Assignment 7 (Chapter7, part2)

7.14 Show that there can be more than one canonical cover for a given set of functional dependencies, using the following set of dependencies:

*X* → *YZ*, *Y* → *XZ*, and *Z* → *XY* .

7.15 The algorithm to generate a canonical cover only removes one extraneous attribute at a time. Use the functional dependencies from Exercise 7.14 to show what can go wrong if two attributes inferred to be extraneous are deleted at once.

7.21 Give a lossless decomposition into BCNF of schema *R* of Exercise 7.1.

7.22 Give a lossless, dependency-preserving decomposition into 3NF of schema *R* of Exercise 7.1.

7.30 Consider the following set *F* of functional dependencies on the relation schema

(*A*, *B*, *C*, *D*, *E*, *G*):

*A* → *BCD*

*BC* → *DE*

*B* → *D*

*D* → *A*

a. Compute B+.

b. Prove (using Armstrong’s axioms) that *AG* is a superkey.

c. Compute a canonical cover for this set of functional dependencies *F*; give each step of your derivation with an explanation.

d. Give a 3NF decomposition of the given schema based on a canonical cover.

e. Give a BCNF decomposition of the given schema using the original set *F* of functional dependencies.