TASK-8 Normalizing database using functional dependence upto BCNF

6/10/25

Aim:- To Normalize database using functional dependent upto BCNF.

Hospital database:-

1. Identify hospital attribute:

Patient_ID, Patient_Name, Doctor_ID, Doctor_Name, Department, Room_No, Treatment, Bill_amount.

2. Define relational schema:

Hospital (Patient_ID, Patient_Name, Doctor_ID, Doctor_Name, Department, Room_No, Treatment, Bill_Amount).

3. Determine functional dependance (FDs)

B/W attributes

Patient_ID → Patient_Name, Doctor_ID, Room_Treatment, Bill_Amount

Doctor_ID → Doctor_Name, Department

ROOM_NO → Department.

Step2:- Convert to INF

1. eliminate repeting groups or array
2. greate separate table for each repeating group

Step 3:- Convert to 2NF:-

1. ensure:- each money non-key attribute depend on the entire primary key.
2. Move non_key attribute to seperate tables if key depend only part of the Priminy ke

- create Doctor table : Doctor (Doctor_ID
  Doctor_Name, Department)
- create Patient table : Patient (Patient_ID,
  Patient_Name, Doctor_ID,
  Room_NO, Treatment, Bill_Amount)

Step 4:- convert to 3NF

1- Ensure there are no transitive dependence

2- Move non-key attribute to seperate table.
  If they depend on another non-key attribute.

- create Room table : Room (Room_NO, Department).

Step 5:- convert to BCNF

1- Ensure every department is a candidate key.

2. Check for overlapping candidate key.

3- Decompose relation to eliminate redundancy.
  NO further decomposition needed.

Using criteria tool:-

1. Input relation schema and functional dependency
2- Python tool generator as dependency graph.
3. Analyze the graph to identify normal issues.
4. Apply normalization rules to transform the scheme.
5. Verify the resulting scheme a meets BCNF criteria.

crifflith tool steps:-

1. create a new project in [illegible]
2. Define the relational schema and in
3. Run the "Dependency Graph" pool.
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_ID, Room_No, treatment, Bill_Amount)
2. Doctor (Doctor_ID, Doctor_Name)
3. Room (Room_No, Department).

VELTECH	
EX No.	9
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	5
TOTAL (25)	25
SIGN WITH DATE	

Result:- Thus the normalized database using functional dependance upto BCNF executed successfully.