30/9/25

TASK - 8

NORMALIZING DATABASE USING FUNCTIONS DEPENDI UPTO BCNF TOOL: SUITABLE NORMALIZATION TOOL

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

Mobile phone database:-

1. Identify mobile phone Attributes phone-id, mobile-name, mobile-price, date,
2. Define relational schema: Mobile (PHONE-ID Mobile-Name mobile-Data, mobile_price
3. Determine functional dependencies (FDs) between attributes

- mobile-name, phone-id, mobile-price, mobile-Data,

Step-2 - CONVERT TO 1NF

* No Repeating gaps or arrays
* All attributes are atomic
* The schema in CNF

Step-3 - CONVERT TO 2NF

* All primary keys are single-column keys
* So no partial dependence

~~Out~~.

output The schema is already in 2NF

Step-4:- Convert to 3NF

Estimate transitive dependence

* product ID → category ID → Category Name.

→ Move category-Name to generate a category valid table

* User-ID → Name, email, Address, phone
  → Already project user table
* phone-ID → user → user Details
  → NO redudancy, as only user Divided in phone

All transitive dependencies are removed

Step-5:- Convert to BCNF

Check if every determinant is a candidate key.

→ Use for their respective tables

* Foriegen keys like category-ID, User-ID

ex.... do not via or BCNF rules

All FD's empty with BCNF with 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. All FD's empty with BCNF no further decomposition needed
5. Verify the resulting schema meet BCNF criteria.

ARCHIFT TOOL steps:-

1. Create a new project in archifit
2. Define the relational schema and FD;
3. Run the "Dependency graph" tool.
4. Analyze the graph for Normalization issues.
5. Apply transformations using the "Normalization" tool
6. Verify BCNF compliance using the "BCNF check tool"

Normalized schema:-

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

Category (ID, Name of the category

Mobile (PHONE-ID, Name category, price

Mobile detail (PHONE-ID, Quantity, price

payment-ID, total-amount).

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