30/9/25 Task-8 - Normalizing database using functional dependencies upto BCNF (Tool: GUI/Table Normalization Tool, ALM Jigsaw)

Aim:- To Perform normalization upto BCNF based on given dependencies

Mobilephone Database:-

identify Mobile phone attributes : Phone-ID, Mobile-Name, Mobile-Price, Date.

Define relational schema : Mobile (Phone-ID, Mobile-Name Mobile-Name , Mobile-Date, Mobile-Price

Determine functional dependencies (FDS) blw attributes

. Mobile-Name, Phone-ID, Mobile-Price ; Mobile Date

convert to 1NF

No repeating groups or arrays
All attributes are atomic
This schema in 1NF

convert to 2NF

All primary keys are single column keys
so no partial Dependencies exist
However we ensure foriegn key attributes are managed correctly
output:- The schema is already in 2NF

convert to 3NF

Eliminate Transitive Dependencies
Product-ID → category-ID → category-Name
Move category-Name to separate categories Mobile table

User-ID → Name, Email, Address, Phone
Already in users table

Phone-ID → user → user details
No redundous, as only user ID is stored in Phone
All transitive dependencies removed
Convert to BCNF
check if every determinant is candidatekey
user-ID, Product-ID : Payment-ID ; Mobile-Name are all unique keys for their tables
foriegn keys like category-ID ; user-ID ex...
do not violate BCNF rules

using Grifth tool
input relational schema and functional dependiencies
Griffth tool genarates a dependency graph
Analyze the graph to identify normalization issues
Apply normalization rules to transform the schema
verify the resulting schema meets BCNF

Griffth tool steps
create a new project in Griffth
Define the relational schema and FDS
Run the "Dependency Graph" tool
Analyze the graph for normalization issues
Apply transformations using normalize tool
verify BCNF compliance using "BCNF check" Tool

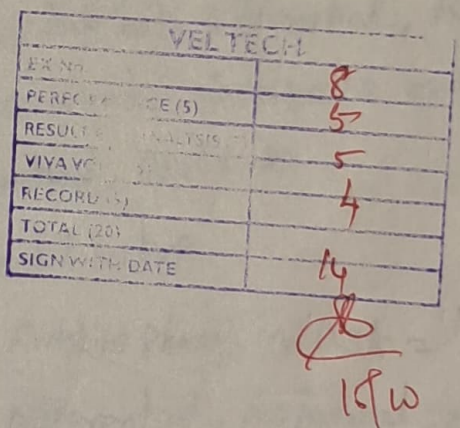
Normalized schema :-

user (user-ID, Name, email, Address)

Categories (category-ID, Name of category)

Mobile (Phone-ID, Name. category-D, Price)

Mobile Details (Phone-ID, Quality, Price-P
Payment-ID, total amount)



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