Task 8 Normalizing data using functional dependencies upto BCNF

Aim:

To Normalize database using functional dependencies upto BCNF

Hospital database:

1. Identify hospital attributes:

Patient ID, Patient_Name, Doctor_ID, Doctor_name, Department, Room_no, Treatment.

2. Define relational Schema:

Hospital (Patient_ID, Patient_Name, Doctor_ID, Doctor_Name, Department, Room_No, treatment, Bill_Amount)

3. Determine functional dependencies (FDS) between attributes

Patient_ID → Patient name, Doctor_ID, Room_no, Treatment, Bill_Amount.

Doctor_ID → Doctor_Name, Department

Room_No → Department

Step 2: Convert to INF

1. Eliminate repeating groups of every

2. Create seperate tables for each repeating group

Step 3 convert to 2NF:

1. Ensure each non-key attribute depend on the entire primary key
2. Move non-key attribute to seperate tables if they depend only part of the primary key.

- create Doctor table: Doctor (Doctor -ID, Doctor_Name, Department)
- create Patient table: Patient(Patient ID, Patient_Name, Doctor_ID, Room-NO, Treatment, Bill-Amount)

Step4: convert to 3NF

1. Ensure there are no transitive dependencies.
2. Move non key attributes to seperate tables if they depend on another non-key attributes
   - create Room table: Room (Room_NO, Department)
   - update Doctor table: Doctor (Doctor-ID, Doctor_Name)

Step 5 : convert to BCNF

1. Ensure every determinant is a candidate key

2. check for overlapping candidate key

3. Decompose relation to eliminate redundancy

• No further decomposition needed

Griffith tool setup:

1. create a new project in griffith

2. Define the Relational schema and FDS

3. Run the "dependency graph" tool.

4. Analyze the graph for normalization issues.

5. Apply transformation using the 'normalize' tool

6. verify BCNF compliance using the 'BCNF check' tool

Normalized schema.

1. Patient (Patient_ID, Patient_Name, Doctor DD, Room_NO, Contact, Bill Amount)
2. Doctor (Doctor_ID, Doctor Name)
3. Room (Room_NO, Department)

VEL TECH - CSE	
EX NO.	8
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	4
RECORD (5)	
TOTAL (20)	19
SIGN WITH DATE	

Result:

Thus the Normalizing database using functional dependencies upto BCNF executed successfully.