NORMALIZATION

- Boyce Codd Normal Form
  - it is in 3NF and for every functional dependency
  - X->Y, X should be the super key of the table.

NORMALIZATION – 3NF

Emp_id	Emp_name	Emp_zip	Emp_state	Emp_city	Emp_district
1001	John	282005	UP	Agra	Dayal Bagh
1002	Ajeet	222008	TN	Chennai	M-City
1006	Lora	282007	TN	Chennai	Urrapakkam
1101	Lilly	292008	UK	Pauri	Bhagwan
1201	Steve	222999	MP	Gwalior	Ratan

NORMALIZATION – 3NF

emp_id	emp_name	emp_zip
1001	John	282005
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emp_zip	emp_state	emp_city	emp_district
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222999	MP	Gwalior	Ratan

NORMALIZATION

- Boyce Codd normal form:

  - it is in 3NF and for every functional dependency

    X->Y, X should be the super key of the table.

emp_id	emp_nationality	emp_dept	dept_type	dept_no_of_emp
1001	Austrian	Production and planning	D001	200
1001	Austrian	stores	D001	250
1002	American	design and technical support	D134	100
1002	American	Purchasing department	D134	600

NORMALIZATION

- Functional dependencies in the table above:

emp_id->emp_nationality

emp_dept -> {dept_type, dept_no_of_emp}

emp_id	emp_nationality	emp_dept	dept_type	dept_no_of_emp
1001	Austrian	Production and planning	D001	200
1001	Austrian	stores	D001	250
1002	American	design and technical support	D134	100
1002	American	Purchasing department	D134	600

NORMALIZATION - BCNF

- emp_nationality table:
- emp_dept table:

emp_id	emp_nationality
1001	Austrian
1002	American

emp_dept	dept_type	dept_no_of_emp
Production and planning	D001	200
stores	D001	250
design and technical support	D134	100
Purchasing department	D134	600

- Emp_dept_mapping :

emp_id	emp_dept
1001	Production and planning
1001	stores
1002	design and technical support
1002	Purchasing department

Multivalued Dependencies

- Conditions:
  - A -> B, if for a single value of A, multiple values of B exists, then table may have multi-values dependency.
  - a table have at-least 3 columns for it to have a multi-valued dependency.
  - For a relation R(A,B,C), if there is a multi-valued dependency between, A and B, then B and C should independent of each other.

Multivalued Dependencies

- Example:

Sid	Course	Skill
1	C C++	English German
2	Java	English French

Sid ->> Course

Sid ->> Skill

Multivalued Dependencies

- Example:

Sid	Course	Skill
1	C	English
1	C++	German
1	C	German
1	C++	English
2	Java	English
2	Java	French

Fourth Normal Form

- Conditions:
  - It should be in the Boyce-Codd normal Form.
  - the table should not have any multi-valued dependency.

Fourth Normal Form

- Student Table:

Sid	Course	Skill
1	C	English
1	C++	German
1	C	German
1	C++	English
2	Java	English
2	Java	French

Fourth Normal Form

- Student_Course Table:

Sid	Course
1	C
1	C++
2	Java

- Student_Skill Table:

Sid	Skill
1	English
1	German
2	English
2	French

Fifth Normal Form

- It is in 4th Normal Form
- If we can decompose table further to eliminate redundancy and anomalies and when we rejoin the table we should not be losing the original data or get a new record(Join Dependency Principle)
- also called as project join normal form.

Fifth Normal Form

C1	C2	C3
A	X	P
B	Y	Q
B	Y	R
B	Y	S
C	Z	T
C	ZA	U

Fifth Normal Form

- Table is not in 4th Normal Form.

C1	C2
A	X
B	Y
C	Z
C	ZA

C1	C3
A	P
B	Q
B	R
B	S
C	T
C	U

Fifth Normal Form

- Join the previous two tables, we will get new records.

C1	C2
A	X
B	Y
C	Z
C	ZA

C1	C3
A	P
B	Q
B	R
B	S
C	T
C	U

C2	C3
X	P
Y	Q
Y	R
Y	S
Z	T
ZA	U

Conn…

Thank You…….