Functional Dependencies

Hospital Employees:

aadhar_id (primary key)

We were having trouble to get BCNF form in Staff and Doctor, by replacing hospital_employee_id by aadhar_id we are able to get BCNF form in Doctor and Staff therefore we replaced hospital_employee_id by aadhar_id.

Staff:

Aadhar id is a primary key. There were some functional dependencies in which attributes were dependent on Employee id and we had taken Aadhar id as a primary key therefore we had to remove Employee id convert this relation into BCNF form.

Aadhar id → Name

Aadhar id → Type

Aadhar id → DOB

Aadhar id → Gender

Aadhar id → Mobile Number

Aadhar id → Status

Aadhar id is a candidate key. It is in BCNF form.

Doctor:

Aadhar id is a primary key. There were some functional dependencies in which attributes were dependent on Employee id and we had taken Aadhar id as a primary key therefore we had to remove Employee id convert this relation into BCNF form.

Aadhar id → Name

Aadhar id → Speciality

Aadhar id → DOB

Aadhar id → Gender

Aadhar id → Office Number

Aadhar id → Mobile Number

Aadhar id → Status

Aadhar id is a candidate key. It is in BCNF form.

Medicines:

Medicine id is a primary key.

Medicine id → Cost Per unit

Medicine id → Medicine Name

Medicine id → Amount in a Unit

Medicine id → Company Name

Medicine id → Amount Available

Medicine id is a candidate key. It is in BCNF form.

Prescription:

Patient id, medicine id, doctor id and from(date) are the primary key attributes and we are representing them as PMDF.

PMDF → To(date)

PMDF → Morning Dose

PMDF → Noon Dose

PMDF → Night Dose

Patient id, medicine id, doctor id and from(date) together make Candidate key. It is in BCNF form.

Patient:(Previous One)

Initially we had functional dependencies as:

Aadhar id, Date of Admit → Mobile number

Aadhar id, Date of Admit → Type(indoor or outdoor)

Aadhar id, Date of Admit → Date of Discharge

Aadhar id, Date of Admit → Name

Aadhar id, Date of Admit → Gender

Aadhar id, Date of Admit → DOB

Aadhar id, Date of Admit → Blood Group

Aadhar id → Name

Aadhar id → Gender

Aadhar id → DOB

Aadhar id → Blood Group

which resulted in partial dependencies (1NF form), so to solve this problem we decomposed table “Patient” into two different tables “Patient Record” and “Patient Details”, they are given below and they both are in BCNF form.

Patient Record: (New Table)

Aadhar id and Date of Admit combined are primary key.

Aadhar id, Date of Admit → Mobile number

Aadhar id, Date of Admit → Type(indoor or outdoor)

Aadhar id, Date of Admit → Date of Discharge

Aadhar id and Date of Admit combined are candidate key. This table is in BCNF form.

Patient Details:(New Table)

Aadhar id is a primary key.

Aadhar id → Name

Aadhar id → Gender

Aadhar id → DOB

Aadhar id → Blood Group

Aadhar id is the candidate key. This relation is in BCNF form.

Patient Diseases:

Disease, Date of admit and Patient Aadhar id are primary key attributes. This relation is in BCNF form.

Room:

Room number is the primary key.

Room number → Number of beds occupied

Room number → Number of beds

Room number is the candidate key. This relation is in BCNF form.

Admitted Patients ID's:

Room number, Date of admit and Patient id are primary key attributes. This relation is in BCNF form.

Bill:

Patient id and Date & Time are primary key attributes.

Initially we were having functional dependencies in which Bill ID was able to determine some of the attributes of the relation and it was not in BCNF form because Patient Aadhar id, Date & Time was the primary key. So, we had to remove Bill ID to convert this relation into BCNF form.

Patient id, Date & Time → medicine charges

Patient id, Date & Time → blood transfusion charges

Patient id, Date & Time → operation charges

Patient id, Date & Time → lab charges

Patient id, Date & Time → service charges

Patient id and Date & Time are candidate key. It is in BCNF form.

Lab Reports:

Date & Time, Patient id and Type are primary keys, we represent them as DtPT.

Initially we were having functional dependencies in which Report ID was able to determine some of the attributes of the relation and it was not in BCNF form because DtPT was the primary key. So, we had to remove Report ID to convert this relation into BCNF form.

DtPT → Lab number

Date & Time, Patient id and Type are candidate keys. This relation is in BCNF form.

Blood Transfusion:

Patient id and Date & Time combined are the primary key.

Initially we had blood group in each entity of this relation but due to function dependency of it with patient id we removed it from here and added it into patient details, such that this (Blood Tra.) relation would convert into BCNF form.

Patient id, Date & Time → Amount given to patient

Patient id and Date & Time combined are candidate key. This relation is in BCNF form.

Blood Bank:

Date is the primary key.

Date → A+

Date → A-

Date → B+

Date → B-

Date → O+

Date → O-

Date → AB+

Date → AB-

Date is the candidate key. This relation is in BCNF form.

Operation:

Operation Id is the primary key.

Operation Id → Begin Date & Time

Operation Id → End Date & Time

Operation Id → Type

Operation Id → Patient Id

Operation Id is the candidate key. This relation is in BCNF form.

Operated By:

Operation Id and Doctor Id combined are the primary key. This relation is in BCNF form.