CHAPTER 8
DISCUSSIONS 4

Discussion 8-15

Consider the following set F of FDs on the relation schema $R(A, B, C, D, E, F)$:

$$A \rightarrow BCD,\ \ BC \rightarrow DE,\ \ B \rightarrow D,\ \ D \rightarrow A$$

a) Compute B^+.

b) Prove that AF is a *superkey*.

c) Give a *BCNF decomposition* of r.

Discussion 8-16

Consider the following relation R with the set *F* of FDs defined on it.

$$R=(A, B, C, D, E, F)$$

$$F = \{ A \rightarrow BC,\ \ C \rightarrow F,\ \ BF \rightarrow E \}$$

1. Formally prove that *R* is not in BCNF.
2. Find a candidate key for *R*. Justify.

Discussion 8-17

Consider relation schema R and its FD set F.

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

$F = \{ A \rightarrow B,\ B \rightarrow C \}$.

Since R is not in BCNF, we can decompose it into

$R_1(A, B)$ and $R_2(A, C, D)$

Prove or disprove that R_1 and R_2 are both in BCNF.

Discussion 8-18

Consider the following relational schema

sales2013(prodID, regionID, amount)

sales2014(prodID, regionID, amount)

sales2015(prodID, regionID, amount)

a. Are these relations in BCNF?
b. Write an SQL query for
‘*find total sales for the three years for each region*’.
c. What seems to be the problem with this design? How would you improve the design?