# Tables before Normalization

**Note : Primary key is denoted as primary key**

**Foreign Key is denoted as foreign key**

**A key that is both foreign and composite key is denoted as foreign key+ primary key**

* Check-ups ( Vol\_ID, First\_Name, Middle\_Name, Last\_Name, Weight, DOB)
* Blood\_Bank (Blood\_Bank\_ID , BB\_Name, BB\_Location, Blood\_Type, Cost)
* Blood\_Donation\_Camp (Orgaization , Camp\_ID , location , Start\_date , End\_dt, Blood\_Bank\_ID, Contact\_info)
* Nurse (Nurse\_ID , First\_Name, Middle\_Name, Last\_Name, DOB , Organization, Camp\_ID, Contact\_Info)
* Donor( Donor\_ID, First\_Name, Middle\_Name, Last\_Name, DOB, Nurse\_ID, Contact\_Info)
* Blood (Donor\_ID,Donation\_Date, Orgaization , Camp\_ID, Blood\_Type , Haemoglobin , Red\_blood\_cells , White\_blood\_cells , Platelets , Plazma)
* Hospital (Hospital\_ID , Hospital\_Name, Hos\_Address, Contact\_Info, Hos\_Email)
* Order (Blood\_Bank\_ID, Hospital\_ID, Issue\_Date, Blood\_Type, Blood\_Quantity)
* Patient (Hospital\_ID , Patient\_ID , First\_Name, Middle\_Name, Last\_Name , Sex , Blood\_Type , Date\_Admitted , Date\_Discharged, Contact\_Info)

# Normalization of Tables

1. **Check\_up :**

Check-ups ( Vol\_ID, First\_Name, Middle\_Name, Last\_Name, Weight, DOB)

* + Here this table is in 1st a normal form because every record is atomic.
  + This table is in 2nd normal form because there is no partial dependency.
  + It is in a 3rd normal form because there is a transitivity.
  + Hence there is no need to normalize the table.

Check-ups ( Vol\_ID, First\_Name, Middle\_Name, Last\_Name, Weight, DOB)

**2. Blood\_Bank :**

Blood\_Bank (Blood\_Bank\_ID , BB\_Name, BB\_Location, Blood\_Type, Cost)

* Here this table is not in 1st a normal form because every record is not atomic.
* Here Blood\_Type and Cost is a multivalued attribute.
* We can create different table for contact info to reduce it to the 1st normal form.
* Here Cost of Blood depends upon Blood\_Type , hence transitivity exists.

Blood\_Bank (Blood\_Bank\_ID , BB\_Name , BB\_Location )

## Bank\_Blood\_Cost (Blood\_Bank\_ID , Blood\_Type , Cost)

* This table is in 2nd normal form because there is no partial dependency.
* Because here Cost of blood in Blood\_Bank\_Cost table depends upon

both Blood\_Bank\_Id and Blood\_Type.

* It is in 3rd normal form because there is no transitivity.

**3. Blood\_Donation\_Camp :**

Blood\_Donation\_Camp (Orgaization , Camp\_ID , location , Start\_date , End\_dt, Blood\_Bank\_ID, Contact\_info)

* Here this table is not in 1st a normal form because every record is not atomic.
* Here Contact\_Info is a multivalued attribute.
* We can create different table for contact info to reduce it to the 1st normal form.

Blood\_Donation\_Camp (Orgaization , Camp\_ID , location , Start\_date , End\_dt, Blood\_Bank\_ID)

Camp\_Contact (Organization , Camp\_ID ,Contact\_info )

* + Blood\_Donation table is not in 2nd normal form because there is a partial dependency.
* Here we have composite key Organization and Camp\_ID.
* Here Blood\_Bank\_ID only depends upon Organization and not on Camp\_ID.

Key = Organization + Camp\_ID

Organization 🡪 Blood\_Bank\_ID

Hence we have to break given table into 2 tables.

Blood\_Donation\_Camp (Orgaization , Camp\_ID , location , Start\_date , End\_date)

Organization\_Blood\_Bank( Organization, Blood\_Bank\_ID)

* It is in 3rd normal form because there is no transitivity.

Blood\_Donation\_Camp (Orgaization , Camp\_ID , location , Start\_date , End\_date)

Organization\_Blood\_Bank( Organization, Blood\_Bank\_ID)

Camp\_Contact (Organization , Camp\_ID ,Contact\_info )

**4. Nurse :**

Nurse (Nurse\_ID , First\_Name, Middle\_Name, Last\_Name, DOB , Organization, Camp\_ID, Contact\_Info)

* Here this table is not in 1st a normal form because every record is not atomic.
* Here Contact\_Info is a multivalued attribute.
* We can create different table for contact info to reduce it to the 1st normal form.

Nurse (Nurse\_ID , First\_Name, Middle\_Name, Last\_Name, DOB , Organization, Camp\_ID, Contact\_Info)

## Nurse\_Contact (Nurse\_ID,Contact\_info)

* Both tables are in 2nd normal form because there is no partial dependency.
* Nurse is in a 3rd normal form because there is a transitivity.

Nurse (Nurse\_ID , First\_Name, Middle\_Name, Last\_Name, DOB , Organization, Camp\_ID, Contact\_Info)

## Nurse\_Contact (Nurse\_ID,Contact\_info)

**5. Donor :**

Donor( Donor\_ID, First\_Name, Middle\_Name, Last\_Name, DOB, Nurse\_ID, Contact\_Info)

* + Here this table is not in 1st a normal form because every record is not atomic.
  + Here Contact\_Info is a multivalued attribute.
  + We can create different table for contact info to reduce it to the 1st normal form.

Donor( Donor\_ID, First\_Name, Middle\_Name, Last\_Name, DOB, Nurse\_ID)

## Donor\_Contact (Donor\_ID , Contact\_info)

* Both tables are in 2nd normal form because there is no partial dependency.
* Donor is in 3rd normal form because there is a transitivity.

1. **Blood :**

Blood (Donor\_ID,Donation\_Date, Orgaization , Camp\_ID, Blood\_Type , Haemoglobin , Red\_blood\_cells , White\_blood\_cells , Platelets , Plazma)

* + Here this table is in 1st a normal form because every record is atomic.
  + This table is in 2nd normal form because there is no partial dependency.
  + It is in 3rd normal form because there is no transitivity.

**7. Hospital :**

Hospital (Hospital\_ID , Hospital\_Name , Hos\_Address, Hos\_Phone, Hos\_Email)

* Here this table is not in 1st a normal form because every record is not atomic.
* Here Hos\_Phone and Hos\_Email is a multivalued attribute.
* We can create different table for contact info to reduce it to the 1st normal form.

Hospital (Hospital\_ID , Hospital\_Name , Hos\_Address)

## Hospital\_Contact (Hospital\_ID , Hos\_Phone)

Hospital\_Email (Hospital\_ID , Hos\_Email)

* This table is in 2nd normal form because there is no partial dependency.
* It is in 3rd normal form because there is no transitivity.

**8. Order :**

Order (Blood\_Bank\_ID, Hospital\_ID, Issue\_Date, Blood\_Type, Blood\_Quantity)

* Here this table is in 1st a normal form because every record is atomic.
* This table is in 2nd normal form because there is no partial dependency.
* It is in 3rd normal form because there is no transitivity.
* Here we have composite key = Blood\_Bank\_ID, Hospital\_ID, Issue\_Date, Blood\_Type
* This table belongs to the order relation because the relation has Many to Many relationship.

**9. Patient :**

Patient (Hospital\_ID , Patient\_ID , First\_Name, Middle\_Name, Last\_Name , Sex , Blood\_Type , Date\_Admitted , Date\_Discharged, Contact\_Info)

* Here this table is not in 1st a normal form because every record is not atomic.
* Here Contact\_Info is a multivalued attribute.
* We can create different table for contact info to reduce it to the 1st normal form.

Patient (Hospital\_ID , Patient\_ID , First\_Name, Middle\_Name, Last\_Name , Sex , Blood\_Type , Date\_Admitted , Date\_Discharged, Contact\_Info)

## Patient\_Contact (Hospital\_ID , Patient\_ID, Contact\_Info)

* This table is in 2nd normal form because there is no partial dependency.
* It is in 3rd normal form because there is no transitivity.

**Tables after Normalization**

* Check-ups ( Vol\_ID, First\_Name, Middle\_Name, Last\_Name, Weight, DOB)
* Blood\_Bank (Blood\_Bank\_ID , BB\_Name, BB\_Location)
* Bank\_Blood\_Type (Blood\_Bank\_ID , Blood\_Type , Cost)
* Blood\_Donation\_Camp (Orgaization , Camp\_ID , location , Start\_date , End\_dt, Blood\_Bank\_ID)
* Camp\_Contact (Organization , Camp\_ID ,Contact\_info )
* Organization\_Blood\_Bank( Organization, Blood\_Bank\_ID)
* Nurse (Nurse\_ID , First\_Name, Middle\_Name, Last\_Name, DOB , Organization, Camp\_ID)
* Nurse\_Contact (Nurse\_ID ,Contact\_info)
* Donor( Donor\_ID, First\_Name, Middle\_Name, Last\_Name, DOB, Nurse\_ID)
* Donor\_Contact (Donor\_ID , Contact\_info)
* Blood (Donor\_ID,Donation\_Date, Orgaization , Camp\_ID, Blood\_Type , Haemoglobin , Red\_blood\_cells , White\_blood\_cells , Platelets , Plazma)
* Hospital (Hospital\_ID , Hospital\_Name, Hos\_Address)
* Hospital\_Contact (Hospital\_ID , Contact\_Info)
* Hospital\_Email (Hospital\_ID , Hos\_Email)
* Order (Blood\_Bank\_ID, Hospital\_ID, Issue\_Date, Blood\_Type, Blood\_Quantity)
* Patient (Hospital\_ID , Patient\_ID , First\_Name, Middle\_Name, Last\_Name , Sex , Blood\_Type , Date\_Admitted , Date\_Discharged)
* Patient\_Contact (Hospital\_ID , Patient\_ID ,Contact\_Info)