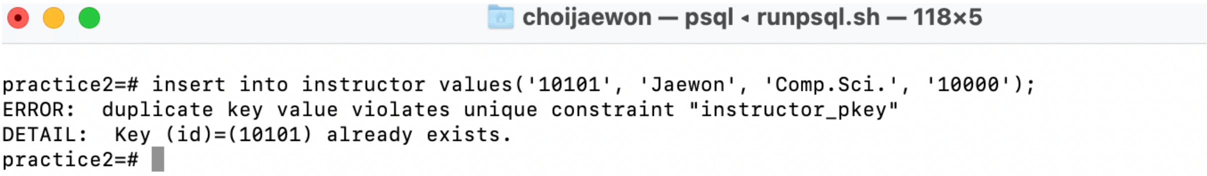
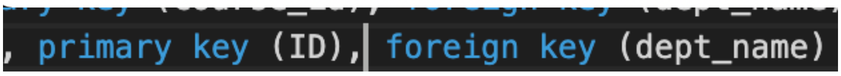
2017320114_최재원_실습3

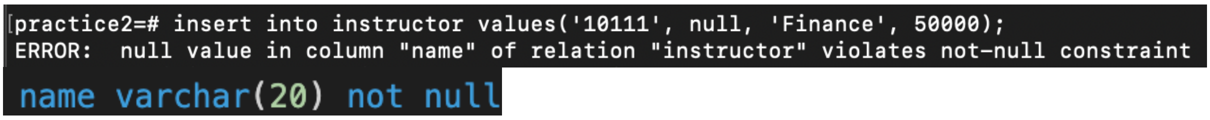
1. Set up integrity constraints, and then execute SQL statements violating them.



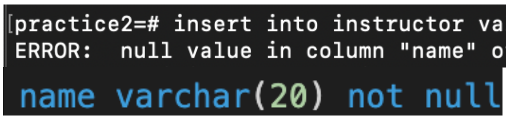
```
practice2=# insert into instructor values('10101', 'Jaewon', 'Comp.Sci.', '10000');
ERROR:  duplicate key value violates unique constraint "instructor_pkey"
DETAIL:  Key (id)=(10101) already exists.
practice2=# 
```



```
, primary key (ID), foreign key (dept_name)
```



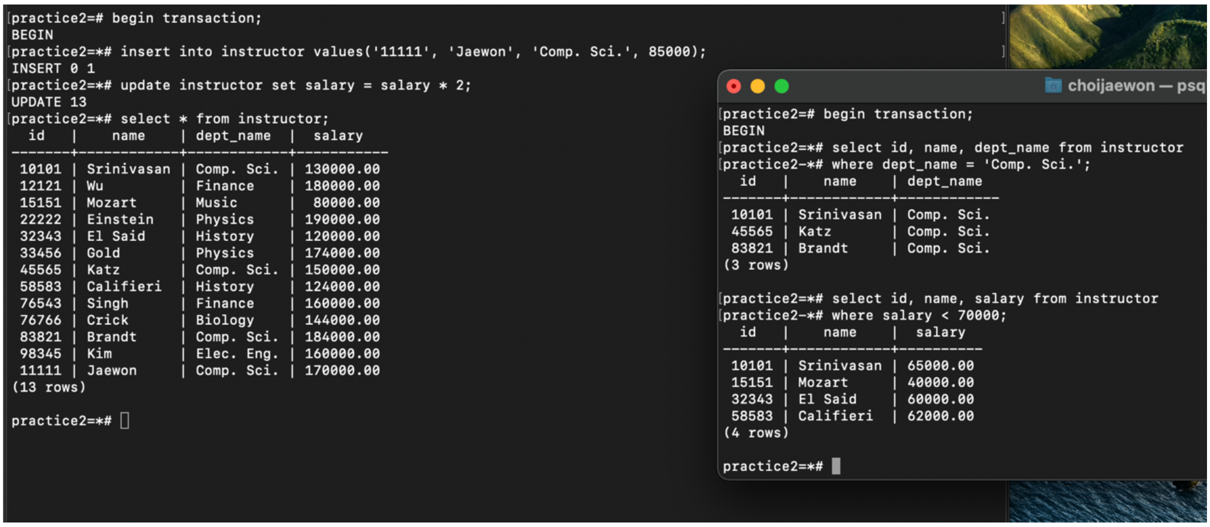
```
[practice2=# insert into instructor values('10111', null, 'Finance', 50000);
 ERROR:  null value in column "name" of relation "instructor" violates not-null constraint
```



```
 name varchar(20) not null
```

2. Make two or more concurrently executed transactions, and show they are executed in isolated manner.

- ✓ Comp. Sci. 학과의 Jaewon이라는 instructor를 추가했지만 동시에 수행되는 다른 transaction(오른쪽) 에서는 select문을 통해서 확인해본 결과, 반영이 안되어 있다.
- ✓ 모든 instructor의 salary를 두배 증가 시켰지만 다른 transaction(오른쪽)에서는 반영이 안되어 있다.
- ✓ Commit 전에는 concurrent하게 수행되는 transaction는 isolated 되어 있다.

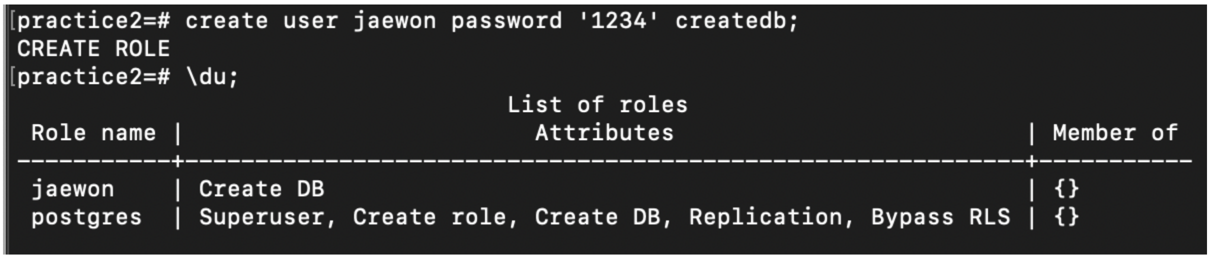


```
[practice2=# begin transaction;
 BEGIN
[practice2=*# insert into instructor values('11111', 'Jaewon', 'Comp. Sci.', 85000);
 INSERT 0 1
[practice2=*# update instructor set salary = salary * 2;
 UPDATE 13
[practice2=*# select * from instructor;
   id   |    name    | dept_name  |   salary
 -------+------------+------------+-----------
  10101 | Srinivasan | Comp. Sci. | 130000.00
  12121 | Wu         | Finance    | 180000.00
  15151 | Mozart     | Music      |  80000.00
  22222 | Einstein   | Physics    | 190000.00
  32343 | El Said    | History    | 120000.00
  33456 | Gold       | Physics    | 174000.00
  45565 | Katz       | Comp. Sci. | 150000.00
  58583 | Califieri  | History    | 124000.00
  76543 | Singh      | Finance    | 160000.00
  76766 | Crick      | Biology    | 144000.00
  83821 | Brandt     | Comp. Sci. | 184000.00
  98345 | Kim        | Elec. Eng. | 160000.00
  11111 | Jaewon     | Comp. Sci. | 170000.00
 (13 rows)

 practice2=*# 
```

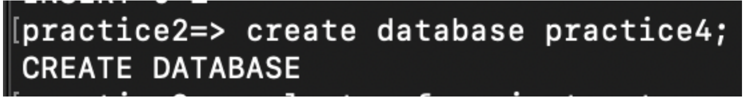
```
[practice2=# begin transaction;
 BEGIN
[practice2=*# select id, name, dept_name from instructor
[practice2-*# where dept_name = 'Comp. Sci.';
   id   |    name    | dept_name
 -------+------------+------------
  10101 | Srinivasan | Comp. Sci.
  45565 | Katz       | Comp. Sci.
  83821 | Brandt     | Comp. Sci.
 (3 rows)

[practice2=*# select id, name, salary from instructor
[practice2-*# where salary < 70000;
   id   |    name    |  salary
 -------+------------+----------
  10101 | Srinivasan | 65000.00
  15151 | Mozart     | 40000.00
  32343 | El Said    | 60000.00
  58583 | Califieri  | 62000.00
 (4 rows)

 practice2=*# 
```

3. Make users and set up a few authorization rules; Show some non-authorized access.

- ✓ Jaewon이라는 user를 생성하고 데이터베이스를 만들 수 있는 권한을 줬다.



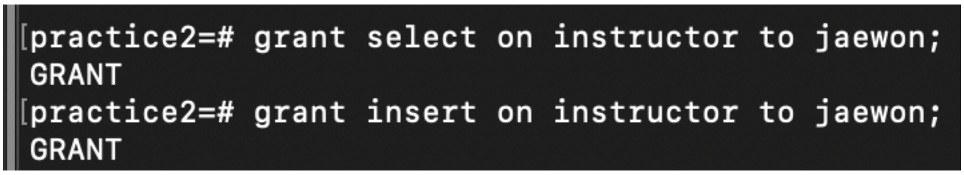
```
[practice2=# create user jaewon password '1234' createdb;
 CREATE ROLE
[practice2=# \du;
                                   List of roles
  Role name |                         Attributes                         | Member of
 -----------+------------------------------------------------------------+-----------
  jaewon    | Create DB                                                  | {}
  postgres  | Superuser, Create role, Create DB, Replication, Bypass RLS | {}
```



```
[practice2=> create database practice4;
 CREATE DATABASE
```

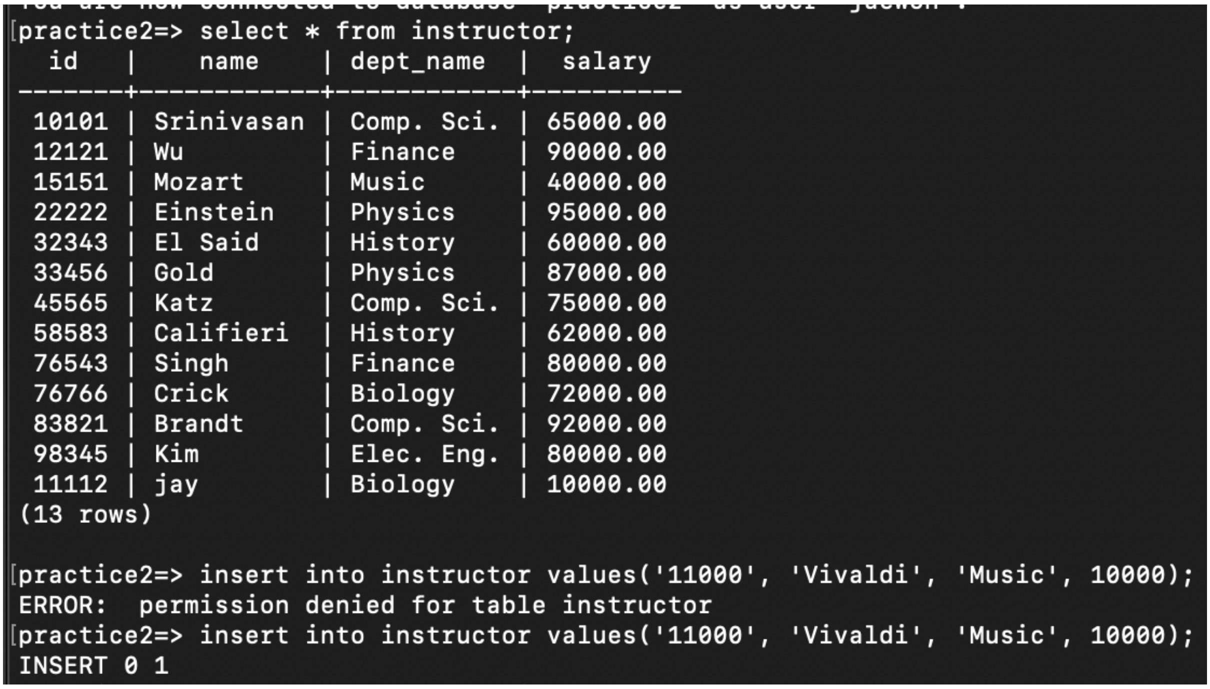
2017320114_최재원_실습3

- ✓ Select 권한을 주고 실행해보고, insert 권한을 주고 차례대로 실행해본 결과다.



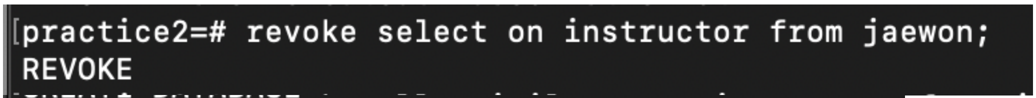
```
[practice2=# grant select on instructor to jaewon;
GRANT
[practice2=# grant insert on instructor to jaewon;
GRANT
```

- ✓ Select 권한은 실행이 되고 insert는 안되다가 insert 권한을 받고 insert도 실행해보았다.

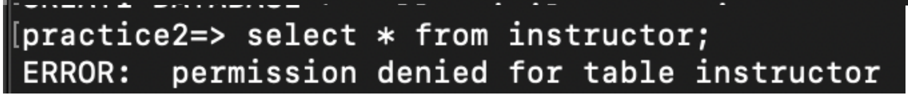


```
[practice2=> select * from instructor;
  id   |    name    | dept_name  |  salary
-------+------------+------------+----------
 10101 | Srinivasan | Comp. Sci. | 65000.00
 12121 | Wu         | Finance    | 90000.00
 15151 | Mozart     | Music      | 40000.00
 22222 | Einstein   | Physics    | 95000.00
 32343 | El Said    | History    | 60000.00
 33456 | Gold       | Physics    | 87000.00
 45565 | Katz       | Comp. Sci. | 75000.00
 58583 | Califieri  | History    | 62000.00
 76543 | Singh      | Finance    | 80000.00
 76766 | Crick      | Biology    | 72000.00
 83821 | Brandt     | Comp. Sci. | 92000.00
 98345 | Kim        | Elec. Eng. | 80000.00
 11112 | jay        | Biology    | 10000.00
(13 rows)

[practice2=> insert into instructor values('11000', 'Vivaldi', 'Music', 10000);
ERROR:  permission denied for table instructor
[practice2=> insert into instructor values('11000', 'Vivaldi', 'Music', 10000);
INSERT 0 1
```

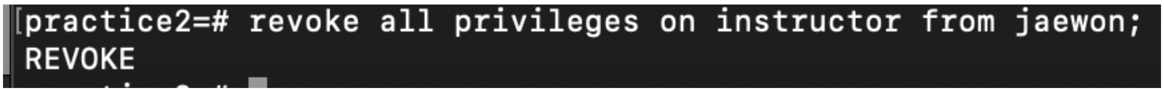
- ✓ 차례대로 revoke를 통해서 권한을 없애 보았다.



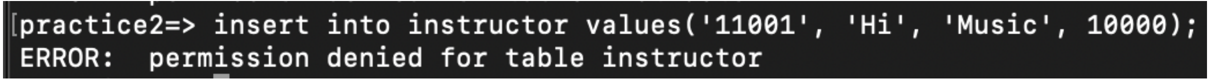
```
[practice2=# revoke select on instructor from jaewon;
REVOKE
```



```
[practice2=> select * from instructor;
ERROR:  permission denied for table instructor
```



```
[practice2=# revoke all privileges on instructor from jaewon;
REVOKE
```

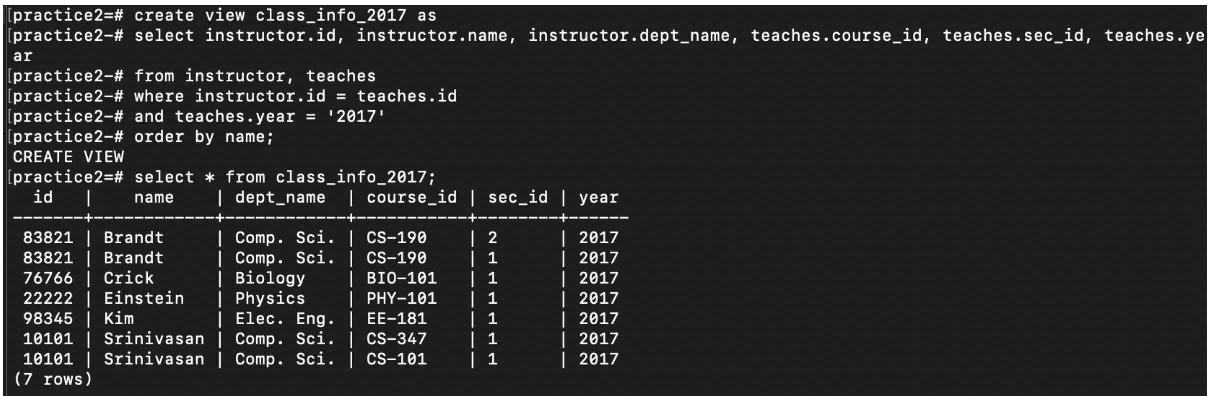


```
[practice2=> insert into instructor values('11001', 'Hi', 'Music', 10000);
ERROR:  permission denied for table instructor
```

2017320114_최재원_실습3

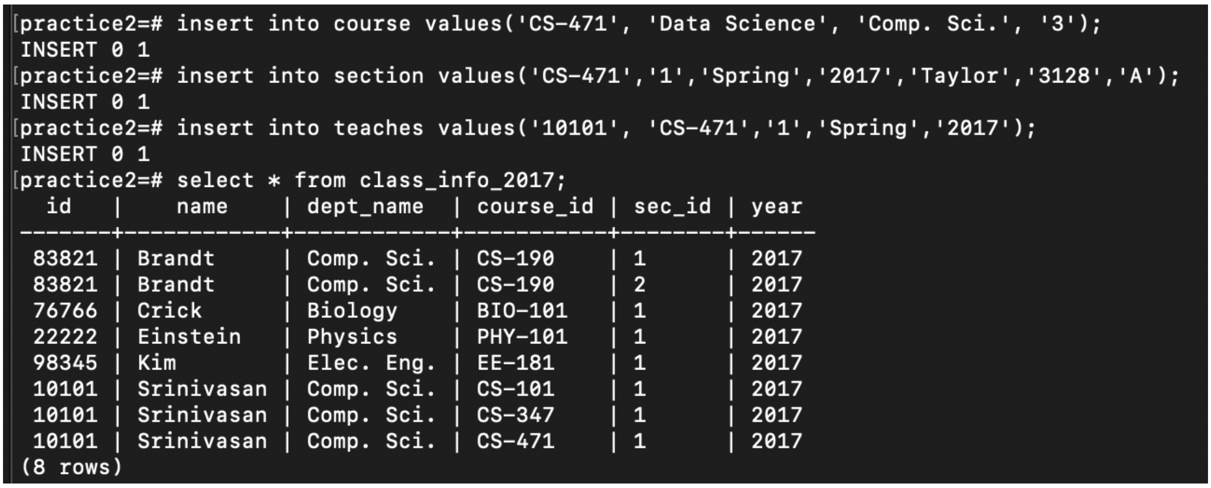
4. Create some views and show how view maintenance works and how view update is processed

- ✓ 2017년에 열린 강의 목록을 교수님의 정보와 함께 보일 수 있도록 view를 생성해 보았다.



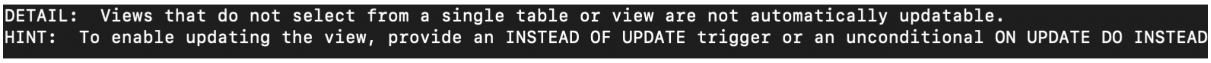
```
[practice2=# create view class_info_2017 as
[practice2-# select instructor.id, instructor.name, instructor.dept_name, teaches.course_id, teaches.sec_id, teaches.ye
ar
[practice2-# from instructor, teaches
[practice2-# where instructor.id = teaches.id
[practice2-# and teaches.year = '2017'
[practice2-# order by name;
CREATE VIEW
[practice2=# select * from class_info_2017;
  id   |    name    | dept_name  | course_id | sec_id | year
-------+------------+------------+-----------+--------+------
 83821 | Brandt     | Comp. Sci. | CS-190    | 2      | 2017
 83821 | Brandt     | Comp. Sci. | CS-190    | 1      | 2017
 76766 | Crick      | Biology    | BIO-101   | 1      | 2017
 22222 | Einstein   | Physics    | PHY-101   | 1      | 2017
 98345 | Kim        | Elec. Eng. | EE-181    | 1      | 2017
 10101 | Srinivasan | Comp. Sci. | CS-347    | 1      | 2017
 10101 | Srinivasan | Comp. Sci. | CS-101    | 1      | 2017
(7 rows)
```

- ✓ 2017년에 수업이 진행된 데이터과학이라는 정보가 데이터베이스에서 누락이 되어서 원본 (Source)에서 차례대로 update를 해주었고, 자동으로 VIEW에서도 update가 된 것을 확인할 수 있었다.



```
[practice2=# insert into course values('CS-471', 'Data Science', 'Comp. Sci.', '3');
INSERT 0 1
[practice2=# insert into section values('CS-471','1','Spring','2017','Taylor','3128','A');
INSERT 0 1
[practice2=# insert into teaches values('10101', 'CS-471','1','Spring','2017');
INSERT 0 1
[practice2=# select * from class_info_2017;
  id   |    name    | dept_name  | course_id | sec_id | year
-------+------------+------------+-----------+--------+------
 83821 | Brandt     | Comp. Sci. | CS-190    | 1      | 2017
 83821 | Brandt     | Comp. Sci. | CS-190    | 2      | 2017
 76766 | Crick      | Biology    | BIO-101   | 1      | 2017
 22222 | Einstein   | Physics    | PHY-101   | 1      | 2017
 98345 | Kim        | Elec. Eng. | EE-181    | 1      | 2017
 10101 | Srinivasan | Comp. Sci. | CS-101    | 1      | 2017
 10101 | Srinivasan | Comp. Sci. | CS-347    | 1      | 2017
 10101 | Srinivasan | Comp. Sci. | CS-471    | 1      | 2017
(8 rows)
```

- ✓ 하지만 단순히 view에서만 임의로 만들어낸 정보를 update 하려고 했을 때는 에러가 나왔다



```
DETAIL:  Views that do not select from a single table or view are not automatically updatable.
HINT:  To enable updating the view, provide an INSTEAD OF UPDATE trigger or an unconditional ON UPDATE DO INSTEAD
```

- ✓ 이번에는 instructor의 id랑 salary만 따로 view로 설정을 해준 다음에 foreign key, primary key constraint가 안 걸려 있는 salary만 view에서 update를 해 보았더니 update가 되었고 원본 (source)도 update가 되었다.

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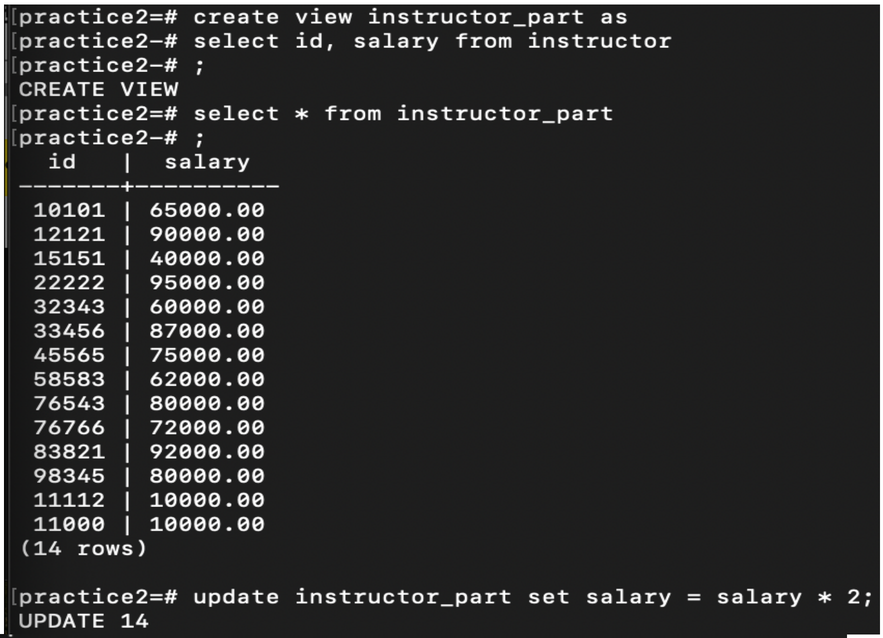
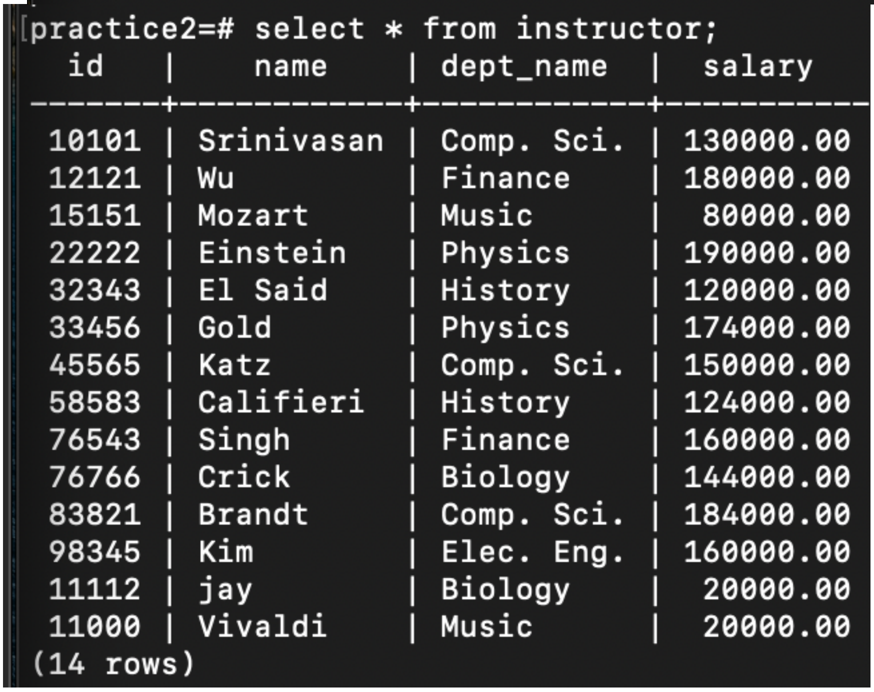


```
[practice2=# create view instructor_part as
[practice2-# select id, salary from instructor
[practice2-# ;
CREATE VIEW
[practice2=# select * from instructor_part
[practice2-# ;
  id   |  salary
-------+----------
 10101 | 65000.00
 12121 | 90000.00
 15151 | 40000.00
 22222 | 95000.00
 32343 | 60000.00
 33456 | 87000.00
 45565 | 75000.00
 58583 | 62000.00
 76543 | 80000.00
 76766 | 72000.00
 83821 | 92000.00
 98345 | 80000.00
 11112 | 10000.00
 11000 | 10000.00
(14 rows)

[practice2=# update instructor_part set salary = salary * 2;
UPDATE 14
```



```
[practice2=# select * from instructor;
  id   |    name    | dept_name  |  salary
-------+------------+------------+-----------
 10101 | Srinivasan | Comp. Sci. | 130000.00
 12121 | Wu         | Finance    | 180000.00
 15151 | Mozart     | Music      |  80000.00
 22222 | Einstein   | Physics    | 190000.00
 32343 | El Said    | History    | 120000.00
 33456 | Gold       | Physics    | 174000.00
 45565 | Katz       | Comp. Sci. | 150000.00
 58583 | Califieri  | History    | 124000.00
 76543 | Singh      | Finance    | 160000.00
 76766 | Crick      | Biology    | 144000.00
 83821 | Brandt     | Comp. Sci. | 184000.00
 98345 | Kim        | Elec. Eng. | 160000.00
 11112 | jay        | Biology    |  20000.00
 11000 | Vivaldi    | Music      |  20000.00
(14 rows)
```

<view update 후 결과>