RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

SQL Constraints, Views , Truncate , delete and update operations

Week #4

1. Create tables for the below mentioned Relational design and add check, default, not null and unique constraints. 10 marks

Ans. Creating a db and creating the tables. Also adding constraints

```
postgres=# create database company_380;
CREATE DATABASE
postgres=# \c company_380
You are now connected to database "company_380" as user "postgres".
company_380=# CREATE TABLE employee_380 (Fname varchar(20) NOT NULL, Minit char, Lname varchar(20) NOT NULL, SSN varchar(10) PRIMARY KEY, Bdate date, Address varchar(50), Sex char, Salary int, Super_SSN varchar(
10), DNo int);
CREATE TABLE
company_380=# ALTER TABLE employee_380 ADD CONSTRAINT fk FOREIGN KEY (Super_SSN) REFERENCES employee_380(SSN);
ALTER TABLE
company_380=#  ALTER TABLE employee_380 ADD CONSTRAINT check_bdate CHECK(Bdate>'1985-01-01');
ALTER TABLE
company_380=# CREATE TABLE department_380 (Dname varchar(20) UNIQUE, Dnumber int PRIMARY KEY, Mgr_SSN varchar(10) REFERENCES employee_380(SSN),Mgr_start_date date);
CREATE TABLE
company_380=# CREATE TABLE dept_location_380 (Dnumber int REFERENCES department_380 (Dnumber), Dlocation varchar(20) PRIMARY KEY );
CREATE TABLE
company_380=# CREATE TABLE project_380 (Pname varchar(10) DEFAULT 'Project01', Pnumber int, Plocation varchar(50), Dnum int REFERENCES department_380(Dnumber),PRIMARY KEY(Pnumber, Plocation));
CREATE TABLE
company_380=# ALTER TABLE project_380 ADD CONSTRAINT unfk UNIQUE (Pnumber);
ALTER TABLE
company_380=#  CREATE TABLE works_on_380 (ESSN varchar(20) REFERENCES employee_380(SSN), PNo int REFERENCES project_380(Pnumber), Hours int, PRIMARY KEY(ESSN,PNo));
CREATE TABLE
company_380=#  CREATE TABLE dependent_380 (ESSN varchar(20) REFERENCES employee_380(SSN),Dependent_name varchar(20), Sex char, Bdate date, relationship varchar(20) NOT NULL DEFAULT 'parent', CONSTRAINT check_dat
e CHECK(Bdate>'1985-01-01'), PRIMARY KEY(ESSN, Dependent_name));
CREATE TABLE
```

1.) Inserting records into the tables

```
company_380=# INSERT INTO employee_380 VALUES ('Name','kkkO','One','PES1U19C90','1980-05-10','B001, PioneerParadise, Bangalore','F', 20000, 'PES1U19C90',10);
ERROR:  value too long for type character(1)
company_380=# INSERT INTO employee_380 VALUES ('Name','kkkO','One','PES1U19C90','1980-05-10','B001, PioneerParadise, Bangalore','F', 20000, 'PES1U19C90',10);
ERROR:  value too long for type character(1)
company_380=# INSERT INTO employee_380 VALUES ('Name','O','One','PES1U19C90','1980-06-05','B001, Pioneer Paradise, Bangalore','F', 20000, 'PES1U19C90',10);
ERROR:  new row for relation "employee_380" violates check constraint "check_bdate"
DETAIL:  Failing row contains (Name, O, One, PES1U19C90, 1980-06-05, B001, Pioneer Paradise, Bangalore, F, 20000, PES1U19C90, 10).
company_380=# INSERT INTO employee_380 VALUES ('Name','O','One','PES1U19C90','1989-06-05','B001, Pioneer Paradise, Bangalore','F', 20000, 'PES1U19C90',10);
INSERT 0 1
```

2.) creating more tables and Adding constraints

```
lab4_380=# CREATE TABLE employee_380 (Fname varchar(20) NOT NULL, Minit char, Lname varchar(20) NOT NULL, SSN varchar(10) PRIMARY KEY, Bdate date, Address varchar(50), Sex char, Salary int, Super_SSN varchar(10
, DNo int);
CREATE TABLE
lab4_380=# ALTER TABLE employee_380 ADD CONSTRAINT fk FOREIGN KEY (Super_SSN) REFERENCES employee_380(SSN);
ALTER TABLE
lab4_380=# ALTER TABLE employee_380 ADD CONSTRAINT check_bdate CHECK(Bdate<'1985-01-01');
ALTER TABLE
lab4_380=# CREATE TABLE department_380 (Dname varchar(20) UNIQUE, Dnumber int PRIMARY KEY, Mgr_SSN varchar(10) REFERENCES employee_380(SSN),Mgr_start_date date);
CREATE TABLE
```

```
lab4_380=# ALTER TABLE employee_380 ADD CONSTRAINT fk FOREIGN KEY (Super_SSN) REFERENCES employee_380(SSN);
ALTER TABLE
lab4_380=# ALTER TABLE employee_380 ADD CONSTRAINT check_bdate CHECK(Bdate<'1985-01-01');
ALTER TABLE
lab4_380=# CREATE TABLE department_380 (Dname varchar(20) UNIQUE, Dnumber int PRIMARY KEY, Mgr_SSN varchar(10) REFERENCES employee_380(SSN),Mgr_start_date date);
CREATE TABLE
lab4_380=# ^BCREATE TABLE dept_location_380 (Dnumber int REFERENCES department_380 (Dnumber), Dlocation varchar(20) PRIMARY KEY );
ERROR:  syntax error at or near "@"
LINE 1: @CREATE TABLE dept_location_380 (Dnumber int REFERENCES depa...
        ^
lab4_380=# CREATE TABLE dept_location_380 (Dnumber int REFERENCES department_380 (Dnumber), Dlocation varchar(20) PRIMARY KEY );
CREATE TABLE
lab4_380=# CREATE TABLE project_380 (Pname varchar(10) DEFAULT 'Project01', Pnumber int, Plocation varchar(50), Dnum int REFERENCES department_380(Dnumber),PRIMARY KEY(Pnumber, Plocation));
CREATE TABLE
lab4_380=# ALTER TABLE project_380 ADD CONSTRAINT unfk UNIQUE (Pnumber);
ALTER TABLE
lab4_380=# CREATE TABLE works_on_380 (ESSN varchar(20) REFERENCES employee_380(SSN), PNo int REFERENCES project_380(Pnumber), Hours int, PRIMARY KEY(ESSN,PNo));
CREATE TABLE
lab4_380=# CREATE TABLE dependent_380 (ESSN varchar(20) REFERENCES employee_380(SSN),Dependent_name varchar(20), Sex char, Bdate date, relationship varchar(20) NOT NULL DEFAULT 'parent', CONSTRAINT check_date CH
ECK(Bdate<'1985-01-01'), PRIMARY KEY(ESSN, Dependent_name));
CREATE TABLE
lab4_380=# INSERT INTO employee_380 VALUES ('Name','O','One','PES1019C90','1980-06-05','B001, Pioneer Paradise, Chennai','F', 20000, 'PES1019C90',10);
INSERT 0 1
lab4_380=# INSERT INTO employee_380 VALUES ('Names','T','Two','PES1019C15','1975-06-08','B001, Pioneer Paradise, Chennai','F', 19000, 'PES1019C90',10);
INSERT 0 1
lab4_380=# INSERT INTO department_380 VALUES ('HelloWd',10,'PES1019C90','2021-09-12');
INSERT 0 1
lab4_380=# INSERT INTO dept_location_380 VALUES (10,'Chennai');
INSERT 0 1
```

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

3.) Tables in the db:

```
lab4_380=# \d
                List of relations
 Schema |        Name         | Type  |  Owner
--------+---------------------+-------+----------
 public | department_380      | table | postgres
 public | dependent_380       | table | postgres
 public | dept_location_380   | table | postgres
 public | employee_380        | table | postgres
 public | project_380         | table | postgres
 public | works_on_380        | table | postgres
(6 rows)
```

```
lab4_380=# \d department_380;
       Table "public.department_380"
 Column  |         Type          | Modifiers
---------+-----------------------+-----------
 dname   | character varying(20) |
 dnumber | integer               | not null
 mgr_ssn | character varying(10) |
Indexes:
    "department_380_pkey" PRIMARY KEY, btree (dnumber)
    "department_380_dname_key" UNIQUE CONSTRAINT, btree (dname)
Foreign-key constraints:
    "department_380_mgr_ssn_fkey" FOREIGN KEY (mgr_ssn) REFERENCES employee_380(ssn)
Referenced by:
    TABLE "dept_location_380" CONSTRAINT "dept_location_380_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department_380(dnumber)
    TABLE "project_380" CONSTRAINT "project_380_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department_380(dnumber)


lab4_380=# \d employee_380;
         Table "public.employee_380"
  Column   |         Type          | Modifiers
-----------+-----------------------+-----------
 fname     | character varying(20) | not null
 minit     | character(1)          |
 lname     | character varying(20) | not null
 ssn       | character varying(10) | not null
 address   | character varying(50) |
 sex       | character(1)          |
 salary    | integer               |
 super_ssn | character varying(10) |
 dno       | integer               |
Indexes:
    "employee_380_pkey" PRIMARY KEY, btree (ssn)
Foreign-key constraints:
    "fk" FOREIGN KEY (super_ssn) REFERENCES employee_380(ssn)
Referenced by:
    TABLE "department_380" CONSTRAINT "department_380_mgr_ssn_fkey" FOREIGN KEY (mgr_ssn) REFERENCES employee_380(ssn)
    TABLE "dependent_380" CONSTRAINT "dependent_380_essn_fkey" FOREIGN KEY (essn) REFERENCES employee_380(ssn)
    TABLE "employee_380" CONSTRAINT "fk" FOREIGN KEY (super_ssn) REFERENCES employee_380(ssn)
```

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

```
lab4_380=# \d project_380;
                        Table "public.project_380"
  Column   |         Type          |              Modifiers
-----------+-----------------------+--------------------------------------
 pname     | character varying(10) | default 'Project01'::character varying
 pnumber   | integer               | not null
 plocation | character varying(50) | not null
 dnum      | integer               |
Indexes:
    "project_380_pkey" PRIMARY KEY, btree (pnumber, plocation)
    "unfk" UNIQUE CONSTRAINT, btree (pnumber)
Foreign-key constraints:
    "project_380_dnum_fkey" FOREIGN KEY (dnum) REFERENCES department_380(dnumber)


lab4_380=# \d dept_location_380;
       Table "public.dept_location_380"
  Column   |         Type          | Modifiers
-----------+-----------------------+-----------
 dnumber   | integer               |
 dlocation | character varying(20) | not null
Indexes:
    "dept_location_380_pkey" PRIMARY KEY, btree (dlocation)
Foreign-key constraints:
    "dept_location_380_dnumber_fkey" FOREIGN KEY (dnumber) REFERENCES department_380(dnumber)


lab4_380=# \d dependent_380;
                          Table "public.dependent_380"
     Column     |         Type          |                  Modifiers
----------------+-----------------------+----------------------------------------------
 essn           | character varying(20) | not null
 dependent_name | character varying(20) | not null
 sex            | character(1)          |
 bdate          | date                  |
 relationship   | character varying(20) | not null default 'parent'::character varying
Indexes:
    "dependent_380_pkey" PRIMARY KEY, btree (essn, dependent_name)
Check constraints:
    "check_date" CHECK (bdate < '1985-01-01'::date)
Foreign-key constraints:
    "dependent_380_essn_fkey" FOREIGN KEY (essn) REFERENCES employee_380(ssn)
```

2. Perform the following operations on the table **4*5 = 20 marks**

- *Drop and truncate*
- *b. Create views and Drop views*
- *c. Create user and grant and revoke privileges on the table*
    - *Grant select for emp table for user 1*
    - *Grant alter privileges on department table for user 2.*
    - *Grant all privileges on all the table for user 3*
- *Grant alter ,delete, update on dependent and project table for user4*
- *Using alter table commands add column , delete column*

Ans

a.) Drop and truncate

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

Droping database, table, rows. Truncating table.

```
postgres=# DROP DATABASE pes1ug19cs380_lab4
postgres-# ;
DROP DATABASE
```

```
lab4_380=# drop table works_on_380;
DROP TABLE
lab4_380=# \dt
               List of relations
 Schema |       Name         | Type  |  Owner
--------+--------------------+-------+----------
 public | department_380     | table | user2
 public | dependent_380      | table | postgres
 public | dept_location_380  | table | postgres
 public | employee_380       | table | postgres
 public | project_380        | table | postgres
(5 rows)
```

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

```
lab4_380=# table department_380;
  dname   | dnumber |  mgr_ssn
----------+---------+------------
 HelloWd |      10 | PES1019C90
(1 row)
```

```
lab4_380=#  INSERT INTO project_380 VALUES ('Val',1,'Chennai', 10);
INSERT 0 1
lab4_380=#  INSERT INTO project_380 VALUES ('Pilar',2,'Panjim', 10);
INSERT 0 1
lab4_380=#  INSERT INTO project_380 VALUES (,1,'Chennai', 10);
ERROR:  syntax error at or near ","
LINE 1: INSERT INTO project_380 VALUES (,1,'Chennai', 10);
                                       ^
lab4_380=#  INSERT INTO project_380 VALUES (1,'Chennai', 10);
ERROR:  invalid input syntax for integer: "Chennai"
LINE 1: INSERT INTO project_380 VALUES (1,'Chennai', 10);
                                        ^
lab4_380=#  INSERT INTO project_380 VALUES (DEFAULT, 1,'Chennai', 10);
ERROR:  duplicate key value violates unique constraint "project_380_pkey"
DETAIL:  Key (pnumber, plocation)=(1, Chennai) already exists.
lab4_380=#  INSERT INTO project_380 VALUES (DEFAULT, 3,'Chennai', 10);
INSERT 0 1
lab4_380=# table project_380;
   pname   | pnumber | plocation | dnum
-----------+---------+-----------+------
 Val       |       1 | Chennai   |   10
 Pilar     |       2 | Panjim    |   10
 Project01 |       3 | Chennai   |   10
(3 rows)


lab4_380=# DELETE FROM projecy_380 where pnumber=2;
ERROR:  relation "projecy_380" does not exist
LINE 1: DELETE FROM projecy_380 where pnumber=2;
                    ^
lab4_380=# DELETE FROM project_380 where pnumber=2;
DELETE 1
lab4_380=# table project_380;
   pname   | pnumber | plocation | dnum
-----------+---------+-----------+------
 Val       |       1 | Chennai   |   10
 Project01 |       3 | Chennai   |   10
(2 rows)
```

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

truncate:

```
lab4_380=# INSERT INTO dept_location_380 VALUES (24,'Chennai');
ERROR:  insert or update on table "dept_location_380" violates foreign key constraint "dept_location_380_dnumber_fkey"
DETAIL:  Key (dnumber)=(24) is not present in table "department_380".
lab4_380=#  INSERT INTO project_380 VALUES ('Val',1,'Chennai', 10);
INSERT 0 1
lab4_380=#  INSERT INTO project_380 VALUES ('Pilar',2,'Panjim', 10);
INSERT 0 1
lab4_380=# table project_380;
 pname | pnumber | plocation | dnum
-------+---------+-----------+------
 Val   |       1 | Chennai   |   10
 Pilar |       2 | Panjim    |   10
(2 rows)


lab4_380=# truncate project_380;
TRUNCATE TABLE
lab4_380=# table project_380;
 pname | pnumber | plocation | dnum
-------+---------+-----------+------
(0 rows)
```

b.)creating and dropping views:

```
INSERT 0 1
lab4_380=# table dept_location_380;
 dnumber | dlocation
---------+-----------
      10 | Chennai
      10 | Panjim
(2 rows)


lab4_380=# create view loc as select * from dept_location_380 where dlocation='Panjim';
CREATE VIEW
lab4_380=# select * from loc;
 dnumber | dlocation
---------+-----------
      10 | Panjim
(1 row)

lab4_380=# drop view loc;
DROP VIEW
```

c.)creating roles and granting access:

1.) creating users:

```
ALTER TABLE
lab4_380=# create user user1 with password '000' createdb;
CREATE ROLE
lab4_380=# create user user2 with password '111' createdb;
CREATE ROLE
lab4_380=# create user user3 with password '222' createdb;
CREATE ROLE
lab4_380=# create user user4 with password '333' createdb;
CREATE ROLE
```

User1:

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

```
lab4_380=# grant select on employee_380 to user1;
GRANT
lab4_380=# \dp employee_380
                                Access privileges
 Schema |     Name     | Type  |     Access privileges     | Column privileges | Policies
--------+--------------+-------+---------------------------+-------------------+----------
 public | employee_380 | table | postgres=arwdDxt/postgres+|                   |
        |              |       | user3=arwdDxt/postgres   +|                   |
        |              |       | user1=r/postgres          |                   |
(1 row)


lab4_380=# revoke select on employee from user1;
ERROR:  relation "employee" does not exist
lab4_380=# revoke select on employee_380 from user1;
REVOKE
lab4_380=# \dp employee_380
                                Access privileges
 Schema |     Name     | Type  |     Access privileges     | Column privileges | Policies
--------+--------------+-------+---------------------------+-------------------+----------
 public | employee_380 | table | postgres=arwdDxt/postgres+|                   |
        |              |       | user3=arwdDxt/postgres    |                   |
(1 row)
```

User2:

```
lab4_380=# alter table department_380 owner to user2;
ALTER TABLE
lab4_380=# \dp department_380;
                                Access privileges
 Schema |      Name      | Type  |  Access privileges   | Column privileges | Policies
--------+----------------+-------+----------------------+-------------------+----------
 public | department_380 | table | ramya=awd/user2    +|                   |
        |                |       | ramya2=awd/user2   +|                   |
        |                |       | user3=arwdDxt/user2 |                   |
(1 row)


lab4_380=# revoke all on department_380 from user2;
REVOKE
lab4_380=# \dp department_380;
                                Access privileges
 Schema |      Name      | Type  |  Access privileges   | Column privileges | Policies
--------+----------------+-------+----------------------+-------------------+----------
 public | department_380 | table | ramya=awd/user2    +|                   |
        |                |       | ramya2=awd/user2   +|                   |
        |                |       | user3=arwdDxt/user2 |                   |
(1 row)
```

Or

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

```
lab4_380=# grant insert, update, delete on department_380 to user2;
GRANT
lab4_380=# \dp department_380;
                                Access privileges
 Schema |      Name      | Type  |  Access privileges   | Column privileges | Policies
--------+----------------+-------+----------------------+-------------------+----------
 public | department_380 | table | ramya=awd/user2     +|                   |
        |                |       | ramya2=awd/user2    +|                   |
        |                |       | user3=arwdDxt/user2+|                   |
        |                |       | user2=awd/user2      |                   |
(1 row)


lab4_380=# revoke all on department_380 from user2;
REVOKE
lab4_380=# \dp department_380;
                                Access privileges
 Schema |      Name      | Type  |  Access privileges   | Column privileges | Policies
--------+----------------+-------+----------------------+-------------------+----------
 public | department_380 | table | ramya=awd/user2     +|                   |
        |                |       | ramya2=awd/user2    +|                   |
        |                |       | user3=arwdDxt/user2  |                   |
(1 row)
```

User 3:

```
lab4_380=# grant all on all tables in schema "public" to user3;
GRANT
lab4_380=# \dt
              List of relations
 Schema |       Name        | Type  |  Owner
--------+-------------------+-------+----------
 public | department_380    | table | user2
 public | dependent_380     | table | postgres
 public | dept_location_380 | table | postgres
 public | employee_380      | table | postgres
 public | project_380       | table | postgres
 public | works_on_380      | table | postgres
(6 rows)


lab4_380=# \dp department_380
                                Access privileges
 Schema |      Name      | Type  |  Access privileges   | Column privileges | Policies
--------+----------------+-------+----------------------+-------------------+----------
 public | department_380 | table | ramya=awd/user2     +|                   |
        |                |       | ramya2=awd/user2    +|                   |
        |                |       | user3=arwdDxt/user2  |                   |
(1 row)


lab4_380=# revoke all on all tables in schema "public" from user3;
REVOKE
lab4_380=# \dp department_380
                               Access privileges
 Schema |      Name      | Type  | Access privileges | Column privileges | Policies
--------+----------------+-------+-------------------+-------------------+----------
 public | department_380 | table | ramya=awd/user2  +|                   |
        |                |       | ramya2=awd/user2  |                   |
(1 row)
```

User4:

RAMYA NARASIMHA PRABHU
5F2 PES1UG19CS380

```
lab4_380=# grant alter, update, delete on dependent_380,project_380 to user4;
ERROR:  unrecognized privilege type "alter"
lab4_380=# grant insert, update, delete on dependent_380,project_380 to user4;
GRANT
lab4_380=# \dp project_380
                                Access privileges
 Schema |    Name     | Type  |     Access privileges     | Column privileges | Policies
--------+-------------+-------+---------------------------+-------------------+----------
 public | project_380 | table | postgres=arwdDxt/postgres+|                   |
        |             |       | user4=awd/postgres        |                   |
(1 row)


lab4_380=# \dp dependent_380
                                Access privileges
 Schema |     Name      | Type  |     Access privileges     | Column privileges | Policies
--------+---------------+-------+---------------------------+-------------------+----------
 public | dependent_380 | table | postgres=arwdDxt/postgres+|                   |
        |               |       | user4=awd/postgres        |                   |
(1 row)


lab4_380=# revoke alter, update, delete on dependent_380,project_380 from user4;
ERROR:  unrecognized privilege type "alter"
lab4_380=# revoke insert, update, delete on dependent_380,project_380 from user4;
REVOKE
lab4_380=# \dp dependent_380
                                Access privileges
 Schema |     Name      | Type  |     Access privileges     | Column privileges | Policies
--------+---------------+-------+---------------------------+-------------------+----------
 public | dependent_380 | table | postgres=arwdDxt/postgres |                   |
(1 row)


lab4_380=# \dp project_380
                                Access privileges
 Schema |    Name     | Type  |     Access privileges     | Column privileges | Policies
--------+-------------+-------+---------------------------+-------------------+----------
 public | project_380 | table | postgres=arwdDxt/postgres |                   |
(1 row)
```

d.) Using alter table commands add column , delete column

```
lab4_380=# ALTER TABLE employee_380 ADD COLUMN Join_date date CONSTRAINT jdate CHECK(Join_date>Bdate);
ALTER TABLE
lab4_380=# ALTER TABLE employee_380 DROP COLUMN Join_date;
ALTER TABLE
```

```
lab4_380=# table department_380;
  dname   | dnumber |  mgr_ssn   | mgr_start_date
----------+---------+------------+----------------
 HelloWd |      10 | PES1019C90 | 2021-09-12
(1 row)


lab4_380=# ALTER TABLE employee_380 DROP COLUMN mgr_start_date;
ERROR:  column "mgr_start_date" of relation "employee_380" does not exist
lab4_380=# ALTER TABLE department_380 DROP COLUMN mgr_start_date;
ALTER TABLE
lab4_380=# table department_380;
  dname   | dnumber |  mgr_ssn
----------+---------+------------
 HelloWd |      10 | PES1019C90
(1 row)
```