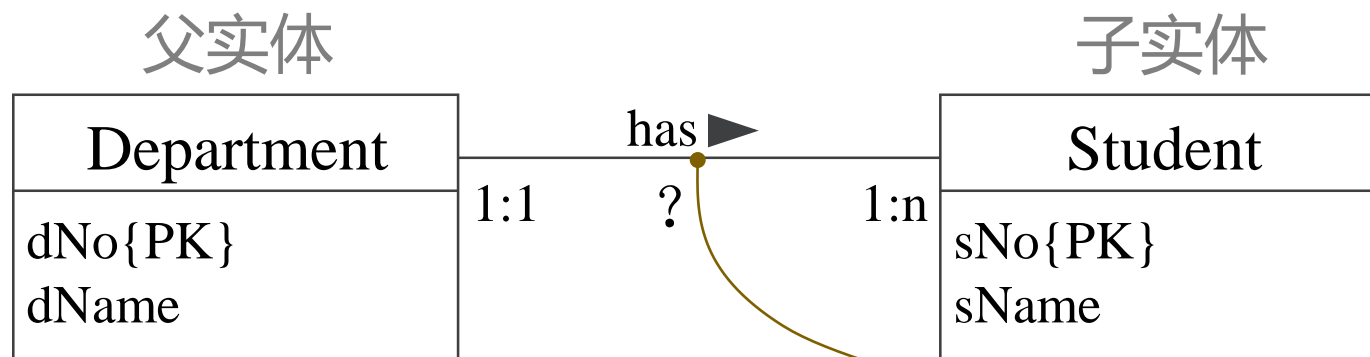
# ER模型向关系模型映射工程总结

## □ 强实体与弱实体



# ER模型向关系模型映射工程总结

## □ 一对多联系

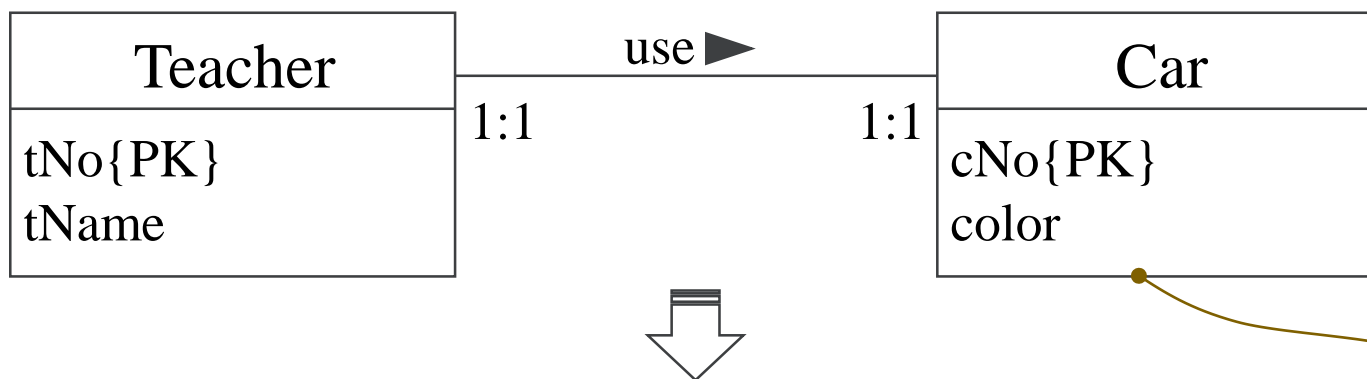


Department(dNo, dName, officeRoom, homepage)  
Primary key: dNo

Student(sNo, sName, sex, DOB, address, email, *dNo* )  
Primary key: sNo  
Foreign key: dNo references Department(dNo)

# ER模型向关系模型映射工程总结

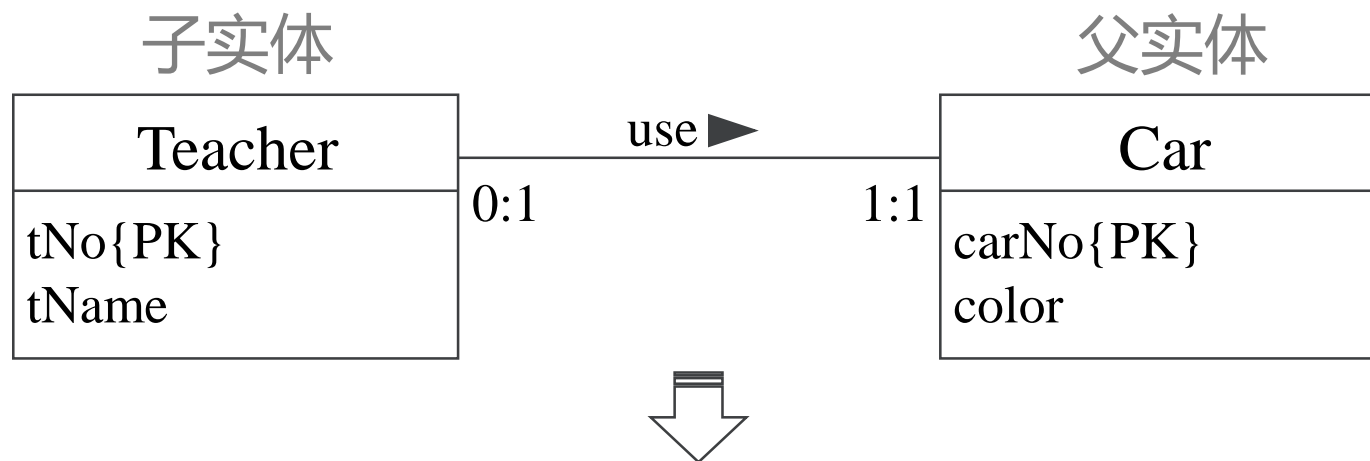
□ 一对一联系 – 联系双方实体均为全部参与



Teacher(tNo, tName, officeRoom, address, homepage, carNo, color)  
Primary key: tNo

# ER模型向关系模型映射工程总结

□ 一对一联系 — 一方全部参与，另一方部分参与



Teacher(tNo, tName, officeRoom, address, homepage, *carNo*)

Primary key: tNo

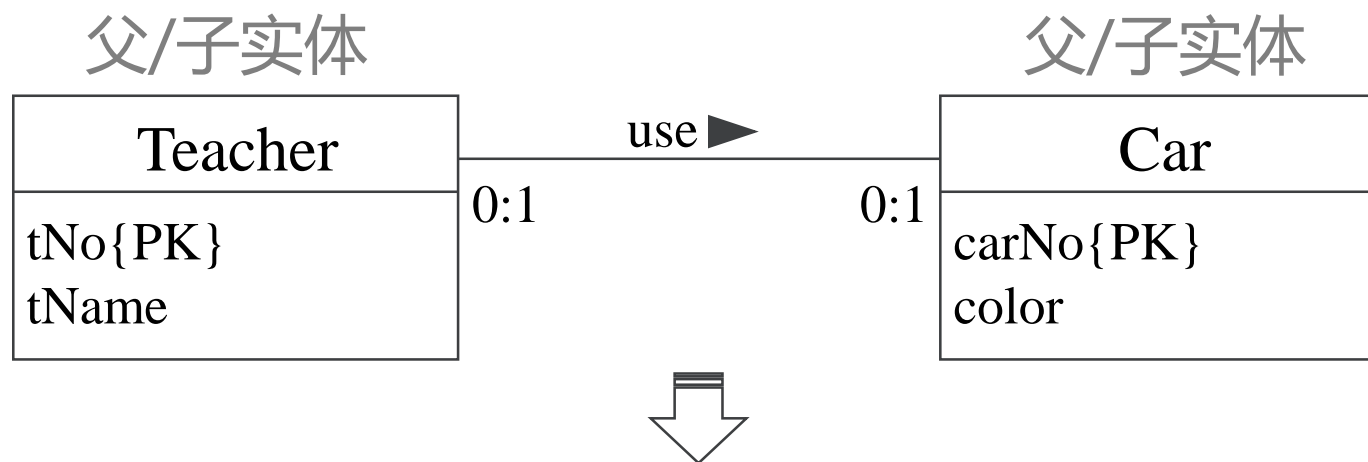
Foreign key: carNo references Car(carNo)

Car(carNo, color)

Primary key: carNo

# ER模型向关系模型映射工程总结

## □ 一对一联系 – 联系双方实体均为部分参与



Teacher(tNo, tName, officeRoom, address, homepage, *carNo*)

Primary key: tNo

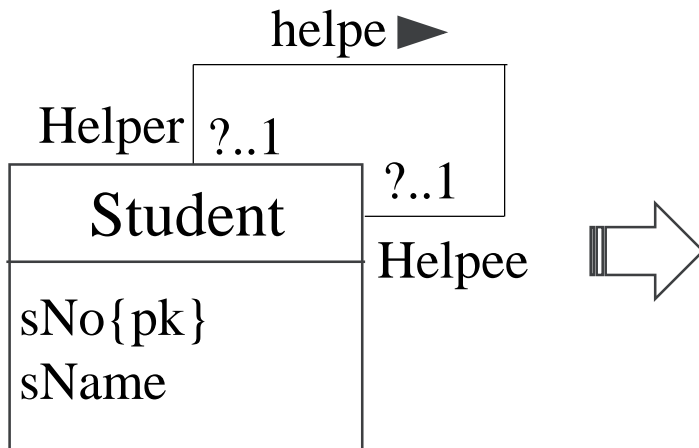
Foreign key: carNo references Car(carNo)

Car(carNo, color)

Primary key: carNo

# ER模型向关系模型映射工程总结

## □ 一对一递归联系



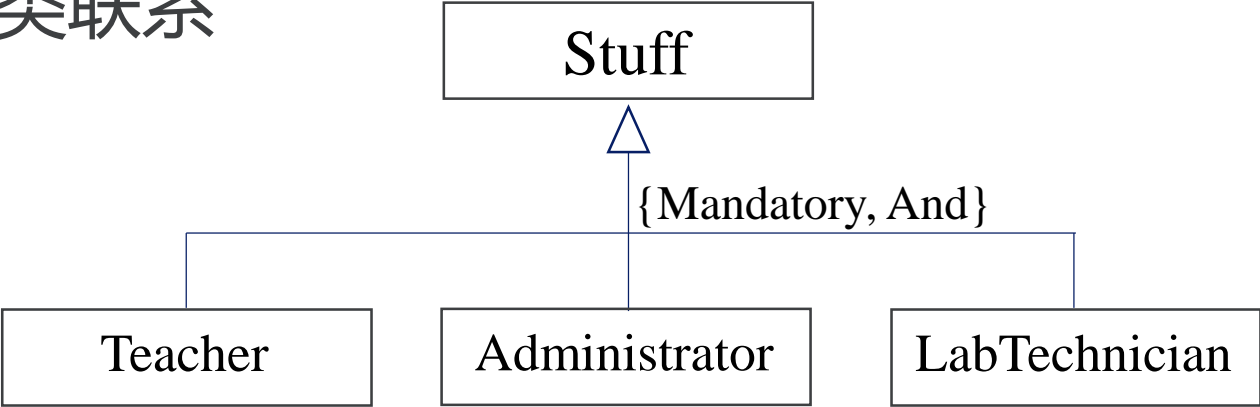
(1) with **mandatory participation on both sides**, represent the recursive relationship as a single relation with two copies of the primary key.

(2) with **mandatory participation on only one side**, we have the option to create a single relation with two copies of the primary key, or to create a new relation to represent the relation.

(3) with **optional participation on both sides**, create a new relation.

# ER模型向关系模型映射工程总结

## □ 超类/子类联系



Participation constraint	Disjoint constraint	Relation required
M	And	Single relation (with one or more discriminators to distinguish the type of each tuple)
O	Or	Two relations: one relation for superclass and one relation for all subclasses (with one or more discriminators to distinguish the type of each tuple)
M	And	Many relations: one relation for each combined superclass/subclass
O	Or	Many relations: one relation for superclass and one for each subclass



# 总结

实体/联系	映射
强实体	创建包含所有简单属性的的关系
弱实体	创建包含所有简单属性的关系（主关键字等到每个主实体的联系映射后再确定）
1：*二元联系	将一方实体的主关键字处理为表示多方实体关系的外部关键字
1：1二元联系	
(a)双方强制参与	组合为一个实体
(b)一方强制参与	将“可选”方实体的主关键字处理为表示“强制”方实体关系的外部关键字
(c)双方可选参与	无进一步消息任选
超类/子类联系	参照超类/子类映射表
*：*二元联系、复杂联系	创建一个关系表示该联系，该关系包含该联系的所有属性。参与联系的所有实体的主关键字作为该关系的外部关键字
多值属性	创建一个新关系表示多值属性，并将主实体的主关键字作为该关系的外部关键字

## 关于本讲内容

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**祝各位学习愉快!**

# 感谢观看！

讲解人：陆伟 教授