

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: $AB \rightarrow C$, $BC \rightarrow D$.

- Identify the candidate 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 2 (15 points)

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

- 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.

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