CS 631: DATA MANAGEMENT SYSTEMS DESIGN

ASSIGNMENT 4

EXERCISE

Consider a relation R(ABCDEFGHIJ) with the following set of functional dependencies
G = { F → AB, CD → E, C → FG, H → IJ, D → H }

1. Is CDE a superkey of R (w.r.t. **G)**?

2. Is CDE a key of R (w.r.t. **G)**?

3. Apply the appropriate algorithm to determine a key for R (w.r.t. **G)**.

4. Apply the appropriate algorithm to determine all the keys for R (w.r.t. **G)**.

5. Determine the prime attributes of R.

6. Is R in BCNF (w.r.t. **G)**?

7. Is R in 3NF (w.r.t. **G)**?

8. Determine whether the decomposition **D** = { CDE, CFG, DH, HIJ, FAB } has (i) the dependency preservation property and (ii) the lossless join property, with respect to **G**. Also determine which normal form each relation in the decomposition is in.