

DBMS

UNIT- IV

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.

$X \rightarrow Y$

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.

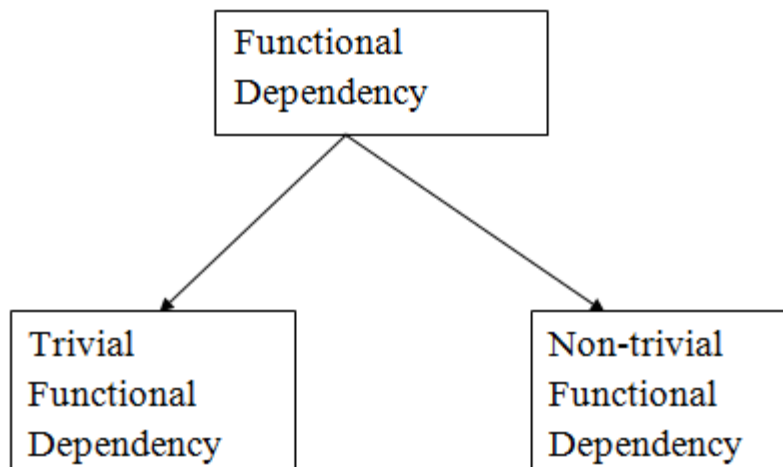
Here Emp_Id attribute can uniquely identify the Emp_Name attribute of employee table because if we know the Emp_Id, we can tell that employee name associated with it.

Functional dependency can be written as:

$\text{Emp_Id} \rightarrow \text{Emp_Name}$

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 $A \cap B$ is NULL, then $A \rightarrow B$ is called as complete non-trivial.

Example:

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