



دانشگاه صنعتی امیرکبیر
(پلی تکنیک تهران)

تمرین چهارم

آز پایگاه داده

سه شنبه ها ۱۶.۳۰-۱۹

عطیه براتی نیا ۹۶۳۱۰۱۰

سوال ۱

```
sql ='''
CREATE EXTENSION IF NOT EXISTS tablefunc;
select * from crosstab(
    'select c.name, s.store_id, count(r.rental_id)
    from rental r
    left join inventory i on i.inventory_id=r.inventory_id
    left join store s on s.store_id=i.store_id
    left join film f on f.film_id=i.film_id
    left join film_category fc on fc.film_id=f.film_id
    left join category c on c.category_id=fc.category_id
    GROUP BY s.store_id, c.name',
    'select m from generate_series(1,2) m'
) as (
name varchar,
"store_1" int,
"store_2" int
);
'''
```

خروجی در تصویر زیر آمده است:

```
['name', 'store_1', 'store_2']
('Sports', 555, None)
('Sci-Fi', 521, None)
('Horror', 386, None)
('Animation', None, 598)
('Documentary', None, 600)
('Classics', 447, None)
('Comedy', None, 439)
('Sports', None, 624)
('Horror', None, 460)
('Documentary', 450, None)
('New', None, 438)
('Action', None, 516)
('Family', None, 539)
('Foreign', None, 509)
('Music', 436, 394)
('Children', 453, None)
('Games', 455, None)
('Animation', 568, None)
('Drama', 576, None)
('Comedy', 502, None)
('Sci-Fi', None, 580)
('Foreign', 524, None)
('Classics', None, 492)
('New', 502, None)
('Travel', 395, None)
('Children', None, 492)
('Action', 596, None)
('Travel', None, 442)
('Drama', None, 484)
('Games', None, 514)
('Family', 557, None)
```

سوال ۲

```
sql ='''
select

case grouping(year)
  when 0 then year
  when 1 then NULL
  end as year,
case grouping(month)
  when 0 then month
  when 1 then NULL
  end as month,
case grouping(day)
  when 0 then day
  when 1 then NULL
  end as day,
sum(amount) from
  (select amount, EXTRACT(YEAR FROM payment_date) as year,
    EXTRACT(MONTH FROM payment_date) as month,
    EXTRACT(DAY FROM payment_date) as day
    from payment) as inner_query
group by rollup(year, month, day);

'''
```

خروجی:

```

['year', 'month', 'day', 'sum']
(Decimal('2007'), Decimal('2'), Decimal('14'), Decimal('116.73'))
(Decimal('2007'), Decimal('2'), Decimal('15'), Decimal('1188.92'))
(Decimal('2007'), Decimal('2'), Decimal('16'), Decimal('1154.18'))
(Decimal('2007'), Decimal('2'), Decimal('17'), Decimal('1188.17'))
(Decimal('2007'), Decimal('2'), Decimal('18'), Decimal('1275.98'))
(Decimal('2007'), Decimal('2'), Decimal('19'), Decimal('1290.90'))
(Decimal('2007'), Decimal('2'), Decimal('20'), Decimal('1219.09'))
(Decimal('2007'), Decimal('2'), Decimal('21'), Decimal('917.87'))
(Decimal('2007'), Decimal('2'), None, Decimal('8351.84'))
(Decimal('2007'), Decimal('3'), Decimal('1'), Decimal('2808.24'))
(Decimal('2007'), Decimal('3'), Decimal('2'), Decimal('2550.05'))
(Decimal('2007'), Decimal('3'), Decimal('16'), Decimal('299.28'))
(Decimal('2007'), Decimal('3'), Decimal('17'), Decimal('2442.16'))
(Decimal('2007'), Decimal('3'), Decimal('18'), Decimal('2701.76'))
(Decimal('2007'), Decimal('3'), Decimal('19'), Decimal('2617.69'))
(Decimal('2007'), Decimal('3'), Decimal('20'), Decimal('2669.89'))
(Decimal('2007'), Decimal('3'), Decimal('21'), Decimal('2868.27'))
(Decimal('2007'), Decimal('3'), Decimal('22'), Decimal('2586.79'))
(Decimal('2007'), Decimal('3'), Decimal('23'), Decimal('2342.43'))
(Decimal('2007'), Decimal('3'), None, Decimal('23886.56'))
(Decimal('2007'), Decimal('4'), Decimal('5'), Decimal('273.36'))
(Decimal('2007'), Decimal('4'), Decimal('6'), Decimal('2077.14'))
(Decimal('2007'), Decimal('4'), Decimal('7'), Decimal('1984.28'))
(Decimal('2007'), Decimal('4'), Decimal('8'), Decimal('2227.84'))
(Decimal('2007'), Decimal('4'), Decimal('9'), Decimal('2067.86'))
(Decimal('2007'), Decimal('4'), Decimal('10'), Decimal('1973.18'))
(Decimal('2007'), Decimal('4'), Decimal('11'), Decimal('1940.32'))
(Decimal('2007'), Decimal('4'), Decimal('12'), Decimal('1930.48'))
(Decimal('2007'), Decimal('4'), Decimal('26'), Decimal('347.21'))
(Decimal('2007'), Decimal('4'), Decimal('27'), Decimal('2673.57'))
(Decimal('2007'), Decimal('4'), Decimal('28'), Decimal('2622.73'))
(Decimal('2007'), Decimal('4'), Decimal('29'), Decimal('2717.60'))
(Decimal('2007'), Decimal('4'), Decimal('30'), Decimal('5723.89'))
(Decimal('2007'), Decimal('4'), None, Decimal('28559.46'))
(Decimal('2007'), Decimal('5'), Decimal('14'), Decimal('514.18'))
(Decimal('2007'), Decimal('5'), None, Decimal('514.18'))
(Decimal('2007'), None, None, Decimal('61312.04'))
(None, None, None, Decimal('61312.04'))

```

سوال ۳

این کوئری تعداد فروش در روزهای مختلف سال، فروش ماه‌های مختلف سال، فروش سال‌های مختلف، فروش هر ماه خاص در طول چند سال، فروش هر روز ماه خاص در طول چند سال، فروش روز ۱ تا ۳۰ در سال‌های مختلف و ... را نشان می‌دهد. cube جمع فروش در همه‌ی حالت‌های مختلف روز و ماه و سال را می‌دهد.

```

sql ='''
select

case grouping(year)
  when 0 then year
  when 1 then NULL
end as year,
case grouping(month)
  when 0 then month
  when 1 then NULL
end as month,
case grouping(day)
  when 0 then day
  when 1 then NULL
end as day,
sum(amount) from
  (select amount, EXTRACT(YEAR FROM payment_date) as year,
    EXTRACT(MONTH FROM payment_date) as month,
    EXTRACT(DAY FROM payment_date) as day
  from payment) as inner_query
group by cube(year, month, day);

'''

```

بخشی از خروجی:

```

['year', 'month', 'day', 'sum']
(Decimal('2007'), Decimal('2'), Decimal('14'), Decimal('116.73'))
(Decimal('2007'), Decimal('2'), Decimal('15'), Decimal('1188.92'))
(Decimal('2007'), Decimal('2'), Decimal('16'), Decimal('1154.18'))
(Decimal('2007'), Decimal('2'), Decimal('17'), Decimal('1188.17'))
(Decimal('2007'), Decimal('2'), Decimal('18'), Decimal('1275.98'))
(Decimal('2007'), Decimal('2'), Decimal('19'), Decimal('1290.90'))
(Decimal('2007'), Decimal('2'), Decimal('20'), Decimal('1219.09'))
(Decimal('2007'), Decimal('2'), Decimal('21'), Decimal('917.87'))
(Decimal('2007'), Decimal('2'), None, Decimal('8351.84'))
(Decimal('2007'), Decimal('3'), Decimal('1'), Decimal('2808.24'))
(Decimal('2007'), Decimal('3'), Decimal('2'), Decimal('2550.05'))
(Decimal('2007'), Decimal('3'), Decimal('16'), Decimal('299.28'))
(Decimal('2007'), Decimal('3'), Decimal('17'), Decimal('2442.16'))
(Decimal('2007'), Decimal('3'), Decimal('18'), Decimal('2701.76'))
(Decimal('2007'), Decimal('3'), Decimal('19'), Decimal('2617.69'))
(Decimal('2007'), Decimal('3'), Decimal('20'), Decimal('2669.89'))
(Decimal('2007'), Decimal('3'), Decimal('21'), Decimal('2868.27'))
(Decimal('2007'), Decimal('3'), Decimal('22'), Decimal('2586.79'))

```

سوال ۴

```
sql = '''
select
f.film_id, name as category_name, length,
rank() over(partition by name order by length)

from film f left join film_category fc on f.film_id=fc.film_id
left join category c on c.category_id=fc.category_id
;

'''
```

بخشی از خروجی:

```
['film_id', 'category_name', 'length', 'rank']
(869, 'Action', 47, 1)
(292, 'Action', 51, 2)
(542, 'Action', 52, 3)
(111, 'Action', 52, 3)
(794, 'Action', 52, 3)
(697, 'Action', 53, 6)
(97, 'Action', 56, 7)
(732, 'Action', 58, 8)
(303, 'Action', 58, 8)
(205, 'Action', 58, 8)
(586, 'Action', 60, 11)
(253, 'Action', 61, 12)
(964, 'Action', 61, 12)
(329, 'Action', 63, 14)
(911, 'Action', 64, 15)
(664, 'Action', 65, 16)
(38, 'Action', 68, 17)
(67, 'Action', 77, 18)
```