Introduction to Advanced Databases

Exercise 1 (Entity–Relationship–Model)

An ER–model for the university library has to be generated. The following facts should be modelled:

a) A book is labeled by its author, title, publisher, year of publication and the inventory number.

b) The university library is structured into departmental libraries, which are described by the name of its institute and a unique number.
   The books’ inventory numbers are not unique over all departmental libraries although a global catalogue has to be generated.

c) Each student, given by his name and matriculation number, is able of borrowing books from the libraries.
   For each lended book, the date of issue could be retrieved to control a maximum lending period of 4 weeks. The lending semester has to be registered, too.

Exercise 2 (Create the database in SQL)

a) Transform the ER–model of the university library into a relational database model. The generated tables have to be specified with their primary and foreign keys.

b) Find suitable CREATE TABLE–statements for the given tables.
Exercise 3 (Database queries in SQL)

Find SQL-statements for the following queries to the database created in Exercise 2.

a) Which students have borrowed a book?

b) Which departmental libraries have the book “Fundamentals of Database Systems” by “Elmasri and Navathe”.

c) Determine the number of available copies of each book.

d) Which students have borrowed more than 50 books in a period of one semester and how many books have they borrowed.

e) Determine the amount of not lended books of each departmental library.