DATABASE SYSTEMS

Practice Exercises 2

CMPT 354, Course Section of Dr. E. Ternovska

Problem 1. Consider the following set of FDs:

$$D \to AC\,, \qquad AB \to DE\,, \qquad FD \to E\,, \qquad C \to F$$

(a) Determine whether each of the following FDs is implied by the FDs above:

$$\begin{array}{ll} AC \to E & BD \to EF \\ AD \to CF & ABC \to DF \\ CD \to DE & BE \to AC \end{array}$$

(b) For each of the FDs in point (a) that are implied, give a derivation using the Armostrong's axioms.

Problem 2. Consider a schema with attributes A, B, C, D, E, F and FDs

$$D \to A\,, \qquad F \to B\,, \qquad DF \to E\,, \qquad B \to C$$

(a) Find the prime attributes and candidate keys of the schema.

(b) Is the schema in BCNF? Justify your answer.

Problem 3. Let R, S and T be relations on attributes A, B, C. Given the following set of INDs:

$$R[A, B] \subseteq S[B, C] \qquad\qquad S[B, C] \subseteq T[C, A]$$

determine which of the following INDs are implied:

$$\begin{array}{ll} R[A] \subseteq T[A] & R[B] \subseteq T[B] \\ R[A] \subseteq T[B] & R[B] \subseteq T[A] \\ R[C] \subseteq T[B] & \end{array}$$