Database Technology
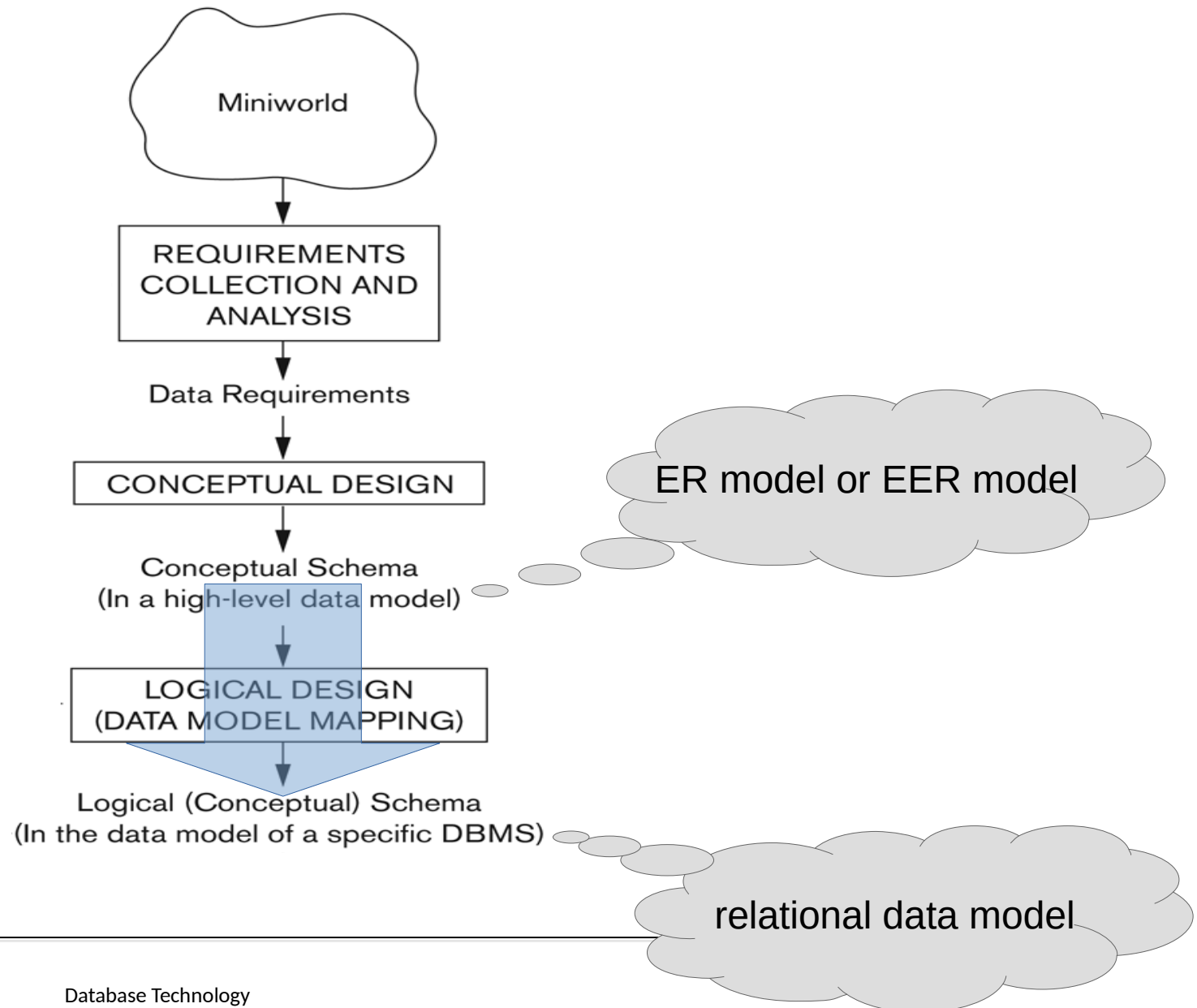
Topic 4: Mapping of EER Diagrams to Relational DBs

Olaf Hartig

olaf.hartig@liu.se

Recall: DB Design Process

Miniworld

REQUIREMENTS COLLECTION AND ANALYSIS

Data Requirements

CONCEPTUAL DESIGN

Conceptual Schema
(In a high-level data model)

ER model or EER model

LOGICAL DESIGN
(DATA MODEL MAPPING)

Logical (Conceptual) Schema
(In the data model of a specific DBMS)

relational data model

LINKÖPING UNIVERSITY

Algorithm/Procedure for ER Diagrams

Step 1: Convert all regular entity types
- new relation, flatten composite attributes, ignore multivalued attributes

Step 2: Convert all weak entity types
- new relation, attributes as above, include identifying relationship type(s)

Step 3: Convert all 1:1 relationship types
- foreign key into either relation, include attributes of the relationship

Step 4: Convert all 1:N relationship types
- foreign key into *N*-side relation, include attributes of the relationship

Step 5: Convert all remaining relationship types
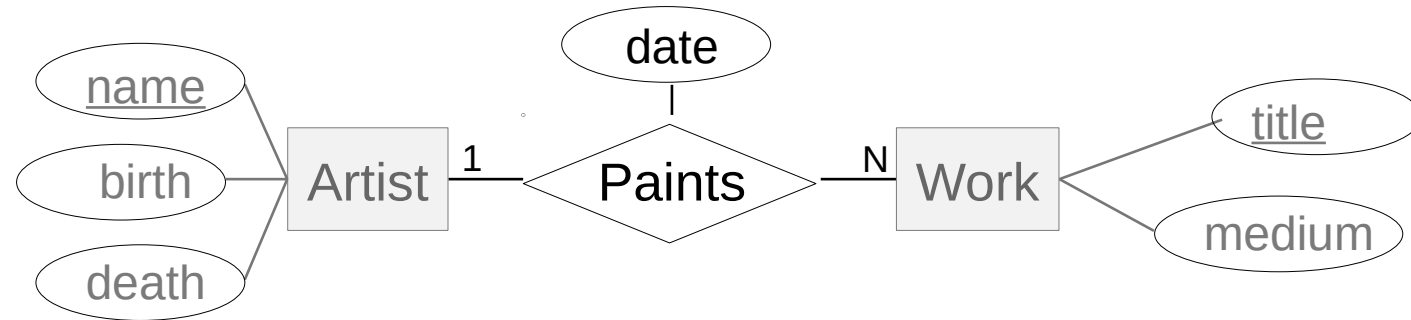   (N:M, ternary, 4-ary, …)
- new relation with foreign keys, include attributes of the relationship

Step 6: Convert all multivalued attributes
- new relation with foreign keys

Quiz

Consider the
given ER diagram
and relational
DB schema

Artist(<u>name</u>,birth,death),   Work(<u>title</u>,medium)

The Paints relationship can be represented by:

A. introducing a third schema: Paints(name,<u>title</u>,date)

B. extending the Work schema to be Work(<u>title</u>,medium,name,date)

C. extending the Artist schema to be Artist(<u>name</u>,birth,death,title,date)
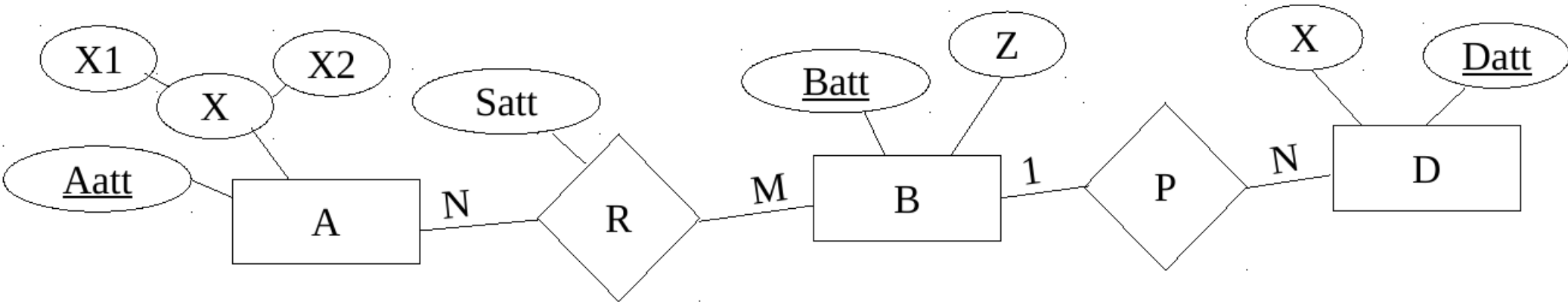
D. either A or B above

E. either A or C above

Example

Translate the following ER Diagram into a relational database schema.
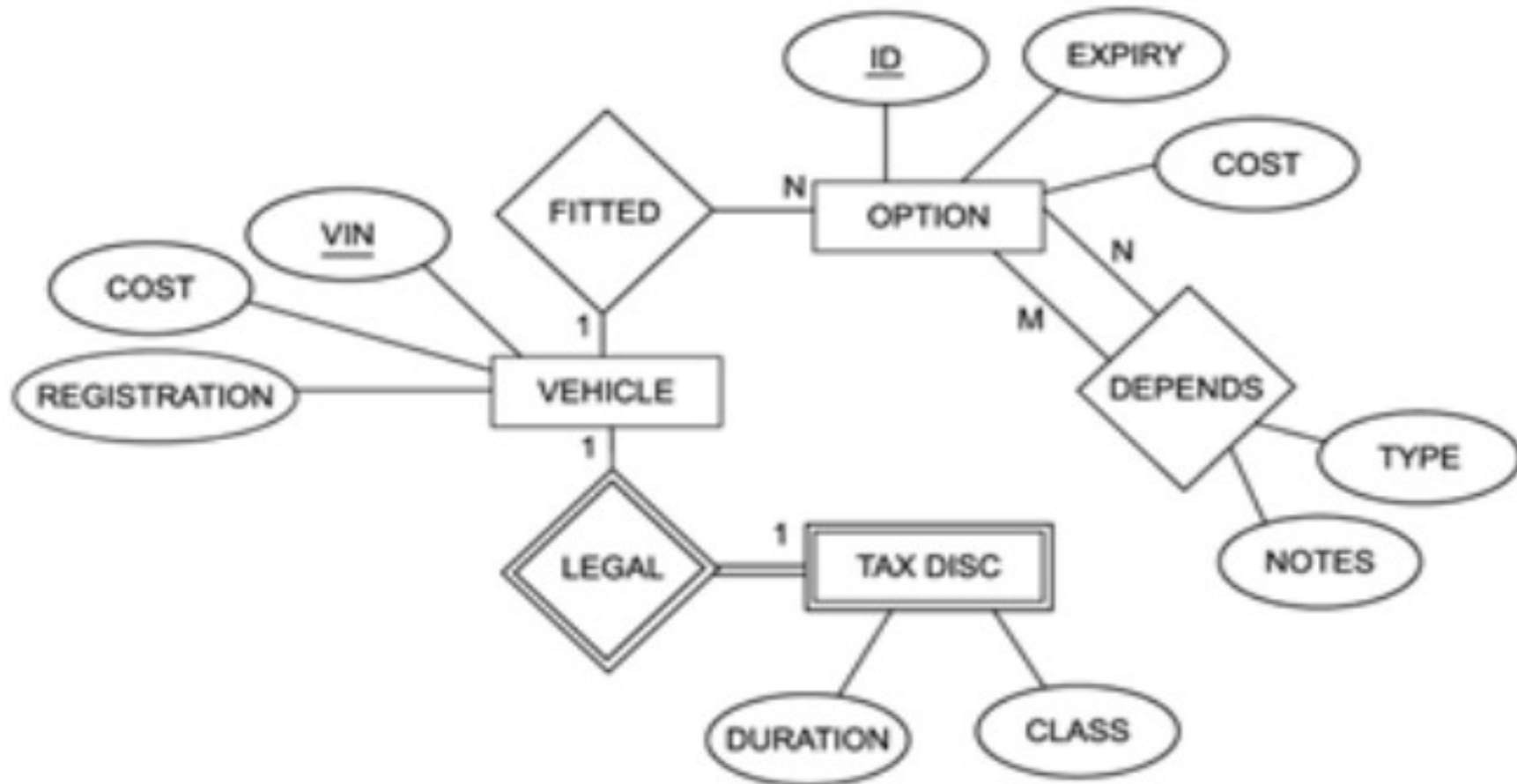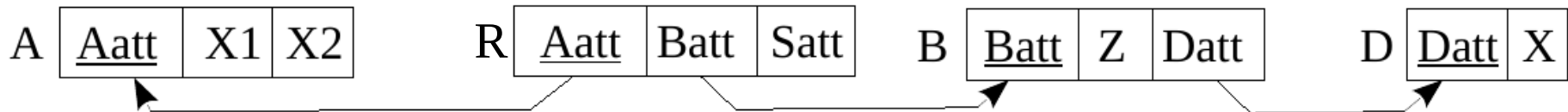
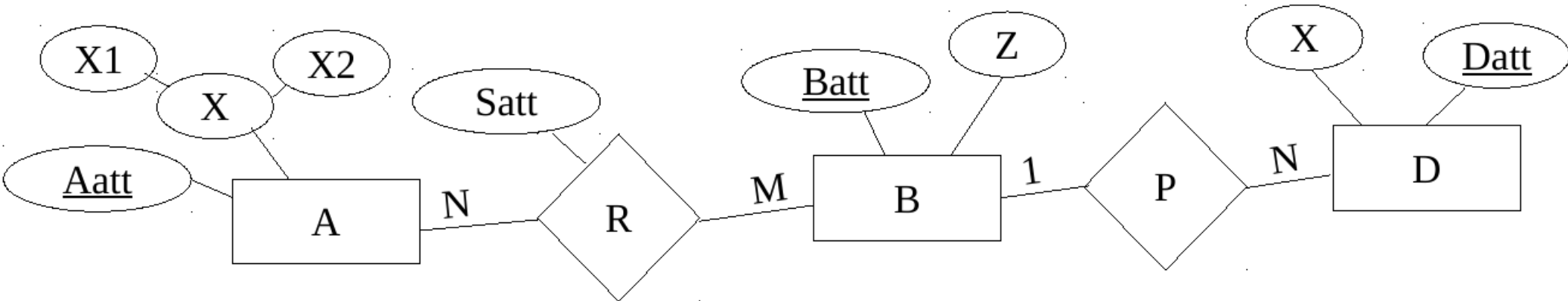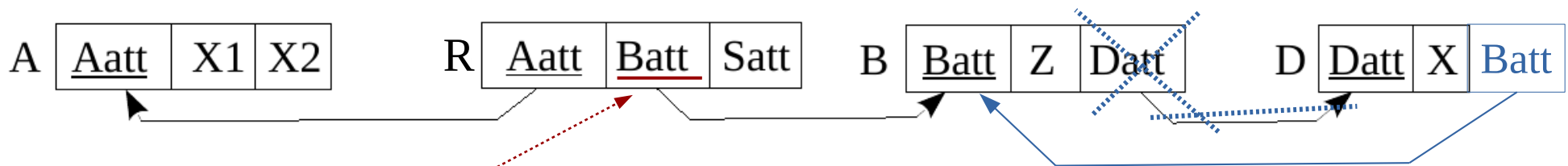# Exercise

Consider the following ER diagram.

Your friend tried to translate this ER diagram into a relation DB schema. The result is illustrated below. Unfortunately, your friend made *two mistakes*. Identify these mistakes.

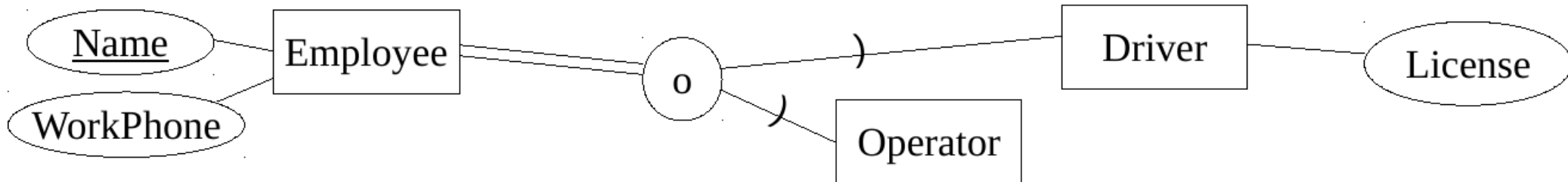# Exercise

Consider the following ER diagram.

Your friend tried to translate this ER diagram into a relation DB schema. The result is illustrated below. Unfortunately, your friend made *two mistakes*. Identify these mistakes.

must be part of the primary key in S (together with Aatt)
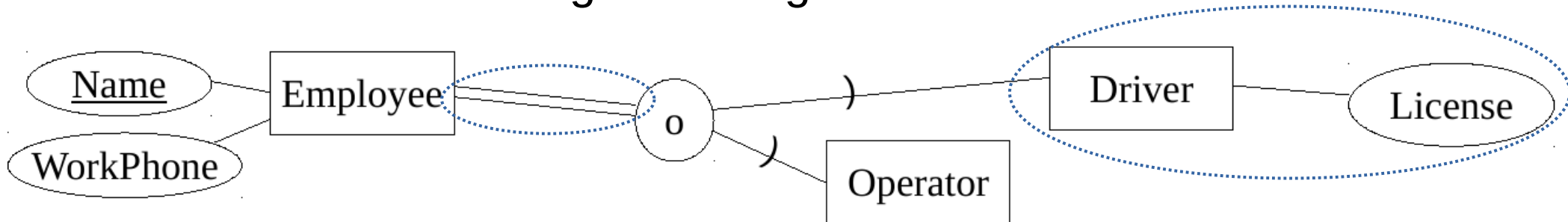
Another Exercise

Consider the following EER diagram.

Possible translation into a relation DB schema: single relation with a Boolean-type attribute for every subclass.

Employee	Name	Workphone	isDriver	isOperator	License

Some information (such as constraints) captured in the EER diagram is not captured anymore in the relational DB schema. Which?

Another Exercise

Consider the following EER diagram.

Possible translation into a relation DB schema: single relation with a Boolean-type attribute for every subclass.

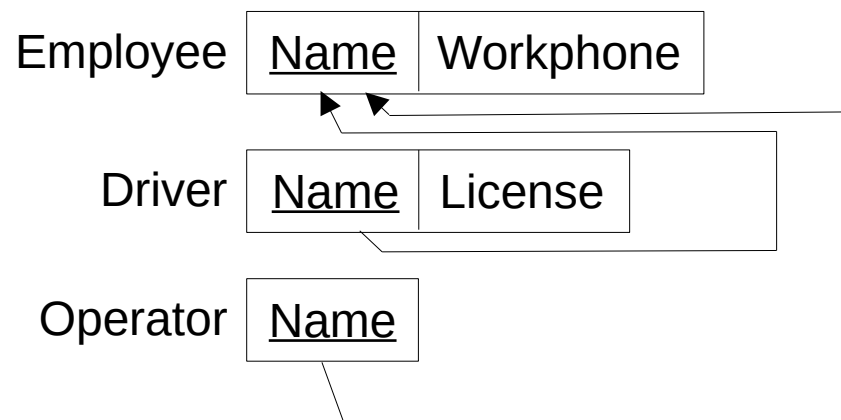| Employee	Name	Workphone	isDriver	isOperator	License

Some information (such as constraints) captured in the EER diagram is not captured anymore in the relational DB schema. Which?
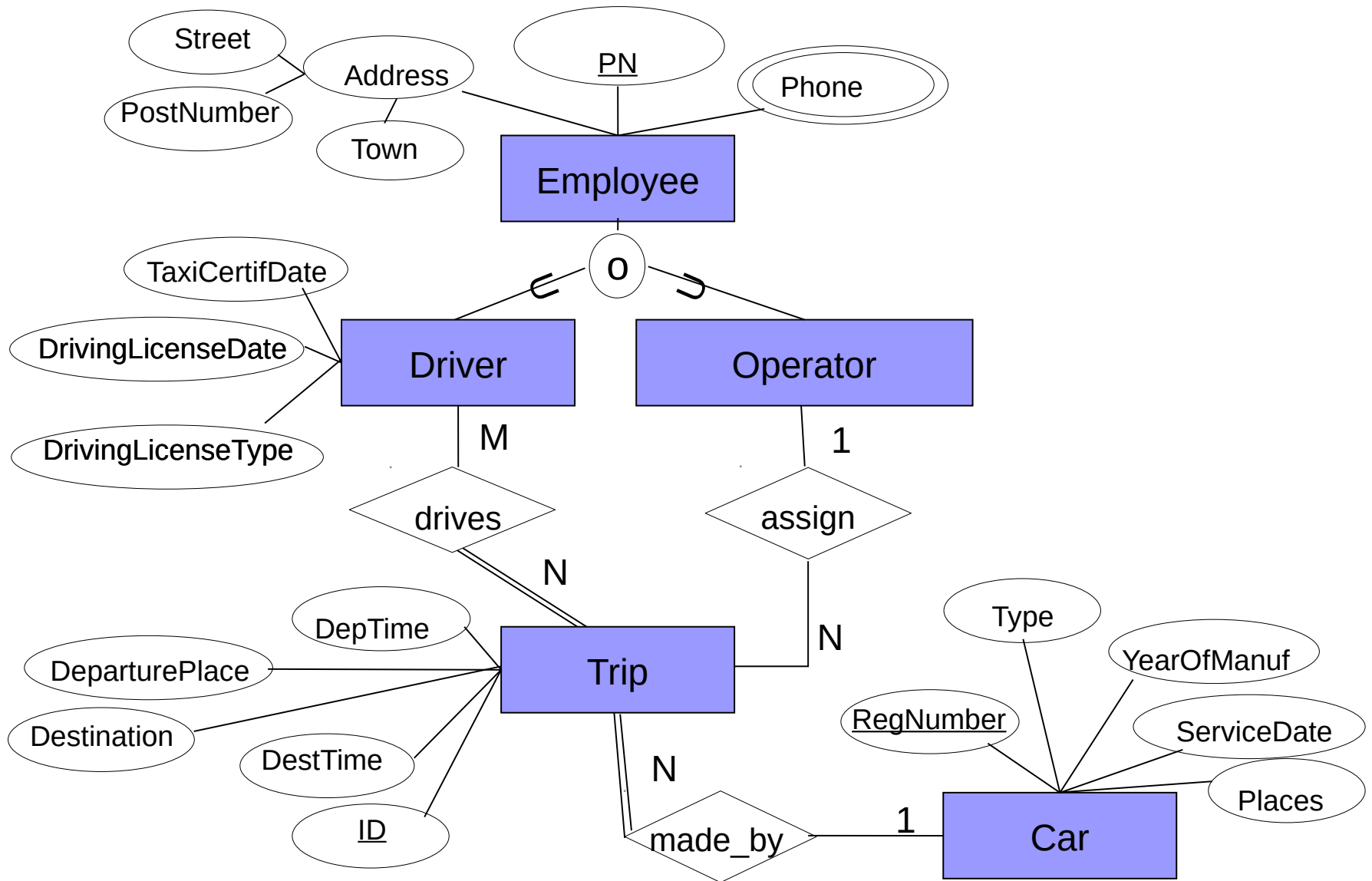
Another Exercise (cont'd)

Consider the following EER diagram.
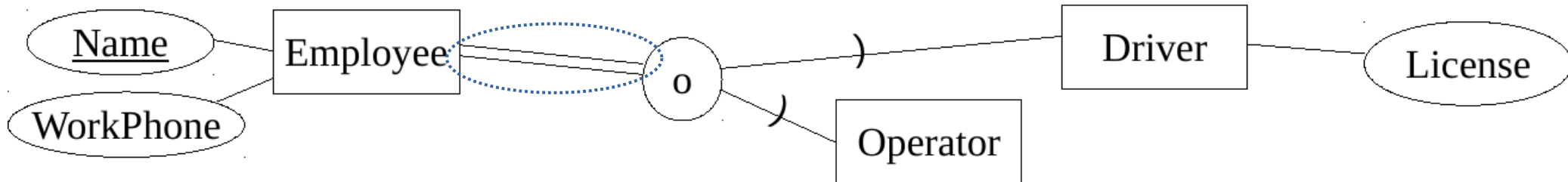
Alternative possible translation into a relation DB schema:
separate relation for each subclass + one for the superclass

Example 2

www.liu.se