

# Minimal Sets of Functional Dependencies or Irreducible Set of Functional Dependencies or Removal of Extraneous Attributes or Canonical Cover –

Some Terms Before Making a Move to the Minimal Sets of Functional Dependencies /Canonical Cover –

- **Non Redundant Functional Dependency** – A set F of FDs is non redundant, if there is no proper subset F' of F such that  $F \equiv F'$ .
- **Redundant Functional Dependency** – If a set F' which is a proper subset of F exists, then F is redundant.
- **Extraneous Attributes** – are the unnecessary/extra attributes appearing in individual functional dependencies either on LHS or on RHS.

Our intention is to remove the Non redundant Functional Dependencies and also the removal of extraneous attributes without changing the closure of F before making a move to the normalization process.

The procedure to find the minimal sets of functional dependencies is as follows :

- **Step 1 : Apply the Union Simplification Inference Rule.**
- **Step 2 : Removal of Redundant Functional Dependency –**  
To check whether a functional dependency is redundant or not , first hide that functional from set and then find closure attributes those are at left of that functional dependency without using reflexivity rule , if closure contains same attributes for whom we are finding closure then functional dependency is redundant, remove this functional dependency from the set.
- **Step 3 : Removal of Extraneous Attributes –**  
Look for the FDs having more than one attribute on the LHS. Remove an attribute from the FD and take the closure of remaining attributes from the other FDs. If the removed attribute exists in the closure, then it is a redundant attribute/extraneous attribute and remove it from that FD. Repeat this process for all the remaining Attributes.
- **Step 4:** If step 3 = Success(i.e. found an extraneous attribute), then apply step 2 again followed by step 4.  
If step 3 = fails (i.e no extraneous attributes found) then go to step 4.
- **Step 5 : Apply the union rule to get the minimal sets of functional dependencies.**