

[Concept of Functional Dependencies]

A	B	C



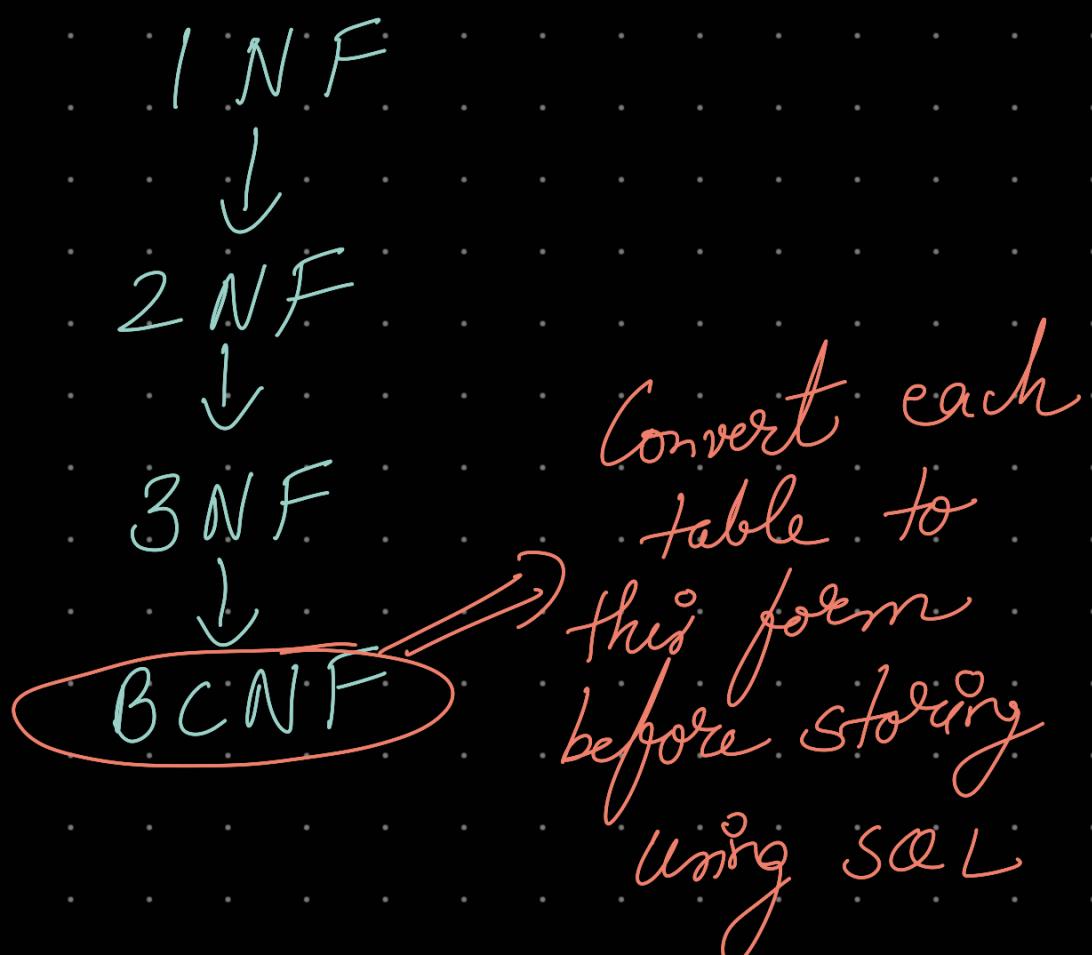
- * A determines B
- * If A is known, B can be determined
- * B is dependent on A

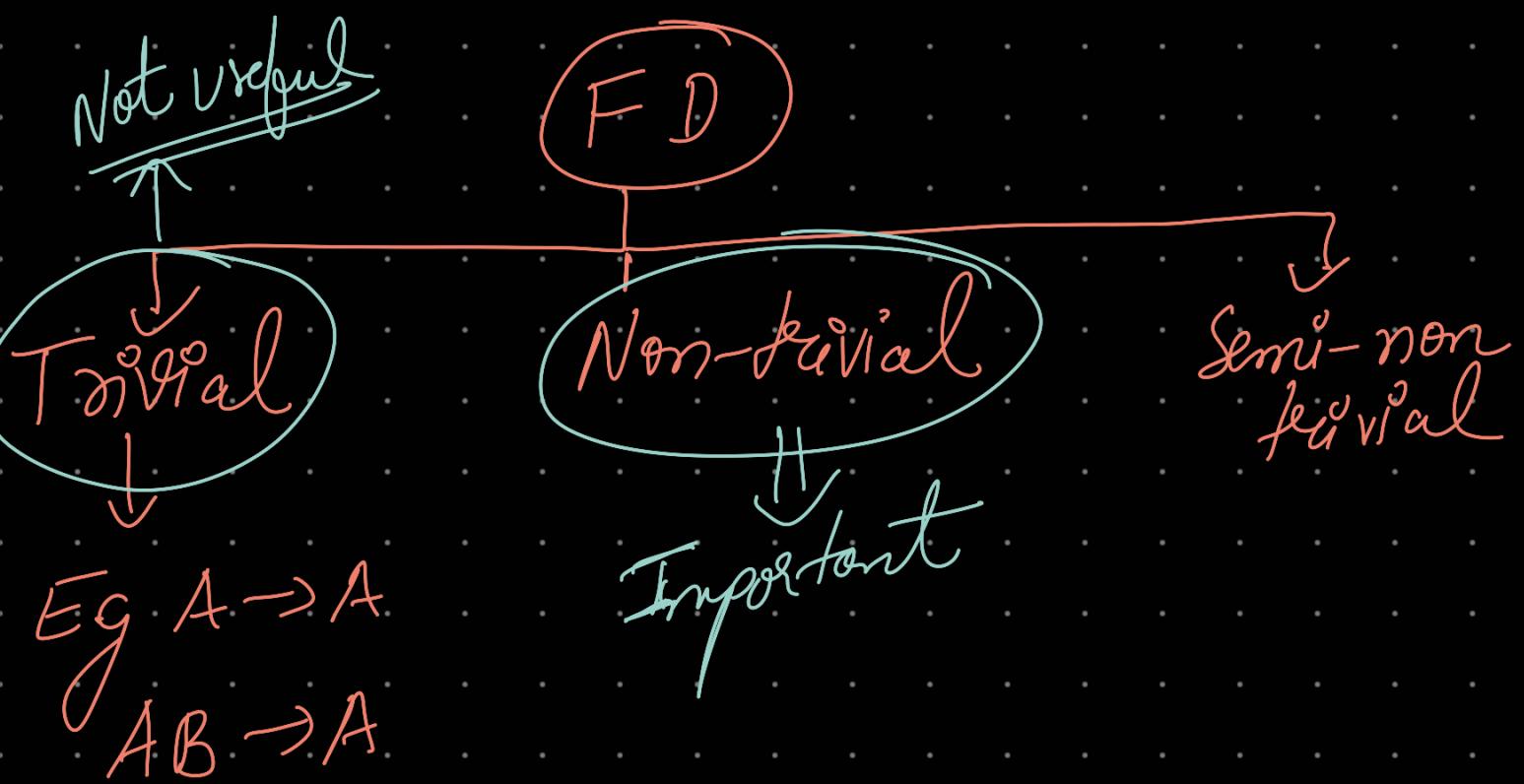
Q → How are functional dependencies created by Database designers?

- ↳ ① Depends on Enterprise requirement
- ↳ ② Observation from Table

- ③ Depends on Business requirements
- ④ Analyzing existing data if any
- ⑤ E-R diagram
- ⑥ Final DB design document contains
all FD

* Majority of Enterprise database tries to make each table to BCNF form





E.g. →

Eid	Ename
1	a
2	b
3	b

From above table, we can derive
Some FDs.

① $Eid \rightarrow Ename$ ✓

② $Ename \rightarrow Eid$ ✗

$\begin{array}{l} a \\ \rightarrow 1 \\ b \\ \rightarrow 2 \\ b \\ \rightarrow 3 \end{array} \rightarrow$ can be FD

* check LHS attribute, if it's original or not

[Usage of FD]

- * Identifying additional FD
- * Identifying Keys
- * Identifying Equivalence of FDs
- * Finding minimal FD set

[Closure set of attributes]

Given FD \rightarrow

$$A \rightarrow B$$
$$B \rightarrow D$$
$$C \rightarrow DE$$
$$CD \rightarrow AB$$

$$A^+ = \{A, B, 0\} \Rightarrow \begin{matrix} A \rightarrow B \\ B \rightarrow D \end{matrix}$$

$$B^+ = \{B, 0\} \Rightarrow B \rightarrow \emptyset$$

$$C^+ = \{C, 0, E, AB\} \xrightarrow{CD} \begin{matrix} C \rightarrow DE \\ CD \rightarrow AB \end{matrix}$$

$$D^+ = \{0\}$$

$$E = \{E\}$$

$$CD^+ = \{C, 0, A, B, E\}$$

$$\hookrightarrow CD \rightarrow AB$$

$$C \rightarrow DE$$