Normalization Proof: Hospital Management System

First Normal Form (1NF)

To satisfy 1NF:

- All tables have atomic (indivisible) values.

- There are no repeating groups or multivalued attributes.

Example:

* Patients table has fields like name, gender, dob, phone, email - all atomic.

* MedicalRecords has a single treatment field per record (or is normalized if multivalued).

* No column contains multiple values in a single field.

Second Normal Form (2NF)

To satisfy 2NF:

- Must already be in 1NF.

- All non-key attributes are fully functionally dependent on the whole primary key (no partial dependencies).

Example:

* In Appointments (appointment_id as PK), attributes like datetime depend entirely on appointment_id.

* In MedicalRecords, recordID is the PK - and fields like diagnosis, treatment depend fully on it.

Third Normal Form (3NF)

To satisfy 3NF:

- Must already be in 2NF.

- No transitive dependencies (i.e., non-key attributes do not depend on other non-key attributes).

Example:

* Users table: user_id -> username, password, role (no role -> permission -> user dependency).

* Staff table: staffID -> name, shift, departmentID (department name is stored in Departments table - no transitive dependency).