

This assignment that accounts for 10% of your total mark, must be done individually. Read the description below, extract the business rules, identify the entities, their attributes and relationships including degree and cardinality and draw an ER diagram using MySQL Workbench and submit it in a file that you will call it `a2.pdf`.

You also need to implement the entities (i.e. relations) using SQL `create table` command and submit the script containing the code, which you will call it `a2.sql`.

As you will probably notice, this assignment follows the first assignment, or better said it focusses on the database design of the software that you ultimately will develop.

Since this is part of your assessment, if you have a question and you decide to post it on Piazza, please make sure that you post it as a private question that is visible to me and my TAs only. If I observe a public leading question, I will assume that as a cheating and you will face its consequence.

Description:

Home Library (HL) is an application that is used as a personal library in which you store data about the book, audio or video disks that you have at home.

Every book is recognized by its title, a unique 13 digits number that is called ISBN and is written in the first page of the book, publisher name, list of authors, the number of pages and year of publication. It is usual that authors decide to edit their books after it's been printed and sold, perhaps because they find an error in the book or they would like to add more relevant contents to it. Specifically speaking, this is usual for the scientific books, which needs to be updated from time to time as new ideas, discoveries, inventions and technologies are introduced. For this, publishers assign a number to this kind of the books and call it edition number.

Sometimes a few authors collaborate with each other to write a book. Although publishers store all the data that is required to get access to an author including their first, middle and family name, their address, phone number and email, you only have access to the information that is written in a book cover.

Sometimes you know that you have read a book when you see the name or book cover but you cannot remember what this book was about. Therefore, it is a good idea to store a small text that briefly explains what this book is about. Of course sometimes the name of the book is self-explanatory so you don't need to maintain any description about the book. For example, a book called *Relational Database Design* is less likely to be a novel or science fiction.

HL should let you find all the books that have the same subjects. For this, the best way is to use a tagging system by which you assign a few keywords to each book. For example, you may tag *Relational Database Design* book with keywords such as database, relational database, database design, relational design, relational data model, etc. etc. Although this will make your HL a comprehensive library system, but HL does not enforce you to define a tag for each book that you store in the library.

It is possible that you collect a few books from the same author perhaps because you like their method of writing or they are a good story teller or maybe the subject that they write about is what you are interested in.

The disks that are owned by you have two types, they are either an audio CD or vinyl that is referred to as a music album, or a movie DVD. In any case, we identify each by their name (album name or movie name) and release year. While each audio disk contains a few sound track, a DVD contains one movie only.

Each music (i.e. a sound track) in an album, has a name, language of the lyrics, at most two singers, one song writer, one composer, and one arranger. All the sound tracks of each album are produced by one producer. However, it is possible that one person is responsible for more than one job (e.g. Jane is not only the singer but also the composer of a music and producer of the album). For everybody involved in producing a song or an album, a first, middle and family name is stored.

For DVDs, HL should be able to maintain the name of the movies, directors, script writers, cast, producers, composers, editors, costume designers and year of release and gender of the crew and whether or not they have won a well-known prize such as Oscar. HL is only able to store three names for each role in the crew except for the cast for which 10 names are stored. We assume that each member of a crew has only one role in a movie (I know this is not true in reality, but there is a learning objective in it for you)!

Requirements:

- If an entity's identifier has not been stated clearly in the description, it should be an *auto incremented* identifier attribute.
- For relationships cardinality, where it is not clearly stated in the text, use common sense to design it. There are plenty of examples around you that can help you decide on this.
- Your drawing should be neat. So rearrange the entities until the diagram is readable and all the relationships are clearly presented.
- For this assignment, we are not interested in the types of the attributes therefore you should hide it. For that, you need to change the setting of the diagram via Model Options (Model Menu).
- As you know, no M:M and supertype/subtype relation can be implemented by relational data model. So you need to convert it to proper relations and relationships before you draw it by MySQL workbench.
- When you implement the relations, take into the consideration that we may make a query about the authors, composers, producers etc. This will affect your design.
- All relations should be in 3rd normal form.
- No handwritten solution will be marked.
- It should be noted that whatever that is said in the first assignment that I did not mention it here, still remains valid. For example, in the first assignment I had said that each book has at most 5 authors. This is true for this assignment as well.

Marking Scheme:

- You will be awarded a point for ERD and SQL script if you
 - identify a correct entity.
 - identify correct attributes including primary and foreign key
 - identify correct cardinalities and constraints.
 - Correctly identify optional and required attribute when you use `create table` command.
- Points will be deducted for your ERD and SQL script if

- You have irrelevant attributes defined in the entities. Remember that I explained in the lecture that not all data and business rules are relevant for our purpose of database design.
- You missed or added redundant entities or relationships.
- You incorrectly defined the attributes. (Remember that the type of the attributes is not our concern for this assignment)
- Your drawing is not neat.