

CONCLUSION OF NORMALIZATION

Normalization:

Convert a complex and huge database table into smaller and easy tables.

These should be sub parts of the main table.

The small normalized tables should follow Join operation.

The join should be Lossless.

No data loss allowed.

Total seven steps are in Normalization:

1. 1NF
2. 2NF
3. 3NF
4. BCNF
5. 4NF
6. 5NF
7. 6NF

1NF / NORMALIZATION FORM

PROCESS: Apply **ATOMIC VALUES** in a table

Input: Un normalized table

Output: 1NF

SID	Name	Class	CID	Course	Mobile	Salutation
01	Rajesh	1 year	027, 049	DBMS, DSA	68759487	Mr.
02	Vikesh	2 year	032, 091	CN, OS	34980988	Mr.
03	Harsh	2 year	027	DBMS	29879878	Mr.
04	Jyoti	3 year	032	OS	48799807, 29875099	Miss



SID	Name	Class	CID	Course	Mobile	Salutation
01	Rajesh	1 year	027	DBMS	68759487	Mr.
01	Rajesh	1 year	049	DSA	68759487	Mr.
02	Vikesh	2 year	032	CN	34980988	Mr.
02	Vikesh	2 year	091	OS	34980988	Mr.
03	Harsh	2 year	027	DBMS	29879878	Mr.
04	Jyoti	3 year	091	OS	48799807	Miss
04	Jyoti	3 year	091	OS	29875099	Miss

2NF / NORMALIZATION FORM

PROCESS: Remove Partial Dependency

Input: 1NF table

Output: 2NF

SID	Name	Class	CID	Course	Mobile	Salutation
01	Rajesh	1 year	027	DBMS	68759487	Mr.
01	Rajesh	1 year	049	DSA	68759487	Mr.
02	Vikesh	2 year	032	CN	34980988	Mr.
02	Vikesh	2 year	091	OS	34980988	Mr.
03	Harsh	2 year	027	DBMS	29879878	Mr.
04	Jyoti	3 year	091	OS	48799807	Miss
04	Jyoti	3 year	091	OS	29875099	Miss



SID	Name	Class	CID	Mobile	Salutation
01	Rajesh	1 year	027	68759487	Mr.
01	Rajesh	1 year	049	68759487	Mr.
02	Vikesh	2 year	032	34980988	Mr.
02	Vikesh	2 year	091	34980988	Mr.
03	Harsh	2 year	027	29879878	Mr.
04	Jyoti	3 year	091	48799807	Miss
04	Jyoti	3 year	091	29875099	Miss



2NF: Remove Partial Dependency

CID	Course
027	DBMS
049	DSA
032	CN
091	OS

3NF / NORMALIZATION FORM

PROCESS: Remove Trivial Functional Dependency

Input: 2NF table

Output: 3NF

$X \longrightarrow Y$

X is a super key

or

Y is a prime attribute, means each element of Y is part of some candidate key

SID	Name	Class	CID	Mobile	Salutation
01	Rajesh	1 year	027	68759487	Mr.
01	Rajesh	1 year	049	68759487	Mr.
02	Vikesh	2 year	032	34980988	Mr.
02	Vikesh	2 year	091	34980988	Mr.
03	Harsh	2 year	027	29879878	Mr.
04	Jyoti	3 year	091	48799807	Miss
04	Jyoti	3 year	091	29875099	Miss



SID	Name	Class	CID	Mobile	Salutation_ID
01	Rajesh	1 year	027	68759487	1
01	Rajesh	1 year	049	68759487	1
02	Vikesh	2 year	032	34980988	1
02	Vikesh	2 year	091	34980988	1
03	Harsh	2 year	027	29879878	1
04	Jyoti	3 year	091	48799807	2
04	Jyoti	3 year	091	29875099	2



3NF: Remove Trivial Functional Dependency

Salutation_ID	Salutation
1	Mr.
2	Miss

CID	Course
027	DBMS
049	DSA
032	CN
091	OS

BCNF / NORMALIZATION FORM

PROCESS: Remove Trivial Functional Dependency

Input: 3NF table

Output: BCNF

$X \longrightarrow Y$

X is a super key.

SID	Name	Class	CID	Mobile	Salutation_ID
01	Rajesh	1 year	027	68759487	1
01	Rajesh	1 year	049	68759487	1
02	Vikesh	2 year	032	34980988	1
02	Vikesh	2 year	091	34980988	1
03	Harsh	2 year	027	29879878	1
04	Jyoti	3 year	091	48799807	2
04	Jyoti	3 year	091	29875099	2



SID	Class	CID	Mobile	Salutation_ID
01	1 year	027	68759487	1
01	1 year	049	68759487	1
02	2 year	032	34980988	1
02	2 year	091	34980988	1
03	2 year	027	29879878	1
04	3 year	091	48799807	2
04	3 year	091	29875099	2



BCNF: Remove Trivial Functional Dependency

SID	Name
01	Rajesh
02	Vikesh
03	Harsh
04	Jyoti

Salutation_ID	Salutation
1	Mr.
2	Miss

CID	Course
027	DBMS
049	DSA
032	CN
091	OS

4NF / NORMALIZATION FORM

PROCESS: Remove Multi Valued Dependency

Input: BCNF table

Output: 4NF

SID	Class	CID	Mobile	Salutation_ID
01	1 year	027	68759487	1
01	1 year	049	68759487	1
02	2 year	032	34980988	1
02	2 year	091	34980988	1
03	2 year	027	29879878	1
04	3 year	091	48799807	2
04	3 year	091	29875099	2

Remove multivalued attribute dependency

Here CID, Mobile is Multivalued Attributes

SID	Class	CID	Mobile	Salutation_ID
01	1 year	027	68759487	1
01	1 year	049	68759487	1
02	2 year	032	34980988	1
02	2 year	091	34980988	1
03	2 year	027	29879878	1
04	3 year	091	48799807	2
04	3 year	091	29875099	2



SID	Class	CID	Salutation_ID
01	1 year	027	1
01	1 year	049	1
02	2 year	032	1
02	2 year	091	1
03	2 year	027	1
04	3 year	091	2



SID	Mobile
01	68759487
02	34980988
03	29879878
04	48799807
04	29875099

SID	Class	CID	Salutation_ID
01	1 year	027	1
01	1 year	049	1
02	2 year	032	1
02	2 year	091	1
03	2 year	027	1
04	3 year	091	2



SID	CID	Salutation_ID
01	027	1
01	049	1
02	032	1
02	091	1
03	027	1
04	091	2



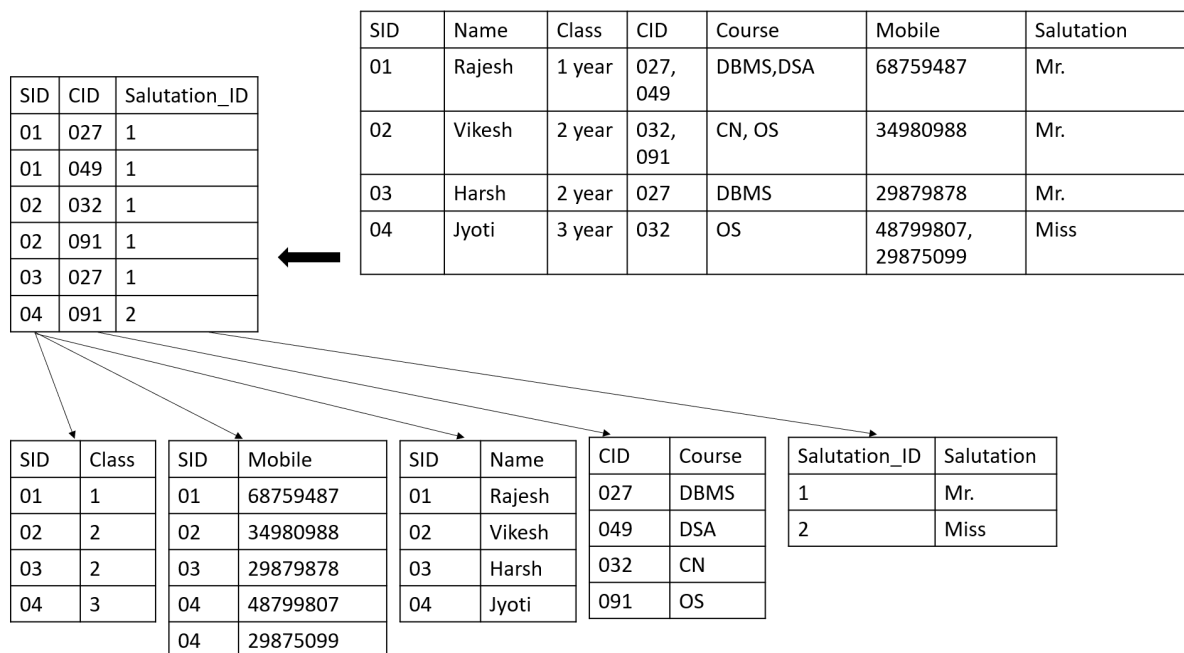
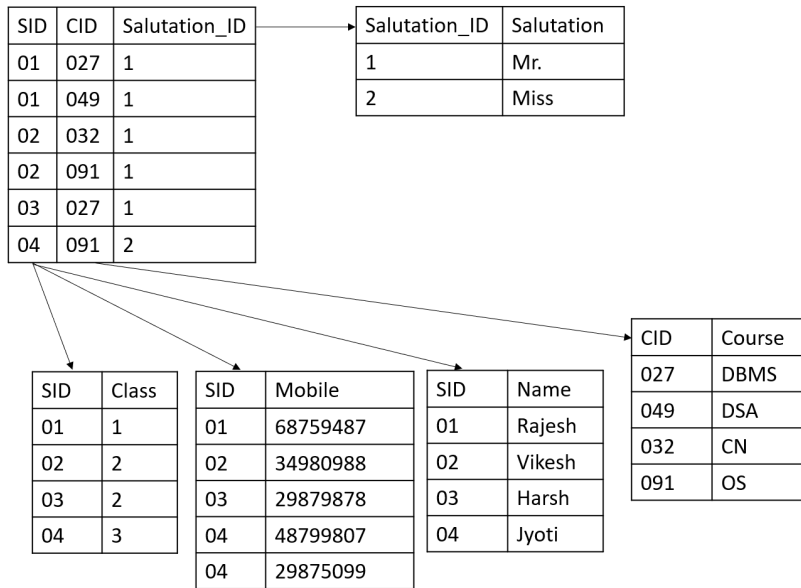
SID	Class
01	1
02	2
03	2
04	3

5NF / NORMALIZATION FORM

PROCESS: Join the split tables and the final outcome should be equal to the original table. If not then cancel the normalization and start from the 1NF and do the lossless normalization.

Input: 4NF table

Output: 5NF



Normalization 1NF to 6NF	
1NF	Apply ATOMIC VALUES in a table
2NF	Remove Partial Dependency
3NF	Remove Trivial Functional Dependency
4NF	Remove Multi Valued Dependency
5NF	Check the final outcome for the lossless decomposition . If the join is lossy then cancel the normalization and start from the 1NF.
6NF	Proposed only, no theories yet.