

Task: 8 Normalizing database using
Date: 30/9/25 Functional dependencies upto
BCNF.

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 Attributes):
Customer-ID \rightarrow Name, Address, Ph-no.

Account-number \rightarrow Account-Name, Category.

Branch-ID \rightarrow Branch Name, location, if SC-Code.

Banker-ID \rightarrow Banker-name, Ph-no.

Customer-ID \rightarrow Account-number

loan-ID \rightarrow loan-Amount.

Customer-ID \rightarrow loan-ID.

Step 2: Convert to 1NF:

* No repeating groups or arrays.

* All attributes are atomic.

The Schema is in 1NF.

Step 3: 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 \rightarrow Account-number \rightarrow loan-ID.
- Move loan-ID to a separate loan table.
- * Customer ID \rightarrow Name, address, Ph-no
- Already in separate users table.
- * Account-number \rightarrow Customer-ID \rightarrow Branch-ID
- No redundancy.

All transitive dependencies removed.

Steps: Convert to BCNF

check if every determinant is a candidate key.

* Customer-ID, Account-number, Branch-ID, loan-ID, are all unique keys for their respective tables.

* Foreign keys like Customer-ID... do not violate BCNF Rules.

All FD's comply with BCNF, no further decomposition needed..

Using Griffin Tool:

1. Input relation schema and functional dependencies.
2. Griffin 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 root Step:

1. Create a new Project in Griffith.
2. Define the relational Schema and FD's
3. Run the "dependency Graph" tool.
4. Analyse the graph for normalization Issues.
5. Apply Transformations using the 'Normalize' tool
6. Verify BCNF compliance.

Normalization Schema:

Customer (Customer-ID, Name, Ph-no)

Account (Account-number, Account-name, category)

Branch (Branch-ID, Branchname, location, IFSC-code)

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

Loan (Loan-ID, Customer-ID, Amount)

Credit card (Credit-Card-Number, Customer-ID, limit)

VEL TECH - CSE	
EX NO.	4
PERFORMANCE	5
RESEARCH	5
WORKING	5
TECHNICAL	5
MANAGEMENT	5
TEACHING	5
ADMINISTRATIVE	5
OTHER	5
TOTAL	16

Result: Thus the implementation of normalizing the database up to BCNF Based on given depending was Successfully Executed.