What is Normalisation?

Normalisation is a method to organise a database. It reduces useless data (redundancy) and avoids problems when inserting, updating, or deleting data. It divides a large table into smaller, related tables using Primary Key and Foreign Key.

Why Normalisation?

Without normalisation:

It’s hard to insert, delete, or update data without errors.

The table doesn’t follow standard formats or unique values.

Levels of Normalisation:

1. 1NF (First Normal Form):

Every column should have single, indivisible values (atomic values).

2. 2NF (Second Normal Form):

It must be in 1NF.

No partial dependency (all data must fully depend on the table’s primary key).

3. 3NF (Third Normal Form):

It must be in 1NF and 2NF.

Remove transitive dependency (indirect relationships between data).

4. BCNF (Boyce-Codd Normal Form):

Advanced version of 3NF.

Each dependency in the table must use a "super key" (a unique identifier for the table).

5. 4NF (Fourth Normal Form):

It must be in BCNF.

Remove multi-valued dependencies (when a single value maps to multiple independent values).

6. 5NF (Fifth Normal Form):

It must be in 4NF.

Eliminate join dependencies (no loss of information when splitting tables).

7. 6NF (Sixth Normal Form):

Most advanced.

Data is split into the smallest tables possible, ensuring no loss of information and managing time-based or historical data efficiently.

Summary:

Normalisation ensures your database is structured, avoids data duplication, and handles changes easily. Each level of normalisation builds on the previous one to improve efficiency and accuracy.