Lab-11

Functional dependencies and Normalization forms

1.Table Name: patient

Functional dependencies:

Patient_id -> patient_name

Patient_id -> gender

Patient_id -> date_of_birth

Patient_id -> contact

Patient_id -> blood_group

Patient_id -> address

Constraints:

- Primary key : Patient_id
- Foreign key : none
- Domain :

  Patient_id : serial primary key ,
  Patient_name : varchar(25) ,
  Gender : char(1),
  Date_of_birth : date,
  Contact : decimal(10,0),
  Blood_group : char(3),
  Address : varchar(50)

Candidate key : patient_id

Normalization form: BCNF

2.Table Name: doctor

Functional dependencies:

Doctor_id -> doctor_name

Doctor_id -> gender

Doctor_id -> date_of_birth

Doctor_id -> contact

Doctor_id -> address

Doctor_id -> qualification

Doctor_id -> consultation_charge

Doctor_id -> department_id

Doctor_id -> shift_id

Contact->gender

Contact-> date_of_birth

Contact-> address

Contact-> qualification

Contact-> consultation_charge

Contact-> department_id

Contact-> shift_id

Contact->gender

Contact->doctor_id

Constraints:

- Primary key : doctor_id
- Foreign key : department_id,shit_id
- Domain :

  Doctor_id : varchar(9) primary key ,
  Doctor_name : varchar(25) ,
  Gender : char(1),
  Date_of_birth : date,
  Contact : decimal(10,0),
  Address : varchar(50),

Qualification : varchar(20),
Consultation_charge : decimal(4,0),
Department_id : varchar(7),
Shift_id : varchar(2)

Candidate key : Doctor_id,contact

here either doctor_id or contact can be used as primary key therefore primary key maps to each coloumn of the table so the table follows **BCNF** Normalization.

Normalization form: BCNF

3.Table name: shift

Functional dependencies:

Shift_id -> shift_name

Shift_id -> timing

Constraints:

- Primary key : shift_id
- Foreign key : none
- Domain :
  Shift_id : varchar(2) primary key ,
  Shift_name : varchar(9) ,
  Timing : varchar(8)

Candidate key : shift_id

Normalization form: BCNF

4.Table name: room

Functional dependencies:

Room_id -> category_id

Constraints:

- Primary key : room_id
- Foreign key : category_id
- Domain :

  Room_id : decimal(3,0) primary key ,
  Category_id : char(4)

Candidate key : room_id

Normalization form: BCNF

5.Table name: room_category

Functional dependencies:

Category_id -> category_type

Category_id -> category_charges

Constraints:

- Primary key : category_id
- Foreign key : none
- Domain :

  Category_id : varchar(4) primary key ,
  Category_type : varchar(12) ,
  Category_charges : decimal(5),

Candidate key : category_id

Normalization form: BCNF

6. Table name: department

Functional dependencies:

Department_id -> department_name

Department_id -> head_of_department

head_of_department->Department_id

Constraints:

- Primary key : department_id
- Foreign key : none
- Domain :

  Department_id : varchar(7) primary key ,
  Department_name : varchar(15),
  Head_of_department: varchar(25) ,

Candidate key : Department_id

Normalization form: 3 NF

7. Table name: operation

Functional dependencies:

Operation_id -> operation_type

Operation_id -> operation_charges

Constraints:

- Primary key : opration_id
- Foreign key : none
- Domain :

  Opration_id : varchar(5) primary key ,
  Opration_type : varchar(50) ,
  Opration_charges : decimal(7,0)

Candidate key : opration_id

Normalization form: BCNF

8.Table name: visit

Functional dependencies:

Visit_id -> disease

Visit_id -> visit_date

Visit_id -> discharge_date

Visit_id -> patient_id

Visit_id -> doctor_id

Visit_id -> room_id

Visit_id -> operation_id

Constraints:

- Primary key : visit_id
- Foreign key : patient_id,doctor_id,room_id,opration_id
- Domain :

  visit_id : bigserial primary key ,
  Disease : varchar(15) ,
  Visit_date : date,
  Discharge_date : date,
  Patient_id : int,
  Doctor_id : varchar(9),
  Room_id : decimal(3,0),
  Opration_id : varchar(5)

Candidate key : visit_id

Normalization form: BCNF

9. Table name: Bill

Functional dependencies:

invoice_no->invoice_date

invoice_no->room_charges

invoice_no->consultation_charges

invoice_no->operation_charges

invoice_no->total_amount

invoice_no->visit_id

visit_id->invoice_no

visit_id->room_charges

visit_id->consultation_charges

visit_id->operation_charges

visit_id->total_amount

visit_id->invoice_date

Constraints:

- Primary key : invoice_no
- Foreign key : visit_id
- Domain :

  Invoice_no : bigserial primary key ,
  Consultation_charges : decimal(4,0) ,
  Room_charges : decimal(6,0),
  Opration_charges : char(7,0),
  Totoal_amount : decimal(8,0),
  Visit_id : bigserial

Candidate key : visit_id,invoice_no

Normalization form: BCNF

EXPLANATION

$(invoice\_no)^+$={invoice_no,room_charges,consultation_charges,operation_charges,total_amount, visit_id}

$(visit\_id)^+$={invoice_no,room_charges,consultation_charges,operation_charges,total_amount,visit_id}

here either visit_id or invoice_no can be used as primary key therefore primary key maps to each coloumn of the table so the table follows **BCNF** Normalization.

10. Table name: Prescribed Medicine

Functional dependencies:

{Visit_id,Medicine_name}->dose

{Visit_id,Medicine_name}->morning_intake

{Visit_id,Medicine_name}->afternoon_intake

{Visit_id,Medicine_name}->night_intake

{Visit_id,Medicine_name}->intake_suggestion

Constraints:

- Primary key : visit_id,medicine_name
- Foreign key : none
- Domain :

  Visit_id : bigint primary key ,
  Medicin_name : varchar(20) ,
  Dose : decimal(3,0),
  Morning_intake : boolean,
  Afternoon_intake : boolean,
  Night_intake : boolean,
  Intake_suggestion : boolean,

Candidate key : visit_id,medicine_id

Normalization form: BCNF

11. Table name: Leave

Functional dependencies:

{Nurse_id,Leave_date}->reason

{ Nurse_id,Leave_date }->substitute_id

Constraints:

- Primary key : nurse_id,leave_date
- Foreign key : substitute_id
- Domain :

  Nurse_id : varchar(4) primary key ,
  Leave_date : date,
  Reason : varchar(50),
  Substitute_id : varchar(4)

Candidate key : nurse_id,leave_date

Normalization form: BCNF