Task NO:- 8	Normalizing databases using functional
Date: 30/09/25	dependencies upto BCNF.

(Tools (·GUI Table, Normalization tool, AML : Jigsaw).

Aim: To perform normalization upto BCNF Based On given dependencies.

Banking database:-

1. Identify Banking attributes :- customer, Account, Branch, Banker info, Loan, credit-card.

2. Relational schema: Banking (customer, Account, Branch, Banker info, Loan, Credit-card)

3. Functional dependencies (FD's between Atributes):

Customer-ID → Name, Address, Ph_no

Account-number → Account-Name, category.

Branch-ID → BranchName, Location, ifsc-code

Banker-ID → Banker-name, Ph-no.

Customer-ID → Account-number.

Loan-ID → Loan-Amount.

Customer-ID → Loan-ID.

Step 2 :- Convert to INF :

 * NO repeating groups or Arrays
 * All attributes are atomic

The schema is in INF

Step3:- Convert to 2NF

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

Output: The schema is already in 2NF.

Step 4: Convert it to 3NF

· Eliminate Transitive dependencies.

* Customer_ID → Account_number → Loan_ID
  → move Loan_ID to a separate Loan table.
* Customer_ID → Name, Address, Ph-no
  → Already in seperate users table
* Account-number → Customer_ID → Branch_ID
  → No redundancy

All transitive dependencies removed.

step 5: Convert to BCNF

check if every determinant is a candidate key:

* Customer_ID, Account_number, Branch_ID, Loan_ID are all are unique keys for their respective tables.

* Foreign keys like Customer_ID.. donot violate BCNF Rules.

All FDs 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 to transform 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 FD's
3. Run the "dependency Graph" tool
4. Analyze the graph for normalization issues
5. Apply transformations using the "Normalize" tool
6. Verify BCNF Compliance using "BCNF check" tool

Normalization Schemas

Customer (customer_ID, Name, Ph-no)

Account (Account_number, Account_name, category)

Branch (Branch_ID, Branch_name, Location, ifsc-code)

Banker info (Banker-ID, Name, Ph-no)

Loan (Loan_ID, Customer_ID, Amount).

Credit card (credit_card_Number, Customer-ID, Limit).

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

30/9/

Result:-

Thus, the implementation of normalizing the database upto BCNF Based on given dependencies was successfully executed.