

Normalization Assignment

due: October 16

For all questions, assume the relation $R = (A, B, C, D, E)$. Let the non-trivial dependencies over R be $F_1 = \{A \rightarrow B, BC \rightarrow D, CD \rightarrow E, BE \rightarrow A\}$ and $F_2 = \{AB \rightarrow BC, AC \rightarrow CD, A \rightarrow B\}$ and $F_3 = \emptyset$.

1. For each set of FDs, find all candidate keys for R .
2. For F_2 , find the canonical cover
3. For each set of FDs, compute BE^+
4. Prove or disprove: Given $X \rightarrow Y, Y \rightarrow Z$ and $Z \subseteq X$, if X is a candidate key, then Y is a candidate key for any scheme $R = (X, Y, W)$.
5. Prove or disprove: Given $X \rightarrow Y, Y \rightarrow Z$ and $X \subseteq Z$, if X is a candidate key, then Y is a candidate key for any scheme $R = (X, Y, W)$.
6. Provide an instance of R such that F_1 is satisfied but F_2 is not.