

Task-8:- Normalizing databases using functions dependencies upto BCNF

26/9/25

(Tool: Gv Table Normalization Tool, ALM: Jig saw)

Employee Data base

- 1) Identify employee attributes: Employee-ID, Name, Department, Job-title, Manager-ID, Hire-Date, Salary
- 2) Define Relational Schema: - Employee (Employee-ID, Name, Department, Job-title=Manager-ID)
- 3) Determine functional dependencies (FDs) between attributes

\rightarrow Employee-ID \rightarrow Name, Department, Job-title, Manager-ID, Hire-Date, Salary

\rightarrow Department \rightarrow Manager-ID

\rightarrow Manager-ID \rightarrow Name

Step-2:- Convert to 1NF

1. Eliminate repeating groups or arrays
2. Create separate tables for each representing group

Step-3:- Convert to 2NF

1. Ensure each non-key attribute depends on the entire Primary key

2. Move non-key attributes to separate tables if they depend on only part of the primary key

\rightarrow Create Department table: - Department (Department-ID, Manager-ID, Name)

\rightarrow Update Department table: - Department (Department-ID, Manager-ID)

Step-4:- Convert to 3NF:-

1. Ensure there are no transitive dependencies

2. Move non-key attributes to separate tables if they depend

Output

Table Name

Attributes

Employee

Employee-ID(PK), Name, Department-ID, Job-title,

Department

Department-ID(PK), Manager-ID(FK)

Manager

Manager-ID(PK) Name

another nonkey attribute

→ Create Manager table :— Manager. (Manager-ID), Names

→ Update Department table :— Department. (Department-ID), Manager-ID)

Step-5 Convert to BCNF

1. Ensure every determinant is a candidate key
2. Check for overlapping candidate keys.
3. Decompose relations to eliminate redundancy
 - No further decomposition needed.

Using Griffith Tool:-

1. Input relational schema and functional dependencies
2. Griffith tool generates a dependency graph
3. Analyze the graph to identify normalization issues
4. Apply normalization rules to form the schema
5. Verify the resulting schema meets BCNF criteria

Griffith Tool steps:-

1. Create a new project in Griffith
2. Define relational schema and FDs
3. Run the "Dependency Graph" tool
4. Analyze the graph for normalization issues
5. Apply transformations using the "Normalize" tool

Normalized Schema:-

1. Employee (Employee-ID), Name, Department-ID, Job Title, Hire Date, Salary.
2. Department (Department-ID, Manager-ID)
3. Manager (Manager-ID), Name.

Result:- Thus, the normalizing databases - Using functional dependencies upto BCNF is executed.

Successfully

VEL TECH - CSE	
EX NO.	8
PERFORMANCE (5)	5
RESULT / NOT ANALYZED	5
VIVA VOCE (5)	5
RECORD (5)	5
TOTAL (20)	20
SIGN WITH DATE	20/1/2023

20/1/2023