Quiz 2, Fall 2019
CSCI 4380 DB Sys
Time: 20 minutes

Name 1: _____ Signature: _____
Name 2: _____ Signature: _____
Name 3: _____ Signature: _____

Rules.

- Open book and notes. Do not use any electronic tools including your computer.
- You can talk to anyone in class. If you know the answer, help someone else in class.
- Each quiz must be by at least two and at most three people by people in classroom right now. Put your name on one quiz only.
- Quiz ends on time. No late papers will be accepted. By signing your name above, you agree that you understand this and have contributed to this quiz personally. Unsigned quizzes will not be graded.

Question 1 (points: a-8 b-8). For the following relations with given functional dependencies, list all keys and explain in detail whether they are in BCNF (Boyce-Codd Normal Form) or not.

(a) $R1(A, B, C, D, E)$, $\mathcal{F} = \{AB \rightarrow CD, ABC \rightarrow E\}$

Answer.

List Keys:

In BCNF? Explain why or why not.

(b) $R2(A, B, C, D, E)$, $\mathcal{F} = \{AB \rightarrow CD, D \rightarrow E, BCDE \rightarrow A\}$

Answer.

List Keys:

In BCNF? Explain why or why not.

Question 2 (points: 9). Are the following two sets of functional dependencies equivalent? Show yes or no by checking (1) if all functional dependencies in $\mathcal{F}_1$ are implied by $\mathcal{F}_2$, and (2) if all functional dependencies in $\mathcal{F}_2$ are implied by $\mathcal{F}_1$. You can skip any functional dependencies that are identical in both relations.

$\mathcal{F}_1 = \{AB \rightarrow C, C \rightarrow D, CDE \rightarrow F\}$

$\mathcal{F}_2 = \{AB \rightarrow C, C \rightarrow D, A \rightarrow A, AB \rightarrow D, DE \rightarrow F\}$