DBMS Laboratory

UE19CS304

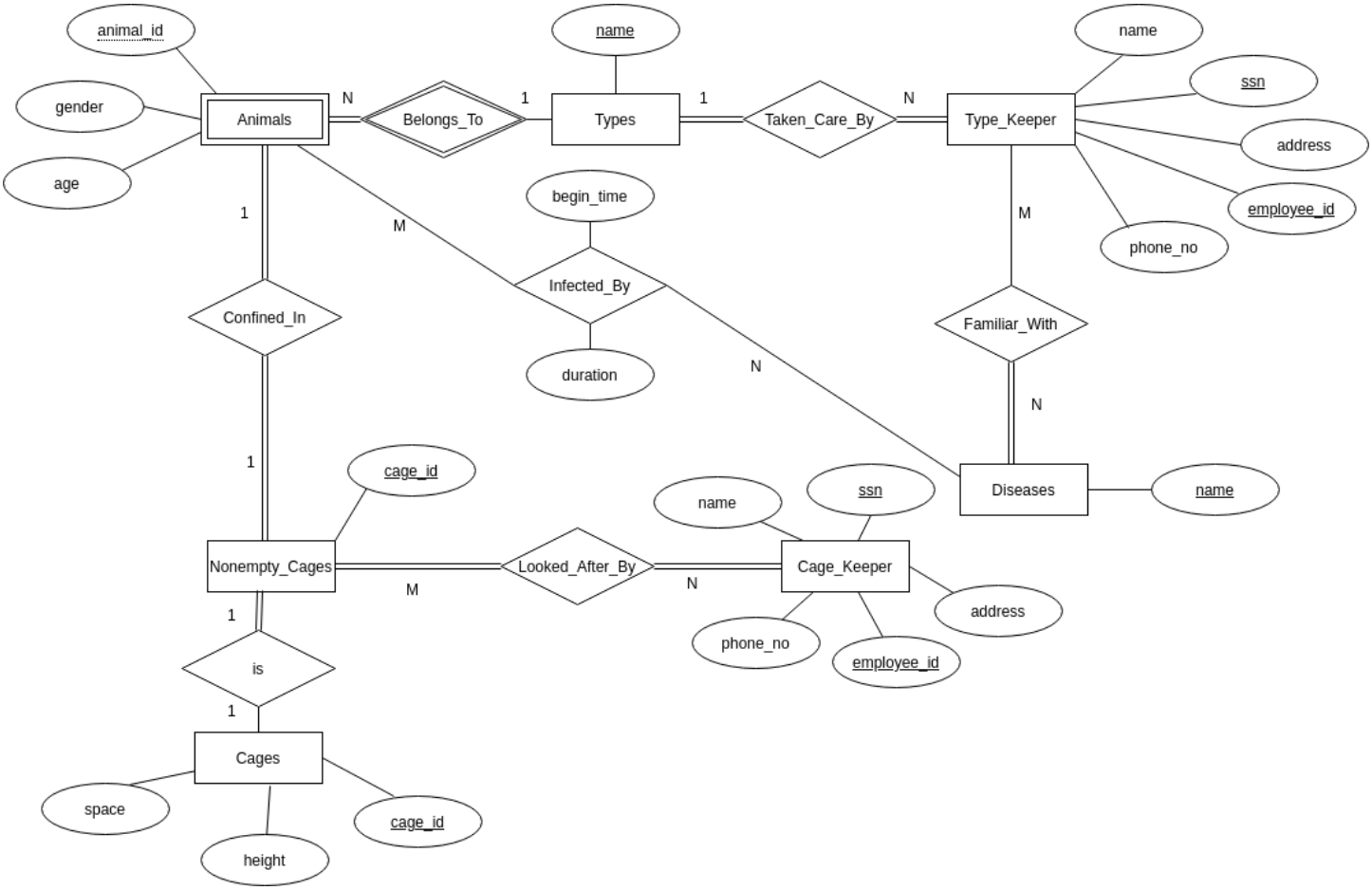
5th Semester, Academic Year 2021-22

Week #: 3 - ER Diagrams, Relational Schema and Create Statements.

Date: 19/9/2021

Name : SUMUKH RAJU BHAT	SRN : PES1UG19CS519	Section : H

1. ER Diagram for Zoo MiniWorld



Some of the assumptions made:

- Instead of normalizing Cage_keeper and Type_Keeper as one entity with one attribute set, they are designed as different entities.

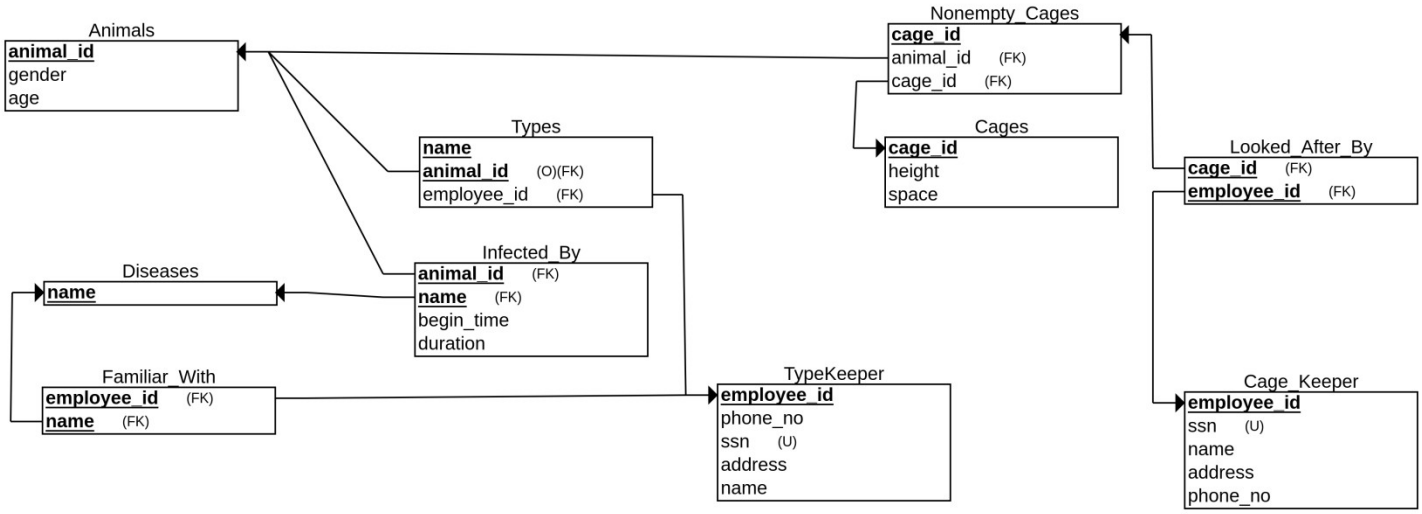
- It is assumed that 1 TypeKeeper can be familiar with many diseases and 1 disease is known to many TypeKeepers.

- It is also assumed that for every Cage_keeper there is a cage assigned.

- It is also assumed that every type can have multiple animals, but every animal belongs to only one type.

- Animal is a week entity w.r.t. types.

2. Relation Schema converted from ER Diagram of Zoo miniworld



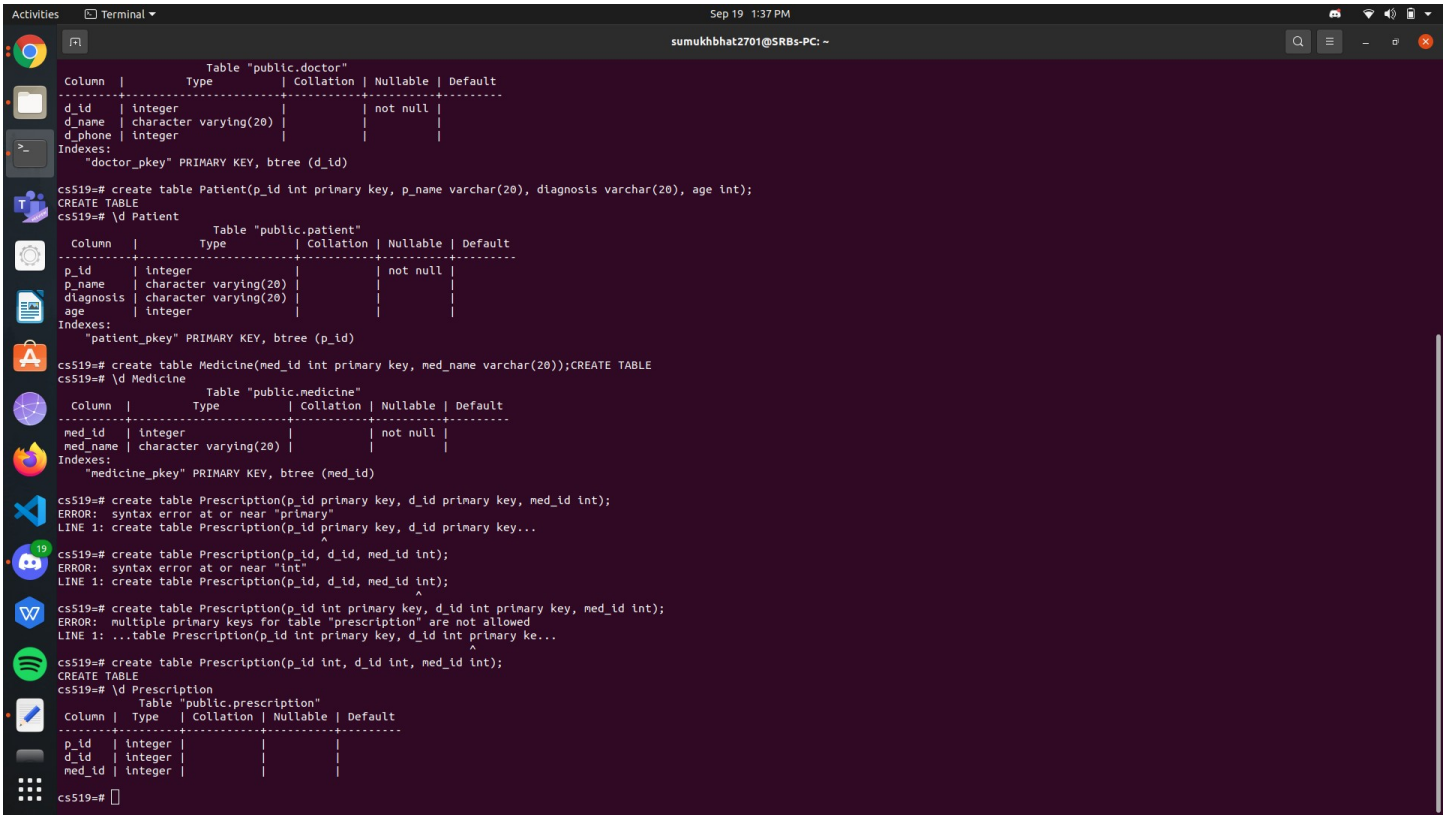
3. Create Statements

- Create Database named cs519

```
postgres=# create database cs519;
CREATE DATABASE
postgres=# \c cs519
You are now connected to database "cs519" as user "postgres".
cs519=# create table Doctor(d_id int primary key, d_name varchar(
```

- Create given tables

```
cs519=# create table Doctor(d_id int primary key, d_name varchar(20), d_phone int);
CREATE TABLE
cs519=# \d
         List of relations
 Schema |  Name  | Type  |  Owner
--------+--------+-------+----------
 public | doctor | table | postgres
(1 row)

cs519=# \d Doctor
                    Table "public.doctor"
 Column  |         Type          | Collation | Nullable | Default
---------+-----------------------+-----------+----------+---------
 d_id    | integer               |           | not null |
 d_name  | character varying(20) |           |          |
 d_phone | integer               |           |          |
Indexes:
    "doctor_pkey" PRIMARY KEY, btree (d_id)

cs519=# create table Patient(p_id int primary key, p_name varchar(20), diagnosis varchar(20), age int);
CREATE TABLE
cs519=# \d Patient
                    Table "public.patient"
  Column   |         Type          | Collation | Nullable | Default
-----------+-----------------------+-----------+----------+---------
 p_id      | integer               |           | not null |
 p_name    | character varying(20) |           |          |
 diagnosis | character varying(20) |           |          |
 age       | integer               |           |          |
Indexes:
    "patient_pkey" PRIMARY KEY, btree (p_id)

cs519=#
```



```
```

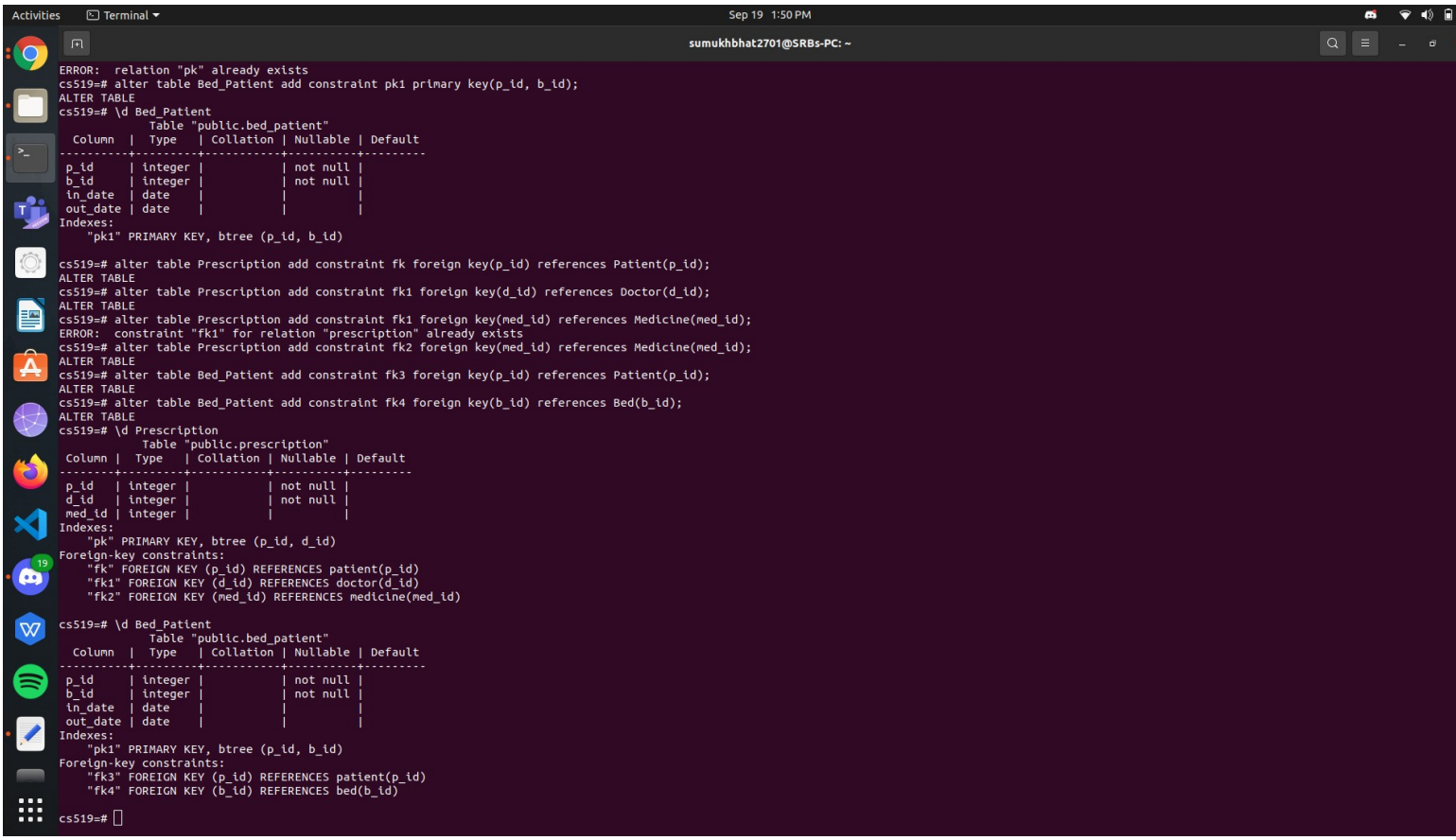
```
cs519=# create table Bed(b_id int primary key, ward_no int);
CREATE TABLE
cs519=# \d Bed
                Table "public.bed"
 Column  |  Type   | Collation | Nullable | Default
---------+---------+-----------+----------+---------
 b_id    | integer |           | not null |
 ward_no | integer |           |          |
Indexes:
    "bed_pkey" PRIMARY KEY, btree (b_id)

cs519=#
```

```
cs519=# create table Bed_Patient(p_id int, b_id int, in_date date, out_date date);
CREATE TABLE
cs519=# \d Bed_Patient
            Table "public.bed_patient"
  Column  |  Type   | Collation | Nullable | Default
----------+---------+-----------+----------+---------
 p_id     | integer |           |          |
 b_id     | integer |           |          |
 in_date  | date    |           |          |
 out_date | date    |           |          |

cs519=#
```

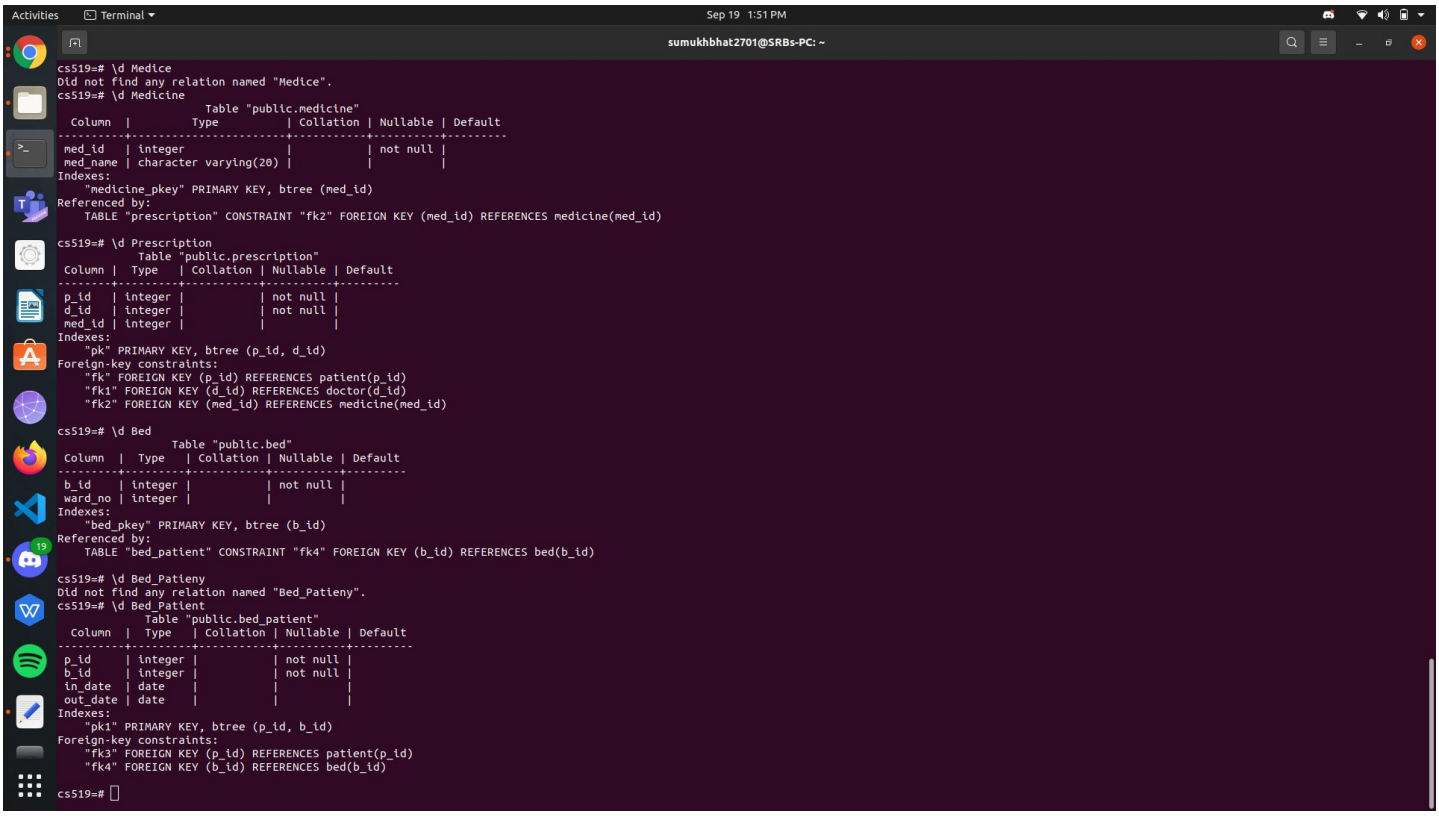
- Alter the constraints to set the primary keys of tables

```
cs519=# alter table Prescription add constraint pk primary key(p_id, d_id);
ALTER TABLE
cs519=# \d
           List of relations
 Schema |     Name     | Type  |  Owner
--------+--------------+-------+----------
 public | bed          | table | postgres
 public | bed_patient  | table | postgres
 public | doctor       | table | postgres
 public | medicine     | table | postgres
 public | patient      | table | postgres
 public | prescription | table | postgres
(6 rows)

cs519=# \d Prescription
           Table "public.prescription"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 p_id   | integer |           | not null |
 d_id   | integer |           | not null |
 med_id | integer |           |          |
Indexes:
    "pk" PRIMARY KEY, btree (p_id, d_id)

cs519=# alter table Bed_Patient add constraint pk primary key(p_id, b_id);
ERROR:  relation "pk" already exists
cs519=# alter table Bed_Patient add constraint pk1 primary key(p_id, b_id);
ALTER TABLE
cs519=# \d Bed_Patient
            Table "public.bed_patient"
  Column  |  Type   | Collation | Nullable | Default
----------+---------+-----------+----------+---------
 p_id     | integer |           | not null |
 b_id     | integer |           | not null |
 in_date  | date    |           |          |
 out_date | date    |           |          |
Indexes:
    "pk1" PRIMARY KEY, btree (p_id, b_id)

cs519=#
```

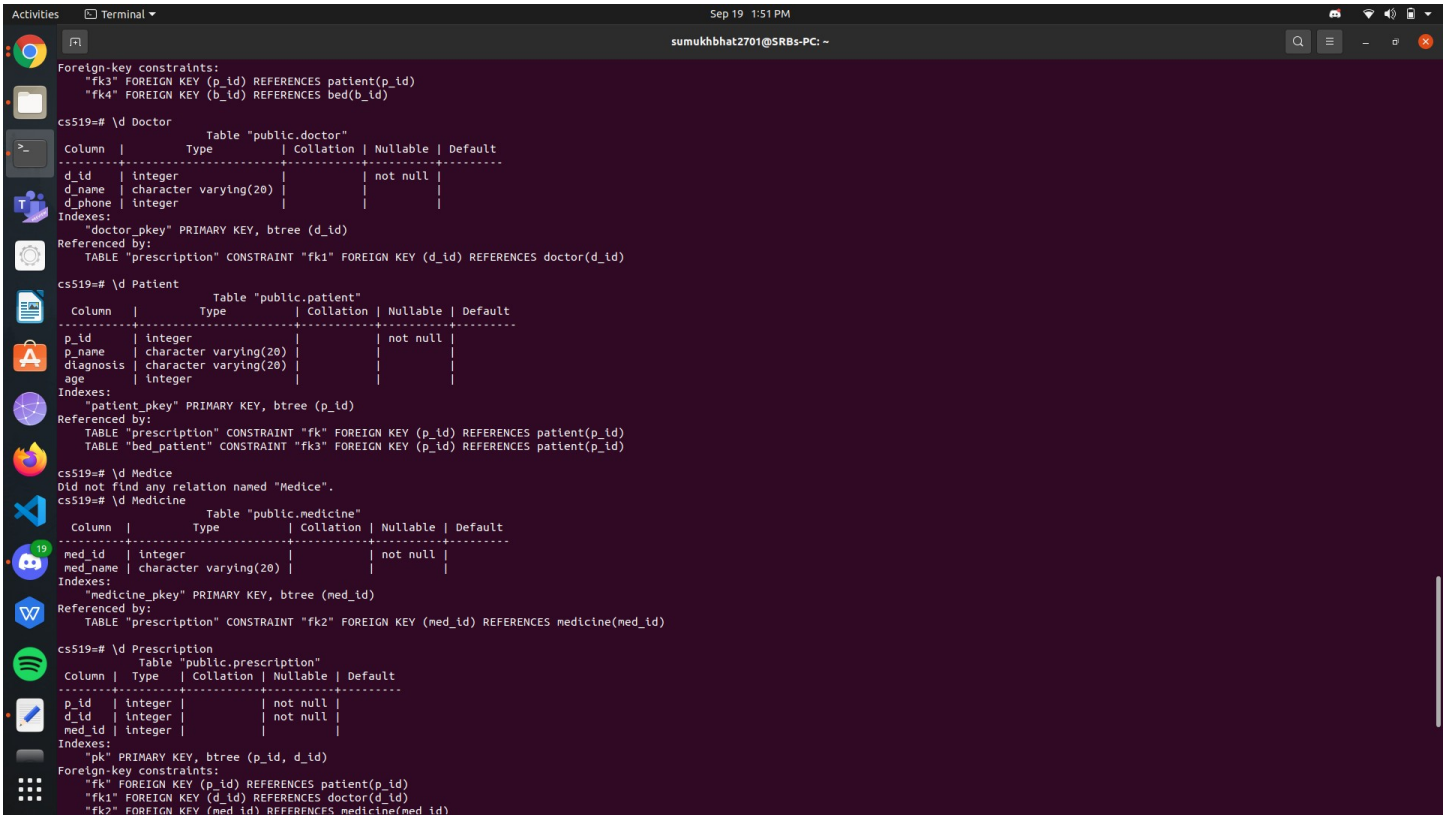
- Alter constraints to set foreign keys of tables



- Schemas after setting up tables




```
cs519=# \d Medice
Did not find any relation named "Medice".
cs519=# \d Medicine
                    Table "public.medicine"
  Column   |         Type          | Collation | Nullable | Default
-----------+-----------------------+-----------+----------+---------
 med_id    | integer               |           | not null |
 med_name  | character varying(20) |           |          |
Indexes:
    "medicine_pkey" PRIMARY KEY, btree (med_id)
Referenced by:
    TABLE "prescription" CONSTRAINT "fk2" FOREIGN KEY (med_id) REFERENCES medicine(med_id)

cs519=# \d Prescription
                Table "public.prescription"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 p_id   | integer |           | not null |
 d_id   | integer |           | not null |
 med_id | integer |           |          |
Indexes:
    "pk" PRIMARY KEY, btree (p_id, d_id)
Foreign-key constraints:
    "fk" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    "fk1" FOREIGN KEY (d_id) REFERENCES doctor(d_id)
    "fk2" FOREIGN KEY (med_id) REFERENCES medicine(med_id)

cs519=# \d Bed
                Table "public.bed"
 Column  |  Type   | Collation | Nullable | Default
---------+---------+-----------+----------+---------
 b_id    | integer |           | not null |
 ward_no | integer |           |          |
Indexes:
    "bed_pkey" PRIMARY KEY, btree (b_id)
Referenced by:
    TABLE "bed_patient" CONSTRAINT "fk4" FOREIGN KEY (b_id) REFERENCES bed(b_id)

cs519=# \d Bed_Patieny
Did not find any relation named "Bed_Patieny".
cs519=# \d Bed_Patient
                Table "public.bed_patient"
  Column  |  Type   | Collation | Nullable | Default
----------+---------+-----------+----------+---------
 p_id     | integer |           | not null |
 b_id     | integer |           | not null |
 in_date  | date    |           |          |
 out_date | date    |           |          |
Indexes:
    "pk1" PRIMARY KEY, btree (p_id, b_id)
Foreign-key constraints:
    "fk3" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    "fk4" FOREIGN KEY (b_id) REFERENCES bed(b_id)

cs519=#
```




```
Foreign-key constraints:
    "fk3" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    "fk4" FOREIGN KEY (b_id) REFERENCES bed(b_id)

cs519=# \d Doctor
                    Table "public.doctor"
 Column  |         Type          | Collation | Nullable | Default
---------+-----------------------+-----------+----------+---------
 d_id    | integer               |           | not null |
 d_name  | character varying(20) |           |          |
 d_phone | integer               |           |          |
Indexes:
    "doctor_pkey" PRIMARY KEY, btree (d_id)
Referenced by:
    TABLE "prescription" CONSTRAINT "fk1" FOREIGN KEY (d_id) REFERENCES doctor(d_id)

cs519=# \d Patient
                    Table "public.patient"
  Column   |         Type          | Collation | Nullable | Default
-----------+-----------------------+-----------+----------+---------
 p_id      | integer               |           | not null |
 p_name    | character varying(20) |           |          |
 diagnosis | character varying(20) |           |          |
 age       | integer               |           |          |
Indexes:
    "patient_pkey" PRIMARY KEY, btree (p_id)
Referenced by:
    TABLE "prescription" CONSTRAINT "fk" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    TABLE "bed_patient" CONSTRAINT "fk3" FOREIGN KEY (p_id) REFERENCES patient(p_id)

cs519=# \d Medice
Did not find any relation named "Medice".
cs519=# \d Medicine
                    Table "public.medicine"
  Column   |         Type          | Collation | Nullable | Default
-----------+-----------------------+-----------+----------+---------
 med_id    | integer               |           | not null |
 med_name  | character varying(20) |           |          |
Indexes:
    "medicine_pkey" PRIMARY KEY, btree (med_id)
Referenced by:
    TABLE "prescription" CONSTRAINT "fk2" FOREIGN KEY (med_id) REFERENCES medicine(med_id)

cs519=# \d Prescription
                Table "public.prescription"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 p_id   | integer |           | not null |
 d_id   | integer |           | not null |
 med_id | integer |           |          |
Indexes:
    "pk" PRIMARY KEY, btree (p_id, d_id)
Foreign-key constraints:
    "fk" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    "fk1" FOREIGN KEY (d_id) REFERENCES doctor(d_id)
    "fk2" FOREIGN KEY (med_id) REFERENCES medicine(med_id)
```

```
cs519=# \d Bed_Patient
            Table "public.bed_patient"
  Column  |  Type   | Collation | Nullable | Default
----------+---------+-----------+----------+---------
 p_id     | integer |           | not null |
 b_id     | integer |           | not null |
 in_date  | date    |           |          |
 out_date | date    |           |          |
Indexes:
    "pk1" PRIMARY KEY, btree (p_id, b_id)
Foreign-key constraints:
    "fk3" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    "fk4" FOREIGN KEY (b_id) REFERENCES bed(b_id)
```

- Inserting 5 entries to each table

```
cs519=# insert into Doctor values(123, 'Sumukh', 9008933991);
ERROR:  integer out of range
cs519=# insert into Doctor values(123, 'Sumukh', 90089);
INSERT 0 1
cs519=# select * from Doctor
cs519-# ;
 d_id | d_name | d_phone
------+--------+---------
  123 | Sumukh |   90089
(1 row)

cs519=# insert into Doctor values(124, 'SRK', 90935);
INSERT 0 1
cs519=# insert into Doctor values(126, 'SKQ', 90936);
INSERT 0 1
cs519=# insert into Doctor values(127, 'RKQ', 90636);
INSERT 0 1
cs519=# insert into Doctor values(128, 'RKG', 90637);
INSERT 0 1
cs519=# select * from Doctor;
 d_id | d_name | d_phone
------+--------+---------
  123 | Sumukh |   90089
  124 | SRK    |   90935
  126 | SKQ    |   90936
  127 | RKQ    |   90636
  128 | RKG    |   90637
(5 rows)

cs519=#
```

```
cs519=# insert into Patient values(789, 'ABC', 'CGF', 58);
INSERT 0 1
cs519=# insert into Patient values(780, 'ABR', 'CFF', 57);
INSERT 0 1
cs519=# insert into Patient values(790, 'HBR', 'LFF', 47);
INSERT 0 1
cs519=# insert into Patient values(190, 'HXR', 'LTF', 37);
INSERT 0 1
cs519=# insert into Patient values(170, 'YXR', 'LOF', 77);
INSERT 0 1
cs519=# select * from Patient;
 p_id | p_name | diagnosis | age
------+--------+-----------+-----
  789 | ABC    | CGF       |  58
  780 | ABR    | CFF       |  57
  790 | HBR    | LFF       |  47
  190 | HXR    | LTF       |  37
  170 | YXR    | LOF       |  77
(5 rows)

cs519=#
```

```
cs519=# insert into Medicine values(189, 'QWR');
INSERT 0 1
cs519=# insert into Medicine values(109, 'QWG');
INSERT 0 1
cs519=# insert into Medicine values(108, 'YUT');
INSERT 0 1
cs519=# insert into Medicine values(101, 'ZUT');
INSERT 0 1
cs519=# insert into Medicine values(121, 'ZQT');
INSERT 0 1
cs519=# select * from Medicine;
 med_id | med_name
--------+----------
    189 | QWR
    109 | QWG
    108 | YUT
    101 | ZUT
    121 | ZQT
(5 rows)

cs519=#
```

```
cs519=# insert into Prescription values(789, 123, 189);
INSERT 0 1
cs519=# insert into Prescription values(780, 124, 109);
INSERT 0 1
cs519=# insert into Prescription values(790, 126, 108);
INSERT 0 1
cs519=# insert into Prescription values(190, 127, 101);
INSERT 0 1
cs519=# insert into Prescription values(170, 128, 121);
INSERT 0 1
cs519=# \d Prescription
            Table "public.prescription"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 p_id   | integer |           | not null |
 d_id   | integer |           | not null |
 med_id | integer |           |          |
Indexes:
    "pk" PRIMARY KEY, btree (p_id, d_id)
Foreign-key constraints:
    "fk" FOREIGN KEY (p_id) REFERENCES patient(p_id)
    "fk1" FOREIGN KEY (d_id) REFERENCES doctor(d_id)
    "fk2" FOREIGN KEY (med_id) REFERENCES medicine(med_id)

cs519=# select * from Prescription;
 p_id | d_id | med_id
------+------+--------
  789 |  123 |    189
  780 |  124 |    109
  790 |  126 |    108
  190 |  127 |    101
  170 |  128 |    121
(5 rows)

cs519=#
```

```
cs519=# insert into Bed values(1, 500);
INSERT 0 1
cs519=# insert into Bed values(2, 501);
INSERT 0 1
cs519=# insert into Bed values(3, 502);
INSERT 0 1
cs519=# insert into Bed values(4, 503);
INSERT 0 1
cs519=# insert into Bed values(5, 504);
INSERT 0 1
cs519=# select * from Bed;
 b_id | ward_no
------+---------
    1 |     500
    2 |     501
    3 |     502
    4 |     503
    5 |     504
(5 rows)

cs519=# insert into Bed_Patient values(123, 1, '2020-5-6','2020-6-6');
ERROR:  insert or update on table "bed_patient" violates foreign key constraint "fk3"
DETAIL:  Key (p_id)=(123) is not present in table "patient".
cs519=# insert into Bed_Patient values(789, 1, '2020-5-6','2020-6-6');
INSERT 0 1
cs519=# insert into Bed_Patient values(780, 2, '2020-5-8','2020-6-7');
INSERT 0 1
cs519=# insert into Bed_Patient values(790, 3, '2020-5-8','2020-6-7');
INSERT 0 1
cs519=# insert into Bed_Patient values(190, 4, '2020-5-8','2020-6-7');
INSERT 0 1
cs519=# insert into Bed_Patient values(170, 5, '2020-8-8','2020-12-12');
INSERT 0 1
cs519=# select * from Bed_Patient;
 p_id | b_id |  in_date   |  out_date
------+------+------------+------------
  789 |    1 | 2020-05-06 | 2020-06-06
  780 |    2 | 2020-05-08 | 2020-06-07
  790 |    3 | 2020-05-08 | 2020-06-07
  190 |    4 | 2020-05-08 | 2020-06-07
  170 |    5 | 2020-08-08 | 2020-12-12
(5 rows)

cs519=#
```