



**SNS COLLEGE OF TECHNOLOGY, COIMBATORE-35**

**(AN AUTONOMOUS INSTITUTION)**



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**19CST202-DATABASE MANAGEMENT SYSTEM**

## **UNIT-III**

### **Database Design**

#### **Topic: Functional Dependency**

#### **Functional Dependency**

The functional dependency is a relationship that exists between two attributes. It typically exists between the primary key and non-key attribute within a table.

#### 1. $X \rightarrow Y$

The left side of FD is known as a determinant, the right side of the production is known as a dependent.

#### **For example:**

Assume we have an employee table with attributes: Emp\_Id, Emp\_Name, Emp\_Address.

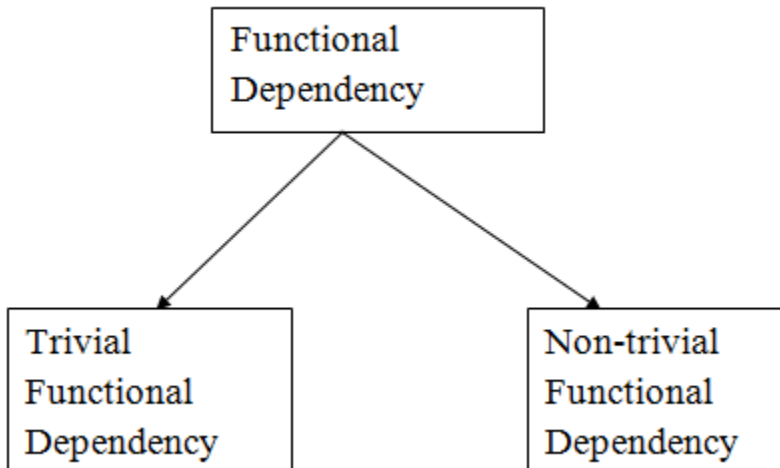
Here Emp\_Id attribute can uniquely identify the Emp\_Name attribute of employee table because if we know the Emp\_Id, we can tell that employee name associated with it.

Functional dependency can be written as:

#### 1. $\text{Emp\_Id} \rightarrow \text{Emp\_Name}$

We can say that Emp\_Name is functionally dependent on Emp\_Id.

#### Types of Functional dependency



### 1. Trivial functional dependency

- $A \rightarrow B$  has trivial functional dependency if  $B$  is a subset of  $A$ .
- The following dependencies are also trivial like:  $A \rightarrow A$ ,  $B \rightarrow B$

#### Example:

1. Consider a table with two columns `Employee_Id` and `Employee_Name`.
2.  $\{Employee\_id, Employee\_Name\} \rightarrow Employee\_Id$  is a trivial functional dependency as
3. `Employee_Id` is a subset of  $\{Employee\_Id, Employee\_Name\}$ .
4. Also,  $Employee\_Id \rightarrow Employee\_Id$  and  $Employee\_Name \rightarrow Employee\_Name$  are trivial dependencies too.

### 2. Non-trivial functional dependency

- $A \rightarrow B$  has a non-trivial functional dependency if  $B$  is not a subset of  $A$ .
- When  $A$  intersection  $B$  is NULL, then  $A \rightarrow B$  is called as complete non-trivial.

#### Example:

1.  $ID \rightarrow Name$ ,
2.  $Name \rightarrow DOB$