What is Functional Dependency?

Functional dependency is a concept that describes the relationship between the attributes of relational database. It helps to maintain data integrity and correctness of data in a relational database. Let’s a relation R with attributes A and B. If values of A determine the values of B, then A is called determinant and B is called dependent.

Types Of Functional Dependencies-

- Full Functional dependency
- Partial dependency
- Trivial dependency
- Non-Trivial dependency

Full Functional Dependency (FFD):

Full Functional Dependency exists between two attributes A and B when attribute B depends entirely on attribute A, and you can't remove any part of A without breaking this dependency.

Partial Dependency:

Partial Dependency occurs when an attribute in a table is functionally dependent on only a part of a composite (multi-attribute) key, rather than the entire key. In other words, some attributes in a set are functionally dependent on a subset of those attributes, but not on the whole set. This can lead to data redundancy and anomalies in the database. The

goal of normalization is to eliminate partial dependencies to ensure data integrity and reduce redundancy.

Trivial Functional Dependencies:

- A functional dependency $X \rightarrow Y$ is said to be trivial if and only if $Y \subseteq X$.
- Thus, if RHS of a functional dependency is a subset of LHS, then it is called as a trivial functional dependency.

Non-Trivial Functional Dependencies:

- A functional dependency $X \rightarrow Y$ is said to be non-trivial if and only if $Y \not\subset X$.
- Thus, if there exists at least one attribute in the RHS of a functional dependency that is not a part of LHS, then it is called as a non-trivial functional dependency.