Task 8:- Normalizing databases using functional dependencies upto BCNF

Aim:- To prove normalizing database using functional dependencies upto BCNF

Determine Possible functional Dependencies (FDs)

Cust_ID -> Cust_Name, Cust_PhoneNO, Cust_city, Cust_Amt_paid
Bill_ID -> Price, Cust_ID
Phone_ID -> Model_Name
Admin_ID -> Password

Convert to 1NF:-

Already in 1NF
All attributes have atomic single values;
there are no repeating groups

Convert to 2NF:-

Check for partial dependencies - they occur only if there's a composite key.

Since all tables have single attributes primary keys Cust_ID, Bill_ID, Phone_ID, Admin_ID),

Convert to 3NF:-

1. Ensure there are no transitive dependencies
2. Move non-key attributes to seperate tables if they depend on another key.
   Cust_ID -> Cust_Name, Cust_Phone No
   Cus_City, Cust_Amount Paid.

Convert to BCNF:-

1. Ensure every determinant is a candidate key
2. Check for overlapping candidate keys
3. Decompose relations to eliminate redundancy
   - 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 Graph" Tool.
4. Analyze the graph for normalization issues.
5. Apply tranformation using the "Normalize" tool.
6. Verify BCNF compliance using "BCNF check" too

Normalized Schema:-

Customer (Cust_ID PK, Cust_Name, Cust_PhoneNo, Cust_city, Cust_AmountPaid)

Bill (Bill_IP PK, Price, Cust_ID FK -> Customer. Cust_ID)

MOBILE (Phone_ID PK, Model_Name, ModelPrice)

LOGIN (Admin_ID PK, Password)

VEL TECH	
EX NO.	8
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	
TOTAL (20)	15
SIGN WITH DATE	

Result: Thus to prove normalizing database upto functional dependencies upto BCNF are verified successfully