DATABASES

ADIT

Lab Compendium – Lab 3 (Normalization)

Institutionen för datavetenskap (IDA), Linköpings universitet

Lab 3; Normalisation

Objectives

The purpose of this lab is to arrive at an understanding of the normal forms 1NF, 2NF, 3NF and BCNF.

Background Reading

Lecture notes and book material on normalisation.

The Lab

1) Given a relation R(A, B, C, D)
   a) Supply a set of functional dependencies and a primary key such that R is in 1NF but *not in 2NF*.
   b) Supply a set of functional dependencies and a primary key such that R is in 2NF but *not in 3NF*.
   c) Supply a set of functional dependencies and a primary key such that R is in 3NF but *not in BCNF*.

2) Given the universal relation R={A, B, C, D, E, F} and the set of functional dependencies F={{AB→C}; {A→D}; {D→AE}; {E→F}}
   a) What is a primary key for R? Show how you arrive at your solution (applying the inference rules for functional dependencies).
   b) Decompose R in 2NF. Watch out for candidate keys.
   c) Decompose R in 3NF. Watch out for candidate keys.
   d) Decompose R in BCNF.

3) Consider the following relation for published books:
   BOOK(Title#, Title, Author#, BookType, Price, AuthorName, Publisher)
   with the following additional dependencies:
   Title#→Title, BookType, Publisher
   Author#→AuthorName
   BookType→Price
   a) What is the normal form of BOOK?
   b) Decompose it stepwise into BCNF.

Handing in

- Answers to the lab question