

Armstrong Axioms

- **Reflexivity:** ("trivial functional dependencies")

If $\beta \subseteq \alpha$ then $\alpha \rightarrow \beta$.

- **Augmentation:**

If $\alpha \rightarrow \beta$ then $\alpha\gamma \rightarrow \beta\gamma$.

- **Transitivity:**

If $\alpha \rightarrow \beta$ and $\beta \rightarrow \gamma$ then $\alpha \rightarrow \gamma$.

lossless: a decomposition is **lossless** if the original relation can be **reconstructed** from the decomposed tables via natural joins

3NF:

for every non trivial ($X \rightarrow A$):

X is a superkey

OR

A is a prime attribute

superkey: any number of attributes, that create unique row(s)

candidate key: least number of attributes, that create unique row(s)

prime: an attribute is prime if it is part of a candidate key

Boyce-Codd NF (by Boyce and Codd 1974):

for every non trivial ($X \rightarrow A$):

X must be a superkey

BCNF = 3NF + no dependencies between (distinct) prime attributes