אלגברה רלציונית

Query 1

```
select distinct supply_location from book
inner join supply
on book.supply_id = supply.supply_id
and book_title= ?
where supply.supply_location='store' or supply.supply_location='storage';
```

π distinct 𝜎 ((book) ⋈ book.supply_id = supply.supply_id (supply) AND book title = ? (supply.supply_location='store' or supply.supply_location='storage')(book))

Query 2

```
select person_first_name,person_last_name,min(customer_join_date) from customer
inner join person on person.person_id = customer.person_id;
```

π person_first_name, person_last_name,min(customer_join_date) 𝜎 ((customer) ⋈ person.person_id = customer.person_id)

Query 3

```
select book_title,book_author,min(supply_date) from supply
inner join book on supply.supply_id = book.supply_id
where supply_location='store' or supply_location='storage';
```

π book_title,book_author,min(supply_date) 𝜎 ((supply) ⋈ supply.supply_id = book.supply_id(supply_location='store' or supply_location='storage')

Query 4

```
select book.book_title,book.book_author,person_first_name,person_last_name,order_date
from _order
inner join book on _order.book_id = book.book_id
inner join customer on customer.customer_id = _order.customer_id
inner join person on person.person_id = customer.person_id
order by order_date;
```

π(book.book_title,book.book_author,person_first_name,person_last_name,order_date) 𝜎((_order) ⋈ _order.book_id = book.book_id(book) ⋈ customer.customer_id = _order.customer_id(customer) ⋈ person.person_id = customer.person_id

(person)) τ order_date

<u>Query 5</u>

```
select book_title,book_author,count(book.book_title)

from book

inner join buy_book_store on book.book_id = buy_book_store.book_id

and book.book_title= ? ;
```

π (book_title,book_author,count(book.book_title)) 𝜎((buy_book_store) ⋈ book.book_id = buy_book_store.book_id and book.book_title = ? (book))

<u>Query 6</u>

```
SELECT  book.book_author,

       max(supply.supply_sold)

FROM    book

       INNER JOIN _order

          ON book.book_id = _order.order_id

       INNER JOIN supply

          ON book.supply_id = supply.supply_id

WHERE   supply.supply_date BETWEEN ? AND ?;
```

π book.book_author,max(supply.supply_sold) 𝜎 ((_order) ⋈ book.book_id = _order.order_id (supply) ⋈ book.supply_id = supply.supply_id (supply.supply_date BETWEEN ? AND ?)(book))

<u>Query 7</u>

```
Select
person.person_first_name,person.person_last_name,sum(transactions.transactions_book_sold)

from transactions

inner join customer on transactions.customer_id = customer.customer_id

inner join person on person.person_id = customer.person_id

group by transactions.customer_id
```

```
order by sum(transactions.transactions_book_sold) desc

limit 3;
```

π(person.person_first_name,person.person_last_name,sum(transactions.transactions_book_sold) *σ* ((customer) ⋈ transactions.customer_id = customer.customer_id (person) ⋈ person.person_id = customer.person_id) γ transactions.customer_id τ sum(transactions.transactions_book_sold) desc limit 3(transactions))

Query 8

```
SELECT          book.book_title,publisher.publisher_translator_name
count(publisher.publisher_translator_name)
FROM            book
                        INNER JOIN      supply
                                ON supply.supply_id = book.supply_id and
         supply.supply_location = 'store' or supply.supply_location = 'storge'
                        INNER JOIN publisher
                                ON publisher.book_id = publisher.publisher_id
GROUP BY                publisher.publisher_translator_name
                        ORDER BY count(publisher.publisher_translator_name) desc
 limit 1;
```

π book.book_title,publisher.publisher_translator_namecount (publisher.publisher_translator_name) *σ* ((supply) ⋈ supply.supply_id = book.supply_id and and supply.supply_location = 'store' or supply.supply_location = 'storge' (publisher) ⋈ publisher.book_id = publisher.publisher_id γ publisher.publisher_translator_name τ count(publisher.publisher_translator_name) desc limit 1 (book))

Query 9

```
select book.book_title,date(transaction_date),store.store_book_price_sell

from transactions

inner join customer on customer.customer_id = transactions.customer_id

inner join person on person.person_id = customer.person_id

inner join delivery on delivery.transactions_id = transactions.transactions_id

inner join buy_book_store on buy_book_store.transactions_id = transactions.transactions_id

inner join book on book.book_id = buy_book_store.book_id or book.book_id = delivery.book_id

inner join store on store.buy_book_store_id = buy_book_store.buy_book_store_id

or store.delivery_id = delivery.delivery_id

where person.person_first_name = 'nahman' and person.person_last_name=  'nahamani'

group by book_title
```

```
order by transactions.transaction_date;
```

π book.book_title,date(transaction_date), store.store_book_price_sell σ(transactions)

⋈customer.customer_id = transactions.customer_id

⋈person.person_id = customer.person_id

⋈delivery.transactions_id = transactions.transactions_id

⋈buy_book_store.transactions_id = transactions.transactions_id

⋈book.book_id = buy_book_store.book_id OR book.book_id = delivery.book_id

⋈store.buy_book_store_id = buy_book_store.buy_book_store_id OR store.delivery_id = delivery.delivery_id

person.person_first_name = '?' and person.person_last_name= '?'

group by book_title ← τ transactions.transaction_date;

<u>Query 10</u>

```
select person.person_first_name,person.person_last_name,book.book_title,
date(order_date),supply.supply_location,

transactions.transactions_id

from _order

INNER JOIN customer ON customer.customer_id = _order.customer_id

inner join person on person.person_id = customer.person_id

INNER JOIN book ON book.book_id = _order.book_id

INNER JOIN supply ON supply.supply_id = book.supply_id

INNER JOIN buy_book_store ON buy_book_store.book_id = book.book_id

INNER JOIN delivery ON delivery.book_id = book.book_id

INNER JOIN transactions on customer.customer_id = transactions.customer_id

where customer.customer_id='2' and supply.supply_location='store' or
supply.supply_location='storge'

group by order_id

order by order_date;
```

π person.person_first_name, person.person_last_name, book.book_title, date(order_date), supply.supply_location, transactions.transactions_id σ(_order)

⋈customer.customer_id = _order.customer_id

⋈person.person_id = customer.person_id

⋈book.book_id = _order.book_id

⋈supply.supply_id = book.supply_id

⋈buy_book_store.book_id = book.book_id

⋈delivery.book_id = book.book_id

⋈customer.customer_id = transactions.customer_id

customer.customer_id='?' and supply.supply_location='store' or supply.supply_location='storge'

group by order_id ← τ order_date;

Query 11

```sql
select distinct delivery_tracking_number,book.book_author,
book_details.book_details_book_weight, book_details_book_weight*2 as delivery_price from delivery
inner join book on book.book_id = delivery.book_id
inner join book_details on book_details.book_details_id = book_details.book_details_id
where book_title = ?
group by delivery_id;
```

π delivery_tracking_number,book.book_author, book_details.book_details_book_weight
σ(delivery) ⋈book.book_id = delivery.book_id

⋈book_details.book_details_id = book_details.book_details_id

book_title = '?' OR book_title ='?'

group by delivery_id;

Query 12

```sql
select person.person_first_name,person.person_last_name ,date(transaction_date),
transactions_price,transactions_book_sold, delivery.delivery_id,
count(delivery.delivery_id)
from transactions
inner join customer on customer.customer_id = transactions.customer_id
inner join person on person.person_id = customer.person_id
inner join delivery on delivery.transactions_id = transactions.transactions_id
where  customer.customer_id=?
```

group by transactions.transactions_id

#group by delivery.delivery_id

having count(delivery.delivery_id) >1;

π person.person_first_name, person.person_last_name , date(transaction_date), transactions_price, transactions_book_sold, delivery.delivery_id, count(delivery.delivery_id) σ(transactions)

⋈ customer.customer_id = transactions.customer_id

⋈ person.person_id = customer.person_id

⋈ delivery.transactions_id = transactions.transactions_id

customer.customer_id= ?

group by transactions.transactions_id

count(delivery.delivery_id) >1;

<u>**Query 13**</u>

select delivery_tracking_number,delivery_status

from delivery where delivery_tracking_number= ?;

π delivery_tracking_number ,delivery_status

σ(delivery) delivery_tracking_number='?';

<u>**Query 14**</u>

select month(transaction_date),transactions_book_sold,sum(transactions_price) from transactions

inner join delivery on delivery.transactions_id = transactions.transactions_id

inner join post_type on delivery.post_type_id = post_type.post_type_id

where post_type_company = 'Xpress' and month(transaction_date) = ?;

π month(transaction_date), transactions_book_sold, sum(transactions_price)
σ(transactions)
⋈ delivery.transactions_id = transactions.transactions_id(delivery)

⋈ delivery.post_type_id = post_type.post_type_id(post_type)

post_type_company = 'Xpress' and month(transaction_date) = ?;

Query 15

```
select month(transaction_date), sum(transactions_price) from transactions

WHERE transactions_payment_method = 'Bit'

and month(transaction_date) = ?;
```

π month(transaction_date), sum(transactions_price) σ(transactions)

transactions_payment_method = 'Bit'

AND month(transaction_date) = ?;

Query 16

```
select
transactions.transactions_id,transactions.transactions_book_sold,transactions.transaction_date,

sum(store_book_price_sell-store_book_price_buy) as sum_transactions from store

INNER JOIN buy_book_store ON buy_book_store.buy_book_store_id = store.buy_book_store_id

INNER JOIN delivery ON delivery.delivery_id = store.delivery_id

INNER JOIN transactions ON delivery.transactions_id = transactions.transactions_id

or buy_book_store.transactions_id = transactions.transactions_id

group by store_id

having transaction_date >= date_sub(now(), interval 12 month)

and sum_transactions >

(select avg(store_book_price_sell-store_book_price_buy) as avg_store from store);
```

ρ(sum_transactions) π(transactions.transactions_id, transactions.transactions_book_sold, transactions.transaction_date, sum(store_book_price_sell-store_book_price_buy)) σ(store)

⋈ buy_book_store.buy_book_store_id = store.buy_book_store_id

⋈ delivery.delivery_id = store.delivery_id

⋈ delivery.transactions_id = transactions.transactions_id

OR buy_book_store.transactions_id = transactions.transactions_id

group by store_id

transaction_date >= date_sub(now(), interval 12 month)

AND sum_transactions >

(select avg(store_book_price_sell-store_book_price_buy) as avg_store from store);

Query 17

```
select post_type_company,count(post_type_company)
FROM post_type
INNER JOIN      delivery
ON post_type.post_type_id =  delivery.post_type_id
INNER JOIN transactions
ON  transactions.transactions_id= delivery.transactions_id
where transaction_date >= date_sub(now(), interval 12 month)
group by post_type_company;
```

π post_type_company, count(post_type_company) σ (post_type)

⋈post_type.post_type_id = delivery.post_type_id

⋈ transactions.transactions_id= delivery.transactions_id

transaction_date >= date_sub(now(), interval 12 month)

group by post_type_company;

Query 18

```
select count(publisher_name),delivery_id,book_title,publisher_name from delivery
INNER JOIN      book
                ON delivery.book_id =  book.book_id
INNER JOIN      publisher
                ON book.book_id =  publisher.book_id
group by book_title
having count(publisher_name) > 1;
```

π count(publisher_name),delivery_id,book_title,publisher_name σ (delivery)

⋈ delivery.book_id = book.book_id

⋈book.book_id = publisher.book_id

group by book_title

count(publisher_name) > 1;

Query 19

```
select person_first_name,person_last_name
from transactions
inner join customer on transactions.customer_id = customer.customer_id
inner join person on customer.person_id = person.person_id
where transaction_date < ?
group by person.person_id;
```

π person_first_name,person_last_name σ (transactions)

⋈ transactions.customer_id = customer.customer_id

⋈customer.person_id = person.person_id

transaction_date < '2018-07-30'

group by person.person_id;

Query 20

```
select person.person_first_name,person.person_last_name,
DATEDIFF(order_date_arrive, transactions.transaction_date)
from _order
inner join customer on _order.customer_id = customer.customer_id
inner join person on person.person_id = customer.person_id
inner join transactions on transactions.transactions_id = _order.transactions_id
where DATEDIFF(order_date_arrive, transactions.transaction_date) > 14;
```

π person.person_first_name, person.person_last_name, DATEDIFF(order_date_arrive,transactions.transaction_date) σ (_order)

⋈_order.customer_id = customer.customer_id

⋈person.person_id = customer.person_id

⋈transactions.transactions_id = _order.transactions_id

DATEDIFF(order_date_arrive, transactions.transaction_date) > 14;

__**Query 21**__

SELECT supply_location,YEAR(supply_date),MONTH(supply_date),sum(supply_quantity)

FROM supply

where supply_location= 'storage'

GROUP BY YEAR(supply_date),MONTH(supply_date)

ORDER BY YEAR(supply_date);

π supply_location ,YEAR(supply_date), MONTH(supply_date), sum(supply_quantity) σ (supply)

supply_location= 'storage'

GROUP BY YEAR(supply_date),MONTH(supply_date) ← τ YEAR(supply_date);

__**Query 22**__

select book_in_store_date between ? and ? ,

count(book.book_id),sum(store.store_book_price_buy)

from book_in_store

inner join store on store.store_id = book_in_store.store_id

inner join book on book.book_id = book_in_store.book_id

where book_in_store_date between ? and ? ;

π book_in_store_date between '?' AND '?', count(book.book_id), sum(store.store_book_price_buy)

σ (book_in_store)

⋈ store.store_id = book_in_store.store_id

⋈book.book_id = book_in_store.book_id

book_in_store_date between '?' and '?';

Query 23

```
select sum_pay_month,sum_sell_month,sum_sell_month-sum_pay_month as profit from

(select sum(store_payment_electric_bill) + sum(store_payment_water_bill) + sum(store_payment_rent)

+ sum(store_payment_tax)

+ sum(store_payment_other) + sum(store_payment_home_number) + sum(store_payment_phone_number)

AS sum_pay_month,

sum(store_book_price_sell)-sum(store_book_price_buy) + sum(transactions_price) AS sum_sell_month

from store_payment

inner join store on store_payment.store_id = store.store_id

inner join buy_book_store on buy_book_store.buy_book_store_id = store.buy_book_store_id

inner join delivery on delivery.delivery_id = store.delivery_id

inner join transactions on transactions.transactions_id = delivery.transactions_id

or buy_book_store.transactions_id = transactions.transactions_id

where store_payment_month = ? and store_payment_year = ?) as a;
```

ρ(profit) π (sum_pay_month, sum_sell_month, sum_sell_month-sum_pay_month)

σ (ρ(sum_pay_month, sum(store_book_price_sell)-sum(store_book_price_buy) + sum(transactions_price)) (π sum(store_payment_electric_bill) + sum(store_payment_water_bill) + sum(store_payment_rent)

+ sum(store_payment_tax) + sum(store_payment_other) + sum(store_payment_home_number) +sum(store_payment_phone_number))

ρ(sum_sell_month)

σ (store_payment)

⋈store_payment.store_id = store.store_id

⋈buy_book_store.buy_book_store_id = store.buy_book_store_id

⋈delivery.delivery_id = store.delivery_id

⋈transactions.transactions_id = delivery.transactions_id

OR buy_book_store.transactions_id = transactions.transactions_id

ρ(a) store_payment_month = 4 and store_payment_year = 2007);

Query 24

```
SELECT YEAR(transaction_date),MONTH(transaction_date), AVG(transactions_price)
FROM transactions
GROUP BY YEAR(transaction_date),MONTH(transaction_date)
ORDER BY YEAR(transaction_date);
```

π (transaction_date),MONTH(transaction_date), AVG(transactions_price) σ (transactions)

GROUP BY YEAR(transaction_date), MONTH(transaction_date) ← τ YEAR(transaction_date);

Query 25

```
select person_first_name, person_last_name, sum(employee_working_hours)*30 from person
INNER JOIN employee
            ON person.person_id =  employee.person_id
WHERE person.person_first_name= ? and
person.person_last_name= ?;
```

π person_first_name, person_last_name, sum(employee_working_hours)*30 σ (person)

⋈person.person_id = employee.person_id

person.person_first_name= '?' AND person.person_last_name= '?';

Query 26

```
select person_first_name,person_last_name,count(transactions_id) from person
INNER JOIN      employee
                        ON person.person_id =  employee.person_id
INNER JOIN      transactions
                        ON employee.employee_id =  transactions.employee_id
where month(transaction_date) = ?
having  max(transactions_id);
```

π person_first_name,person_last_name,count(transactions_id) σ (person)

⋈person.person_id = employee.person_id

⋈employee.employee_id = transactions.employee_id

month(transaction_date) = ?

max(transactions_id);