Q1- Add gender column for the student table[Enum]. It holds two value (male or female).

```
iti=# create type gender as enum ('male', 'female');

CREATE TYPE

iti=# alter table student add column gender type gender;

ERROR: syntax error at or near "gender"

LINE 1: alter table student add column gender type gender;

iti=# alter table student add column gender gender;

ALTER TABLE

iti=# select * from student;

iti=# []
```

Q2- Add birth date column for the student table.

```
iti=# alter table student add column birth_date date;
ALTER TABLE
```

Q3- Delete the name column and replace it with two columns first name and last name.

```
iti=# alter table student drop column name;
ALTER TABLE
iti=# alter table student add column first_name varchar(25);
ALTER TABLE
iti=# alter table student add column last_name varchar(25);
ALTER TABLE
iti=# \d student
                                                       Table "public.student"
| Collation | Nullable |
    Column
                                                                                                                          Default
 student_id | integer
                                                                           I not null | nextval('student student id seg'::regclass)
                    character(100)
 email
 street
                     character(25)
city
track_id
                     character(25)
                    integer
 gender
                    gender
 birth_date | date
 first_name | character varying(25)
last name | character varying(25)
      "student_pkey" PRIMARY KEY, btree (student_id)
Foreign-key constraints:
"student_track_id_fkey" FOREIGN KEY (track_id) REFERENCES track(track_id)
 eferenced by:
     TABLE "student_course" CONSTRAINT "student_course_student_id_fkey" FOREIGN KEY (student_id) REFERENCES student(student_id)
TABLE "student_exam" CONSTRAINT "student_exam_student_id_fkey" FOREIGN KEY (student_id) REFERENCES student(student_id)
TABLE "student_phone" CONSTRAINT "student_phone_student_id_fkey" FOREIGN KEY (student_id) REFERENCES student(student_id)
iti=# 🗌
```

Q4- Delete the address and email column and replace it with contact info (Address, email) as object/Composite Data type.

Q5- Change any Serial Datatype at your tables to smallInt

```
iti=# alter table student alter column student_id type smallint;

ALTER TABLE

iti=# alter table course alter column course_id type smallint;

ALTER TABLE

iti=# alter table exam alter column exam_id type smallint;

ALTER TABLE

iti=# alter table track alter column track_id type smallint;

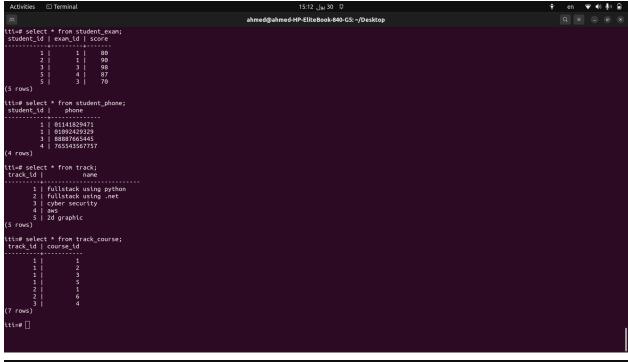
ALTER TABLE

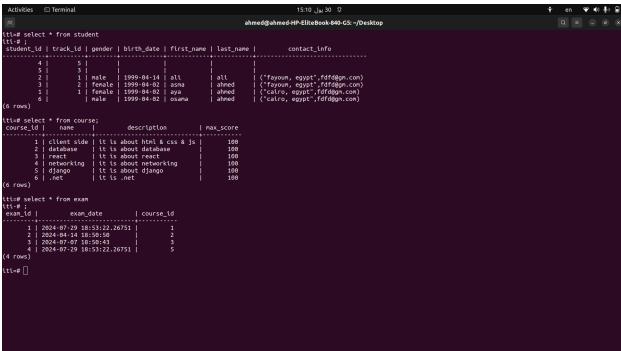
iti=# alter table track alter column track_id type smallint;
```

Q6- Add/Alter foreign key constrains in Your Tables.

Done in last lab

Q7- Insert new data in all Tables.





Q8- Display all students' information.

```
iti=# select * from student
iti-#;
 student_id | track_id | gender | birth_date | first_name | last_name |
                                                                                                             contact_info
                                                                                                 ("fayoum, egypt",fdfd@gm.com)
("fayoum, egypt",fdfd@gm.com)
("cairo, egypt",fdfd@gm.com)
("cairo, egypt",fdfd@gm.com)
                                                               ali
                                              1999-04-14
                                                                                 ali
                                 male
                                 female
                                              1999-04-02
                                                               asma
                                                                                 ahmed
                                 female
                                              1999-04-02
                                                                                 ahmed
                                                               aya
                                 male
                                              1999-04-02
                                                                                 ahmed
                                                               osama
(6 rows)
```

Q9- Display male students only.

```
iti=# select * from student where gender = 'male';
student_id | track_id | gender | birth_date | first_name | last_name | contact_info

2 | 1 | male | 1999-04-14 | ali | ali | ("fayoum, egypt",fdfd@gm.com)
6 | | male | 1999-04-02 | osama | ahmed | ("cairo, egypt",fdfd@gm.com)

(2 rows)

iti=#
```

Q10- Display the number of female students.

```
iti=# select * from student;
student_id | track_id | gender | birth_date | first_name | last_name |
                                                                                                                            contact_info
                                                                                                              ("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
                                                                        nabil
                                      male
                                                    1991-08-01
                                                                                            ali
                                                    1991-08-01
                                      male
                                                                        nabil
                                                                                            ali
                                      male
                                                    1991-08-01
                                                                        {\tt ahmed}
                                      male
                                                    1991-08-01
                                                                                            ali
                                                                        Mohammed
                                                    1991-08-01
                                                                        nabil
                                                                                           ali
                                      female
                                                                        nabil
                                                    1991-08-01
                                      female
                                                                                            ali
                                                    2024-07-30
                                      male
                                                                        ahmed
                                                                                           nabil
(7 rows)
iti=# select count(student_id) from student where gender = 'female';
 count
(1 row)
```

Q11- Display the students who are born before 1992-10-01

Q12- Display male students who are born before 1991-10-01.

```
iti=# select * from student where gender = 'male' and birth_date < '1991-10-01';
 student_id | track_id | gender | birth_date | first_name | last_name |
                                                                                                                    contact_info
                                                                                                       ("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
("fayoum, egypt",dsdds@dsd.com)
                             5 | male
                                                 1991-08-01 |
                                                                   nabil
                                                                                      ali
              2 i
                             1
                                   male
                                                 1991-08-01
                                                                   nabil
                                                                                      ali
                                                 1991-08-01
                                                                   nabil
                                   male
              3 I
                             2
                                   male
                                                 1991-08-01
                                                                   nabil
                                                                                      ali
                                                 1991-08-01 |
                                                                   nabil
              6
                                   male
                                                                                      ali
                                                1991-08-01
                                                                  nabil
                                                                                      ali
                             3 | male
(6 rows)
```

Q13- Display subjects and their max score sorted by max score.

```
iti=# select name, max_score from course order by max_score;
    name
             | max_score
 react
                      80
database
                      85
django
                      90
 client side
                     100
networking
                     100
.net
                     100
(6 rows)
iti=#
```

Q14- Display the subject with highest max score

```
iti=# select * from course order by max_score desc limit 1;
course_id | name | description | max_score
1 | client side | it is about html & css & js | 100
(1 row)
iti=# [
```

Q15- Display students' names that begin with A.

Q16- Display the number of students' their name is "Mohammed"

```
iti=# select count(student_id) from student where first_name like 'Mohammed';
 count
(1 row)
iti=# select * from student;
student_id | track_id | gender | birth_date | first_name | last_name |
                                                                                                                            contact_info
                                                                                                           | ("fayoum, egypt",dsdds@dsd.com)
                               5 | male
2 | male
| male
                                                    1991-08-01 |
                                                                        nabil
               3
                                                    1991-08-01
                                                                                           ali
                                                                        nabil
                                                    1991-08-01
                                                                                           ali
                                                                        nabil
                               3 | male
                                                    1991-08-01
                                                                                           ali
                                                                        nabil
                               1 | male
                                                    1991-08-01
               1 |
                                                                        ahmed
                                                                                           ali
                                                   1991-08-01
                                1 | male
                                                                       Mohammed
(6 rows)
iti=# 🗌
```

Q17- Display the number of males and females.

Q18- Display the repeated first names and their counts if higher than 2.

```
iti=# select first_name, count(*) from student group by first_name having count(*) > 2;
  first_name | count
------
nabil | 4
(1 row)
```

Q19- Display the all Students and track name that belong to it

Q20- Display students' names, their score and subject name.

Lab 3

Q1- Insert new student and his score in exam in different subjects as transaction and save it.

```
iti=# begin;
BEGIN
iti=*# insert into student (student_id, track_id, gender, birth_date, first_name, last_name) values (7, 1, 'male', now(), 'ahmed'
,'nabil');
INSERT 0 1
iti=*# insert into student_exam (student_id, exam_id, score) values (7, 3, 95);
INSERT 0 1
iti=*# commit;
COMMIT
iti=#
```

Q2- Insert new students and his score in exam in different subjects as transaction and undo it.

```
iti=# begin
iti=# begin
itt-#;
BEGIN
itt=# insert into student (student_id, track_id, gender, birth_date, first_name, last_name) values (8, 1, 'male', now(), 'ahmed'
,'nabil');
INSERT 0 1
iti=*# insert into student_exam (student_id, exam_id, score) values (8, 3, 95);
INSERT 0 1
iti=*# rollback;
ROLLBACK
iti=#
```

Q8- Create user and give him all privileges.

```
postgres=# create user ahmed with password '123';

CREATE ROLE
postgres=# \du
postgres=# grant all on *.* to ahmed;

ERROR: syntax error at or near "*"

LINE 1: grant all on *.* to ahmed;

postgres=# grant all on DATABASE iti to ahmed;

GRANT

GRANT

postgres=# \du
postgres=# \du
postgres=#
```

Q9- Create another new user and make the authentication method is "trust" and give him all privileges if he login from his "local" server.

