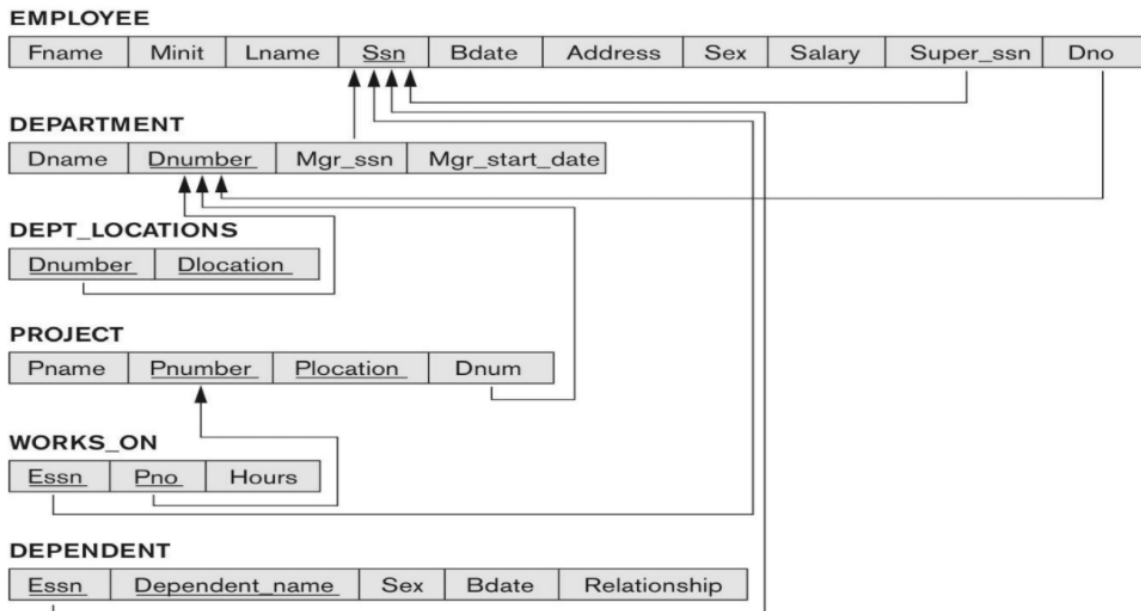


DBMS LAB
WEEK 4
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PES1UG19CS592
Sem5, I section

Creating table and adding constraints for the given relational design:



Create database:

```
postgres=# create database lab4592
postgres-# ;
CREATE DATABASE
postgres=# \c lab4592
You are now connected to database "lab4592" as user "postgres".
```

Create employee table:

```
postgres=# create table employee592(fname varchar(30) not null, minit varchar(1),lname varchar(30) not
null,ssn int,bdate date check(date_part('year',bdate)<1985),address varchar,sex varchar(10),salary int)
;
CREATE TABLE
postgres=# \d employee592
          Table "public.employee592"
  Column |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 fname   | character varying(30) |           | not null |
 minit   | character varying(1)  |           |          |
 lname   | character varying(30) |           | not null |
 ssn     | integer               |           |          |
 bdate   | date                  |           |          |
 address | character varying     |           |          |
 sex     | character varying(10) |           |          |
 salary  | integer               |           |          |
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)

postgres=#
```

```
postgres=# alter table employee592 add primary key(ssn);
ALTER TABLE
postgres=# \d employee592
          Table "public.employee592"
  Column |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 fname   | character varying(30) |           | not null |
 minit   | character varying(1)  |           |          |
 lname   | character varying(30) |           | not null |
 ssn     | integer               |           | not null |
 bdate   | date                  |           |          |
 address | character varying     |           |          |
 sex     | character varying(10) |           |          |
 salary  | integer               |           |          |
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)

postgres=#
```

Create department table, add unique constraints to it:

```
postgres=# create table department592 (dname varchar(100) unique, dnumber int unique, mgr_ssn int,mgr_s
tart_date date);
CREATE TABLE
postgres=# \d department592
          Table "public.department592"
  Column |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 dname   | character varying(100) |           |          |
 dnumber | integer               |           |          |
 mgr_ssn | integer               |           |          |
 mgr_start_date | date                  |           |          |
Indexes:
    "department592_dname_key" UNIQUE CONSTRAINT, btree (dname)
    "department592_dnumber_key" UNIQUE CONSTRAINT, btree (dnumber)

postgres=# alter table department592 add primary key(dnumber);
ALTER TABLE
postgres=#
```

Create dept_location table with foreign keys:

```
postgres=# create table dept_location592(dnumber int references department592(dnumber), dlocation varchar(100));
```

```
CREATE TABLE
```

```
postgres=# \d department592
```

```
Table "public.department592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 dname        | character varying(100) |           |          |
 dnumber      | integer         |           | not null |
 mgr_ssn      | integer         |           |          |
 mgr_start_date | date            |           |          |
```

```
Indexes:
```

```
    "department592_pkey" PRIMARY KEY, btree (dnumber)
```

```
    "department592_dname_key" UNIQUE CONSTRAINT, btree (dname)
```

```
    "department592_dnumber_key" UNIQUE CONSTRAINT, btree (dnumber)
```

```
Referenced by:
```

```
    TABLE "dept_location592" CONSTRAINT "dept_location592_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department592(dnumber)
```

```
postgres=# \d dept_location592
```

```
Table "public.dept_location592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 dnumber      | integer         |           |          |
 dlocation    | character varying(100) |           |          |
```

```
Foreign-key constraints:
```

```
    "dept_location592_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department592(dnumber)
```

```
postgres=# alter table dept_location592 add primary key(dlocation);
```

```
ALTER TABLE
```

```
postgres=# \d dept_location592
```

```
Table "public.dept_location592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 dnumber      | integer         |           |          |
 dlocation    | character varying(100) |           | not null |
```

```
Indexes:
```

```
    "dept_location592_pkey" PRIMARY KEY, btree (dlocation)
```

```
Foreign-key constraints:
```

```
    "dept_location592_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department592(dnumber)
```

```
postgres=#
```

Create project table:

```
postgres=# create table project(pname varchar default 'new_project', pnumber int, plocation varchar, dn
um int references department592(dnumber));
CREATE TABLE
postgres=# \d project
```

Column	Type	Collation	Nullable	Default
pname	character varying			'new_project'::character varying
pnumber	integer			
plocation	character varying			
dnum	integer			

```
Foreign-key constraints:
    "project_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department592(dnumber)

postgres=# alter table project add primary key(pnumber,plocation);
ALTER TABLE
postgres=# \d project
```

Column	Type	Collation	Nullable	Default
pname	character varying			'new_project'::character varying
pnumber	integer		not null	
plocation	character varying		not null	
dnum	integer			

```
Indexes:
    "project_pkey" PRIMARY KEY, btree (pnumber, plocation)
Foreign-key constraints:
    "project_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department592(dnumber)
```

```
postgres=# alter table project add constraint unique_no unique(pnumber);
ALTER TABLE
```

Create works_on table:

```
postgres=# create table works_on592(essn int,pno int references project(pnumber),hours int);
CREATE TABLE
postgres=# \d project
```

Column	Type	Collation	Nullable	Default
pname	character varying			'new_project'::character varying
pnumber	integer		not null	
plocation	character varying		not null	
dnum	integer			

```
Indexes:
    "project_pkey" PRIMARY KEY, btree (pnumber, plocation)
    "unique_no" UNIQUE CONSTRAINT, btree (pnumber)
Foreign-key constraints:
    "project_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department592(dnumber)
Referenced by:
    TABLE "works_on592" CONSTRAINT "works_on592_pno_fkey" FOREIGN KEY (pno) REFERENCES project(pnumber)

postgres=# \d works_on592
```

Column	Type	Collation	Nullable	Default
essn	integer			
pno	integer			
hours	integer			

```
Foreign-key constraints:
    "works_on592_pno_fkey" FOREIGN KEY (pno) REFERENCES project(pnumber)
```

```
postgres=# alter table works_on592 add foreign key(essn) references employee592(ssn);
ALTER TABLE
postgres=# \d works_on592
          Table "public.works_on592"
  Column | Type   | Collation | Nullable | Default
-----+-----+-----+-----+-----
 essn   | integer |           |          |
 pno    | integer |           |          |
 hours  | integer |           |          |
Foreign-key constraints:
  "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
  "works_on592_pno_fkey"  FOREIGN KEY (pno) REFERENCES project(pnumber)
```

Create dependent table:

```
postgres=# create table dependent(essn int references employee592,dependent_name varchar primary key,sex
x varchar(10),bdate date,relationship varchar not null default 'parent');
CREATE TABLE
postgres=# \d dependent592
Did not find any relation named "dependent592".
postgres=# alter table dependent to dependent592;
ERROR:  syntax error at or near "to"
LINE 1: alter table dependent to dependent592;
                             ^
postgres=# alter table dependent rename to dependent592;
ALTER TABLE
postgres=# \d dependent592
          Table "public.dependent592"
  Column      | Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 essn         | integer       |           |          |
 dependent_name | character varying |         | not null |
 sex          | character varying(10) |         |          |
 bdate        | date          |           |          |
 relationship  | character varying |         | not null | 'parent'::character varying
Indexes:
  "dependent_pkey" PRIMARY KEY, btree (dependent_name)
Foreign-key constraints:
  "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)

postgres=#
```

list of tables created:

```
postgres=# \d
          List of relations
 Schema | Name              | Type  | Owner
-----+-----+-----+-----
 public | department592     | table | postgres
 public | dependent592      | table | postgres
 public | dept_location592  | table | postgres
 public | employee592       | table | postgres
 public | project592        | table | postgres
 public | works_on592       | table | postgres
(6 rows)
```

Adding columns to employee592:

```
postgres=# alter table employee592 add column super_ssn int references employee592(ssn);
ALTER TABLE
postgres=# \d employee592
Table "public.employee592"
  Column      |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 fname       | character varying(30) |           | not null |
 minit       | character varying(1)  |           |          |
 lname       | character varying(30) |           | not null |
 ssn         | integer               |           | not null |
 bdate       | date                  |           |          |
 address     | character varying     |           |          |
 sex         | character varying(10) |           |          |
 salary      | integer               |           |          |
 super_ssn   | integer               |           |          |
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)
Foreign-key constraints:
    "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
Referenced by:
    TABLE "dependent592" CONSTRAINT "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
    TABLE "employee592" CONSTRAINT "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
    TABLE "works_on592" CONSTRAINT "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
postgres=#
```

```
postgres=# alter table employee592 add column dno int references department592(dnumber);
ALTER TABLE
postgres=# \d employee592
Table "public.employee592"
  Column      |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 fname       | character varying(30) |           | not null |
 minit       | character varying(1)  |           |          |
 lname       | character varying(30) |           | not null |
 ssn         | integer               |           | not null |
 bdate       | date                  |           |          |
 address     | character varying     |           |          |
 sex         | character varying(10) |           |          |
 salary      | integer               |           |          |
 super_ssn   | integer               |           |          |
 dno         | integer               |           |          |
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)
Foreign-key constraints:
    "employee592_dno_fkey" FOREIGN KEY (dno) REFERENCES department592(dnumber)
    "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
Referenced by:
    TABLE "dependent592" CONSTRAINT "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
    TABLE "employee592" CONSTRAINT "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
    TABLE "works_on592" CONSTRAINT "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
postgres=#
```

Final Screenshot of all tables' details:

```

postgres=# \d employee592
               Table "public.employee592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 fname       | character varying(30) |           | not null |
  init       | character varying(1) |           |          |
  lname      | character varying(30) |           | not null |
  ssn        | integer          |           | not null |
  bdate      | date             |           |          |
  address    | character varying |           |          |
  sex        | character varying(10) |           |          |
  salary     | integer          |           |          |
  super_ssn  | integer          |           |          |
  dno        | integer          |           |          |
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)
Foreign-key constraints:
    "employee592_dno_fkey" FOREIGN KEY (dno) REFERENCES department592(dnumber)
    "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
Referenced by:
    TABLE "dependent592" CONSTRAINT "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
    TABLE "employee592" CONSTRAINT "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
    TABLE "works_on592" CONSTRAINT "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)

```

```

postgres=# \d department592
               Table "public.department592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
  dname       | character varying(100) |           |          |
  dnumber     | integer          |           | not null |
  mgr_ssn     | integer          |           |          |
  mgr_start_date | date             |           |          |
Indexes:
    "department592_pkey" PRIMARY KEY, btree (dnumber)
    "department592_dname_key" UNIQUE CONSTRAINT, btree (dname)
    "department592_dnumber_key" UNIQUE CONSTRAINT, btree (dnumber)
Referenced by:
    TABLE "dept_location592" CONSTRAINT "dept_location592_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department592(dnumber)
    TABLE "employee592" CONSTRAINT "employee592_dno_fkey" FOREIGN KEY (dno) REFERENCES department592(dnumber)
    TABLE "project592" CONSTRAINT "project_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department592(dnumber)

```

```

postgres=# \d dept_location592
               Table "public.dept_location592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
  dnumber     | integer          |           | not null |
  dlocation   | character varying |           | not null |
Indexes:
    "dept_location592_pkey" PRIMARY KEY, btree (dlocation)
Foreign-key constraints:
    "dept_location592_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department592(dnumber)

```

```

postgres=# \d project592
               Table "public.project592"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
  pname       | character varying |           |          | 'new_project'::character varying
  pnumber     | integer          |           | not null |
  plocation   | character varying |           | not null |
  dnum        | integer          |           |          |
Indexes:
    "project_pkey" PRIMARY KEY, btree (pnumber, plocation)
    "unique_no" UNIQUE CONSTRAINT, btree (pnumber)
Foreign-key constraints:
    "project_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department592(dnumber)
Referenced by:
    TABLE "works_on592" CONSTRAINT "works_on592_pno_fkey" FOREIGN KEY (pno) REFERENCES project592(pnumber)

```

```
postgres=# \d works_on592
          Table "public.works_on592"
  Column |  Type  | Collation | Nullable | Default
-----+-----+-----+-----+-----
  essn   | integer |           |          |
  pno    | integer |           |          |
  hours  | integer |           |          |
Foreign-key constraints:
  "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
  "works_on592_pno_fkey" FOREIGN KEY (pno) REFERENCES project592(pnumber)
```

```
postgres=# \d dependent592
          Table "public.dependent592"
  Column |  Type  | Collation | Nullable | Default
-----+-----+-----+-----+-----
  essn   | integer |           |          |
  dependent_name | character varying |           | not null |
  sex    | character varying(10) |           |          |
  bdate  | date   |           |          |
  relationship | character varying |           | not null | 'parent'::character varying
Indexes:
  "dependent_pkey" PRIMARY KEY, btree (dependent_name)
Foreign-key constraints:
  "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
```

2. a. Creating/dropping views

```
postgres=# create view salaryview as select * from employee592 where salary=30000;
CREATE VIEW
postgres=# \dv
          List of relations
 Schema |  Name  | Type | Owner
-----+-----+-----+-----
 public | salaryview | view | postgres
(1 row)

postgres=# drop view salaryview;
DROP VIEW
postgres=#
```

b. creating and granting access to users

granting select acer to user1:

```
postgres=# create user user2 with password'xyz123' createdb;
CREATE ROLE
postgres=# grant update on employee592 to user2;
GRANT
postgres=#
```

```
postgres=# create user user1 with password'xyz123' createdb;
CREATE ROLE
postgres=# grant select on employee592 to user1;
GRANT
postgres=# alter table employee592 add constraint x unique(super_ssn);
ALTER TABLE
```


Granting all access to user3,

```
postgres=# create user user1 with password'xyz123' createdb;
CREATE ROLE
postgres=# grant select on employee592 to user1;
GRANT
postgres=# alter table employee592 add constraint x unique(super_ssn);
ALTER TABLE
postgres=# grant update on employee592 to user2;
ERROR:  role "user2" does not exist
postgres=# create user user2 with password'xyz123' createdb;
CREATE ROLE
postgres=# grant update on employee592 to user2;
GRANT
postgres=# create user user3 with password'xyz123' createdb;
CREATE ROLE
postgres=# grant all on employee592 to user3;
GRANT
postgres=# grant all on department592 to user3;
GRANT
postgres=# grant all on dept_location592 to user3;
GRANT
postgres=# grant all on project592 to user3;
GRANT
postgres=# grant all on project592 to user3;
GRANT
postgres=# grant all on works_on to user3;
ERROR:  relation "works_on" does not exist
postgres=# grant all on works_on592 to user3;
GRANT
postgres=# grant all on dependent592 to user3;
GRANT
postgres=#
```

Grant delete, update to user 4, Revoking access:

```
postgres=# grant delete, update on dependent592 to user4;
GRANT
postgres=# revoke select on dependent592 from user3;
REVOKE
postgres=# revoke delete on project592 from user4;
REVOKE
postgres=# revoke update on employee592 from user2;
REVOKE
postgres=# revoke select on employee592 from user1;
REVOKE
postgres=#
```

c. Adding a column called joindate with a constraint that it should be greater than the birthdate:

```
postgres=# alter table employee592 add column joindate date check(joindate-bdate>0);
ALTER TABLE
postgres=# \d employee592
```

Column	Type	Collation	Nullable	Default
fname	character varying(30)		not null	
minit	character varying(1)			
lname	character varying(30)		not null	
ssn	integer		not null	
bdate	date			
address	character varying			
sex	character varying(10)			
salary	integer			
super_ssn	integer			
dno	integer			
joindate	date			

```
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
    "x" UNIQUE CONSTRAINT, btree (super_ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)
    "employee592_check" CHECK ((joindate - bdate) > 0)
Foreign-key constraints:
    "employee592_dno_fkey" FOREIGN KEY (dno) REFERENCES department592(dnumber)
    "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
Referenced by:
    TABLE "dependent592" CONSTRAINT "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
    TABLE "employee592" CONSTRAINT "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
    TABLE "works_on592" CONSTRAINT "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)

postgres=#
```

Removing a column:

```
postgres=# alter table employee592 drop column joindate;
ALTER TABLE
postgres=# \d employee592
```

Column	Type	Collation	Nullable	Default
fname	character varying(30)		not null	
minit	character varying(1)			
lname	character varying(30)		not null	
ssn	integer		not null	
bdate	date			
address	character varying			
sex	character varying(10)			
salary	integer			
super_ssn	integer			
dno	integer			

```
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
    "x" UNIQUE CONSTRAINT, btree (super_ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)
Foreign-key constraints:
    "employee592_dno_fkey" FOREIGN KEY (dno) REFERENCES department592(dnumber)
    "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
Referenced by:
    TABLE "dependent592" CONSTRAINT "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
    TABLE "employee592" CONSTRAINT "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
    TABLE "works_on592" CONSTRAINT "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)

postgres=#
```

Adding a column called joindate again but with a different constraint that at the time of joining, the age should be greater than 21:

```
postgres=# alter table employee592 add column joindate date check(date_part('year',joindate)-date_part('year',b
date)>21);
ALTER TABLE
postgres=# \d employee592
Table "public.employee592"
  Column      |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 fname       | character varying(30) |           | not null |
 minit       | character varying(1)  |           |          |
 lname       | character varying(30) |           | not null |
 ssn         | integer               |           | not null |
 bdate       | date                  |           |          |
 address     | character varying     |           |          |
 sex         | character varying(10) |           |          |
 salary      | integer               |           |          |
 super_ssn   | integer               |           |          |
 dno         | integer               |           |          |
 joindate    | date                  |           |          |
Indexes:
    "employee592_pkey" PRIMARY KEY, btree (ssn)
    "x" UNIQUE CONSTRAINT, btree (super_ssn)
Check constraints:
    "employee592_bdate_check" CHECK (date_part('year'::text, bdate) < 1985::double precision)
    "employee592_check" CHECK ((date_part('year'::text, joindate) - date_part('year'::text, bdate)) > 21::double precision)
Foreign-key constraints:
    "employee592_dno_fkey" FOREIGN KEY (dno) REFERENCES department592(dnumber)
    "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
Referenced by:
    TABLE "dependent592" CONSTRAINT "dependent_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
    TABLE "employee592" CONSTRAINT "employee592_super_ssn_fkey" FOREIGN KEY (super_ssn) REFERENCES employee592(ssn)
    TABLE "works_on592" CONSTRAINT "works_on592_essn_fkey" FOREIGN KEY (essn) REFERENCES employee592(ssn)
```

d. Delete and truncate tables

```
postgres=# drop table works_on592;
DROP TABLE
postgres=# \d
List of relations
 Schema |          Name          | Type  | Owner
-----+-----+-----+-----
 public | department592          | table | postgres
 public | dependent592           | table | postgres
 public | dept_location592       | table | postgres
 public | employee592            | table | postgres
 public | project592             | table | postgres
(5 rows)
```

```
postgres=# truncate table project592;
TRUNCATE TABLE
postgres=#
```