NORMALIZATION

**Defination** :

Normalization is a method to use in the design of database to create a neat, structured, and structured in which each relates to just one subject or one-to-one correspondence. The objective is to extensively reduce data redundancy and dependency.

Normalization split a large table into smaller tables and define relationships between them to increases the clarity in organizing data.

**OverallSource:** <https://in.search.yahoo.com/search?fr=mcafee&type=E211IN826G0&p=defination+of+normalization+in+dbms>

Types Of Normalization :

1. First Normal Form (1NF)
2. Second Normal Form (2NF)
3. Third Normal Form (3NF)
4. Boyce-Codd Normal Form (BCNF)
5. Fourth Normal Form (4NF)
6. Fifth Normal Form (5NF)

Let’s cover all the Database Normal forms one by one with some basic examples to help you understand the DBMS normal forms.

1. First Normal Form (1NF)

* All the column in a table should have unique names

Example: Employee table in which we store the employee information along with the employee skillset, the table will look like this:

|  |  |  |  |
| --- | --- | --- | --- |
| Emp\_id | Emp\_name | Emp\_mobile | Emp\_skill |
| 1 | Aniket | 1234567890 | SQL,Power BI |
| 2 | Rohan | 4567891234 | Python, SQL |
| 3 | Sanket | 7458612345 | Java, Excel |

1. Second Normalization Form (2NF)

* It should be in the First Normal Form and it should not have Partial Dependency

Student Table

|  |  |  |
| --- | --- | --- |
| Student\_id | Student\_name | Branch |
| 1 | Aniket | Bcom |
| 2 | Rohan | Bcom |

Subject Table

|  |  |
| --- | --- |
| Subject\_id | Subject\_name |
| 1 | C Language |
| 2 | C++ |
| 3 | Operative System |

Score

|  |  |  |  |
| --- | --- | --- | --- |
| Student\_id | Subject\_id | Marks | Teacher\_name |
| 1 | 1 | 70 | Mr. A |
| 1 | 2 | 82 | Mrs. D |
| 2 | 1 | 65 | Mr. R |

1. **Third Normal Form(3NF)**

* It satisfies the First Normal Form and the Second Normal Form
* If such an entity exists, move it outside into a new table
* 3NF is achieved, considered as the database is normalized.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Student\_id | Subject\_id | Marks | Exam\_type | Total\_marks |
| 1 | 1 | 70 | Practical | 100 |
| 1 | 2 | 82 | Theory | 100 |
| 2 | 1 | 42 | Theory | 50 |

1. **Boyce-Codd Normal Form (BCNF)**

* Boyce and Codd Normal Form is a higher version of the Third Normal Form.
* A 3NF table does not have multiple overlapping candidate keys is said to be in BCNF.

1. **Fourth Normal Form (4NF)**

* Tables cannot have multi-valued dependencies on a Primary Key.

1. **Fifth Normal Form (5NF)**

* A composite key should not have any cyclic dependencies.