CSC343 Worksheet 13

July 4, 2020

a) **Exercise 3.4.1:** Let $R(A, B, C, D, E)$ be decomposed into relations with the following three sets of attributes: $\{A, B, C\}$, $\{B, C, D\}$, and $\{A, C, E\}$. For each of the following sets of FD 's, use the chase test to tell whether the decomposition of R is lossless. For those that are not lossless, give an example of an instance of R that returns more than R when projected onto the decomposed relations and rejoined.

   a) $B \rightarrow E$ and C $E \rightarrow A$.

   b) $AC \rightarrow E$ and $BC \rightarrow D$.

   c) $A \rightarrow D$, $D \rightarrow E$, and $B \rightarrow D$.

   d) $A \rightarrow D$, $CD \rightarrow E$, and $E \rightarrow D$.

b) **Exercise 3.6.1:** Suppose we have a relation $R(A, B, C)$ with an MVD $A \rightarrow\rightarrow B$. If we know that the tuples (a_1, b_1, c_1), (a_2, b_2, C_2), and (a_3, b_3, c_3) are in the current instance of R, what other tuples do we know must also be in R?