CS430/630 – Homework 6

50 points

Due May 08 BEFORE CLASS

Instructions: Please submit paper copies (either typeset or hand-written copies are fine, as long as the hand writing is clear).

Question 1 (15 points)

Suppose you are given a relation R with four attributes ABCD and the following set of FDs: AB→C, BC→D.

a. Identify the candidate key(s) for R (recall that keys must be *minimal*)

b. Determine if R is in BCNF, 3NF, or none of the above. If it is not in BCNF, decompose it into a set of BCNF relations.

Question 2 (15 points)

Suppose you are given a relation R with four attributes ABCD and the following set of FDs: BC→A, AB→C, C→DA.

a. Identify the key(s) for R (recall that keys must be *minimal*)

b. Determine if R is in BCNF, 3NF, or none of the above. If it is not in BCNF, decompose it into a set of BCNF relations.

Note: For both questions, recall that it is not sufficient to consider the set of FDs that are given, but also its closure.

Question 3 (20 points)

Show the grant diagrams after steps 7 and 8 of the sequence of actions below, where *A* owns the relation on which the privilege *p* is assigned. Can *C* still exercise privilege *p* after step 8? What about *E*?

Step	Executed by	Action
1	A	GRANT *p* TO *B*
2	A	GRANT *p* TO *C* WITH GRANT OPTION
3	C	GRANT *p* TO *D* WITH GRANT OPTION
4	A	GRANT *p* TO *D* WITH GRANT OPTION
5	D	GRANT *p* TO *B* WITH GRANT OPTION
6	B	GRANT *p* TO *C*
7	D	GRANT *p* TO *E*
8	A	REVOKE *p* FROM *C* CASCADE