CS430/630 – Homework 6

Instructions:

The homework is due on **Thu May 13th, 18:59:59 EST**. Submissions must be **TYPESET**; submission must be in a single file called **HW6.pdf**.

The timestamp will be considered according to the UMB email server. Submissions received late **WILL NOT BE GRADED**. You are only allowed a **SINGLE** submission (i.e., you cannot send multiple emails – only the **first received** will be graded).

Email submissions must be sent to Nicholas J Pankewytch at <N.Pankewytch001@umb.edu>

Question 1 (15 points)

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

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.

Question 2 (15 points)

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

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

Question 3 (20 points)

Show the grant diagrams after steps 6 and 7 of the sequence of actions below, where *A* owns the relation on which the privilege *p* is assigned. Can *D* still exercise privilege *p* after step 7? What about *B*?

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