CS 6360.002/003- Assignment 4

Due Date: October 20, 2017, 11:59PM

1. Are the following sets of FDs equivalent? Explain why.
E = {A->C, AC->D, E->AD, EC->DH, DE->CH}
F = {A->CD, E->AH}

2. Find a 3NF decomposition of a relation R(ABCDEFGHIJ) that satisfies the following FDs: { AB->C, BD->EF, AD->GH, A->I, H->J, GD->ABH }
(follow regular normalization steps and successively normalize to 3NF)

3. Find a minimal cover of the following set of dependencies:
{AB->CDE, C->BD, CD-> E, DE->B }

4. Consider a relation R(ABCDEFGHIJ) satisfying the following FDs: FI→EHJC H→GB F→EA HI→FGD A→C

(a) Find all candidate keys for R. Show all the steps. List prime attributes of R.

(b) Based on given functional dependencies and candidate keys that you have found, find a 3NF decomposition of R. (follow regular normalization steps and successively normalize to 3NF)

5. Find a lossless (non-additive), dependency preserving 3NF decomposition of R(EFGHI) using the minimal cover method. R satisfies the following dependencies:

FG→E HI→E F→G FE→H H→I

6. Consider a relation R(ABCDEFGHIJ) satisfying the following FDs:

DG→CFHB D→CJ F→EA J→B FG→DEI

(a) Find all candidate keys for R. Show all the steps. List prime attributes of R.

(b) Based on given functional dependencies and candidate keys that you have found, find a 3NF decomposition of R. (follow regular normalization steps and successively normalize to 3NF)

7. Find a lossless, dependency preserving 3NF decomposition of R(CDEFG) using the minimal cover method. R satisfies the following dependencies:

F→G D→E DC→F DE→C FG→C

Questions 1, 4, 6 are 20 points; 2, 3, 5, 7 are 10 points.