Hw4 q5

Assume FD hold for $R(A, B, C, D, E, F)$

FD: $A \to BC$,
$C \to E$
$B \to D$.

Is R is BCNF?

R is in BCNF iff. X contains a key. for every $(X \to Y) \in FD$.

Answer: FDs are:

$A \to BC$ A contain a key?

$C \to E$ C contain a key?

$B \to D$ B contain a key?

$\{A\}^+ = \{ABC\}$
$\{A\}^+ = \{ABCDE\}$
} A doesn't contain a key.

$\{B\}^+ = \{BD\}$. } B doesn't contain a key.

$\{C\}^+ = \{CE\}$ } C doesn't contain a key.

BCNF Decomposition Algorithm

Decompose R into R1 (X+) and R2 (X, Z)

X is the common attribute

Z is all attr except X+

Step 1: $A \rightarrow BC$.

$\{A\}^+ = \{ABCDE\}$

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

Step 2: $C \rightarrow E$

$\{C\}^+ = \{CE\}$

R3 (C E) R4 (C, A B D F)

R4 (A, B, C, D, F)

Step 3: $B \rightarrow D$

$\{B\}^+ = \{BD\}$

$R_5(B.D)$ $R_6(A.B.C, E, F)$