Tutorial: Functional Dependencies

1. Consider $R = \{A, B, C, D, E\}$ with $\Sigma = \{\{A\} \to \{A, B, C\}, \{A, B\} \to \{A\}, \{B, C\} \to \{A, D\}, \{B\} \to \{A, B\}, \{C\} \to \{D\}\}$
   (a) Compute the attribute closures of the attributes in R with Σ in order to find the candidate keys of R with Σ.
   (b) Find the candidate keys of R with Σ.
   (c) Find the prime attributes.
   (d) Compute a minimal cover of R with Σ.
   (e) Compute a compact minimal cover of R with Σ.
   (f) What could be an example of a table with such constraints?
2. Create Your Own Example
   (a) Invent a random R and Σ.
   (b) Compute the attribute closures of the attributes in R with Σ.
   (c) Find the candidate keys of R with Σ.
   (d) Compute a minimal cover of R with Σ.
   (e) Compute a compact minimal cover of R with Σ.

References

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[3] R. Ramakrishnan and J. Gehrke. *Database Management Systems.* McGraw-Hill, 2002.