

Task-8 Normalizing database using functional  
dependencies upto BCNF  
30/9/25

Aim:

To Determine possible functional dependencies (FDs)

$\text{cust-ID} \rightarrow \text{cust-Name}, \text{cust-phone No}, \text{cust-city}$ ,  
 $\text{cust-Amount Paid}$

$\text{Bill-ID} \rightarrow \text{Price}, \text{cust-ID}$

$\text{Phone-ID} \rightarrow \text{Model-Name}$

$\text{Admin-ID} \rightarrow \text{password}$

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 ( $\text{cust-ID}$ ,  $\text{Bill-ID}$ ,  $\text{Phone-ID}$ ,  $\text{Admin-ID}$ ),

Convert to 3NF:

1. ensure there are no transitive dependencies

2. move non-key attributes to separate tables

if they depend on another key.

$\text{cust-ID} \rightarrow \text{cust-Name}, \text{cust-Phone No}$

$\text{cust-city}, \text{cust-Amount Paid}$

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 information using the "Normalize" tool.
6. Verify BCNF Compliance using "BCNF check" tool.

## Normalized schema:

customer (cust-ID PK, cust\_Name, cust\_PhoneNo,  
cust\_City, cust\_AmountPaid)

Bill (Bill-ID PK, price, cust-ID FK → customer,

MOBILE (Phone-ID PK, model\_name, modelPrice)

LOGIN (Admin-ID PK,

GUSTI FD VEL TECH	
EX NO.	TOTAL (20)
PERFORMANCE (5)	0
RESULT AND ANALYSIS (6)	0
VIVA VOCE (5)	0
RECORD (5)	0

Result: Thus the implementation of normalizing database dependencies has been successfully executed.

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