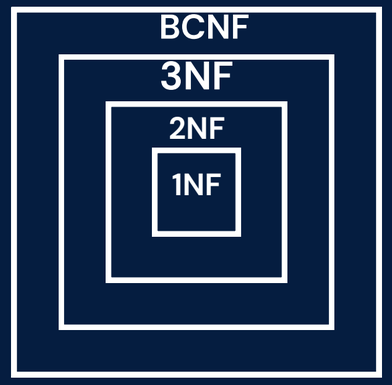
LET'S START WITH DBMS :)

Normalisation and its types

How to find the highest Normal form of a given relation?

Step 1: Identify the candidate key for the given relation using FD and closure method.
Step 2: Find the prime and non-prime attributes.
Step 3: Start checking for normal forms one by one according to their rule



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Normalisation and its types

For a given relation R(A,B,C) with the following functional dependencies:
A→BC, B→C ,A→B, AB→C, B→A , find the highest normal form.

1. Find the CK for the given relation

C.K : A,B

2. Find prime and non-prime attributes

P.A={A,B}

N.P.A={C}

3. Checking for normal forms one by one according to their rule

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1. **First Normal Form (1NF)**

A relation is in 1NF if it contains only atomic values (no multivalued attributes). Since we are assuming our relation R is in a standard relational model, it is **already in 1NF**.

2. **Second Normal Form (2NF)**

A relation is in 2NF if it is in 1NF and every non-prime attribute is fully functionally dependent on every candidate key of the relation(P.D ->LHS is a proper subset of Candidate key AND RHS is a non-prime attribute).

A→BC = no partial dependency (A is a CK)
B→C = no partial dependency (B is a CK)
A→B= no partial dependency (A is a CK)
AB→C= no partial dependency (AB is a combination of candidate keys, Its SK)
B→A= no partial dependency (B is a CK) , **R is in 2NF**.

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3. Third Normal Form (3NF)

A relation is in 3NF if it is in 2NF and no transitive dependency exists.

X->Y (X is a superkey OR Y is a prime attribute if true no transitive dependency)

A→BC = no transitive dependency (A is a CK)

B→C = no transitive dependency (B is a CK)

A→B= no transitive dependency (A is a CK)

AB→C= no transitive dependency (AB is a combination of candidate keys, Its SK)

B→A= no transitive dependency (B is a CK) , **R is in 3NF**.

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4. BCNF

A relation is in BCNF if it is in 3NF and for every functional dependency X→Y, X is a superkey.

A→BC = A is a CK
B→C = B is a CK
A→B= A is a CK
AB→C= AB is a combination of candidate keys, Its SK
B→A= B is a CK , **R is in BCNF**.

The highest normal form for the given relation R(A,B,C,D) is BCNF.