Spring 2016, CS122A, UC Irvine, Quiz 8, Prof. Chen Li

Student ID:_____ Name:_____ Score (out of 16):_____

Let the relation R(A, B, C, D, E) have a functional dependency set F={A->B, B->C, CD->E}.

1. Suppose we decompose R into R1(A, B, C) and R2(C, D, E)
    a. Compute the local dependencies in F_{R1} and F_{R2}.

    b. What's the strongest normal form of R1 and R2 respectively? Justify.

    c. Is this decomposition lossless join? Justify.

    d. Is this decomposition dependency preserving? Justify.

2. Suppose we decompose R into R3(A, B, C, D), R2(C, D, E).
    a. Compute the local dependencies in F_{R3} and F_{R2}.

    b. What's the strongest normal form of R3 and R2 respectively? Justify.

    c. Is this decomposition lossless join? Justify.

    d. Is this decomposition dependency preserving? Justify.

Let relation R(A, B, C, D, E) have a functional dependency set F={A->B, B->C, CD->E} (same as before).

3. Suppose we decompose R into R4(A, B), R5(B, C), R2(C, D, E).
   a. Compute the local dependencies in F_{R4}, F_{R5} and F_{R2}.

   b. What's the strongest normal form of R4, R5, and R2 respectively? Justify.

   c. Is this decomposition lossless join? Justify.

   d. Is this decomposition dependency preserving? Justify.

4. Suppose we decompose R into R6(A, B, D), R7(A, C, D, E).
   a. Compute the local dependencies in F_{R6} and F_{R7}.

   b. What's the strongest normal form of R6 and R7 respectively? Justify.

   c. Is this decomposition lossless join? Justify.

   d. Is this decomposition dependency preserving? Justify.