CS1555 Recitation 11

Objective: to practice normalization, canonical forms and finding keys, decomposing relations into BCNF.

Part 1: For each of the following relations R and sets of functional dependencies F, do the following:

1) Find the canonical cover (minimal cover) of F.
2) Using the canonical cover, find the keys of the R.

1. Consider the following set of functional dependencies F on a relation R (A, B, C, D, E):

$A \rightarrow BC$
$A \rightarrow D$
$B \rightarrow C$
$C \rightarrow D$
$DE \rightarrow C$
$BC \rightarrow D$

2. Consider the following set of functional dependencies F on relation R (A, B, C, D, E, H):

$A \rightarrow C$
$AC \rightarrow D$
$E \rightarrow AD$
$E \rightarrow H$
$A \rightarrow CD$
$E \rightarrow AH$

Part 2:

1. Consider the following set of functional dependencies F on relation R (A, B, C, D, E, H):
   $A \rightarrow C$
   $AC \rightarrow D$
   $E \rightarrow AD$
   $E \rightarrow H$
   $A \rightarrow CD$
   $E \rightarrow AH$

The key for R is *EB* and the following set of functional dependencies constitutes the canonical cover:

$A \rightarrow C, E \rightarrow A, E \rightarrow H, A \rightarrow D$

1) Using Synthesis Method, construct a set of 3NF relations.

2) Using Universal Method, decompose R into a set of BCNF relations.

2. Consider the following set of functional dependencies F on relation R (A, B, C, D, E):
   $A \rightarrow BC$
   $A \rightarrow D$
   $B \rightarrow C$
   $C \rightarrow D$
   $DE \rightarrow C$
   $BC \rightarrow D$

The key for R is *AE* and the following set of functional dependencies constitutes the canonical cover:

$A \rightarrow B, B \rightarrow C, C \rightarrow D, DE \rightarrow C$

a) Using Synthesis Method, construct a set of 3NF relations.

b) Using Universal Method, decompose R into a set of BCNF relations.