

## Normalization:

It is the process of splitting the table into another table in order to minimize the redundancy.

- Redundancy data means repeated or duplicate data.
- Due to the redundancy the problems arise are.
  1. Occupied more space in DB.
  2. Anomaly in insert, update, delete

### Types of Normal Forms

1. 1NF, 2. 2NF, 3. 3NF, 4. BCNF or 3.5NF (BOYCECODD)

#### 1. 1NF: 1<sup>st</sup> Normal Form:

Suppose data stored in a table

- That would be a single value in attribute.
- In the table column attributes are unique.
- The storing of data may be in any order.
- No duplicates (Similar type of data)

**Bad Data:** Suppose data not followed 1NF that data called Bad Data

#### 2. 2NF: 2<sup>nd</sup> Normal Form:

- Suppose data stored in a table it should be 1NF
- It eliminates **partial** dependency.
- Partial Dependency occurs when a non-prime attribute is functionally dependent on part of a candidate key.
- A functional dependency  $X \rightarrow Y$  is a partial dependency if Y is functionally dependent on X and Y cannot be determined by any proper subset of X.
- For example, we have a relationship  $AC \rightarrow B$ ,  $A \rightarrow D$  and  $D \rightarrow B$ ...

#### 3. 3NF: 3<sup>rd</sup> Normal Form:

- It should be in the Second Normal form.
- Its eliminate Transitive Dependency.
- What is Transitive Dependency?
- When an indirect relationship causes functional dependency it is called Transitive Dependency.
- If  $P \rightarrow Q$  and  $Q \rightarrow R$  is true, then  $P \rightarrow R$  is a transitive dependency.

#### 4. Boyce Codd Normal Form or 3.5 Normal Form

- It should be in the Third Normal Form.
- And, for any dependency  $A \rightarrow B$ , A should be a super key.
- The second point sounds a bit tricky, right? In simple words, it means, that for a dependency  $A \rightarrow B$ , A cannot be a non-prime attribute, if B is a prime attribute.