NORMALISATION

“It’s a process of reducing a larger table into many small tables to eradicate redundancy and anomalies”

Redundancy in relation may cause insertion, deletion, and update anomalies. So, it helps to minimize the redundancy in relations.

Normal forms are used to eliminate or reduce redundancy in database tables.

1. First Normal Form

If a relation contain composite or multi-valued attribute, it violates first normal form or a relation is in first normal form if it does not contain any composite or multi-valued attribute. A relation is in first normal form if every attribute in that relation is **singled valued attribute**.

In the below example the table is already in the First Normal Form.

COLLEGE
RegNo – PK
Sname
Semester
DOB
Mail-id
Phone
BookNo - PK
Bname
Author
DOI
DOR
Fine

2. Second Normal Form

To be in second normal form, a relation must be in first normal form and relation must not contain any partial dependency. No non-prime attribute (attributes which are not part of any candidate key) is dependent on any proper subset of any candidate key of the table.

COLLEGE
RegNo – PK
Sname
Semester
DOB
Mail-id
Phone
BookNo - PK
Bname
Author
DOI
DOR
Fine

In this example the above table breaks into below Students and Books table which are in 2NF.

STUDENTS
RegNo – PK
Sname
Semester
DOB
Mail-id
Phone

BOOKS
BookNo- PK
RegNo – FK
Bname
Author
DOI
DOR
Fine

3. Third Normal Form

A relation is in third normal form, if there is **no transitive dependency** for non-prime attributes as well as it is in second normal form.

STUDENTS
RegNo – PK
Sname
Semester
DOB
Mail-id
Phone

BOOKS
BookNo- PK
RegNo – FK
Bname
Author
DOI
DOR
Fine

The above tables are then decomposed into 3 different tables, which are in 3NF.The attributes like “DOI” and “DOR” which have transitive relationship are segregated in a different table.

STUDENTS
RegNo – PK
Sname
Semester
DOB
Mail-id
Phone

BOOKS
BookNo- PK
Bname
Author

LIBRARY
BookNo- PK
RegNo – PK
DOI
DOR
Fine