

UNF (Unnormalised Form)

Description

A table that contains one or more repeating groups.

1NF (First Normal Form)

Description

A relation in which each cell contains one and only one value (possibly NULL) ; a relation where every non-key attribute depends on:

- the key (1NF)

UNF → 1NF Normalisation

1. Determine primary key (PK)
2. Separate repeating groups into a new relation

$A(p, a, g)$

$PK(p)$

p, a non-repeating attribute sets

g repeating groups

$\Rightarrow A(p, a) + R(p, pk_g)$ where pk_g is the value of each group member

$FK(p) \quad FK(p, pk_g)$

2NF (Second Normal Form)

Description

A relation in 1NF where every non-key is fully functionally dependent on the PK; a relation where every non-key attribute depends on:

- the key (1NF), and
- the whole key (2NF)

1NF → 2NF Normalisation

- Separate groups whose non-key columns are not functionally dependent on the whole PK

$A(p_1, p_2, a, b)$

$PK(p_1, p_2)$

p_1, p_2, a, b attribute sets

$FD_1: p_1, p_2 \rightarrow a$

$FD_2: p_1 \rightarrow b$

$\Rightarrow A(p_1, p_2, a) + R(p_1, b)$

$PK(p_1, p_2) \quad PK(p_1)$

3NF (Third Normal Form)

Description

A relation in 2NF where no non-key attribute is transitively dependent on the primary key; a relation where every non-key attribute depends on:

- the key (1NF),
- the whole key (2NF), and
- nothing but the key (3NF)

2NF → 3NF Normalisation

- Separate groups whose non-key columns are functionally dependent on each other

$A(p, a, b, c)$

$PK(p)$

p, a, b, c attribute sets

$FD_1: p \rightarrow a, b$

$FD_2: b \rightarrow c$

$\Rightarrow A(p, a, b) + R(b, c)$

$PK(p)$

$PK(b)$

BCNF (Boyce-Codd Normal Form)

Description

A relation is in BCNF if and only if for all:

$FD_n: p \rightarrow a \Rightarrow p$ is a candidate key in the relation