

[Exercise 19.7 from the textbook.] Suppose you are given a relation R with four attributes $ABCD$. For each of the following sets of FDs, assuming those are the only dependencies that hold for R , do the following:

- Identify the candidate key(s) for R .
- Identify the best normal form that R satisfies (1NF, 2NF, 3NF, or BCNF).
- If R is not in BCNF, decompose it into a set of BCNF relations that preserve the dependencies.

1. $C \rightarrow D, C \rightarrow A, B \rightarrow C$

2. $B \rightarrow C, D \rightarrow A$

3. $ABC \rightarrow D, D \rightarrow A$

4. $A \rightarrow B, BC \rightarrow D, A \rightarrow C$

5. $AB \rightarrow C, AB \rightarrow D, C \rightarrow A, D \rightarrow B$