Course Name: **A Level (1st Sem)** Subject : **Introduction to DBMS**

Topic: **FD – Its types (Part 2)** Date: **20-Apr-2020**

Functional Dependency – Its types

Types of FD

1. Trivial Functional Dependency
2. Non Trivial Functional Dependency
3. Completely Non Trivial Functional Dependency

Trivial Functional Dependency

A Functional Dependency $\alpha \rightarrow \beta$ is said to trivial FD if β is subset of α i.e. $\beta \subseteq \alpha$.

The functional dependency like $A \rightarrow A$, $AB \rightarrow B$ are trivial FDs.

Suppose a relation employee (emp_id, emp_name, emp_dob), the following FDs are trivial FDs

- **{emp_id, emp_name } → emp_name**

  [emp_name is subset of {emp_id, emp_name}. It is very obvious that if we know the emp_id and emp_name of the employee then we can find or tell the emp_name of the employee.]

- **{emp_id, emp_dob} → emp_id**

  [emp_id is subset of {emp_id, emp_dob}. It is very obvious that if we know the emp_id and emp_dob of the employee then we can find or tell the emp_id of the employee.]

- **emp_id → emp_id**

- **emp_name → emp_name**

- **emp_dob → emp_dob**

Non Trivial Functional Dependency

A Functional Dependency $\alpha \rightarrow \beta$ is said to non trivial FD if β is not subset of α i.e. $\beta \not\subseteq \alpha$.

The functional dependency like $A \rightarrow A$, $A \rightarrow AB$ are trivial FDs.

Suppose a relation employee (emp_id, emp_name, emp_dob), the following FDs are non-trivial FDs

- **emp_id → emp_name**

  [emp_name is not subset of emp_id.]

- **emp_id → emp_dob**

  [emp_dob is not subset of emp_id.]

Completely Non Trivial Functional Dependency

A Functional Dependency $\alpha \rightarrow \beta$ is said to completely non trivial FD if the intersection of α and β is NULL (Φ) i.e. α is not subset of β and β is not subset of α ($\beta \not\subseteq \alpha$ and $\alpha \not\subseteq \beta$).

The functional dependency $AB \rightarrow CD$ is completely non trivial FDs.

Note: $A \rightarrow AB$ is non - trivial FD but it is not completely non trivial because the intersection of A and AB is A.

Exercise:

Which functional dependency holds in given relation and why?

1. $B \rightarrow C$
2. $A \rightarrow C$
3. $A \rightarrow D$
4. $C \rightarrow D$

R(A, B, C, D)

A	B	C	D
a_1	b_1	c_1	d_1
a_1	b_2	c_1	d_2
a_2	b_2	c_2	d_2
a_2	b_3	c_2	d_3
a_3	b_3	c_2	d_4