

PRACTICE PROBLEM SET #5

CSC 261/461 (Database Systems), Spring 2018,
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Problem 1

Refer: Section 15.1.2

Let $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$.

Let $G = \{A \rightarrow CD, E \rightarrow AH\}$.

Show that:

1. G covers F
2. F covers G
3. F and G are equivalent

Problem 2

Refer: Section 15.1.3

Let the relation R be R(A,B,C,D,E) and the given set of FDs be

$F : \{A \rightarrow D, BC \rightarrow AD, C \rightarrow B, E \rightarrow A, E \rightarrow D\}$.

Find the minimal cover of F

Problem 3

Let the relation schema R(A,B,C,D) is given. For each of the following set of FDs do the following:

i) indicate all the BCNF violations. Do not forget to consider FD's that are not in the given set. However, it is not required to give violations that have more than one attribute on the right side.

ii) Decompose the relations, as necessary, into collections of relations that are in BCNF.

1. FDs $AB \rightarrow C$, $C \rightarrow D$, and $D \rightarrow A$
2. FDs $B \rightarrow C$, $B \rightarrow D$
3. FDs $AB \rightarrow C$, $BC \rightarrow D$, $CD \rightarrow A$, $AD \rightarrow B$