Solution – Quiz#3

Database Systems – BESE15A

06-12-2010

Question#1 (3+2)

Consider the following relational schema

EmpProject(EID, EName, Age, Address, salary, bonus, PID, PName, hoursWorked)

And the following functional dependencies:

$EID \rightarrow EName$ $PID \rightarrow PName$

$EID \rightarrow Address$ $salary \rightarrow bonus$

$EName, Address \rightarrow Age$ $PID, SID \rightarrow hoursWorked$

a. Find (EID,PID)+.
b. Is the combination (EID,PID) a super key for the given relation?

Solution

To find (EID,PID)+ step wise add the attributes depending upon the dependencies.

i. EID, PID, Ename
ii. EID, PID, Ename, Address
iii. EID, PID, Ename, Address, Age
iv. EID, PID, Ename, Address, Age, PName
v. EID, PID, Ename, Address, Age, PName, hoursWorked

This is not a super key of the given relation as it does not contain all the attributes of the relation.

Question#2 (2)

R(A,B,C,D,E)

Primary Key = (A,C)

$C \rightarrow E$

$A,B \rightarrow C,D,E$

$A,C \rightarrow B,D,E$

What is the highest normal form the R is in?

Solution

The given relation is in 1NF. It is NOT in 2NF as the there exist a partial dependency C->E in the relation.

Question#3 (3)

R(A,B,C,D,E)

Primary Key = (A,B)

$C \rightarrow B$

$A,B \rightarrow C,D,E$

$A,C \rightarrow B,D,E$

Convert R to BCNF.

Solution

For BCNF, every determinant should be a candidate key which is not the case in the above relation. It can be decomposed as:

R1(A,C,D,E)
R2(C,B)

The two relations are now in BCNF.