Exercise 06: Relational database design and normal forms

Task 1: Normal forms

Given the following relations R and S in the first normal form with functional dependencies F :

$$
\begin{aligned}
R &= (A,B,C,D,E,F)\ mit \\
A,B &\rightarrow C,D,E \\
D &\rightarrow F \\
A,B,C &\rightarrow D,E
\end{aligned}
\qquad\qquad
\begin{aligned}
S &= (V,W,X,Y,Z)\ mit \\
V &\rightarrow W,X,Y,Z \\
W,Z &\rightarrow V,X,Y \\
Y &\rightarrow Z.
\end{aligned}
$$

1. First, use the `COVER` algorithm to simplify the set of functional dependencies.

2. Determine the keys of the relations.

3. Do the relations correspond with the second normal form (2NF)?

4. Do the relations correspond with the third normal form (3NF)?

5. Do the relations correspond with the Boyce-Codd normal form (BCNF)?