《Introduction to Database System A*》 Experiment 4

contents: query over multi-relations,subqueries	**lab:** 10-409 **Instructor:liuli**
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Software Environment ：

Windows/linum/macOS + postgresql/Mysql+GUI

- **Purpose:**

The exercise is to have a taste on query over multi-relations
Practice on subqueries

- **Guidance for the laboratory exercise:**

Notation:

SELECT [DISTINCT] A_1[AS ALIAS1], A_2[as ALIAS2]…

FROM R_1,R_2…

[WHERE condtion]

[GROUP BY A_i,A_j]

[HAVING $_{\text{condition}}$]

[ORDER BY attribute list ASC|DESC];

Notation:

Subquery can be placed in the from clause and where clause

- **Examples**

1. get the studios with presdent's value more than100000000, return studio,movieexec,networth

ANSWER:
SELECT studio.name,movieexec.name,networth
FROM movieexec,studio
WHERE cert=presC AND networth>100000000 ;

2. find all the titles and years of movies that appeared in relation movies or relation starsin in our running database

ANSWER:

```
(SELECT title,year FROM Movie)
UNION
(SELECT movieTitle AS title,movieYear AS year FROM StarsIn
```

3. find the name of producer of ‘Star Wars’ in1977

ANSWER:

```
SELECR name
FROM movieexec
WHERE cert=  (SELECR producerC
              FROM movies
              WHERE title=‘Star Wars’ and year=1977)
```

4. find movies which also appear in   starsIn,return their title, year and length

ANSWER:

```
SELECT title,year
FROM Movies
 WHERE( title,year) IN (SELECT movieTitle,movieyear FROM starsIn);
```

5. Find the name and address of stars who acted in movie ‘Star Wars’ (require the subquery in FROM clause)

ANSWER:

```
SELECT name,address
FROM moviestar,(SELECR starname
                FROM starsin
                WHERE movietitle=‘Star Wars’)m
WHERE    name=m.starname
```

Experiment background:

we have set up a database “my_movie_database” with the relations schema below:

Movies(title,year,length,movietype, studioname, producerC)

movieStar(name,address,gender,birthdate)

starsIn(movietitle,movieyear,starname)

Studio(name,address,presC)

Movieexec(name,address,cert,networt)

Experiment questions:

(1)Write SQL statements and execute each statement for the following queries(questions);

(2) After you have successfully execute the statement, copy this statement to the document ; paste the snapshot picture for execution result of the SQL statement in the document if necessary;

Part 1. Query over multi-relations:

1. Who was the president of MGM studios,return the name.

SQL ANSWER:

```
SELECT `name`
FROM `movieexec`
WHERE `cert`=(SELECT `presC`
FROM `studio`
WHERE `name`='MGM')
```

2. Who were the male stars in Star Wars? (Return the star's name).

SQL ANSWER:

```
SELECT `name`
FROM `moviestar`
WHERE `gender`='M' AND `name` IN (SELECT `starname`
                                  FROM `starsin`
                                  WHERE `movietitle`='Star Wars')
```

3. Who were the stars in the movies which were issued by MGM, return their name, birthdate, listing the result in a descending order by name.

SQL ANSWER:

```
SELECT `name`,`birthdate`
    FROM `moviestar`
    WHERE `name` IN (SELECT `starname`
    FROM `starsin`
    WHERE `movietitle` IN (SELECT `title` FROM `movies` WHERE `studioname`='MGM'))

    ORDER BY `name` DESC;
```

4. Which movie is longer than ‘Star Wars’ in 1977. Return their title,year,movietype and length,listing the result by type in ascending order and then among the same type of movie, by length in descending order.

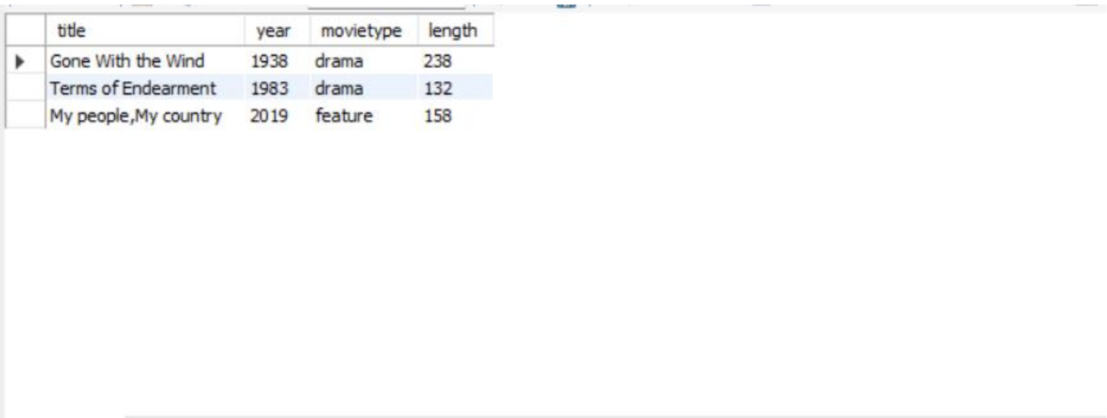
SQL ANSWER:

```
SELECT `title`,`year`,`movietype`,`length`
FROM `movies`
WHERE `length`>(SELECT `length` FROM `movies` WHERE `title`='Star Wars')
```

ORDER BY `movietype` ASC,`length` DESC;

RESULTING

PICTURE:



	title	year	movietype	length
▶	Gone With the Wind	1938	drama	238
	Terms of Endearment	1983	drama	132
	My people,My country	2019	feature	158

Part 2.union,intersection and difference of Queries:

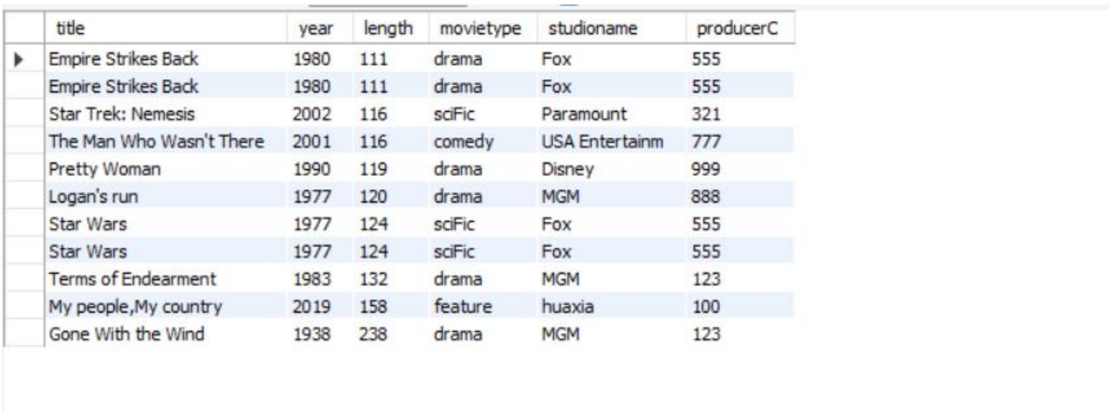
5. use set operator to develop the query:Find all information about movies which had length more than 110 minutes or were produced by studio fox,not removing the duplicate tuples,ordering the result by length in ascending order.

SQL ANSWER:

SELECT *
FROM `movies`
WHERE `length` > 110
UNION ALL
SELECT *
FROM `movies`
WHERE `studioname`='Fox'
ORDER BY `length` ASC;

RESULTING

PICTURE:



	title	year	length	movietype	studioname	producerC
▶	Empire Strikes Back	1980	111	drama	Fox	555
	Empire Strikes Back	1980	111	drama	Fox	555
	Star Trek: Nemesis	2002	116	sciFic	Paramount	321
	The Man Who Wasn't There	2001	116	comedy	USA Entertainm	777
	Pretty Woman	1990	119	drama	Disney	999
	Logan's run	1977	120	drama	MGM	888
	Star Wars	1977	124	sciFic	Fox	555
	Star Wars	1977	124	sciFic	Fox	555
	Terms of Endearment	1983	132	drama	MGM	123
	My people,My country	2019	158	feature	huaxia	100
	Gone With the Wind	1938	238	drama	MGM	123

6. use set operator to develop the query:find the star name which appear in the starsin while not appear in the moviestar relation.

SQL ANSWER:
```
SELECT `starname`
    FROM `starsin`
    EXCEPT
    SELECT `name`
    FROM `moviestar`;
```

Part 3. Query with subqueries as value:

7. Find the name of president who manage the studio “Fox”. (require subquery in WHERE clause)

SQL ANSWER:
```
SELECT name
FROM Movieexec
WHERE cert = (SELECT presC
              FROM Studio
              WHERE name = 'Fox');
```

8. Find the name and address of movieexec richer than ‘Ted Turner’.(require subquery returning value in WHERE clause)

SQL ANSWER:
```
SELECT `name`, `address`
FROM `movieexec`
WHERE `networth` > (SELECT `networth`
FROM `movieexec`
WHERE `name` = 'Ted Turner');
```

Part 4. IN\EXISTS\ALL\ANY before subquery:

9. Find those stars who are in table ‘starsin’ and not in table moviestar, return their name distinctly.（require using of [NOT]IN）

SQL ANSWER:
```
SELECT DISTINCT `starname`
FROM `starsin`
WHERE `starname` NOT IN(
    SELECT `name`
    FROM `moviestar`
);
```

10. find the executives who had the highest networth,return the name and networth. (require ALL or ANY in subqueries in answer).

SQL ANSWER:

```
SELECT `name`,`networth`
FROM `movieexec`
WHERE `networth` > ALL(
    SELECT `networth`
    FROM `movieexec`
    WHERE `networth`<(SELECT MAX(`networth`) FROM `movieexec`)
);
```

11. find the movie star who only acted in one movie,return the name in order of name. (require [NOT]EXISTS to answer)

SQL ANSWER:

```
SELECT `starname`

FROM `starsin` s1

WHERE NOT EXISTS(

    SELECT 1

    FROM `starsin` s2

    WHERE s1.starname=s2.starname

    GROUP BY s2.starname

    HAVING COUNT(s2.starname)>=2

);
```

Part 5. Subquery in from clause:

12. Find the name and address of stars who acted in movie ‘The Usual Suspects’ .

SQL ANSWER:

```
SELECT `name`,`address`

FROM `moviestar`

WHERE `name`=(
    SELECT `starname`
    FROM `starsin`
    WHERE `movietitle`='The Usual Suspects'
);
```

Part 6. others:

13. find moviestar younger than ‘Jane fonda’.(3 ways.one must use subquery)

SQL ANSWER:

```
1.SELECT `name`
FROM `moviestar`
WHERE `birthdate` >(
    SELECT `birthdate`
    FROM `moviestar`
    WHERE `name`='Jane Fonda'
);
2.SELECT `name`
FROM `moviestar` m1
WHERE EXISTS(
    SELECT 1
    FROM `moviestar` m2
    WHERE m1.birthdate > m2.birthdate AND m2.name='Jane Fonda'
);
3.SELECT ms.name
```

```
FROM `moviestar` ms

JOIN `moviestar` ms2 ON ms.birthdate>ms2.birthdate

WHERE ms2.name='Jane Fonda';
```

14. Let’s find the name of the movie executive who produce the film that ‘Carrie Fisher’ had ever stared in.(2 ways.one must use subquery)

SQL ANSWER:

```
1.SELECT `name`

FROM `movieexec`

WHERE `cert`= (

    SELECT `producerC`

    FROM `movies`

    WHERE `title`=(

        SELECT `movietitle`

        FROM `starsin`

        WHERE `starname`='Carrie Fisher'

    )

);
```

```
2.
SELECT `name`
FROM `movieexec`
JOIN `movies` ON movieexec.cert=movies.producerC
JOIN `starsin` ON movies.title=starsin.movietitle
WHERE starsin.starname='Carrie Fisher';
```

Handing your answer file with PDF fomat using the file name as exp4 _ID(ID should be replaced by your own student ID);