

CS430/630 – Homework 6

Instructions:

The homework is due on **Wed May 11th, 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 the TA at <Wenxiu.Ye001@umb.edu>

Question 1 (15 points)

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

- Identify the key(s) for R (recall that keys must be *minimal*)s
- 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: $AB \rightarrow C$, $B \rightarrow D$.

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