Introduction to Databases
Normal Forms

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CHANGELOG

v26.0 Initial version.

Problem 1. Consider a relation schema over attributes A, B, C, D, E, F with the following set of FDs:

$$EF \to BC\,, \qquad A \to D\,, \qquad B \to AE\,, \qquad BD \to C$$

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

(b) List all of the FDs that violate the requirements of BCNF.

(c) Apply the BCNF decomposition algorithm. Is the resulting schema dependency-preserving? **(optional)**

(d) List all of the FDs that violate the requirements of 3NF.

(e) Apply the 3NF synthesis algorithm to obtain a lossless, dependency-preserving 3NF schema.

Problem 2. Consider a relation schema over attributes A, B, C, D, E, F with the following set of 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) List all of the FDs that violate the requirements of BCNF.

(c) Apply the BCNF decomposition algorithm. Is the resulting schema dependency-preserving? **(optional)**

(d) List all of the FDs that violate the requirements of 3NF.

(e) Apply the 3NF synthesis algorithm to obtain a lossless, dependency-preserving 3NF schema.