Exercise Sheet 5: Relational Model (until Thursday, 24.11.2016) (25 points)

Please note: you need **50%** of all exercise points to receive the *Studienleistung* for this lecture. In order to pass the RDB 1 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!**
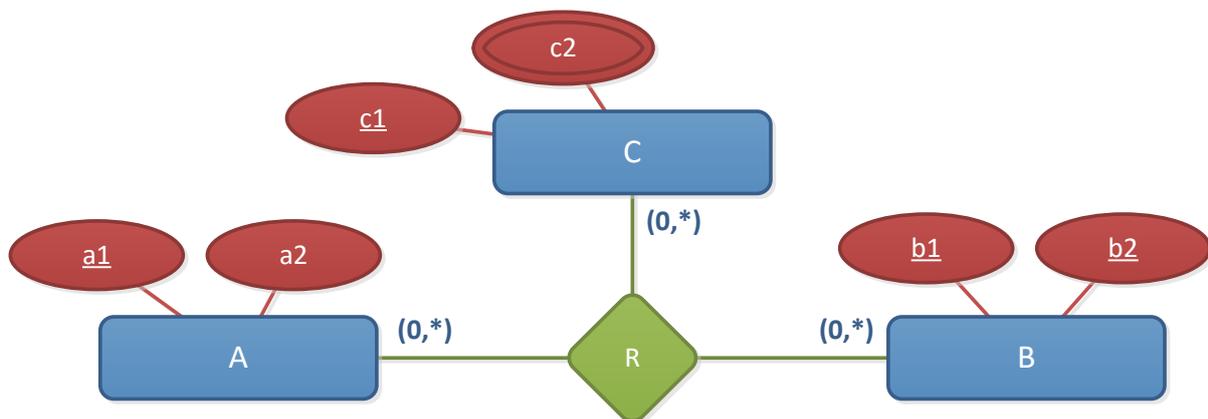
Exercise 5.1 (5 points)

a) Explain the following (3 points):
  - Primary key constraint.
  - NOT NULL constraint.
  - Foreign key constraint.
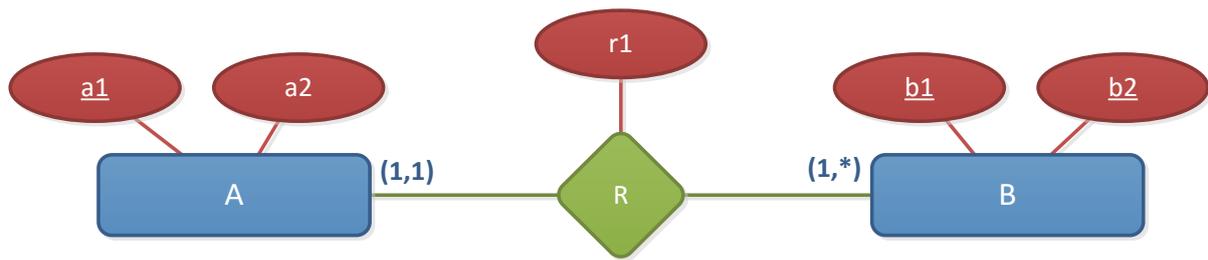b) What is meant by First Normal Form? (2 points)

Exercise 5.2 (5 points)

Convert the following EER to the Relational Schema.

a)

b)

Exercise 5.3 (15 points)

For the following mini world description:
1. Create an EER model for the following mini world description. (10 points)
2. Convert your EER to a Relational Schema Model. (5 points)

Note: in your model, please consider as entities at least the underlined nouns.

Wikidata: Figure 1 gives an overview of how Wikidata is structured. In the next paragraphs, we will describe *some components* of Wikidata that you have to model. Thus, consider the following:

At its core, Wikidata is organized around items. An item is identified by a unique id. Each item represents one coherent concept, e.g., a person, a city, etc. The content of an item divides into head and body parts. The head of an item consists of labels, descriptions, and groups of aliases (i.e., variations on the label), all of which may be present in several supported languages. The body of an item consists of statements and sitelinks.

Figure 1. Wikidata item page

- Statements encode all of the structured knowledge of Wikidata, and they basically are subject-predicate-object triples, where, as per Wikidata's terminology, an item corresponds to the subject, a property to the predicate, and a value to the object. Statements are grouped by property (e.g., "instance of" and "position held" in Figure 1). The set of supported properties is a controlled vocabulary, currently more than 2000. Statements may have one of a three-valued rank: normal (default), preferred (current information) and deprecated (outdated information). A statement may contain supplementary information called qualifiers. Qualifiers encode additional information about a statement. For instance in Figure 1 the statement s = ("Barack Obama", "position held", "President of the United States of America") is the subject of qualifier q=(s, "start time", "20 January 2009").
- Sitelinks refer to other Wikimedia sites which deal with the item in question. Each sitelink has an id (uri) and a title.
- Items are edited by users. We need to store information regarding first name, last name, country of origin, a unique user name and date of birth for every user. Every edit results in a new revision that is stored in the item´s revision history with a timestamp. Besides the timestamp, every revision has a text description that encodes what was actually edited.