

## Overview

- reversible process of changing database schema for better quality and simplicity
- step by step
  - **1<sup>st</sup> Normal Form: no multi-valued attributes**
  - **2<sup>nd</sup> Normal Form: all non-key attributes fully functional dependent on primary key**
  - **3<sup>rd</sup> Normal Form: no dependencies among non-key attributes**
- 
- 4,5,6th Normal Form also exists
- Denormalization
  - may improve performance for read-only DBs
  - \* anomalies avoided due to read-only e.g.

### 1st Normal Form

- no multi-value attributes ==> all attributes are atomic
- split relations with 1:N or M:N relationships

### 2nd Normal Form

- must be in 1st Normal Form
- every non-key attribute must be fully dependent on every key

### 3rd Normal Form

- every non-key attribute is non-transitively dependent on every key
  - no dependencies among non-key attributes

[[Database Design]]