Task 8:- Normalizing databases using functional dependencies upto BCNF Date:- 26/9/25

Given relational tables created in task-2 perform normalization upto BCNF based on given dependencies or following for assumed relations specified below

Employee Database:-

1. Identify employee attributes - Employee - ID, Name, Department, Job - Title - manager - ID Hire - Date - Salary

2. Determine functional dependencies (FDs) between attributes:-

- Employee - ID -> Name, Department, Job - Title, manager - ID, Hire - Date, Salary
- Department -> manager - ID
- manager - ID -> Name

Step2:- convert to 1NF

1- Eliminate repeating groups or array (none in this example):

2. Create separate tables for each repeating group (none in this example).

Step 3:- convert to 3NF

1. Ensure there are no transitive dependencies

- Create manager table: manager (manager - ID, Name).
- update Department table: Department (Department - ID, manager - ID)

Output

Normalized tables

Table name	Attributes
Employee	Emp-ID-(PK), Name, Dept_I (FK)
	Jobtitle, Hire-Date, Sala
Department	Dept - ID(PK), manage
	- ID(FK)
Manager	Manager - ID (PK), Nam

Steps for conversion to 3NF

1. Ensure there are no transitive dependencies
2. Move partial key attributes to a separate table if they depend on another portion of the key

Steps: - convert to BCNF

1. Ensure every determinant is a candidate key
2. Check for overlapping candidate keys
   - No further decomposition needed

Using Griffith Tool

1. Input relational schema and functional dependencies
2. Griffith tool generates a dependency graph
3. Analyse the graph to identify normalization issues.

Griffith Tool steps

1. Create a new project in Griffith.
2. Define the relational schema and FDs.
3. Run the "Dependency Graph" tool.
4. Analyse the graph for normalization issues.

Normalized Schema

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

Result: Thus the experiment was Normalized fully database using functional dependencies upto BCNF was successfully completed