Task-8 Date: 30/9/25

Normalizing database using functional dependencies upto BCNF. (Tool: Any Table Normalization Tool, ALM: Jigsaw)

Aim: To perform normalization upto BCNF based on given dependencies.

Mobilephone Database:

1. Identify Mobile phone attributes: phone-ID, Mobile_name, Mobile_price, Date.

2: Define relational schema: Mobile(phone-ID, Mobile_name, Mobile_Date, Mobile_price, Product_ID)

3. Determine functional dependencies (FDs) between attributes:

- Mobile_name, phone_ID, Mobile_price
Mobile_Date. Product_ID

Step2 :- Convert to INF.

* No repeating groups or arrays
* All attributes are atomic

The schema in INF.

Steps :- convert to 2NF.

* All primary keys are single-column keys, so no partial dependence exist
* However, we ensure foreign-key attributes are managed correctly

output :- The schema is already in 2NF.

Step4 :- Convert to 3NF.

Elimate Transitive Dependencies.

* product_ID → category_ID → category_name
  → Move category_name to a seperate Categories mobile table.
* user_ID → name, email, Address, phone
  → Already in seperate users table
* Order_ID → user_ID → user details.
  phone
  → No redundancy, as only user_ID is stored in ot'phones.

All transitive dependencies removed.

Step:5 Convert to BCNF

Check if every determinant is a candidate key:

* User_ID, Product_ID, Payment_ID, Model_Name, are all unique keys for their respective tables.
* Foreign keys like Category_ID, User_ID etc... do not violate BCNF rules

All FD's comply with BCNF — 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 transform the schema.
5. Verify the resulting schema meets BCNF criteria.

Griffith Tool Steps:

1. Create a new project in Griffith.
2. Define the relational schema and FDs
3. Run the "dependency Graphs" tool
4. Analyze the graphs for normalization issues.
5. Apply transformations using the "normalization" tool.
6. Verify BCNF compliance using the "BCNF Check" tool

Normalized Schema.

Users (User-ID, Name, Email, Address)

Categories (Category ID, name of the category)

Product:
Mobile (Phone ID, Name Category-ID, Price)

Mobile Details (phone-ID, Quality, Price

Payment_ID, Total_amount)

VEL TECH	
EX NO.	8
PERFORMANCE (5)	4
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	
TOTAL (20)	19
SIGN WITH DATE	30/9/13

Result:- Thus, the implementation of normalizing the database upto BCNF based on given dependencies was executed successfully.