8/8/25

Task-8: Normalizing Database using fundamental Dependences

Aim:- To normalize the employee database up BCNF we decompose the schema using functional dependencies to estimate Redundancy.

Initial Relation Schema:-

Employee (employee, to, name, Dept, Job-title, manager, ID, Hire, Data salary)

Functional Dependency:-

* Employee - ID - Name, Dept, Job-title; manager - ID, hire - Date; salary)
* Department - manager ID
* Manager - ID → Name.

Step by Step Normalization:

1NF (first Normal form)

- No repeating groups (or) arrays in schema
- already in 1NF

2nf (second Normal form)

- Remove partial dependencies
- However, FDs suggest dependencies not on primary key.

Decomposition:-

→ Employee (Employee-ID, Name, Dept-ID, Job title, hire - Date Salary)

- Department (Dept-ID, manager-ID, Name)

3NF (Third Normal form):

→ Eliminate transitive dependency i.e manager ID name

(Identifie via)

Department → manager_ID

Updated tables:-

Employee (employees_ID, name, Department_ID, Job_title, Hire Date, Salary).

Department (Dept_ID, manager_ID)

manager (manage_ID, Name)

BCNF:-

→ Energy determine must be a candidate key

→ all remaining FDs here determine that are Candidate keys.

* employee_ID
* Department_ID
* manager_ID

No Decomposition is needed

Find BCNF:-

Employee (Employee_ID, Name, Dept_ID, Job_title, Hire data_Salary)

Department (Dept_ID, manager_ID)

manager (manager_ID, Name)

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Result :- Thus, the database was normalized to BCNF by decomposing it into employee department manager tables based on functional dependency.