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

Instructor: Hasan Jamil **Assignment#: 4** (for traditional group)
Semester: Spring 2025 **Total: 15 Points** **Due Date: April 12, 2025**

1. Let $R = \{ABCDELGHIJK\}$ and $F = \{I \rightarrow K, AI \rightarrow BLG, IC \rightarrow ADE, BIG \rightarrow CJ, K \rightarrow HA\}$.

   (a) Prove using inference rules that $F \models AI \rightarrow H$. [2 points]

   (b) Prove or disprove that $F \not\models AC \rightarrow K$. [2 points]

   (c) Compute BIC_F^+. [2 points]

   (d) Compute all candidate keys of R. [4 points]

2. Let R be a relation with scheme over the attributes {A,B,C,D,E,H}, and the set of functional dependencies $F = \{fA \rightarrow B, BD \rightarrow H, E \rightarrow D, C \rightarrow AE\}$ holds on R.

   (a) Prove using inference rules that $F \models ADC \rightarrow H$. [2 points]

   (b) Compute BE_F^+. [1 point]

   (c) Compute all candidate keys of R. [2 points]