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Course Name: **A Level (1st Sem)**   Subject : **Introduction to DBMS**
Topic: **Database Normalization – Introduction (Part 1)**   Date: **13-May-2020**

Database Normalization

🞢 Normalization

The concept of normalization was initially proposed by IBM researchers E.F. Codd in 1970s.

Normalization is the process of organizing or arranging the data in the database in such a way that it minimizes the data redundancy and brings the database into consistent state.

It splits tables into several multiple tables and defines which attributes should be grouped together to form the various tables, and also links various tables using relationships. It consists of various rules for doing this.

It helps in designing good and perfect database. If the database is not normalized it may lead to bad or poor design of database.

If the data in the database are not organized properly, it may contain various flaws or anomalies in the database which may create problem. These anomalies are:

- **Insert Anomalies**
- **Update Anomalies**
- **Delete Anomalies**

These anomalies occur when data in the database are not logically arranged and stored. Therefore it is necessary to normalize the database to avoid these anomalies.

♦ Normalization Rules

There are various rules defined for normalization and these rules are classified into several normal forms. These normal forms are:

- **First Normal Form (1 NF)**
- **Second Normal Form (2 NF)**
- **Third Normal Form (3 NF)**
- **Boyce Codd Normal Form (BCNF or 3.5 NF)**
- **Fourth Normal Form (4 NF)**
- **Fifth Normal Form (5 NF)**

In most of the cases, database is normalized in its best if it satisfies the rules of third normal form. It means that if database is normalized up to 3NF then it will be in its best consistent state.

Exercise:

1. Why it is necessary to normalize the database?