**NORMAL FORMS**

NORMAL FORMS ARE A MECHANISM TO IDENTIFY THE TABLES AND THEIR RELATIONS.

MEANS, NORMAL FORMS ARE USED IN THE DATABASE DESIGN FOR EASY RELATION MANAGEMENT & EASY DATA VALIDATIONS.

**1 NF :** ATOMIC VALUES. MEANS : EVERY COLUMN CAN HAVE ONLY SINGLE VALUE.

ADVANTAGE: EASY & FASTER DMLs. FASTER RETREIVALS (DQL).

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| **EXAMPLE** | |
| CREATE TABLE EMPLOYEE\_INFO  (  EMP\_ID INT, EMP\_NAME CHAR(3000), EMP\_ADDRESS VARCHAR(2000),  EMP\_SAL INTEGER ) | CREATE TABLE EMPLOYEE\_INFO  (  EMP\_ID INT, EMP\_NAME CHAR(3000), EMP\_COUNTRY VARCHAR(40),  EMP\_STATE VARCHAR(30),  EMP\_CITY VARCHAR(20),  EMP\_SAL INTEGER ) |

**2 NF :** A TABLE SHOULD HAVE ATLEAST ONE **UNIQUE** COLUMN.

TABLE SHOULD EXHIBIT FUNCTIONAL DEPENDANCY USING "**CANDIDATE KEYS**".

CANDIDATE KEYS ARE SUCH COLUMNS THAT ENFORCE UNIQUENESS.

**PK & UQ** ARE CANDIDATE KEYS.

EXAMPLE: CREATE TABLE TBLCOURSES

(

COURSE\_ID INT UNIQUE,

COURSE\_NAME VARCHAR(30) NOT NULL,

COURSE\_DUR INT CHECK (COURSE\_DUR = 120 OR COURSE\_DUR = 180)

)

**3 NF :** TABLE SHOULD HAVE ATLEAST ONE **FOREIGN KEY**.

MULTI VALUED DEPENDANCY (MVD) : IMPLEMENTATION OF "REFERENCES" TO PK / UQ

THIS RESULTS IN 1 TO MANY RELATIONSHIP. 1 : M

EX : ONE COURSE CAN HAVE MULTIPLE STUDENTS.

IF WE DEFINE FOREIGN KEY AS WELL AS CANDIDATE KEY ON SAME COLUMN THEN SUCH

COLUMN DOES NOT ALLOW DUPLICATES. IT IS CALLED **1 : 1** RELATION.

EXAMPLE: ONE PROJECT HAS ONE MANAGER. ONE MANAGER HAS ONE PROJECT.

CREATE TABLE MANAGER\_TABLE

(

MANAGER\_ID INT PRIMARY KEY,

MANAGER\_NAME VARCHAR(30) NOT NULL,

MNGR\_PROJ\_ID INT UNIQUE REFERENCES PROJECT\_TABLE(PROJECT\_ID)

)

**BCNF :** BOYCEE-CODD NORMAL FORM. TABLE SHOULD BE IN 3NF.

THERE CAN BE MORE THAN ONE FOREIGN KEY IN THE TABLE. [M:1]

EX: A RETAIL ENVIRONMENT.

SALES TABLE REFERENCES PRODUCTS TABLE, TIME TABLE & CUSTOMERS TABLE

CREATE TABLE **SALES\_DATA**

(

SALE\_ID INT IDENTITY (10001, 1),

CustomerKey INT REFERENCES CUSTOMERS\_DATA(CustomerKey), ProductKey INT REFERENCES PRODUCTS\_DATA(ProductKey),

SalesAmount FLOAT CHECK (SalesAmount >= 1) NOT NULL,

TaxAmt FLOAT CHECK (TaxAmt >= 0.5) NOT NULL

)

**4 NF :** A TABLE CAN BE RELATED TO ITSELF. **SELF REFERENCING KEY.**

CREATE TABLE EMPLOYEE\_DETAILS

(

EmpID int UNIQUE,

EmpName varchar(30) NOT NULL,

EmpManagerID int REFERENCES EMPLOYEE\_DETAILS (EmpID)

)

**SYNOPSYS:**

1ST NORMAL FORM : ATOMIC VALUES

2ND NORMAL FORM : CANDIDATE KEY (PK / UQ)

3RD NORMAL FORM : A TABLE WITH ONE REFERENCE

BCNF NORMAL FORM : A TABLE WITH MULITPLE REFERENCES

4TH NORMAL FORM : SELF REFERECING KEYS