University of Toronto
CSC343, Winter 2016

Lecture Prep for Week 11

Questions

1. Suppose we have a relation on attributes P, Q, R, S, and T.

   (a) Create an instance of this relation with two tuples that violates $R \to T$.

   (b) Create an instance of this relation with two tuples that violates $Q \to RP$.

   (c) Create an instance of this relation with two tuples that violates $SR \to P$.

   (d) Create an instance of this relation with four tuples, all of which have the value 1 for Q. This instance must satisfy all three of the FDs listed above.

2. Suppose we have a relation on attributes A, B, C, D, E, and F, and these functional dependencies hold: $S = \{\ B \to DE, \quad BF \to C, \quad CF \to B, \quad DF \to AE\ \}$.

   (a) Compute B^+.

   (b) Compute CF^+.

   (c) Compute DF^+.

   (d) Compute BC^+.

   (e) Compute ABC^+.

   Write your closures in alphabetical order. For example, rather than $BDFA$, write $ABDF$.

3. Again, suppose we have a relation on attributes A, B, C, D, E, and F, and these functional dependencies hold: $S = \{\ B \to DE, \quad BF \to C, \quad CF \to B, \quad DF \to AE\ \}$.

   (a) Does it follow from S that $B \to A$?

   (b) Does it follow from S that $CF \to E$?

   (c) Does it follow from S that $DF \to B$?

   (d) Does it follow from S that $BD \to C$?

   (e) Does it follow from S that $BFC \to A$?

4. Suppose we have a relation with attributes $ABCDE$ and functional dependencies $A \to D$, $B \to A$, $C \to A$, $D \to CE$. Project the functional dependencies onto the attribute set ABD.

Submitting your work

Put your answers in a pdf file called "prep11.pdf" and submit it under Prep 11 on MarkUs. Once you have submitted, click on the file's name to check that you submitted the correct version. You can submit a new version of a file later (before the deadline, of course); look in the "Replace" column.