Вариант №1

https://www.youtube.com/shorts/9xzX4ACDsEI

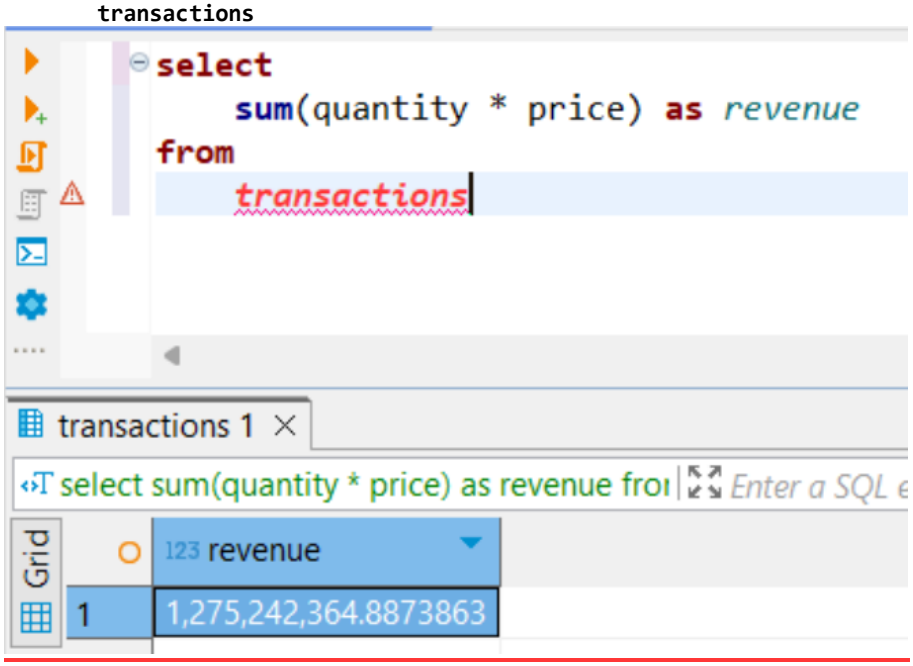
- Создание таблицы transaction и ее наполнение

```
create table transactions (
    transaction_id uint32,
    user_id uint32,
    product_id uint32,
    quantity uint8,
    price float32,
    transaction_date date
) engine = mergetree()
order by (transaction_id);


insert into transactions
select
        number as transaction_id,
        (intdiv(rand(),
        429496) % 10000) + 1 as user_id,
        (intdiv(rand(),
        429496) % 1000) + 1 as product_id,
        (intdiv(rand(),
        429496) % 100) + 1 as quantity,
        round(((rand() % 49500) / 100) + 5,
        2) as price,
        todate('2023-01-01') + (intdiv(rand(),
        429496) % 365) as transaction_date
from
        numbers(100000)
```

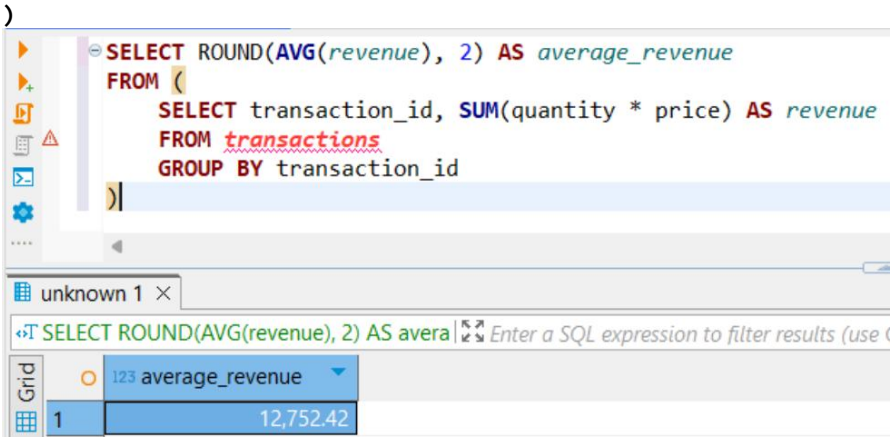
- Рассчитайте общий доход от всех операций

```
select
        sum(quantity * price) as revenue
from
        transactions
```



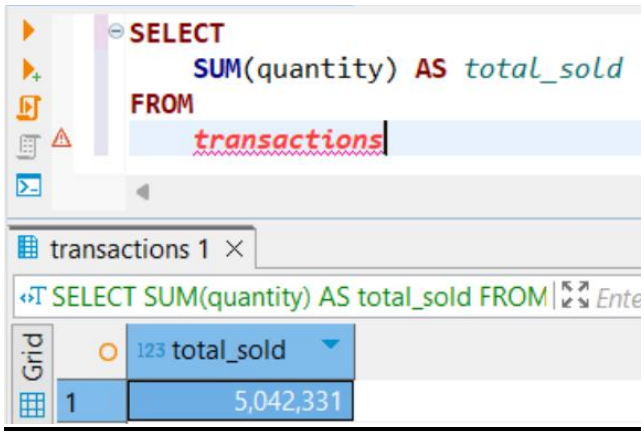
- Найдите средний доход с одной сделки

```
select round(avg(revenue), 2) as average_revenue
from (
    select transaction_id, sum(quantity * price) as revenue
    from transactions
    group by transaction_id
)
```



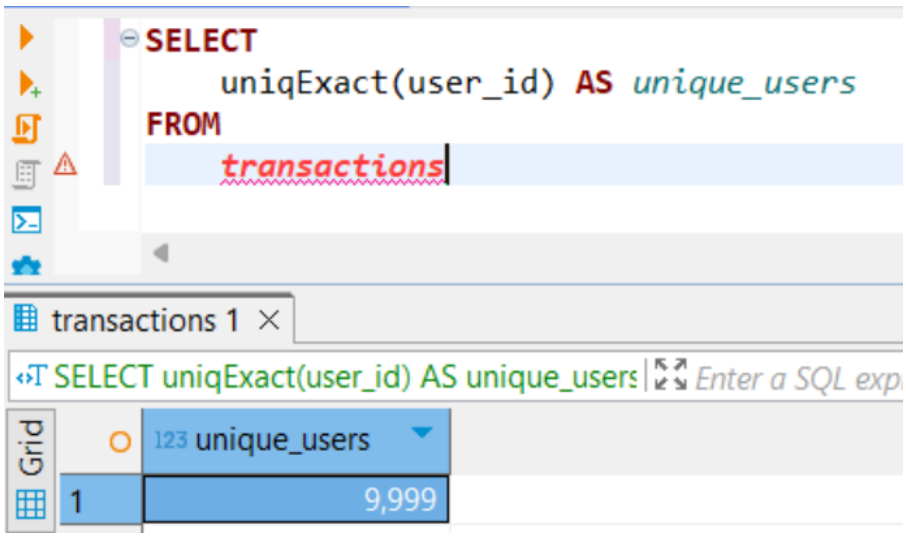
- Определите общее количество проданной продукции

```
select
        sum(quantity) as total_sold
from
        transactions
```



- Подсчитайте количество уникальных пользователей, совершивших покупку

```
select
        uniqexact(user_id) as unique_users
from
        transactions
```



- Преобразуйте `transaction_date` в **строку** формата `YYYY-MM-DD`

```
select
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    formatdatetime(transaction_date, '%y-%m-%d') as formatted_date
from transactions
```

```
SELECT
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    formatDateTime(transaction_date, '%Y-%m-%d') AS formatted_date
FROM transactions
```

transactions 1

SELECT transaction_id, user_id, product_id, | Enter a SQL expression to filter results (use Ctrl+Space)

	transaction_id	user_id	product_id	quantity	price	formatted_date
1	0	9,898	898	98	424.2	2023-02-12
2	1	6,767	767	67	361.8	2023-07-16
3	2	6,057	57	57	445.47	2023-08-05
4	3	918	918	18	301.59	2023-07-07
5	4	5,290	290	90	222.49	2023-06-29
6	5	4,248	248	48	187.87	2023-08-21
7	6	7,583	583	83	412.47	2023-10-10
8	7	271	271	71	259.15	2023-09-28
9	8	8,108	108	8	488.25	2023-03-19
10	9	4,932	932	32	84.96	2023-07-06

- Извлеките год и месяц из `transaction_date`

```
select
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    toyear(transaction_date) as year,
    tomonth(transaction_date) as month
from transactions
```

```
SELECT
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    toYear(transaction_date) AS year,
    toMonth(transaction_date) AS month
FROM transactions
```

transactions 1

SELECT transaction_id, user_id, product_id, | Enter a SQL expression to filter results (use Ctrl+Space)

	transaction_id	user_id	product_id	quantity	price	year	month
1	0	9,898	898	98	424.2	2,023	2
2	1	6,767	767	67	361.8	2,023	7
3	2	6,057	57	57	445.47	2,023	8
4	3	918	918	18	301.59	2,023	7
5	4	5,290	290	90	222.49	2,023	6
6	5	4,248	248	48	187.87	2,023	8
7	6	7,583	583	83	412.47	2,023	10
8	7	271	271	71	259.15	2,023	9
9	8	8,108	108	8	488.25	2,023	3
10	9	4,932	932	32	84.96	2,023	7
11	10	3,338	338	38	293.75	2,023	2

- Округлите `price` до ближайшего целого числа

```
select
    transaction_id,
    user_id,
    product_id,
    quantity,
    round(price) as rounded_price,
    transaction_date
from transactions
```

```
SELECT
    transaction_id,
    user_id,
    product_id,
    quantity,
    round(price) AS rounded_price,
    transaction_date
FROM transactions
```

transactions 1

SELECT transaction_id, user_id, product_id, Enter a SQL expression to filter results (use Ctrl+Space)

	transaction_id	user_id	product_id	quantity	rounded_price	transaction_date
1	0	9,898	898	98	424	2023-02-12
2	1	6,767	767	67	362	2023-07-16
3	2	6,057	57	57	445	2023-08-05
4	3	918	918	18	302	2023-07-07
5	4	5,290	290	90	222	2023-06-29

- Преобразуйте `transaction_id` в строку

```
select
    tostring(transaction_id) as transaction_id_str,
    user_id,
    product_id,
    quantity,
    price,
    transaction_date
from transactions
```

```
SELECT
    toString(transaction_id) AS transaction_id_str,
    user_id,
    product_id,
    quantity,
    price,
    transaction_date
FROM transactions
```

transactions 1

SELECT transaction_id, user_id, product_id, Enter a SQL expression to filter results (use Ctrl+Space)

	transaction_id	user_id	product_id	quantity	rounded_price	transaction_date
1	0	9,898	898	98	424	2023-02-12
2	1	6,767	767	67	362	2023-07-16
3	2	6,057	57	57	445	2023-08-05
4	3	918	918	18	302	2023-07-07
5	4	5,290	290	90	222	2023-06-29
6	5	4,248	248	48	188	2023-08-21

- Создайте простую UDF для расчета общей стоимости транзакции

```
create function calculate_total_cost as (quantity, price) ->
    quantity * price;
```

```
CREATE FUNCTION calculate_total_cost AS (quantity, price) ->
    quantity * price;
```

Statistics 1

Name	Value
Updated Rows	0
Query	CREATE FUNCTION calculate_total_cost AS (quantity, price) -> quantity * price
Start time	Mon Oct 21 13:40:09 MSK 2024
Finish time	Mon Oct 21 13:40:09 MSK 2024

- Используйте созданную UDF для расчета общей цены для каждой транзакции

```
select
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    calculate_total_cost(quantity, price) as total_cost
from transactions;
```

```
CREATE FUNCTION calculate_total_cost AS (quantity, price) ->
    quantity * price;

SELECT
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    calculate_total_cost(quantity, price) AS total_cost
FROM transactions;
```

transactions 1

SELECT transaction_id, user_id, product_id, | Enter a SQL expression to filter results (use Ctrl+Space)

	transaction_id	user_id	product_id	quantity	price	total_cost
1	0	9,898	898	98	424.2	41,571.6011962891
2	1	6,767	767	67	361.8	24,240.5991821289
3	2	6,057	57	57	445.47	25,391.7900695801
4	3	918	918	18	301.59	5,428.619934082
5	4	5,290	290	90	222.49	20,024.1004943848

- Создайте UDF для классификации транзакций на «высокоценные» и «малоценные» на основе порогового значения (например, 100)

```
create function classify_transaction as (quantity, price, threshold) ->
    if(quantity * price >= threshold, 'высокоценная', 'малоценная');
```

```
CREATE FUNCTION classify_transaction AS (quantity, price, threshold) ->
    if(quantity * price >= threshold, 'высокоценная', 'малоценная');
```

Statistics 1

Name	Value
Updated Rows	0
Query	CREATE FUNCTION classify_transaction AS (quantity, price, threshold) -> if(quantity * price >= threshold, 'высокоценная', 'малоценная')
Start time	Mon Oct 21 13:45:42 MSK 2024
Finish time	Mon Oct 21 13:45:42 MSK 2024

- Примените UDF для категоризации каждой транзакции

```
select
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    calculate_total_cost(quantity, price) as total_cost,
    classify_transaction(quantity, price, 100) as transaction_class
from transactions
order by transaction_id;
```

```
SELECT
    transaction_id,
    user_id,
    product_id,
    quantity,
    price,
    calculate_total_cost(quantity, price) AS total_cost,
    classify_transaction(quantity, price, 100) AS transaction_class
FROM transactions
ORDER BY transaction_id;
```

transactions 1

SELECT transaction_id, user_id, product_id, Enter a SQL expression to filter results (use Ctrl+Space)

	transaction_id	user_id	product_id	quantity	price	total_cost	transaction_class
1	0	9,898	898	98	424.2	41,571.6011962891	высокоценная
2	1	6,767	767	67	361.8	24,240.5991821289	высокоценная
3	2	6,057	57	57	445.47	25,391.7900695801	высокоценная
4	3	918	918	18	301.59	5,428.619934082	высокоценная
5	4	5,290	290	90	222.49	20,024.1004943848	высокоценная