

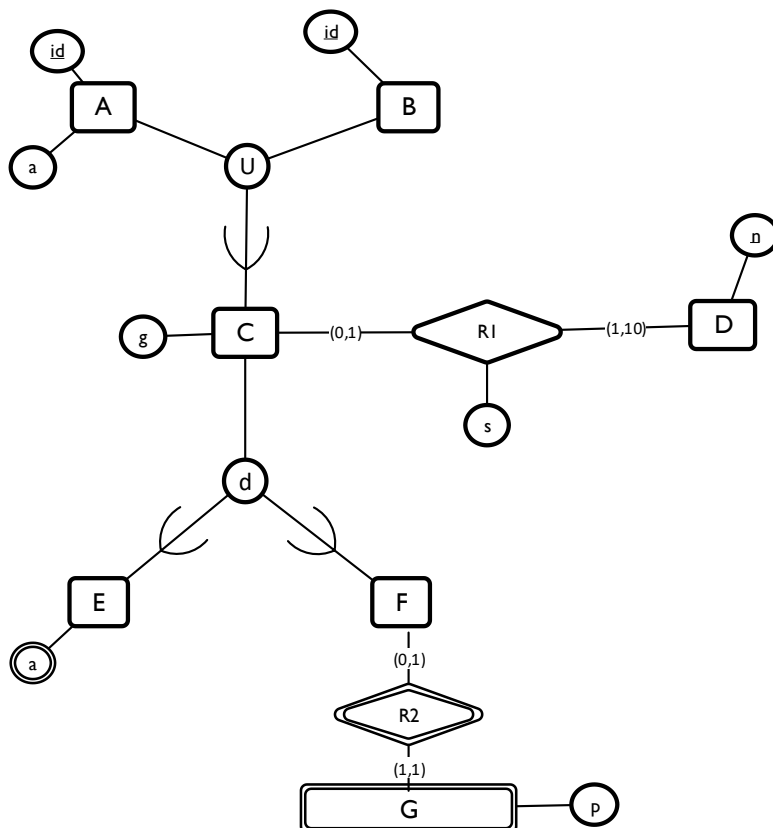


Exercise Sheet 5: Relational Model (until Thursday, 23.11.2017) (34 points)

Please note: you need **50%** of all exercise points to receive the *Studienleistung* for this lecture. In order to pass the RDB I Module, you need both the *Studienleistung* **and** you need to pass the exam. Exercises have to be turned in until **Thursday before the lecture** either in the lecture hall or into our mailbox at the IFIS floor (Mühlenpfordtstraße 23, 2nd floor). Please do not forget your **Matrikelnummer** and your **tutorial group number** on your solutions. **If you forget** to write your Matrikelnummer and/or your tutorial group number, you get **automatically 0 points**. Your solutions may be in German or English. Unless otherwise specified: **Always use your own words!**

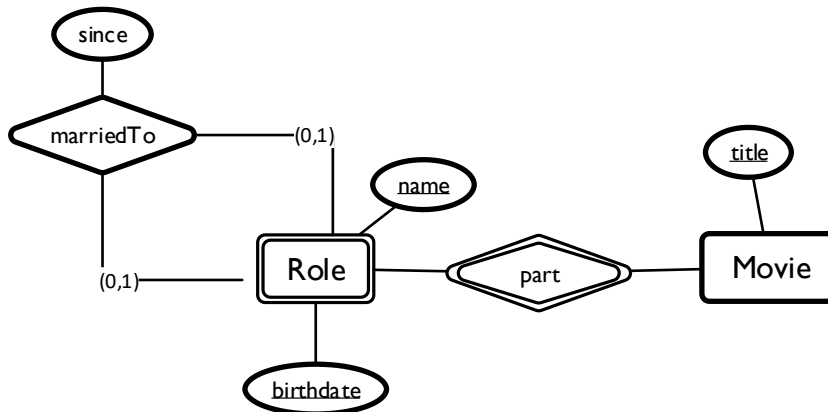
Exercise 5.1 (10 points)

Convert the following EER Diagram into a relational model. Also, model primary and foreign keys. Also, note constraints that cannot be modelled in your relational model. You may introduce surrogate keys.



Exercise 5.2 (4 points)

Convert the following EER Diagram into a relational model.



Exercise 5.3 (20 points)

- (10 Points)** Model the following mini world in EER (Chen-Notation). Please make a written note of non-expressible constraints in the diagram. Insert suitable keys.
- (10 Points)** Convert the EER Diagram from a) into a relational model. Also, model primary and foreign keys. Also, note constraints that cannot be modelled in your relational model. You may introduce surrogate keys.

In this world, we have persons with an identifying Id, a name, a power-level and an evilness-level. A person with a power-level greater than 10 is considered a powered person. Each powered person is either a super villain, if its evilness is higher than zero or a superhero otherwise. A superhero may have up to two sidekicks, while a person is only the sidekick of one superhero (or not a sidekick at all). A super villain may have any amount of persons as underlings, but has at least one, while a person may be an underling of several super villains. Both, sidekicks as well as underlings are regular persons but a sidekick is never an underling and vice versa.

Each person lives in at least one home, which is identified by its address, consisting of country, street, no, and zip code. A home does also have a number of residents. A home might even be an evil lair or a secret base (or both, if a hero and a villain rent an apartment in the same building). An evil lair does always contain a weapon of mass destruction, while a secret base contains a hero outfit.

Of course a hero always lives in at least one secret base and in each secret base lives at least one hero. The same goes for villains and evil lairs.