

CS 360: Database Systems
Department of Computer Science
University of Idaho

Instructor: Hasan Jamil

Semester: Spring 2025

Assignment#: 5 (for all groups)

Total: 30 Points

Due Date: April 24, 2025

1. Given $R = \{ABCDEFGHIJK\}$ and $F = \{I \rightarrow K, AI \rightarrow BLG, IC \rightarrow ADE, BIG \rightarrow CJ, K \rightarrow HA\}$. Find a canonical cover for F . Find a 3NF decomposition of R . Is there a BCNF decomposition of R that is both dependency-preserving and also loss-less join. If so, compute such a decomposition.
2. Let $R = \{ABCDEH\}$ and $F = \{ABC \rightarrow DE, AB \rightarrow D, DE \rightarrow ABCH, E \rightarrow C\}$. Is this scheme in 3NF, BCNF or none? If it isn't, decompose this scheme into a normal form that is both dependency preserving and loss-less join.
3. Consider the scheme $R = \{ABCDEFGHI\}$ and the associated functional dependencies $F = \{A \rightarrow BCDEIGH, BCD \rightarrow AEIGH, BCE \rightarrow ADEIGH, CE \rightarrow H, CD \rightarrow H\}$. Find a BCNF decomposition of R . Is the decomposition you computed dependency preserving? Why or why not?