HOMEWORK

Homework 1

The aim of this homework is to go over the entire case-study, discovering the main business requirements and details need to implement a database.

Understanding the Case-study

Consider the following quote from a KTH-librarian about the LMS (case-study):

> *"A student and faculty can borrow books. Different limits for the number of books a student and teacher can borrow. In addition, the number of days will be distinct in the case of students and teachers for borrowing any book. Each book will have a different ID. In addition, each book of the same name and same author (but the number of copies) will have a different ID. Entry of all the books will be done, who borrowed that book and when and duration. Detail of Fine (when the book is not returned at a time) is also stored."*

Within this quote there are some important features that need to be implemented at some point (read at the end of the course). **But what is important and what is not important?** Please answer the following:

1. Given the above quote, identify at least **three** relations and what their purpose would be.
2. Similarly, what information (attributes) would you have to store for a "borrowed book"?
3. Choose an appropriate domain (data type) for each attribute in question 2. Why do you choose these? Support your answer with some sample data sets.

Homework 1 P+

Users/Clients

The notion of functional dependencies is used to define normal forms for relations. Thus to see what is wrong with the design, to do so we must first determine the functional dependencies that hold for the relation. The library has two types of users, students and administrators.

- Identify all the schemas, in your design, that deal with user information or user data.
- Now by using decomposition, create three schemas that remove any redundant data (duplicate data) from the schemas that you found.
  - Clearly mark the keys and data types.