

# DBNormalizer

- Das Werkzeug DBNormalizer unterstützt den Entwurf relationaler Datenbanken
- <http://www-home.htwg-konstanz.de/~waesch/DBResearch/content/dbnormalizer.htm>
- Funktionale Abhängigkeiten zwischen Attributen in Relationen können definiert werden
- Es kann überprüft werden, ob Normalformen vorliegen
- Ein vorliegendes relationales DB-Schema kann (gegebenenfalls) in eine bessere Normalform transformiert werden
- Zentrale Begriffe des relationalen Datenbankentwurfs (Schlüsselkandidat, minimale Überdeckung, Abschluss einer Attributmenge, ...) werden unterstützt

DBNormalizer - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

DBNormalizer

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# DBNormalizer

Prof. Dr.-Ing. Jürgen Wäsch, HTWG Konstanz

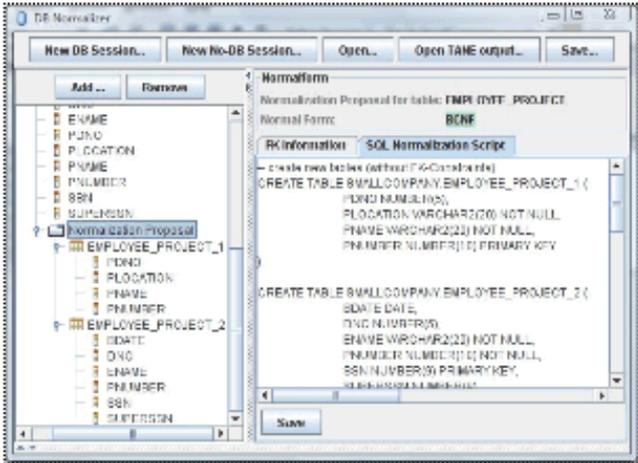


- Overview
- DBNormalizer
- TANE-java
- RRR

## Project Description

Relational databases have been investigated intensively over the last decades and are still the most common ones on the market. The underlying relational design theory enables the development of highly normalized schemes. In practice, however, a lot of relational database schemes are "badly" designed.

Therefore, DBNormalizer has been developed during a master thesis (Fesenmeyer, 2008) to support database engineers in improving relational database schemes.



**Download:**  
 Source (JavaDoc Included).....4.5 MB

## Features

At the moment, DBNormalizer provides the following features:

- Import of database schemes (metadata) from a database instance; if no database connection is available, relational schemes may be prompted manually
- Specification and editing of functional dependencies (FDs)
- Testing if a given set of FDs is satisfied in a database table (only if a database connection is available)
- Computation of a minimal cover
- Determination of the attribute closure for a given attribute set
- Calculation of *all* candidate keys
- Normal Form (NF) testing from 1NF up to BCNF; FDs which violate a certain NF are reported to the user
- Generation of a normalization proposal: synthesis of relations in 3NF is guaranteed; BCNF synthesis may be possible. Normalization includes computation of
  - the new relations
  - functional dependencies for the new relations
  - *all* candidate keys for the new relations
  - foreign key dependencies between the new relations
  - normal forms of the new relations (3NF or BCNF)
- If a database connection is established, a SQL script for database transformation is created. This script includes
  - DDL statements to create the new tables
  - DML statements to migrate data from the old table to the new tables
  - DDL statements to delete the old table
  - DDL statements to add foreign key and constraints to the new tables
  - DDL statements for view generation to ease the porting of existing database applications
- Import and export of FDs and database schemes as XML files
- Import of FDs, automatically retrieved from a database by TANE-java

### License

- DB Normalizer has been developed under the GPLv2 License
- There is absolutely no warranty
- It has been developed for academic use only

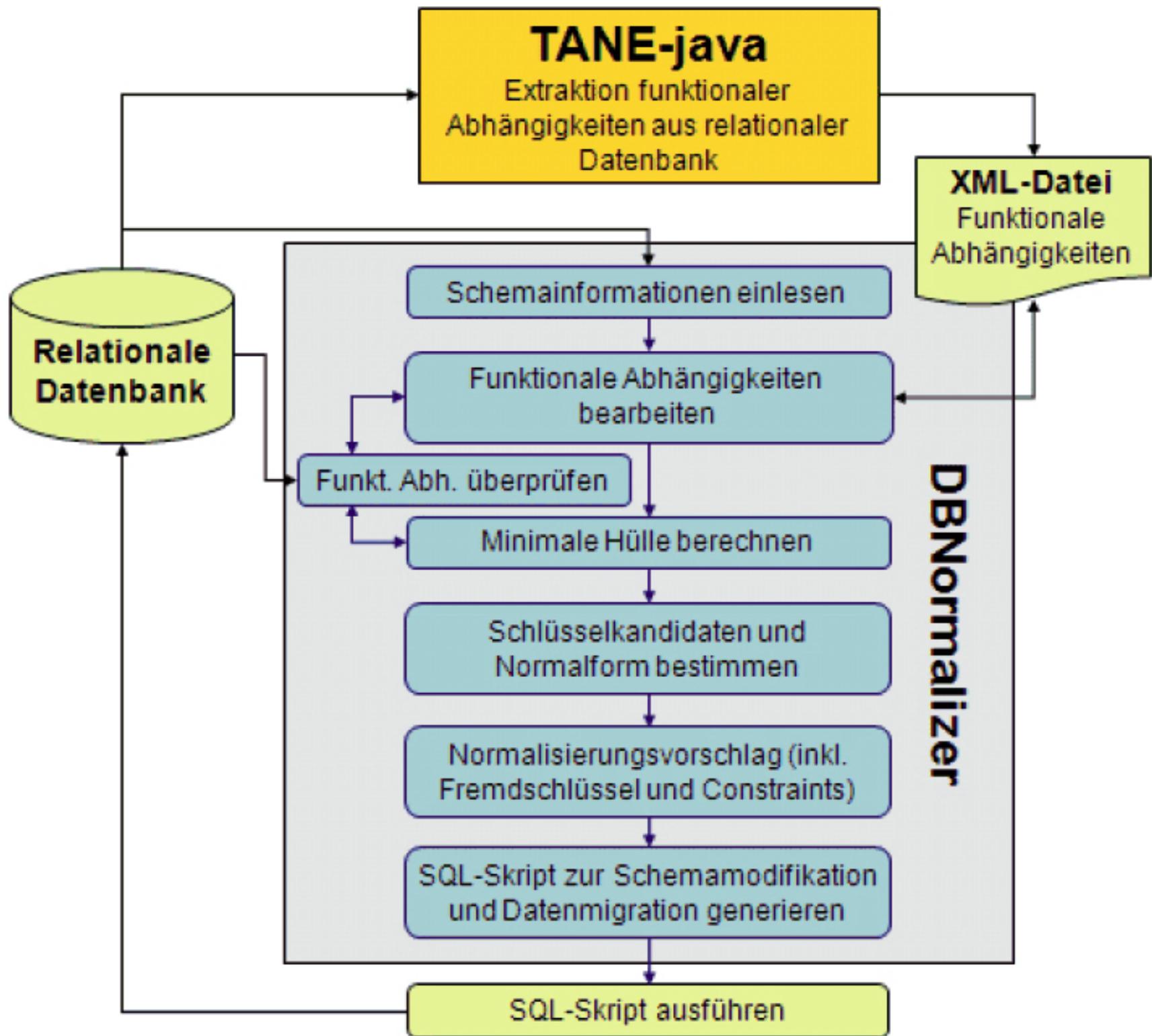
### Installation

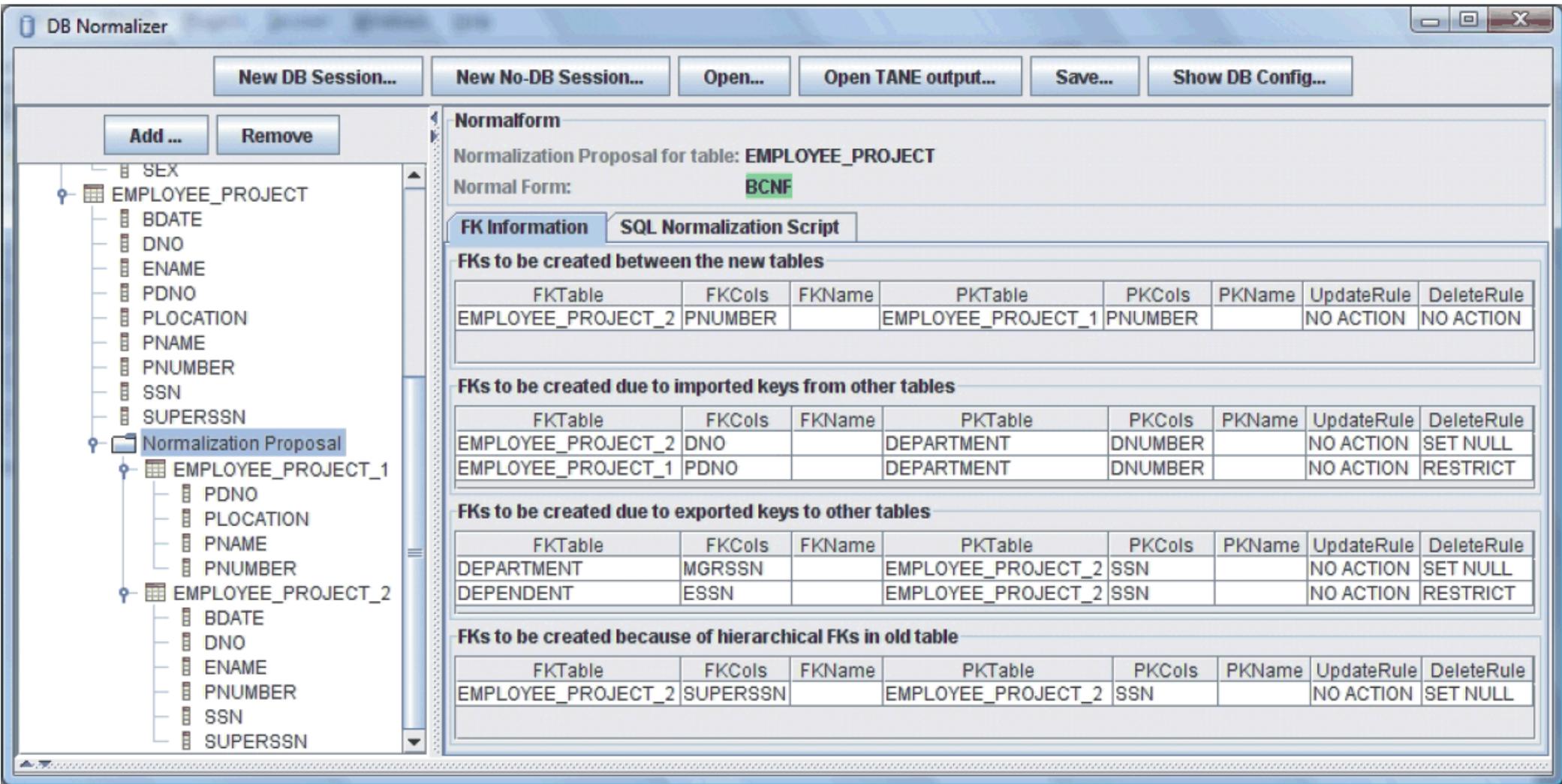
- DB Normalizer requires Java 1.6. Simply unpack the archive to a location of your choice. Under Windows simply run *dbnormalizer.bat* to launch DB Normalizer
- **Important:** Make sure that the path where DBNormalizer has been extracted contains no blanks, e.g., "C:\DB Normalizer" does not work properly when using the batch file *dbnormalizer.bat*

### References

D. Fesenmeyer (2008): *Design und prototypische Implementierung eines Software-Tools zur Normalisierung relationaler Datenbanken*. Diploma Thesis, Konstanz University of Applied Sciences, 2008.







# Zentrale Begriffe der Benutzungsschnittstelle

- Functional Dependency (FD); funktionale Abhängigkeit
- Left hand side (LHS), right hand side (RHS)
- 1NF, 2NF, 3NF, BCNF; 1., 2., 3. Normalform, Boyce-Codd-Normalform
- Minimal Cover (MinCover); minimale Überdeckung
- Candidate Key; Schlüsselkandidat, Schlüssel
- Attribute Closure; Abschluss einer Attributmenge

Add Attribute Remove

- Tables to observe
  - LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

Tablename and Normalform  
Table name: LIEFERANT  
Normal Form: 1NF

FDs and Table Info  
Edit FDs Analyse FDs (MinCover) Table Info

LHS	RHS	...	...
LName	LAdr	...	...
LName, Ware	Preis	...	...

Remove Add Save Check FDs

Keys  
Candidate Keys: [LName, Ware]  
PK: LName, Ware

Normalization Proposal Show AttributeClosure

New DB Session... New No-DB Session... Open... Open TANE output... Save... Show DB Config...

Add Attribute Remove

- Tables to observe
  - LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

Tablename and Normalform

Table name: LIEFORT  
Normal Form: 2NF

FDs and Table Info

Edit FDs Analyse FDs (MinCover) Table Info

LHS	RHS		
LAdr	LOrt	...	...
LName	LAdr	...	...

Remove Add Save Check FDs

Keys

Candidate Keys [LName] PK LName

Normalization Proposal Show AttributeClosure

New DB Session... New No-DB Session... Open... Open TANE output... Save... Show DB Config...

Add Attribute Remove

- Tables to observe
  - LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

Tablename and Normalform

Table name: SSP

Normal Form: 3NF

FDs and Table Info

Edit FDs Analyse FDs (MinCover) Table Info

LHS	RHS	...	...
Plz	Stadt	...	...
Stadt, StrasseNr	Plz	...	...

Remove Add Save Check FDs

Keys

Candidate Keys  
[Plz, StrasseNr]  
[Stadt, StrasseNr]

PK  
Plz  
StrasseNr

Normalization Proposal Show AttributeClosure

- Tables to observe
- LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

**Tablename and Normalform**  
 Table name: STADT  
 Normal Form: **BCNF**

**FDs and Table Info**

LHS	RHS	...	...
SName	EinwAnz	...	...
SName	X, Y	...	...
X, Y	SName	...	...

**Keys**

**Candidate Keys**

**PK**

Add Attribute Remove

- Tables to observe
  - LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

Tablename and Normalform

Table name: STADT

Normal Form: BCNF

FDs and Table Info

Edit FDs Analyse FDs (MinCover) Table Info

LHS	RHS	...	violated NF
SName	EinwAnz	...	...
SName	X	...	...
SName	Y	...	...
X, Y	SName	...	...

Check FDs Use MinCover to edit

Keys

Candidate Keys  
[SName]  
[X, Y]

PK  
SName

Normalization Proposal Show AttributeClosure

New DB Session... New No-DB Session... Open... Open TANE output... Save... Show DB Config...

Add Attribute Remove

- Tables to observe
  - LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

Tablename and Normalform

Table name: SSP

Normal Form: 3NF

FDs and Table Info

Edit FDs Analyse FDs (MinCover) Table Info

LHS	RHS	violated NF
Plz	Stadt	BCNF
Stadt, StrasseNr	Plz	

Check FDs Use MinCover to edit

Keys

Candidate Keys  
[Plz, StrasseNr]  
[Stadt, StrasseNr]

PK  
Plz  
StrasseNr

Normalization Proposal Show AttributeClosure

- Tables to observe
  - LIEFERANT (SCHEMA)
    - LIEFERANT
      - LAdr
      - LName
      - Preis
      - Ware
  - LIEFORT (SCHEMA)
    - LIEFORT
      - LAdr
      - LName
      - LOrt
  - SSP (SCHEMA)
    - SSP
      - Plz
      - Stadt
      - StrasseNr
  - STADT (SCHEMA)
    - STADT
      - EinwAnz
      - SName
      - X
      - Y

**Tablename and Normalform**  
 Table name: LIEFORT  
 Normal Form: **2NF**

**FDs and Table Info**

LHS	RHS	...	violated NF
LAdr	LOrt	...	3NF
LName	LAdr	...	

**Keys**  
 Candidate Keys: [LName]  
 PK: LName

- Tables to observe
- LIEFERANT (SCHEMA)
      - LIEFERANT
        - LAdr
        - LName
        - Preis
        - Ware
    - LIEFORT (SCHEMA)
      - LIEFORT
        - LAdr
        - LName
        - LOrt
    - SSP (SCHEMA)
      - SSP
        - Plz
        - Stadt
        - StrasseNr
    - STADT (SCHEMA)
      - STADT
        - EinwAnz
        - SName
        - X
        - Y

**Tablename and Normalform**  
 Table name: LIEFERANT  
 Normal Form: **1NF**

**FDs and Table Info**

LHS	RHS	...	violated NF
LName	LAdr	...	2NF
LName, Ware	Preis	...	

**Keys**  
 Candidate Keys: [LName, Ware]  
 PK: LName, Ware