WEEK4 -

SQL Constraints, Views, Truncate, delete and update operations.

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Section: G Section

Problem Statement:

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

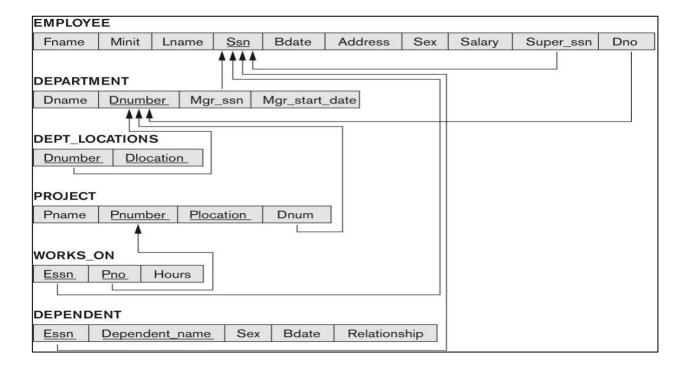
PK and FK constraints for all applicable Relations

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 defult constraint for project name Dname and

dnumber should be unique

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



```
new_493=# create table employee_493(fname varchar(20) NOT NULL, Minit varchar(20), Lname varchar(20) NOT NULL, Ssn int, Bdate date, Address varchar(70) NOT NULL, Sex varchar(10), Salary int NOT NULL, Super_ssn int, Dno int);

CREATE TABLE

new_493=# alter table employee add constraint pk1 primary key (Ssn);

ERRORS: relation "employee" does not exist

new_493=# alter table employee_493 add constraint fk1 foreign key(Super_ssn) references employee_493(Ssn);

ERROR: there is no unique constraint matching given keys for referenced table "employee_493"

new_493=# alter table employee_493 add constraint pk1 primary key (Ssn);

ALTER TABLE

new_493=# alter table employee_493 add constraint fk1 foreign key(Super_ssn) references employee_493(Ssn);

ALTER TABLE

new_493=# d employee_493

Table "public.employee_493"

Column | Type | Collation | Nullable | Default

fname | character varying(20) | not null |
minit | character varying(20) | not null |
ssn | integer | not null |
ssn | integer | date |
address | character varying(70) | not null |
ssn | integer | not null |
```

Creating department, its primary and foreign key

```
.493=# create table department_493(dname varchar(20) NOT NULL UNIQUE, Dnumber int, Mgr_ssn int NOT NULL, Mgr_start_date date NOT
CREATE TABLE
new_493=# alter table department_493 add constraint pk2 primary key (Dnumber);
ALTER TABLE
new_493=# alter table department add constraint fk2 foreign key(Mgr_ssn) references employee_293(Ssn);
new_493=# alter table department add constraint fk2 foreign key(Mgr_ssn) references employee_293(Ssn);
ERROR: relation "department" does not exist
new_493=# alter table department add constraint fk2 foreign key(Mgr_ssn) references employee_293(Ssn);
ERROR: relation "department" does not exist
 ew_493=# alter table department add constraint fk2 foreign key(Mgr_ssn) references employee_293(Ssn);
ERROR: relation "department" does not exist
new_493=# alter table department_493 add constraint fk2 forign key(Mgr_ssn) references employee_493(Ssn);
ERROR: syntax error at or near "forign"
.INE 1: alter table department_493 add constraint fk2 forign key(Mgr...
new_493=# alter table department_493 add constraint fk2 foreign key(Mgr_ssn) references employee_493(Ssn);
ALTER TABLE
new_493=# \d department_493
                       Table "public.department_493"
    Column
                                          | Collation | Nullable | Default
dname
                  character varying(20)
                                                         not null
dnumber
                  integer
                  integer
                                                         not null
mgr_ssn
mgr_start_date | date
                                                        not null
Indexes:
    "pk2" PRIMARY KEY, btree (dnumber)
"department_493_dname_key" UNIQUE
                               UNIQUE CONSTRAINT, btree (dname)
                                 REFERENCES employe
```

Creating dept_location and its PK and FK's

Creating a project and its PK's and FK's, NOT NULL constraint is added

```
new 493=# create table project 493(pname varchar(20) NOT NULL, Pnumber int, Plocation varchar(20), Dnum int);
new_493=# alter table project_493 add constraint pk4 primary key (Pnumber);
ALTER TABLE
new_493=# alter table project_493 add constraint uk1 unique(Plocation);
ALTER TABLE
new_493=# alter table project_493 add constraint fk3 foreign key(Dnum) references department_493(dnumber);
new_493=# \d project_493
                      Table "public.project_493"
                                      | Collation | Nullable | Default
 Column
                      Type
           | character varying(20)
                                                    not null
pname
                                                     not null
 pnumber
             integer
plocation
             character varying(20)
             integer
dnum
Indexes:
   "pk4" PRIMARY KEY, btree (pnumber)
"uk1" UNIQUE CONSTRAINT, btree (plocation)
Foreign-key constraints:
"fk3" FOREIGN KEY (dnum) REFERENCES department_493(dnumber)
```

Creating table works_on and its PK's and FK's

Creating a dependent table and its PK's and FK's

Adding **default-**parent as the relationship value, default constraint for project name, **and unique constraints-** dname and number should be unique

```
new_493=# alter table dependent_493 alter relationship SET default 'Parent';
ALTER TABLE
new_493=# alter table project_493 alter pname SET default 'Project_1';
ALTER TABLE
new_493=# alter table department_493 add unique(dname);
ALTER TABLE
new_493=# alter table department_493 add unique(dnumber);
ALTER TABLE
new_493=# alter table department_493 add unique(dnumber);
ALTER TABLE
new_493=#
```

Result of **check**, **default**, **and unique** Check constraint for dependent

```
new_493=# alter table dependent_493 add contraint date check(bdate >= '1985-01-01');
ALTER TABLE
new 493=# \d dependent 493
                                 Table "public.dependent_493"
    Column
                                       | Collation | Nullable |
                                                                            Default
                  integer
                                                     not null
essn
department_name
                   character varying(20)
                                                       not null
                  character varying(10)
sex
hdate
                  date
relationship
                  character varying(20)
                                                       not null
                                                                  'Parent'::character varying
contraint
                 date
Indexes:
    "dependent_493_pkey" PRIMARY KEY, btree (essn, department_name)
Check constraints:
    "dependent_493_bdate_check" CHECK (bdate >= '1985-01-01'::date)
Foreign-key constraints:
    "dependent 493 essn fkey" FOREIGN KEY (essn) REFERENCES employee 493(ssn)
```

Check constraint for employee

```
new_493=# alter table employee_493 add contraint date check(bdate >= '1985-01-01');
ALTER TABLE
```

Permission denied when violating the constraint

```
new_493=# insert into employee_493 values('Tresa', 'Maria', 'Ignatius', 305, '04-04-1984', 'RR Nagar', 'F', 80000, 305, 2);
ERROR: new row for relation "employee_493" violates check constraint "employee_493_bdate_check"
DETAIL: Failing row contains (Tresa, Maria, Ignatius, 305, 1984-04-04, RR Nagar, F, 80000, 305, 2, null).
new_493=#
```

Inserting values

Employee

```
new_493=# insert into employee_493 values('Sona', 'S', 'K', 301, '03-04-2001', 'Hebbal', 'F', 30000, 301, 3);
INSERT 0 1
new_493=# insert into employee_293 values('Nishi', 'S', 'Eedula', 302, '03-04-2003', 'Kempapura', 'M', 40000, 302, 2);
ERROR: relation "employee_293" does not exist
LINE 1: insert into employee_293 values('Nishi', 'S', 'Eedula', 302,...
new 493=# insert into employee 493 values('Nishi', 'S', 'Eedula', 302, '03-04-2003', 'Kempapura', 'M', 40000, 302, 2);
 new_493=# insert into employee_493 values('Karan', 'W', 'Singh', 303, '01-02-1985', 'Indiranagar', 'M', 60000, 303, 3);
new_493=# insert into employee_493 values('Sushmita', 'R', 'Menon', 304, '01-02-1988', 'Kormangala', 'F', 70000, 304, 3);
INSERT 0 1
new_493=# insert into employee_293 values('Maria', 'M', 'Darling', 305, '04-04-1985', 'RR Nagar', 'F', 80000, 305, 2);
ERROR: relation "employee_293" does not exist
LINE 1: insert into employee_293 values('Maria', 'M', 'Darling', 305...
 new_493=# insert into employee_493 values('Maria', 'M', 'Darling', 305, '04-04-1985', 'RR Nagar', 'F', 80000, 305, 2);
NEW 493=# SELECT * FROM employee_493
new_493=# SELECT * FROM employee_493;
new_493-# SELECT * FROM employee_493;
CONOR: syntax error_at or near "SELECT"
ERROR: syntax error at or near "SE
LINE 2: SELECT * FROM employee_493;
 new_493=# SELECT * FROM employee_493;
  fname | minit | lname | ssn | bdate
                                                                     address | sex | salary | super_ssn | dno
                                                 2001-03-04
                                         301
                                                                                                30000
                                                                  Hebbal
                          Eedula
Singh
Menon
                                                 2003-03-04
1985-01-02
 Nishi
                                                                   Kempapura
                                                                                                40000
                                                                   Indiranagar
                                                                                                60000
                                                                                                                   303
 Karan
 Sushmita
                                                                  Kormangala
RR Nagar
                                                 1985-01-02 |
1985-04-04 |
 Maria
 5 rows)
```

Department

```
new_493=# insert into department_493 values('Sales', 1, 301, '09-08-1998');
INSERT 0 1
new_493=# insert into department_493 values('HR', 2, 302, '03-12-1998');
INSERT 0 1
new_493=# insert into department_493 values('Analyst', 3, 303, '09-08-1921');
INSERT 0 1
new_493=# SELECT * FROM department_493;
 dname | dnumber | mgr_ssn | mgr_start_date
Sales
                1 |
                        301 | 1998-09-08
                             1998-03-12
HR
                 2
                         302
                         303 | 1921-09-08
Analyst |
(3 rows)
```

Project

Dept_locations

Works on

```
new_493=# insert into works_on_493 values(301, 11024, 20);
INSERT 0 1
INSERT 0 1
new_493=# insert into works_on_493 values(303, 11026, 30);
INSERT 0 1
new 493=# SELECT * FROM works on 493;
essn | pno | hours
               20
    11024
      11025
               10
 302
 303
      11026
               30
(3 rows)
```

2. Perform the following operations on the table

4*5 = 20 marks

- a. Drop and truncate
- b. Create views and Drop views
- c. Create user and grant and revoke privileges on the table
 - i. Grant select for emp table for user 1
 - ii. Grant alter privileges on department table for user 2.
 - iii. Grant all privileges on all the table for user 3
 - iv. Grant alter ,delete, update on dependent and project table for user4

Using alter table commands add column, delete column

Creating view female_employee_493 and male_employee_493

```
new_493=# insert into dependent_493 values(301, 'Nirmala', 'F', '09-06-1988', 'Mother');
new_493=# insert into dependent_493 values(301, 'Suresh', 'M', '09-06-1986', 'Father');
INSERT 0 1
new 493=# insert into dependent 493 values(303, 'Sohan', 'M', '10-11-2000', 'Uncle');
INSERT 0 1
new_493=# SELECT * FROM dependent_493;
essn | department name | sex | bdate
                                            | relationship | contraint
                        | F
| M
| M
 301 | Nirmala
                               | 1988-09-06 | Mother
 301 | Suresh
303 | Sohan
                                1986-09-06
                                              Father
                               2000-10-11 Uncle
(3 rows)
new_493=# create view female_employee_493 as select * from employee_493 where sex = 'F';
CREATE VIEW
new_493=# create view male_employee_493 as select * from employee_493 where sex = 'M';
CREATE VIEW
new_493=# select * from female_employee_493;
 fname | minit | lname | ssn | bdate
                                                | address | sex | salary | super_ssn | dno
                  Hebbal | F
Kormangala | F
RR Nagar | F
                                                                       30000
                                                                                      301
 Sushmita
                                                                        70000
                                                                                      304
Maria
(3 rows)
new_493=# select * from male_employee_493;
fname | minit | lname | ssn | bdate
                                                           | sex | salary | super_ssn | dno
                                                address
Nishi | S
Karan | W
                Eedula | 302 | 2003-03-04 | Kempapura
Singh | 303 | 1985-01-02 | Indiranagar
                                                                    40000
                                                                                   302
                                                                    60000
                                                                                   303
(2 rows)
```

```
new_493=# create view senior_employee_493 as select * from employee_493 where Salary >= 60000;
CREATE VIEW
new_493=# select * from senior_employee_493
new_493-# select * from senior_employee_493;
ERROR: syntax error at or near "select"
LINE 2: select * from senior_employee_493;
new_493=# select * from senior_employee_493;
fname | minit | lname | ssn | bdate
                                                                 address
                                                                               | sex | salary | super_ssn | dno
                       Singh
 Karan
                                              1985-01-02 | Indiranagar | M
 Sushmita | R
Maria | M
                         Menon
                                              1988-01-02
                                                               Kormangala
                                                                                           70000
                       | Darling | 305 | 1985-04-04 | RR Nagar
                                                                                          80000
(3 rows)
```

Drop view

```
new_493=# drop view senior_employee_493;
DROP VIEW

new_493=# select * from senior_employee_493

new_493-# select * from senior_employee_493;

ERROR: syntax error at or near "select"

LINE 2: select * from senior_employee_493;

new_493=# select * from senior_employee_493;

ERROR: relation "senior_employee_493" does not exist

LINE 1: select * from senior_employee_493;
```

C. Create user and grant and revoke privileges on the table

(i) Grant select for emp table for user 1

```
CREATE ROLE

new_493=# create user user2 with password 'user2' createdb;

CREATE ROLE

new_493=# create user user3 with password 'user3' createdb;

CREATE ROLE

new_493=# create user user4 with password 'user4' createdb;

CREATE ROLE

new_493=# create user user4 with password 'user4' createdb;

CREATE ROLE

new_493=#
```

(ii) Grant alter privileges on department table for user 2

```
new_493=# grant select on employee_493 to user1;
GRANT
new_493=# grant select on department_493 to user2;
GRANT
new_493=# grant alter on department_493 to user2;
ERROR: unrecognized privilege type "alter"
new_493=# grant update on department_493 to user2;
GRANT
```

(iii) Grant all privileges on all the tables for user 3

```
new_493=# GRANT SELECT, INSERT, UPDATE, DELETE ON ALL TABLES IN SCHEMA public TO user3;
GRANT
```

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

```
new_493=# GRANT INSERT, UPDATE, DELETE on dependent_493 to user4;
GRANT
new_493=# GRANT INSERT, UPDATE, DELETE on project_493 to user4;
GRANT
```

Checking front end Grant select for emp table for user 1

Checking select permissions for user 1

```
C:\Program Files\PostgreSQL\13\bin>psql -U user1 -d new_493
Password for user user1:
psql (13.4)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.
```

```
new_493=> Select * from employee_493;
         | minit | lname | ssn |
                                                  address
                                                            | sex | salary | super_ssn |
 fname
                                     bdate
Sona
         15
                             301 I
                                   2001-03-04
                                                Hebbal
                                                                      30000
                                                                                    301
                  I K
         S
                   Eedula
Nishi
                             302
                                   2003-03-04
                                                Kempapura
                                                                     40000
                                                                                    302
                   Singh
Karan
                             303
                                   1985-01-02
                                                Indiranagar
                                                                      60000
                                                                                    303
                   Menon
                             304
Sushmita
         R
                                   1988-01-02
                                                Kormangala
                                                                      70000
                                                                                    304
         M
                  | Darling | 305 | 1985-04-04 |
                                                                                    305
                                                                     80000
Maria
                                                RR Nagar
(5 rows)
```

Permission denied for user 1 to insert

```
new_493=> insert into employee_493 values('Navya', 'S', 'Eedula', 201, '03-04-2001', 'Banaswadi', 'F', 30000, 201, 3);
DERROR: permission denied for table employee_493
new_493=>
```

Grant alter privileges on department table for user 2.

```
new_493=> update department_493 set Mgr_start_date = '01-02-1995';
UPDATE 3
```

Grant all privileges on all the tables for user 3

Grant alter, delete, update on dependent and project table for user4

Revoking the user 1 select permissions

```
new_493=# revoke select on employee_493 from user1;
REVOKE
```

D . Adding and deleting columns

Adding no_of_projects to department

```
new_493=# alter table department_493 add column no_of_projects int;
ALTER TABLE
new_493=# \d department_493
                                        Table "public.department_493"
         Column
                                             Type
                                                                       | Collation | Nullable | Default
                             | character varying(20) |
 dname
                                                                                                    not null
                                                                                                    not null
 dnumber
                                integer
 mgr_ssn | integer
mgr_start_date | date
no_of_projects | integer
                                                                                                    not null
                                                                                                    not null
Indexes:
Indexes:
    "pk2" PRIMARY KEY, btree (dnumber)
    "department_493_dname_key" UNIQUE CONSTRAINT, btree (dname)
    "department_493_dname_key1" UNIQUE CONSTRAINT, btree (dname)
    "department_493_dnumber_key" UNIQUE CONSTRAINT, btree (dnumber)
Foreign-key constraints:
    "fk2" FOREIGN KEY (mgr_ssn) REFERENCES employee_493(ssn)
Referenced by:
TABLE "dept_locations_493" CONSTRAINT "fk3" FOREIGN KEY (dnumber) REFERENCES department_493(dnumber)
TABLE "project_493" CONSTRAINT "fk3" FOREIGN KEY (dnum) REFERENCES department_493(dnumber)
```

Deleting the same column

```
new_493=# alter table department_493 drop column no_of_projects;

ALTER TABLE

new_493=# \d department_493

Table "public.department_493"

Column | Type | Collation | Nullable | Default

dname | character varying(20) | | not null |
dnumber | integer | | not null |
mgr_ssn | integer | | not null |
mgr_start_date | date | | not null |
Indexes:
    "pk2" PRIMARY KEY, btree (dnumber)
    "department_493_dname_key" UNIQUE CONSTRAINT, btree (dname)
    "department_493_dname_key" UNIQUE CONSTRAINT, btree (dnumber)

Foreign-key constraints:
    "fk2" FOREIGN KEY (mgr_ssn) REFERENCES employee_493(ssn)

Referenced by:
    TABLE "dept_locations_493" CONSTRAINT "fk3" FOREIGN KEY (dnumber) REFERENCES department_493(dnumber)
    TABLE "project_493" CONSTRAINT "fk3" FOREIGN KEY (dnum) REFERENCES department_493(dnumber)
```

A. Drop and truncate

```
new_493=# drop table dependent_493;
DROP TABLE
new_493=# \d dependent_493
Did not find any relation named "dependent_493".
```

