University of Toronto
CSC**343**

Sample 3NF Problem

Questions

Consider a relation R with attributes $ABCDEFGH$ and functional dependencies S:

$$S = \{A \to CD, \quad ACF \to G, \quad AD \to BEF,$$

$$BCG \to D, \quad CF \to AH, \quad CH \to G, \quad D \to B, \quad H \to DEG\}$$

1. Compute all keys for R.
2. Compute a minimal basis for S. In your final answer, put the FDs into alphabetical order.
3. Using the minimal basis from part (b), employ the 3NF synthesis algorithm to obtain a lossless and dependency-preserving decomposition of relation R into a collection of relations that are in 3NF.
4. Does your schema allow redundancy?

Explain all your answers and show your rough work.