week11 tutorial

November 2023

1 Given the relation schema R = (A, B, C, D, E) and the canonical cover of its set of functional dependencies

- $A \to B, C$
- $C, D \to E$
- $B \to D$
- $E \to A$

1. Is true that $A \to B$ and $A \to C$
2. Is true that $A, D \to E$
3. Is true that if $C, D \to E$ then $E \to C$ and $E \to D$.
4. prove the functional dependency $E \to C$ and $E \to D$.
5. Is true that $A \leftrightarrow E$.
6. Is (A) a candidate key of this schema.

2 Suppose you are given the following functional dependencies:

- $name \to address, gender$
- $address \to rank$
- $rank, gender \to salary$

1 Give a primary key of this relational schema

2 Normalize the relation r(name, address, gender, rank, salary) to 3rd normal form

3 Practical Design

Suppose you are given the following requirements for a simple database for a bank account management system R = {bankid, bankaddress, cid, customername, accountholder}

- There are many banks in this system and each bank has a unique bankid and the address of the banks will be recorded.

- For each customer, he/she has a unique cid and they can only own one account in one bank. Besides, the customer'name should be recorded

- For each account, it should record the account balance and the information of the account holder.

1 Please find out all the functional dependency.

2 Please find out the candidate key.