

## LAB 1 – DB Design Exercise DT228/4 – Advanced Databases, Dr. Pierpaolo Dondio

*In this lab we review DB modelling: ER diagram design, relational model and physical implementation of the model using Oracle.*

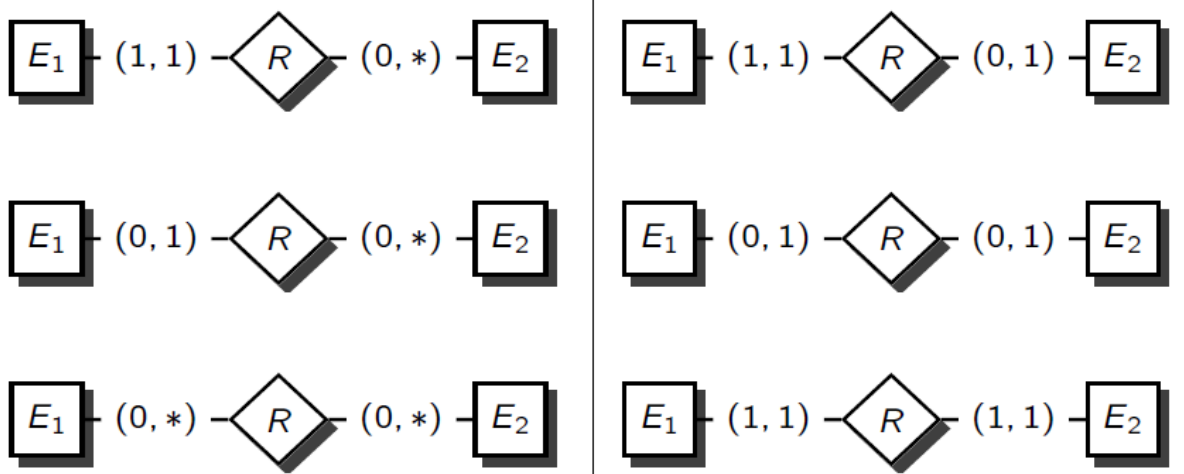
### Exercise 1 (short question on DB modelling)

A database contains a list of toys, all of them identified by a name, a price, a unique ID. However, toys are different and each toy could have specific attributes that only that toys has. For instance, the toy *car* has 2 attributes specific to the car only: *engine\_size*, *petrol\_or\_diesel*. The toy *teddy* has two other specific attributes *material* and *age* (and, of course, teddy does not have the *engine\_size* and *petrol\_or\_diesel* attributes, and the toy car does not have the *material* and *age* attributes) and so on...

How would you store this information in a database? Explain and justify your solution. Consider all the potential aspects of the solution (easy to use and maintain, performance, storage efficiency, what if some new attributes are added?). You might also search the web for the problem

### Exercise 2 – From ER diagram to relational model.

You need to model the relationship between two entities E1 and E2. Suppose the key of E1 is the attribute K1 and the key of E2 is attribute K2. You can ignore the other entities attributes. Chose 3 of the following 6 situations and show how they can be modelled using a relational model (tables and keys) and how it can be implemented in oracle (using create table statements).



Consider the following relation:

Is it possible to model it with a relational model and implement it with Oracle “create table” statements? Why?



### **Exercise 3 – Design a Relational model for a cinema DB.**

A company is managing more than 50 cinemas over the country. You are required to design their relational DB, showing tables with primary and foreign keys to model relationships among tables.

For each cinema, it is important to store its location, contact number, name and number of screens.

Each day in each screen there are many shows at different times.

The DB has a list of all the movies (past and present) shown, with the title of the movie, duration and rating. The number of seats for each screen is recorded as well.

The DB contains the booking system data as well. In order to submit a booking, each customer must be registered with a username, password, DOB.

Users can book tickets for a specific show. A booking consists of a number of tickets for a specific show at a specific time, screen and cinema. Tickets have different prices depending if they are adult or child ticket.

Seats numbers are assigned during the booking (the user can select them). Therefore, a booking is for instance, "3 adult tickets + 2 child tickets for movie X at time Y at cinema Z screen W, seats 3,4,56".

The total price of a booking is also recorded.

Note that a unique booking ID is generated for each booking since the same user can book twice for the same movie.