

## **FUNCTIONAL DEPENDENCIES**

**1) user\_details** (This table is in 2NF form)

(u\_id, u\_name, u\_gender, u\_age, u\_address\_line, u\_state, u\_city, u\_landmark, u\_pincode, u\_email)

{u\_id} -> u\_name

{u\_id} -> u\_gender

{u\_id} -> u\_age

{u\_id} -> u\_address\_line

{u\_id} -> u\_city

{u\_id} -> u\_state

{u\_id} -> u\_pincode

{u\_id} -> u\_email

{u\_pincode} -> u\_city

{u\_pincode} -> u\_state

### **Normalization to 3NF and BCNF:-**

u\_pincode is not unique, thus it is in 2NF form. So to convert it to BCNF u\_id and u\_pincode will be together declared as a super key which will uniquely identify user city and user state.

{u\_id} -> u\_name

{u\_id} -> u\_gender

{u\_id} -> u\_age

{u\_id} -> u\_address\_line

{u\_id} -> u\_city

{u\_id} -> u\_state

{u\_id} -> u\_pincode

{u\_id} -> u\_email

{u\_id, u\_pincode} -> u\_city

{u\_id, u\_pincode} -> u\_state

**PRIMARY KEY:-** {u\_id}

**FOREIGN KEY:-** None

**PRIME ATTRIBUTE:-** u\_id, u\_pincode

**NON-PRIME ATTRIBUTE:-** u\_name, u\_gender, u\_age, u\_address\_line, u\_state, u\_city, u\_landmark, u\_email

**2) user\_symptoms** (This table is in 3NF and BCNF form)

(u\_id, u\_symptoms, u\_history, u\_allergy)

{u\_id} -> u\_symptoms

{u\_id} -> u\_history

{u\_id} -> u\_allergy

**PRIMARY KEY:-** None

**FOREIGN KEY:-** {u\_id}

**PRIME ATTRIBUTE:-** u\_id

**NON-PRIME ATTRIBUTE:** u\_symptoms, u\_history, u\_allergy

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**3) u\_phone** ( This table is in 3NF and BCNF form)

( u\_id, phone\_no )

{u\_id} -> phone\_no

**PRIMARY KEY:-** None

**FOREIGN KEY:-** {u\_id}

**PRIME ATTRIBUTE:-** u\_id

**NON-PRIME ATTRIBUTE:-** phone\_no

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**4) lab\_info** ( This table is in 2NF form)

l\_id, l\_name, l\_address\_line, l\_state, l\_city, l\_landmark, l\_pincode, l\_phone, l\_timing, l\_email, l\_cost

{l\_id} -> l\_name

{l\_id} -> l\_address\_line

{l\_id} -> l\_state

{l\_id} -> l\_city

{l\_id} -> l\_landmark

{l\_id} -> l\_pincode

{l\_id} -> l\_phone

{l\_id} -> l\_timing

{l\_id} -> l\_email

{l\_id} -> l\_cost

{l\_pincode} -> l\_city

{l\_pincode} -> l\_state

**Normalization to 3NF and BCNF:-**

l\_pincode is not unique, thus it is in 2NF form. So to convert it to BCNF l\_id and l\_pincode will be together declared as a super key which will uniquely identify lab city and lab state.

{l\_id} -> l\_name

{l\_id} -> l\_address\_line

{l\_id} -> l\_state

{l\_id} -> l\_city

{l\_id} -> l\_landmark

{l\_id} -> l\_pincode

{l\_id} -> l\_phone

{l\_id} -> l\_timing

{l\_id} -> l\_email

{l\_id} -> l\_cost

{l\_id, l\_pincode} -> l\_city

{l\_id, l\_pincode} -> l\_state

**PRIMARY KEY:-** {l\_id}

**FOREIGN KEY:-** None

**PRIME ATTRIBUTE:-** l\_id, l\_pincode

**NON-PRIME ATTRIBUTE:-** l\_name, l\_address\_line, l\_state, l\_city, l\_landmark, l\_phone, l\_timing, l\_email, l\_cost

**5) lab\_details** (This table is in 3NF and BCNF form)

(l\_id, l\_technician, l\_doctor, l\_receptionist)

{l\_id} -> l\_technician

{l\_id} -> l\_doctor

{l\_id} -> l\_receptionist

**PRIMARY KEY:-** None

**FOREIGN KEY:-** {l\_id}

**PRIME ATTRIBUTE:-** l\_id

**NON-PRIME ATTRIBUTE:-** l\_technician, l\_doctor, l\_receptionist

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**6) lab\_testing** ( This table is in 3NF and BCNF form)

(l\_id, u\_id, l\_report, s\_time, s\_date, pay\_status)

{ l\_id , u\_id } -> l\_report

{ l\_id , u\_id } -> s\_time

{ l\_id , u\_id } -> s\_date

{ l\_id , u\_id } -> pay\_status

**PRIMARY KEY:- None**

**FOREIGN KEY:-** { l\_id , u\_id }

**PRIME ATTRIBUTE:-** l\_id , u\_id

**NON-PRIME ATTRIBUTE:-** l\_report , s\_time , s\_date , pay\_status

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**7) hos\_info** ( This table is 2NF form)

( h\_id, h\_name , h\_address\_line, h\_landmark , h\_city, h\_state, h\_pincode , h\_phone , h\_timing , h\_email , consulting\_charge , h\_type )

{h\_id} -> h\_name

{h\_id} -> h\_address\_line

{h\_id} -> h\_landmark

{h\_id} -> h\_city

{h\_id} -> h\_state

{h\_id} -> h\_pincode

{h\_id} -> h\_phone

{h\_id} -> h\_timing

{h\_id} -> h\_email

{h\_id} -> consulting\_charge

{h\_id} -> h\_type

{h\_pincode} -> h\_city

{h\_pincode} -> h\_state

### **Normalization to 3NF and BCNF:-**

h\_pincode is not unique, thus it is in 2NF form. So to convert it to BCNF h\_id and h\_pincode will be together declared as a super key which will uniquely identify hospital city and hospital state.

{h\_id} -> h\_name

{h\_id} -> h\_address\_line

{h\_id} -> h\_landmark

{h\_id} -> h\_city

{h\_id} -> h\_state

{h\_id} -> h\_pincode

{h\_id} -> h\_phone

{h\_id} -> h\_timing

{h\_id} -> h\_email

{h\_id} -> consulting\_charge

{h\_id} -> h\_type

{ h\_id , h\_pincode} -> h\_city

{ h\_id , h\_pincode} -> h\_state

**PRIMARY KEY:-** {h\_id}

**FOREIGN KEY:-** None

**PRIME ATTRIBUTE:-** h\_id, h\_pincode

**NON-PRIME ATTRIBUTE:-** h\_name , h\_address\_line, h\_landmark , h\_city, h\_state, h\_phone , h\_timing , h\_email , consulting\_charge , h\_type

**8) doc\_details** ( This table is in 3NF and BCNF form)

( h\_id , doc\_id , doc\_name , doc\_degree , doc\_email , doc\_phone , doc\_address\_line , doc\_city , doc\_state, doc\_landmark , doc\_type )

{ h\_id , doc\_id} -> doc\_name

{ h\_id , doc\_id } -> doc\_degree

{ h\_id , doc\_id } -> doc\_email

{ h\_id , doc\_id } -> doc\_phone

{ h\_id , doc\_id } -> doc\_address

{ h\_id , doc\_id } -> doc\_city

{ h\_id , doc\_id } -> doc\_state

{ h\_id , doc\_id } -> doc\_landmark

{ h\_id , doc\_id } -> doc\_type

**PRIMARY KEY:-** {doc\_id}

**FOREIGN KEY:-** {h\_id}

**PRIME ATTRIBUTE:-** h\_id , doc\_id

**NON-PRIME ATTRIBUTE:-** doc\_name , doc\_degree , doc\_email , doc\_phone , doc\_address\_line , doc\_city , doc\_state , doc\_landmark , doc\_type

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**9) patient\_details** ( This table is in 3NF and BCNF form)

(u\_id , pt\_status , pt\_medication , pt\_consultdate , pt\_admitdate , pt\_dischargedate , pt\_lung\_infec )

{u\_id} -> pt\_status

{u\_id} -> pt\_medication

{u\_id} -> pt\_consultdate

{u\_id} -> pt\_admitdate

{u\_id} -> pt\_dischargedate

{u\_id} -> pt\_lung\_infec

**PRIMARY KEY:- None**

**FOREIGN KEY:-** {u\_id}

**PRIME ATTRIBUTE:-** u\_id

**NON-PRIME ATTRIBUTE:-** pt\_status , pt\_medication , pt\_consultdate , pt\_admitdate ,  
pt\_dischargedate , pt\_lung\_infec

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**10) staff\_details** ( This table is in 3NF and BCNF form)

( h\_id , n\_name , med\_off\_name )

{h\_id} -> n\_name

{h\_id} -> med\_off\_name

**PRIMARY KEY:-** None

**FOREIGN KEY:-** {h\_id}

**PRIME ATTRIBUTE:-** h\_id

**NON-PRIME ATTRIBUTE:-** n\_name , med\_off\_name

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**11) bed\_details** ( This table is in 3NF and BCNF form)

( h\_id , gen\_count , gen\_cost , spec\_count , spec\_cost , icu\_count , icu\_cost , vent\_count ,  
vent\_cost )

{h\_id} -> gen\_count

{h\_id} -> gen\_cost

{h\_id} -> spec\_count

{h\_id} -> spec\_cost



{h\_id} -> icu\_count

{h\_id} -> icu\_cost

{h\_id} -> vent\_count

{h\_id} -> vent\_cost

**PRIMARY KEY:-** None

**FOREIGN KEY:-** {h\_id}

**PRIME ATTRIBUTE:-** h\_id

**NON-PRIME ATTRIBUTE:-** gen\_count , gen\_cost , spec\_count , spec\_cost, icu\_count , icu\_cost , vent\_count , vent\_cost

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**12) payment\_details** ( This table is in 3NF and BCNF form)

( u\_id, h\_id , total\_cost , upay\_status ,trans\_id , trans\_date )

{trans\_id} -> u\_id

{trans\_id} -> h\_id

{trans\_id} -> total\_cost

{trans\_id} -> upay\_status

{trans\_id} -> trans\_date

**PRIMARY KEY:-** {trans\_id}

**FOREIGN KEY:-** {u\_id,h\_id}

**PRIME ATTRIBUTE:-** trans\_id

**NON-PRIME ATTRIBUTE:-** total\_cost , upay\_status , trans\_date, h\_id , u\_id

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.

**13) imaging\_centre** ( This table is in 3NF and BCNF form)

( h\_id , xray\_avail , ctscan\_avail , xray\_cost , ctscan\_cost )

{h\_id} -> xray\_avail

{h\_id} -> ctscan\_avail

{h\_id} -> xray\_cost

{h\_id} -> ctscan\_cost

**PRIMARY KEY:- None**

**FOREIGN KEY:-** {h\_id}

**PRIME ATTRIBUTE:-** h\_id

**NON-PRIME ATTRIBUTE:-** xray\_avail , ctscan\_avail , xray\_cost , ctscan\_cost

**Reason:-**

A relation is in third normal form and BCNF, as there is no transitive dependency for non-prime attributes as well as it is in second normal form.