DBMS LAB

WEEK 4

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PES1UG19CS001

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

• PK and FK constraints for all applicable Relations

• For Fname , Lname in employee add not null constraints and relationship in dependent should be not null and by default add parent as the relationship value

• Add default constraint for project name

• Dname and dnumber should be unique

• Add check constraints to BDATE in employee and dependent table (born before 1985)

```
naren=# create database office;
CREATE DATABASE
naren=# \c office;
You are now connected to database "office" as user "naren".
office=#
```

Creating Tables

Employee_001

```
office=# create table employee_001(Fname varchar(10) not null, Minit varchar(1), Lname
 varchar(10) not null, Ssn integer, Bdate date check(bdate < '1985-01-01'), Address va
rchar(30), Sex varchar(1), Salary integer, Super_ssn integer, Dno integer,primary key(
ssn), constraint fk foreign key(super_ssn) references employee_001(ssn));
CREATE TABLE
office=# \d employee_001
                    Table "public.employee_001"
  Column    |          Type          | Collation | Nullable | Default
------------+------------------------+-----------+----------+---------
 fname      | character varying(10)  |           | not null |
 minit      | character varying(1)   |           |          |
 lname      | character varying(10)  |           | not null |
 ssn        | integer                |           | not null |
 bdate      | date                   |           |          |
 address    | character varying(30)  |           |          |
 sex        | character varying(1)   |           |          |
 salary     | integer                |           |          |
 super_ssn  | integer                |           |          |
 dno        | integer                |           |          |
Indexes:
    "employee_001_pkey" PRIMARY KEY, btree (ssn)
Check constraints:
    "employee_001_bdate_check" CHECK (bdate < '1985-01-01'::date)
Foreign-key constraints:
    "fk" FOREIGN KEY (super_ssn) REFERENCES employee_001(ssn)
Referenced by:
    TABLE "employee_001" CONSTRAINT "fk" FOREIGN KEY (super_ssn) REFERENCES employee_0
01(ssn)
```

Department_001

```
office=# create table department_001(dname varchar(10) unique, Dnumber integer unique,
 mgr_ssn integer, mgr_start_date date, primary key(dnumber), constraint fk foreign key
(mgr_ssn) references employee_001(ssn));
CREATE TABLE
office=# \d department_001
                    Table "public.department_001"
    Column      |          Type          | Collation | Nullable | Default
----------------+------------------------+-----------+----------+---------
 dname          | character varying(10)  |           |          |
 dnumber        | integer                |           | not null |
 mgr_ssn        | integer                |           |          |
 mgr_start_date | date                   |           |          |
Indexes:
    "department_001_pkey" PRIMARY KEY, btree (dnumber)
    "department_001_dname_key" UNIQUE CONSTRAINT, btree (dname)
Foreign-key constraints:
    "fk" FOREIGN KEY (mgr_ssn) REFERENCES employee_001(ssn)
```

Dept_locations_001

```
office=# create table dept_locations_001(dnumber integer unique,dlocation varchar(10),
primary key(dnumber,dlocation),constraint fk foreign key(dnumber) references departmen
t_001(dnumber));
CREATE TABLE
office=# \d dept_locations_001;
                Table "public.dept_locations_001"
   Column   |         Type          | Collation | Nullable | Default
------------+-----------------------+-----------+----------+---------
 dnumber    | integer               |           | not null |
 dlocation  | character varying(10) |           | not null |
Indexes:
    "dept_locations_001_pkey" PRIMARY KEY, btree (dnumber, dlocation)
    "dept_locations_001_dnumber_key" UNIQUE CONSTRAINT, btree (dnumber)
Foreign-key constraints:
    "fk" FOREIGN KEY (dnumber) REFERENCES department_001(dnumber)
```

Project_001

```
office=# create table project_001(pname varchar(10) default 'ProjectX', pnumber intege
r, plocation varchar(10), dnum integer, primary key(pnumber), constraint fk foreign ke
y(dnum) references department_001(dnumber));
CREATE TABLE
office=# \d project_001
                            Table "public.project_001"
   Column   |         Type          | Collation | Nullable |            Default
------------+-----------------------+-----------+----------+----------------------------
----
 pname      | character varying(10) |           |          | 'ProjectX'::character vary
ing
 pnumber    | integer               |           | not null |
 plocation  | character varying(10) |           |          |
 dnum       | integer               |           |          |
Indexes:
    "project_001_pkey" PRIMARY KEY, btree (pnumber)
Foreign-key constraints:
    "fk" FOREIGN KEY (dnum) REFERENCES department_001(dnumber)
```

Works_on_001

```
office=# create table works_on_001(essn integer,pno integer,hours decimal, primary key
(essn,pno), constraint fk1 foreign key(pno) references project_001(pnumber),constraint
 fk2 foreign key(essn) references employee_001(ssn));
CREATE TABLE
office=# \d works_on_001
            Table "public.works_on_001"
 Column |  Type   | Collation | Nullable | Default
--------+---------+-----------+----------+---------
 essn   | integer |           | not null |
 pno    | integer |           | not null |
 hours  | numeric |           |          |
Indexes:
    "works_on_001_pkey" PRIMARY KEY, btree (essn, pno)
Foreign-key constraints:
    "fk1" FOREIGN KEY (pno) REFERENCES project_001(pnumber)
    "fk2" FOREIGN KEY (essn) REFERENCES employee_001(ssn)
```

Dependent_001

```
office=# create table dependent_001(essn integer,dependent_name varchar(10),sex varcha
r(1),bdate date check(bdate < '1985-01-01'), relationship varchar(10) default 'Parent'
 not null,primary key(essn,dependent_name), constraint fk foreign key(essn) references
 employee_001(ssn));
CREATE TABLE
office=# \d dependent_001
                        Table "public.dependent_001"
     Column     |         Type          | Collation | Nullable |         Default
----------------+-----------------------+-----------+----------+------------------------
-------
 essn           | integer               |           | not null |
 dependent_name | character varying(10) |           | not null |
 sex            | character varying(1)  |           |          |
 bdate          | date                  |           |          |
 relationship   | character varying(10) |           | not null | 'Parent'::character v
arying
Indexes:
    "dependent_001_pkey" PRIMARY KEY, btree (essn, dependent_name)
Check constraints:
    "dependent_001_bdate_check" CHECK (bdate < '1985-01-01'::date)
Foreign-key constraints:
    "fk" FOREIGN KEY (essn) REFERENCES employee_001(ssn)
```

Inserting into table

Employee_001

```
office=# insert into employee_001 values('Naren','A','Eswaran','2','1980-12-31','No 20
Blore','M','300000','1',12345);
ERROR:  insert or update on table "employee_001" violates foreign key constraint "fk"
DETAIL:  Key (super_ssn)=(1) is not present in table "employee_001".
office=# alter table employee_001 drop constraint fk
office-# ;
ALTER TABLE
office=# insert into employee_001 values('Naren','A','Eswaran',1,'1980-12-31','No 20 Bl
ore','M','300000',100,12345);
INSERT 0 1
office=# insert into employee_001 values('Abhi','D','Dinesh',2,'1982-01-31','No 30 Blor
e','M','200000',200,12346);
INSERT 0 1
office=# insert into employee_001 values('Shigi','A','Rehman',3,'1981-03-30','No 40 Blo
re','M','100000',300,12347);
INSERT 0 1
```

Department_001

```
office=# insert into department_001  values('CSE',123456,1,'1983-01-01');
INSERT 0 1
office=# insert into department_001  values('ECE',12346,2,'1983-01-01');
INSERT 0 1
office=# insert into department_001  values('ME',12347,3,'1983-01-01');
INSERT 0 1
```

Dept_locations_001

```
office=# insert into dept_locations_001  values(12345,'B-block');
INSERT 0 1
office=# insert into dept_locations_001  values(12346,'C-block');
INSERT 0 1
office=# insert into dept_locations_001  values(12347,'D-block');
INSERT 0 1
```

Project_001

```
office=# insert into project_001 values('Web App',1,'B-block',12345);
INSERT 0 1
office=# insert into project_001 values('Ardrino',2,'C-block',12346);
INSERT 0 1
office=# insert into project_001 values('IC Engine',3,'D-block',12347);
INSERT 0 1
```

Works_on_001

```
office=# insert into works_on_001 values(1,1,5);
INSERT 0 1
office=# insert into works_on_001 values(2,2,3);
INSERT 0 1
office=# insert into works_on_001 values(3,3,10);
INSERT 0 1
```

Dependent_001

```
office=# insert into dependent_001 values(1,'CSE','F','1966-02-02','Mother')
office-# ;
INSERT 0 1
office=# insert into dependent_001 values(2,'ECE','F','1968-05-02','Father');
INSERT 0 1
office=# insert into dependent_001 values(3,'ME','M','1978-04-21','Brother');
INSERT 0 1
```

2. Perform the following operations on the table

A)

Truncate

```
office=# truncate table project_001,works_on_001;
TRUNCATE TABLE
office=# select * from works_on_001;
 essn | pno | hours
------+-----+-------
(0 rows)

office=# select * from project_001;
 pname | pnumber | plocation | dnum
-------+---------+-----------+-------
(0 rows)
```

Drop

```
office=# drop table works_on_001,project_001;
DROP TABLE
office=# select * from project_001;
ERROR:  relation "project_001" does not exist
LINE 1: select * from project_001;
                      ^
office=# select * from works_on_001;
ERROR:  relation "works_on_001" does not exist
LINE 1: select * from works_on_001;
                      ^
```

B) Creating and dropping Views

```
office=# create view employee_view as select fname,bdate,salary from employee_0
01;
CREATE VIEW
office=# select * from employee_view
office-# ;
 fname |   bdate    | salary
-------+------------+--------
 Naren | 1980-12-31 | 300000
 Abhi  | 1982-01-31 | 200000
 Shigi | 1981-03-30 | 100000
(3 rows)
```

```
office=# create view salary_view as select fname,lname,salary from employee_001
 where salary<250000;
CREATE VIEW
office=# select * from salary_view;
 fname | lname  | salary
-------+--------+--------
 Abhi  | Dinesh | 200000
 Shigi | Rehman | 100000
(2 rows)
```

```
office=# drop view salary_view;
DROP VIEW
office=# select * from salary_view;
ERROR:  relation "salary_view" does not exist
LINE 1: select * from salary_view;
                      ^
```

```
office=# drop view employee_view;
DROP VIEW
office=# select * from employee_view;
ERROR:  relation "employee_view" does not exist
LINE 1: select * from employee_view;
                      ^
```

C(i) Grant select for emp table for user 1

```
office=# create user user1 with password 'PES1UG19CS001' createdb;
CREATE ROLE
office=# grant select on Employee_001 to user1;
GRANT
```

C(ii) Grant insert privileges on department table for user 2.

```
office=# create user user2 with password 'PES1UG19CS001' createdb;
CREATE ROLE
```
```
office=# grant insert on department_001 to user2;
GRANT
```

C(iii) Grant all privileges on all the table for user 3

```
office=# grant all privileges on employee_001,department_001,dept_locations_001,projec
t_001,works_on_001,dependent_001 to user3;
GRANT
```

C(iv) Grant delete, update on dependent and project table for user4

```
ERROR:  relation "projext_001" does not exist
office=# grant delete,update on dependent_001,project_001 to user4
;
GRANT
```

Revoke

```
office=# revoke select on table employee_001 from user1;
REVOKE
office=# revoke insert on table department_001 from user2;
REVOKE
office=# revoke all on table employee_001,department_001,dept_locations_001,project_001,works_on_001,dependent
_001 from user3;
REVOKE
office=# revoke select,insert on table dependent_001 , project_001 from user4;
REVOKE
```

D)

Adding column

```
office=# alter table employee_001 add column join_date date check(join_date > bdate);
ALTER TABLE
office=# update employee_001 set join_date='2002-12-31' where ssn=1;
UPDATE 1
office=# select * from employee_001;
 fname | minit |  lname  | ssn |   bdate    |   address    | sex | salary | super_ssn |  dno  | join_date
-------+-------+---------+-----+------------+--------------+-----+--------+-----------+-------+------------
 Abhi  | D     | Dinesh  |   2 | 1982-01-31 | No 30 Blore  | M   | 200000 |       200 | 12346 |
 Shigi | A     | Rehman  |   3 | 1981-03-30 | No 40 Blore  | M   | 100000 |       300 | 12347 |
 Naren | A     | Eswaran |   1 | 1980-12-31 | No 20 Blore  | M   | 300000 |       100 | 12345 | 2002-12-31
(3 rows)
```

Deleting column

```
office=# alter table employee_001 drop column join_date;
ALTER TABLE
office=# select * from employee_001;
 fname | minit |  lname  | ssn |   bdate    |   address    | sex | salary | super_ssn |  dno
-------+-------+---------+-----+------------+--------------+-----+--------+-----------+-------
 Naren | A     | Eswaran |   1 | 1980-12-31 | No 20 Blore  | M   | 300000 |       100 | 12345
 Abhi  | D     | Dinesh  |   2 | 1982-01-31 | No 30 Blore  | M   | 200000 |       200 | 12346
 Shigi | A     | Rehman  |   3 | 1981-03-30 | No 40 Blore  | M   | 100000 |       300 | 12347
(3 rows)
```

21 years

```
office=# alter table employee_001 add column join_date date check(date_part('year',join_date) - date_part('yea
r', bdate) > 21);
ALTER TABLE
office=# update employee_001 set join_date='1990-12-31' where ssn=1;
ERROR:  new row for relation "employee_001" violates check constraint "employee_001_check"
DETAIL:  Failing row contains (Naren, A, Eswaran, 1, 1980-12-31, No 20 Blore, M, 300000, 100, 12345, 1990-12-3
1).
office=# update employee_001 set join_date='2003-12-31' where ssn=1;
UPDATE 1
office=# select * from employee_001;
 fname | minit |  lname  | ssn |   bdate    |   address   | sex | salary | super_ssn |  dno  | join_date
-------+-------+---------+-----+------------+-------------+-----+--------+-----------+-------+------------
 Abhi  | D     | Dinesh  |   2 | 1982-01-31 | No 30 Blore | M   | 200000 |       200 | 12346 |
 Shigi | A     | Rehman  |   3 | 1981-03-30 | No 40 Blore | M   | 100000 |       300 | 12347 |
 Naren | A     | Eswaran |   1 | 1980-12-31 | No 20 Blore | M   | 300000 |       100 | 12345 | 2003-12-31
(3 rows)


office=# alter table employee_001 drop column join_date;
ALTER TABLE
office=# select * from employee_001;
 fname | minit |  lname  | ssn |   bdate    |   address   | sex | salary | super_ssn |  dno
-------+-------+---------+-----+------------+-------------+-----+--------+-----------+-------
 Abhi  | D     | Dinesh  |   2 | 1982-01-31 | No 30 Blore | M   | 200000 |       200 | 12346
 Shigi | A     | Rehman  |   3 | 1981-03-30 | No 40 Blore | M   | 100000 |       300 | 12347
 Naren | A     | Eswaran |   1 | 1980-12-31 | No 20 Blore | M   | 300000 |       100 | 12345
(3 rows)
```