

DA 2032 - Databases

Assignment 2

This second assignment consists of two parts: A theoretical and a practical part. Deadline for the theoretical part is *October 10, 2007*. Deadline for the practical part is *October 17, 2007*.

1 Theoretical Part

Consider the following two schemata:

Schema 1: $R(A,B,C,D)$

Schema 2: $R_1(A,B,C), R_2(B,D)$

1. Consider schema 1 and assume that the only functional dependencies are $A \rightarrow B, C \rightarrow D$ and those possibly derived from these. Is schema 1 in BCNF?
2. Consider schema 2 and assume that the only functional dependencies are $A \rightarrow B, A \rightarrow C, B \rightarrow A$, and $A \rightarrow D$ and those derived from these. Is schema 2 in BCNF?
3. Take away the FD $A \rightarrow D$ from question 3). Is schema 2 then in BCNF?
4. Consider schema 1 and assume that the only functional dependencies and multivalued dependencies are $A \twoheadrightarrow BC, B \rightarrow D, B \twoheadrightarrow CD$, and those derived from these. Is schema 1 in NF4 ?
5. Consider schema 1 and assume that the only functional dependencies and multivalued dependencies are $A \rightarrow BD, D \rightarrow C, C \twoheadrightarrow AB$, and $B \twoheadrightarrow D$, and those derived from these. Is schema 1 in NF4 ?

2 Practical Part - Movie Database

Read in the movie data from the previous exercise. For this, write a program in a programming language of your choice. One idea is to write a program that produces a textfile containing a number of SQL statements and then use mysql in batch-mode:

```
mysql --user=root < batchfile.sql
```

When reading in the data, follow these rules:

- A movie is identified by *name* and *year*. This allows for, e.g., remakes.

- If you find a movie which is not contained in `movies.txt`, then ignore this movie. I.e., ignore datasets that reference movies not contained in `movies.txt`.
- Ignore *episodes* which you find in `times.txt`.

Create SQL statements for the following questions:

1. What year did *Kasiping* air?
2. How many movies has *Abel, Alfred* starred in?
3. In which movies that *Aaronson, Evan* has produced did *Beers, Thom* star in?
4. In how many horror movies have people with last name *Clark* acted?
5. Which movies have a play time of 3 1/2 hours or longer?
6. How many movies have been produced, directed, and written by one and the same person?

Hand in your program that populates the database, and the SQL statements together with the answers to the questions.