

Sample BCNF Problem

Questions

Consider a relation schema R with attributes $ABCDEFGH$ with functional dependencies S :

$$S = \{B \rightarrow CD, \quad BF \rightarrow H, \quad C \rightarrow AG, \quad CEH \rightarrow F, \quad CH \rightarrow B\}$$

1. Which of these functional dependencies violate BCNF?
2. Employ the BCNF decomposition algorithm to obtain a lossless decomposition of R into a collection of relations that are in BCNF. Make sure it is clear which relations are in the final decomposition and project the dependencies onto each relation in that final decomposition.
3. Is your decomposition dependency-preserving?

Explain all your answers and show your rough work.