18 ДЗ - Интеграции с BI-инструментами

Собираем Dockerfile для clickhouse.

Dockerfile:

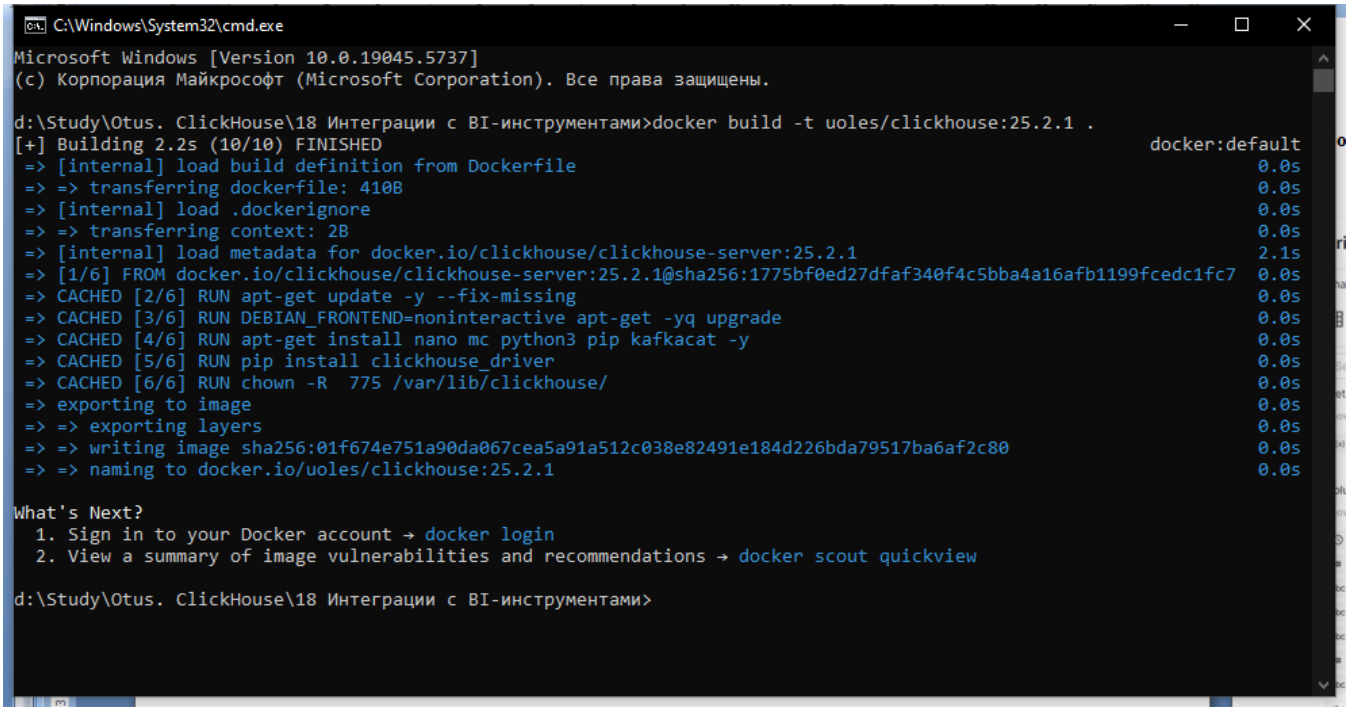
FROM clickhouse/clickhouse-server:25.2.1
MAINTAINER Maksim Kulikov max.uoles@rambler.ru

RUN apt-get update -y --fix-missing
RUN DEBIAN_FRONTEND=noninteractive apt-get -yq upgrade
RUN apt-get install nano mc python3 pip kafkacat –y
RUN pip install clickhouse_driver

EXPOSE 8123 9000
ENTRYPOINT ["/entrypoint.sh"]

Собираем образ командой:

docker build -t uoles/clickhouse:25.2.1 .



Поднимаем superset с clickhouse.

Скачиваем репозиторий superset:

git clone https://github.com/apache/superset.git
cd superset
git checkout 2.1.0

Редактируем файл docker-compose-non-dev.yml и сохраняем как docker-compose-clickhouse.yml:
- добавил установку clickhouse-connect в superset
- добавил разворачивание clickhouse-server
- добавил зависимость от clickhouse-server для superset и линк

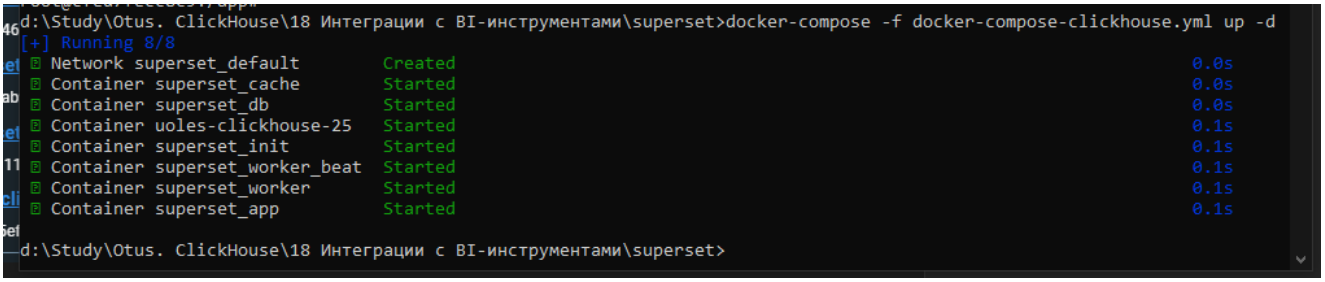
docker-compose-clickhouse.yml:

```yaml
x-superset-image: &superset-image apache/superset:${TAG:-latest-dev}
x-superset-depends-on: &superset-depends-on
  - db
  - redis
x-superset-only-depends-on: &superset-only-depends-on
  - db
  - redis
  - clickhouse-server
x-superset-volumes: &superset-volumes
  # /app/pythonpath_docker will be appended to the PYTHONPATH in the final container
  - ./docker:/app/docker
  - superset_home:/app/superset_home

version: "3.7"
services:
  redis:
    image: redis:7
    container_name: superset_cache
    restart: unless-stopped
    volumes:
      - redis:/data

  db:
    env_file: docker/.env-non-dev
    image: postgres:14
    container_name: superset_db
    restart: unless-stopped
    volumes:
      - db_home:/var/lib/postgresql/data

  superset:
    env_file: docker/.env-non-dev
    image: *superset-image
    container_name: superset_app
    command: [sh, -c, "pip install clickhouse-connect && /app/docker/docker-bootstrap.sh app-gunicorn"]
    user: "root"
    restart: unless-stopped
    ports:
      - 8088:8088
    depends_on: *superset-only-depends-on
    volumes: *superset-volumes
    links:
      - clickhouse-server

  superset-init:
    image: *superset-image
    container_name: superset_init
    command: ["/app/docker/docker-init.sh"]
    env_file: docker/.env-non-dev
    depends_on: *superset-depends-on
    user: "root"
    volumes: *superset-volumes
    healthcheck:
      disable: true

  superset-worker:
    image: *superset-image
    container_name: superset_worker
    command: ["/app/docker/docker-bootstrap.sh", "worker"]
    env_file: docker/.env-non-dev
```

```
    restart: unless-stopped
    depends_on: *superset-depends-on
    user: "root"
    volumes: *superset-volumes
    healthcheck:
      test: ["CMD-SHELL", "celery inspect ping -A superset.tasks.celery_app:app -d celery@$$HOSTNAME"]

  superset-worker-beat:
    image: *superset-image
    container_name: superset_worker_beat
    command: ["/app/docker/docker-bootstrap.sh", "beat"]
    env_file: docker/.env-non-dev
    restart: unless-stopped
    depends_on: *superset-depends-on
    user: "root"
    volumes: *superset-volumes
    healthcheck:
      disable: true

  clickhouse-server:
    container_name: uoles-clickhouse-25
    image: uoles/clickhouse:25.2.1
    environment:
      CLICKHOUSE_DB: my_database
      CLICKHOUSE_USER: username
      CLICKHOUSE_DEFAULT_ACCESS_MANAGEMENT: 1
      CLICKHOUSE_PASSWORD: password
    ports:
      - "18123:8123"
      - "19000:9000"
    ulimits:
      nofile:
        soft: 262144
        hard: 262144

volumes:
  superset_home:
    external: false
  db_home:
    external: false
  redis:
    external: false
```

Поднимаем приложения командой:

docker-compose -f docker-compose-clickhouse.yml up -d



Проверяем в логах установку clickhouse-connect:

superset_app

apache/superset:latest-dev

5a45080d5546

8088:8088

Logs | Inspect | Bind mounts | Exec | Files | Stats

```
2025-04-20 02:24:34 Collecting clickhouse-connect
2025-04-20 02:24:34   Downloading clickhouse_connect-0.8.17-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (3.4 kB)
2025-04-20 02:24:34 Requirement already satisfied: certifi in /usr/local/lib/python3.10/site-packages (from clickhouse-connect) (2024.2.2)
2025-04-20 02:24:34 Requirement already satisfied: urllib3>=1.26 in /usr/local/lib/python3.10/site-packages (from clickhouse-connect) (1.26.18)
2025-04-20 02:24:34 Requirement already satisfied: pytz in /usr/local/lib/python3.10/site-packages (from clickhouse-connect) (2024.1)
2025-04-20 02:24:34 Requirement already satisfied: zstandard in /usr/local/lib/python3.10/site-packages (from clickhouse-connect) (0.22.0)
2025-04-20 02:24:34 Collecting lz4 (from clickhouse-connect)
2025-04-20 02:24:34   Downloading lz4-4.4.4-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (3.8 kB)
2025-04-20 02:24:34 Downloading clickhouse_connect-0.8.17-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (979 kB)
2025-04-20 02:24:34    ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 979.5/979.5 kB 7.6 MB/s eta 0:00:00
2025-04-20 02:24:34 Downloading lz4-4.4.4-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.3 MB)
2025-04-20 02:24:34    ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 1.3/1.3 MB 19.6 MB/s eta 0:00:00
2025-04-20 02:24:35 Installing collected packages: lz4, clickhouse-connect
2025-04-20 02:24:35 Successfully installed clickhouse-connect-0.8.17 lz4-4.4.4
2025-04-20 02:24:36 Skipping local overrides
```

Создаем dataset в superset.

Connect a database

STEP 2 OF 3

Enter the required ClickHouse Connect (Superset) credentials

Need help? Learn more about connecting to ClickHouse Connect (Superset).

HOST * clickhouse-server

PORT 8123

DATABASE NAME my_database

Copy the name of the database you are trying to connect to.

USERNAME username

PASSWORD password

DISPLAY NAME * ClickHouse Connect (Superset)

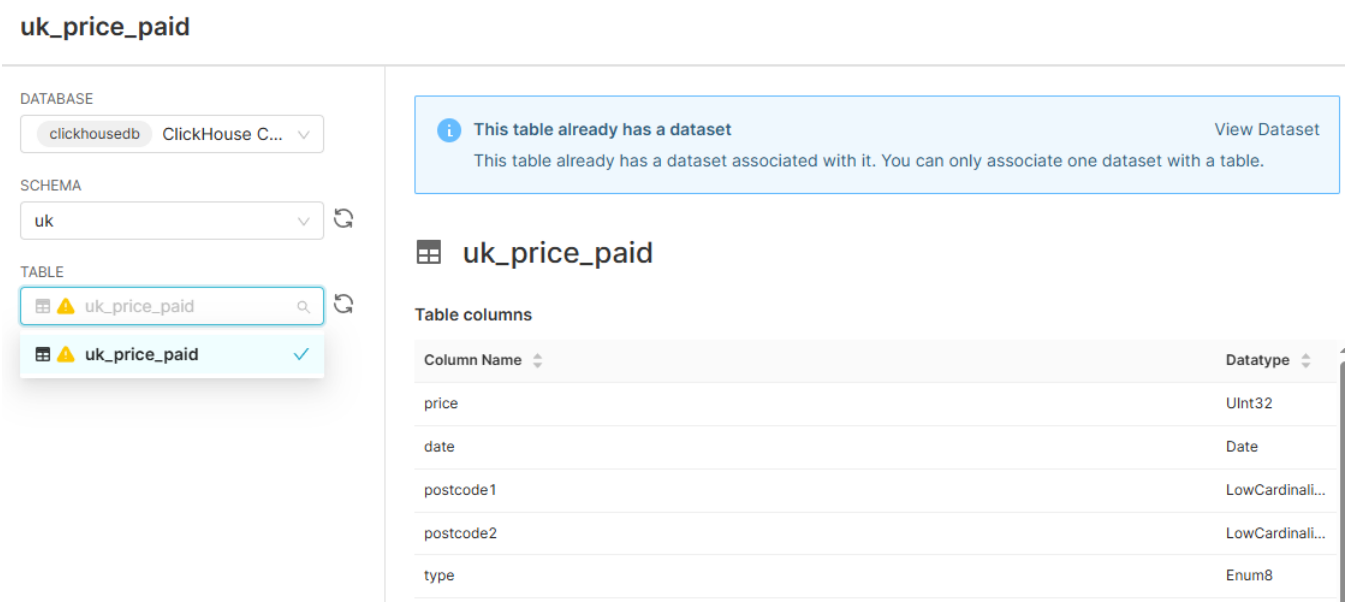
Pick a nickname for how the database will display in Superset.

ADDITIONAL PARAMETERS e.g. param1=value1&param2=value2

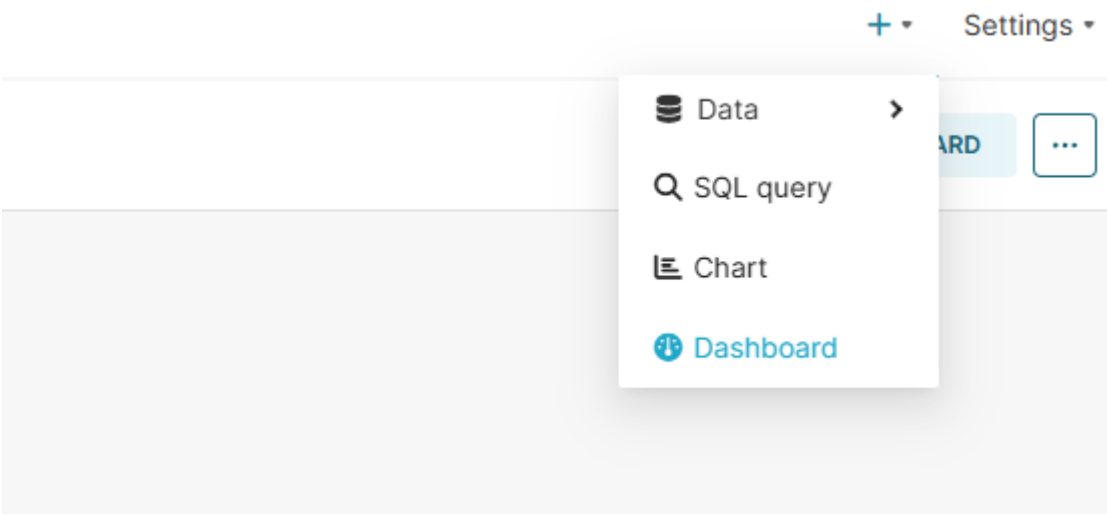
Add additional custom parameters

SSL

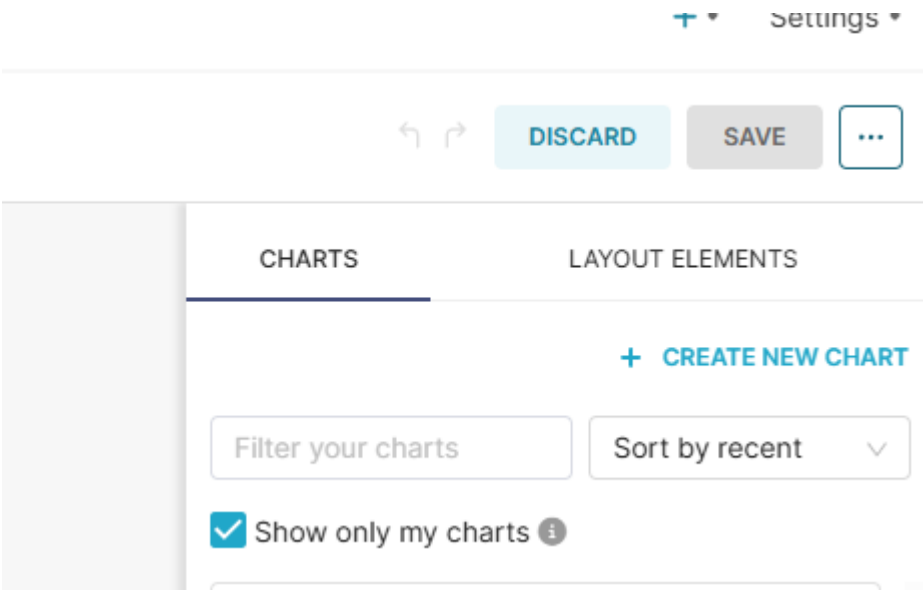
BACK | CONNECT

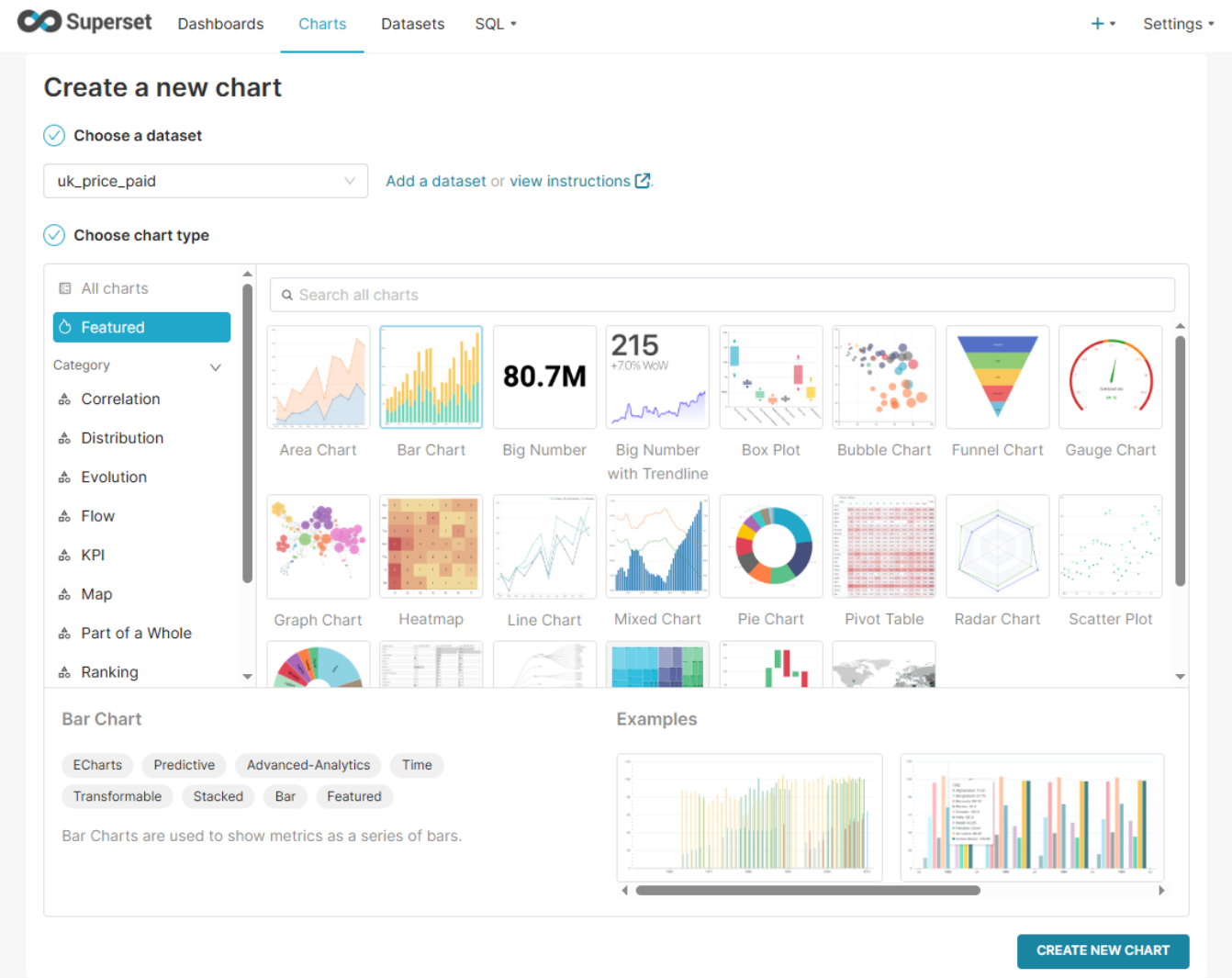


Далее создаем дашборд для графиков:



Жмем CREATE NEW CHART для создания нового графика





Выбираем график и созданный ранее датасет.

Добавление данных в clickhouse.

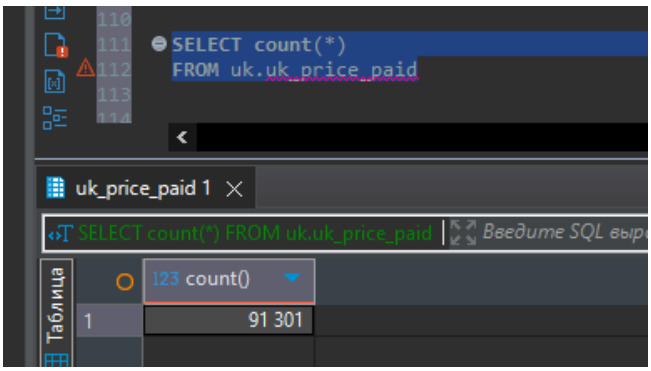
Я использовал стандартный набор данных – стоимость жилья в Англии:
https://clickhouse.com/docs/getting-started/example-datasets/uk-price-paid

Загрузил ежемесячные изменения:
https://www.gov.uk/government/statistical-data-sets/price-paid-data-downloads

Создание схемы и таблицы:

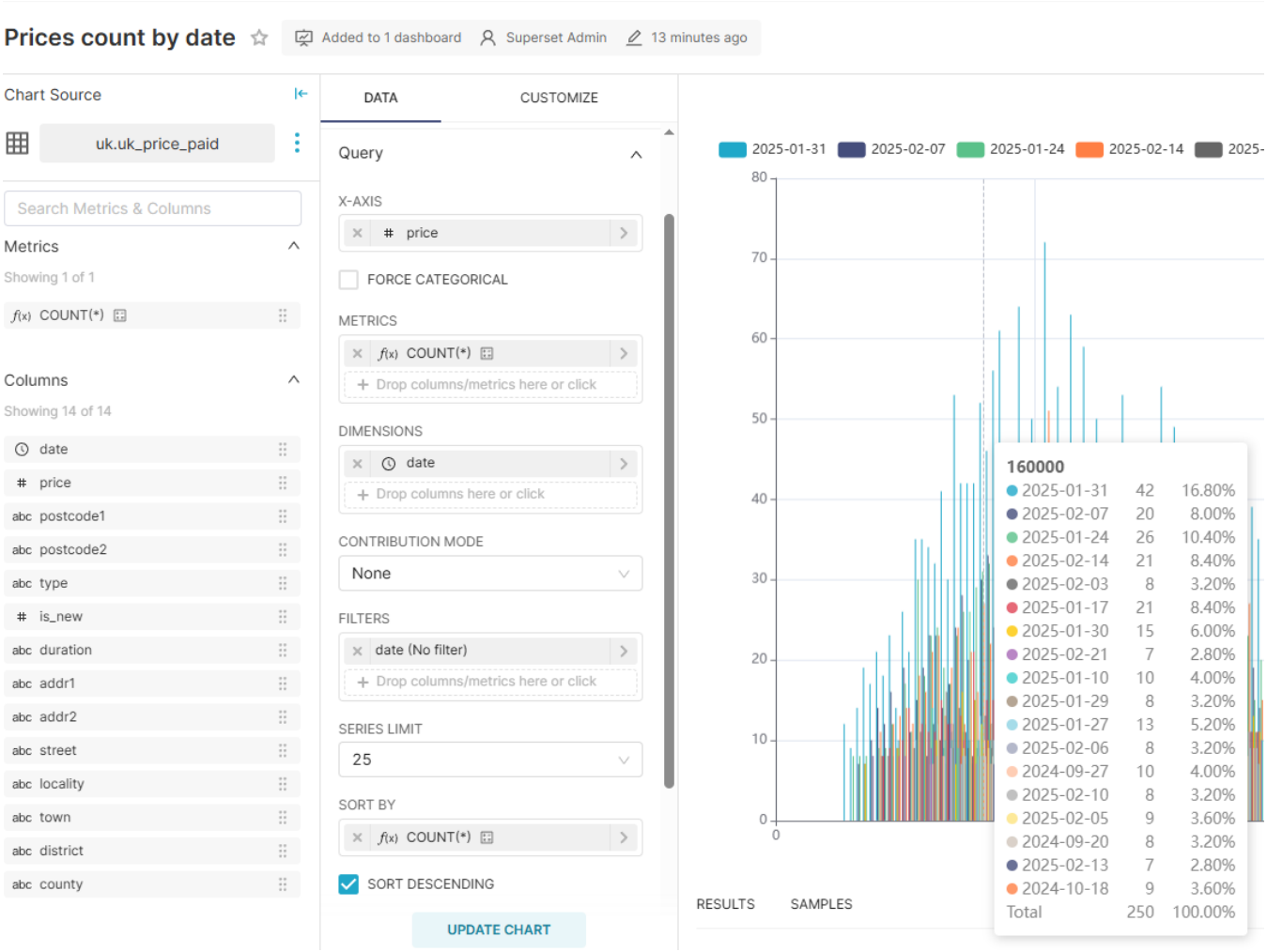
```
CREATE DATABASE uk;

CREATE TABLE uk.uk_price_paid
(
    price UInt32,
    date Date,
    postcode1 LowCardinality(String),
    postcode2 LowCardinality(String),
    type Enum8('terraced' = 1, 'semi-detached' = 2, 'detached' = 3, 'flat' = 4, 'other' = 0),
    is_new UInt8,
    duration Enum8('freehold' = 1, 'leasehold' = 2, 'unknown' = 0),
    addr1 String,
    addr2 String,
    street LowCardinality(String),
```

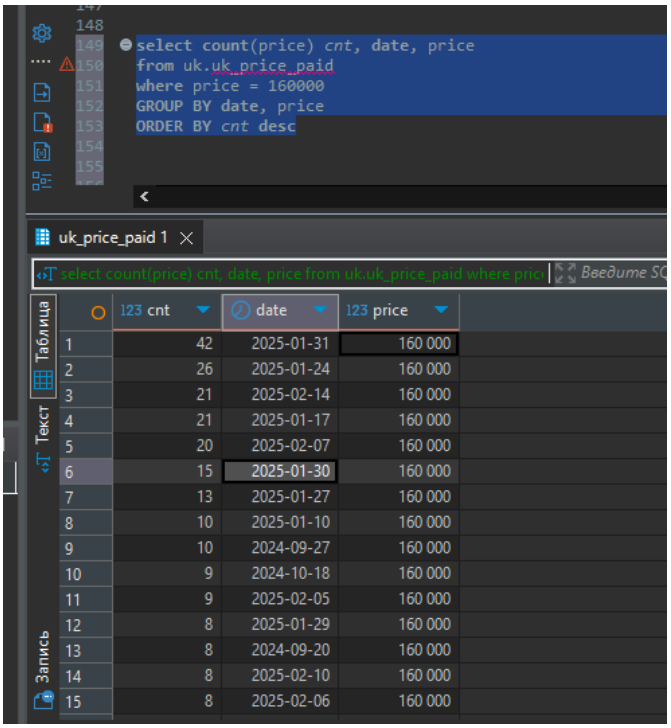
```
    locality LowCardinality(String),
    town LowCardinality(String),
    district LowCardinality(String),
    county LowCardinality(String)
)
ENGINE = MergeTree
ORDER BY (postcode1, postcode2, addr1, addr2);


INSERT INTO uk.uk_price_paid
SELECT
    toUInt32(price_string) AS price,
    parseDateTimeBestEffortUS(time) AS date,
    splitByChar(' ', postcode)[1] AS postcode1,
    splitByChar(' ', postcode)[2] AS postcode2,
    transform(a, ['T', 'S', 'D', 'F', 'O'], ['terraced', 'semi-detached', 'detached', 'flat', 'other']) AS type,
    b = 'Y' AS is_new,
    transform(c, ['F', 'L', 'U'], ['freehold', 'leasehold', 'unknown']) AS duration,
    addr1,
    addr2,
    street,
    locality,
    town,
    district,
    county
FROM url(
    'http://prod.publicdata.landregistry.gov.uk.s3-website-eu-west-1.amazonaws.com/pp-monthly-update-new-
version.csv',
    'CSV',
    'uuid_string String,
    price_string String,
    time String,
    postcode String,
    a String,
    b String,
    c String,
    addr1 String,
    addr2 String,
    street String,
    locality String,
    town String,
    district String,
    county String,
    d String,
    e String'
) SETTINGS max_http_get_redirects=10;
```



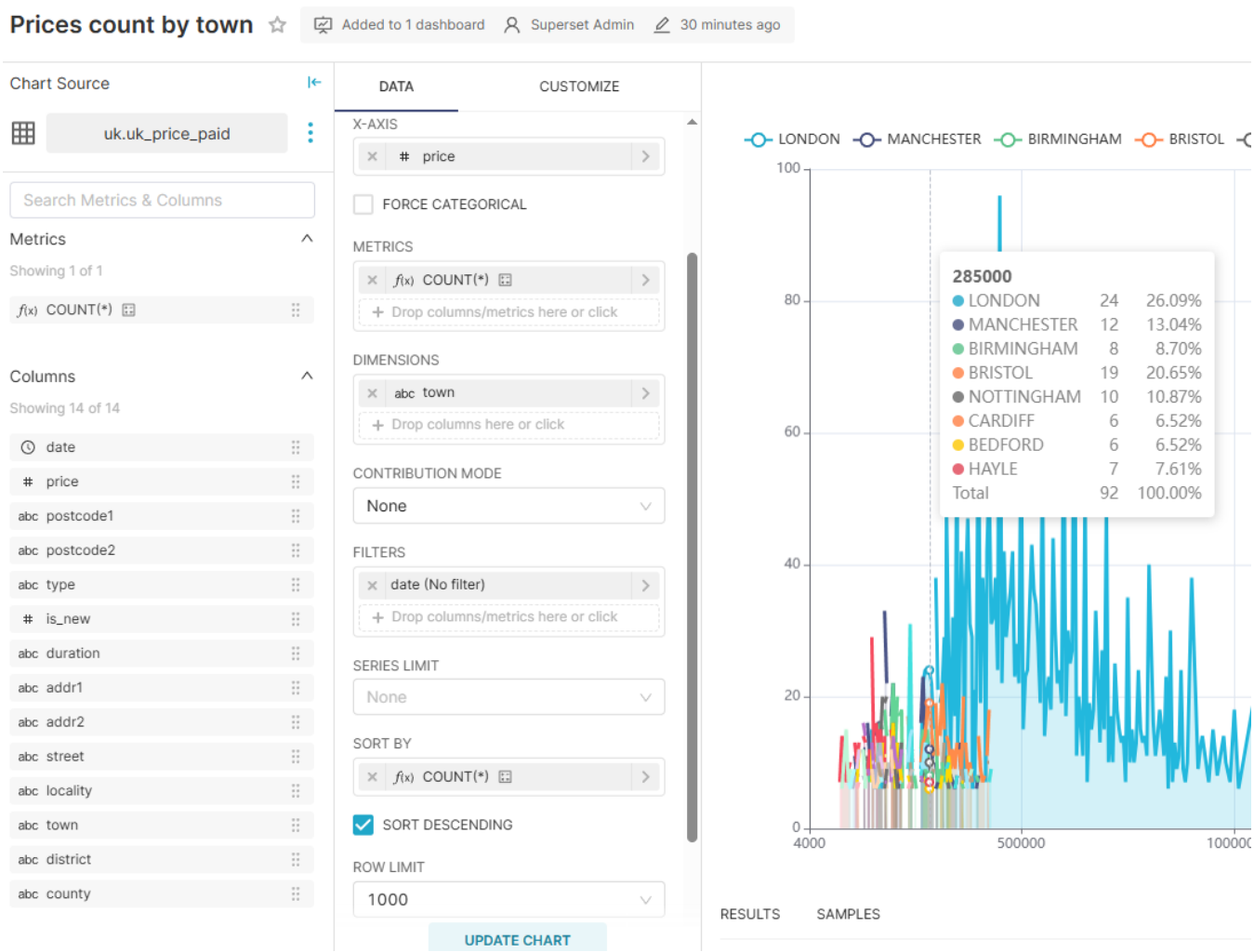
Создание графиков и их проверка запросом.

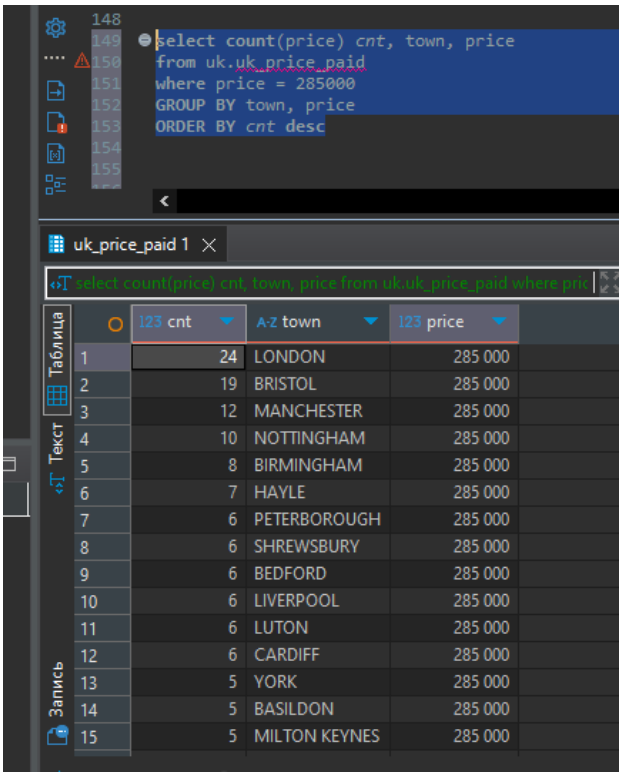
1. Bar – выборка кол-ва цен жилья относительно даты.





2. Line – выборка кол-ва цен жилья относительно города.





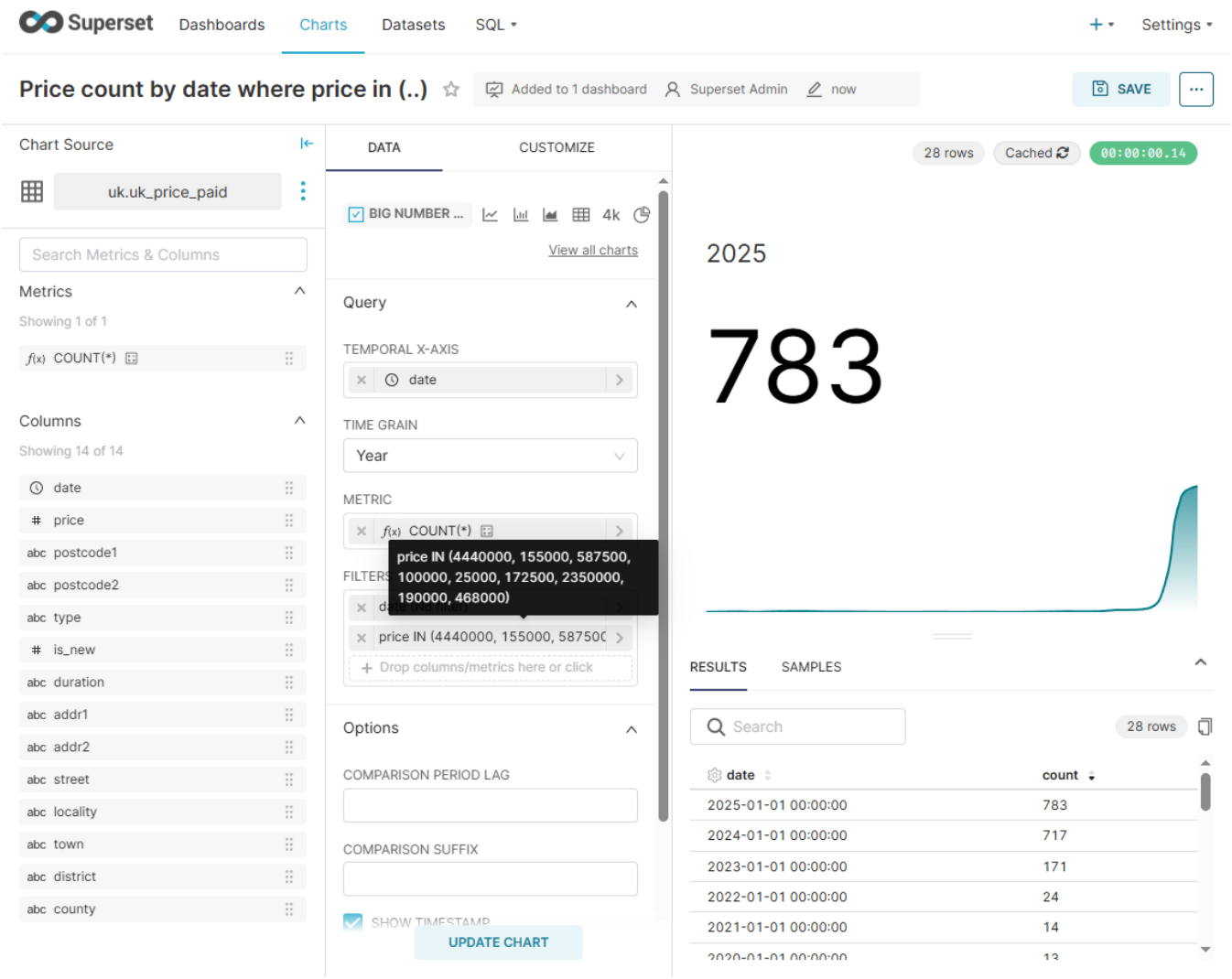
```
select count(price) cnt, town, price
from uk.uk_price_paid
where price = 285000
GROUP BY town, price
ORDER BY cnt desc
```

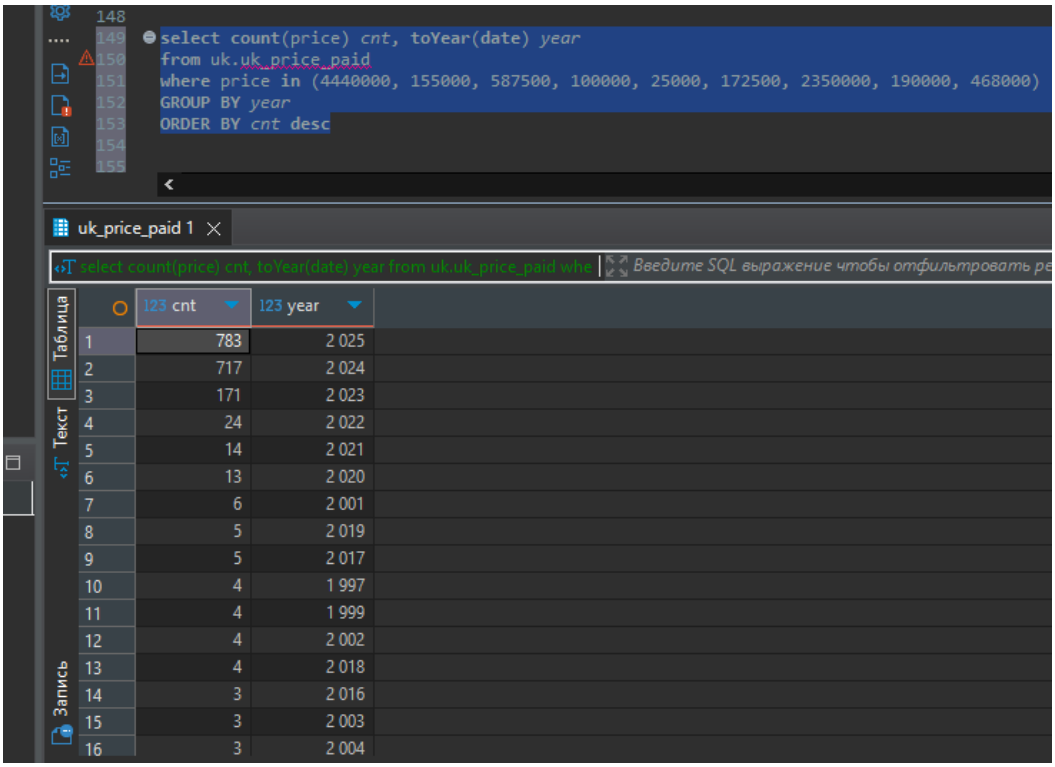
uk_price_paid 1

select count(price) cnt, town, price from uk.uk_price_paid where pric

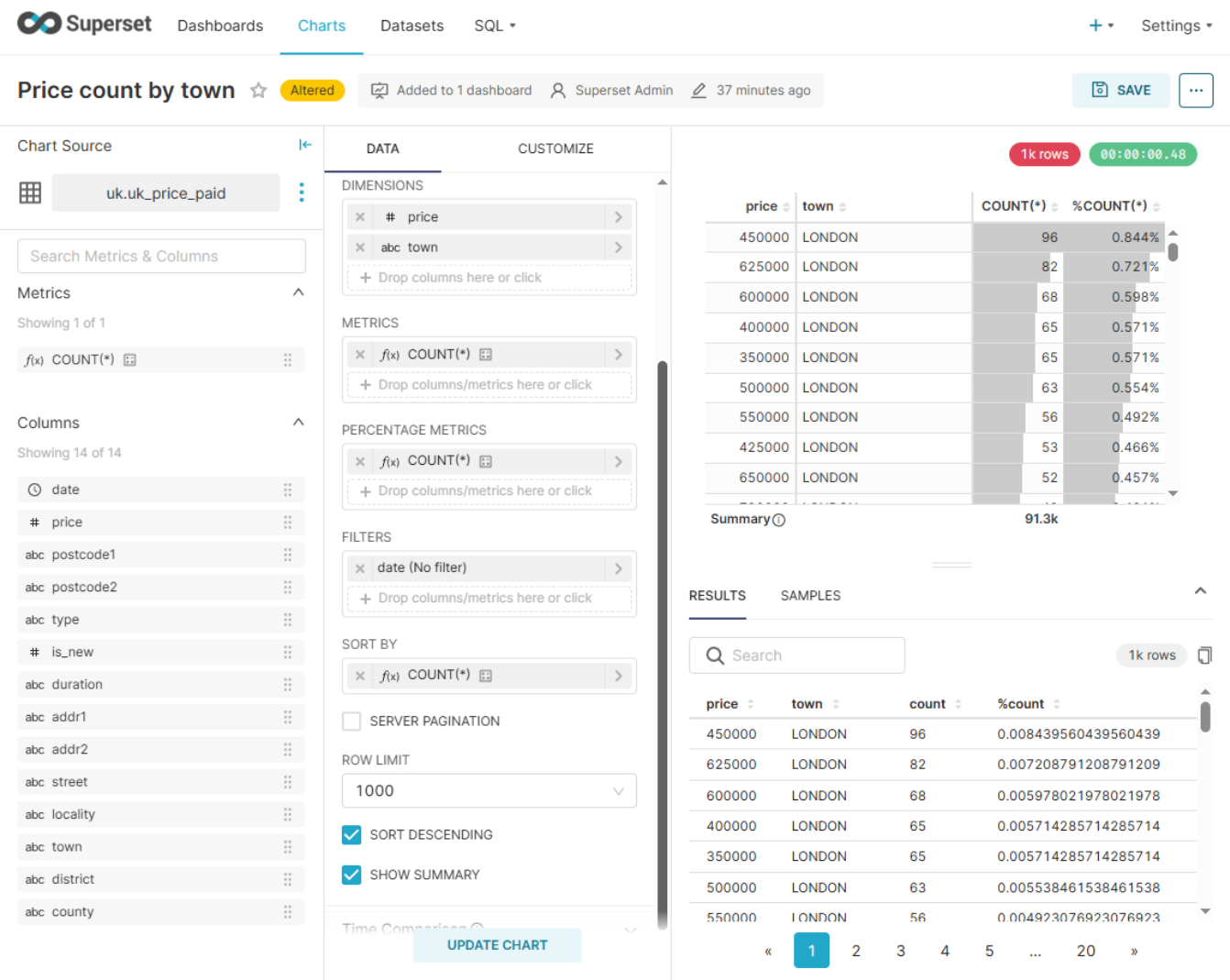
	cnt	town	price
1	24	LONDON	285 000
2	19	BRISTOL	285 000
3	12	MANCHESTER	285 000
4	10	NOTTINGHAM	285 000
5	8	BIRMINGHAM	285 000
6	7	HAYLE	285 000
7	6	PETERBOROUGH	285 000
8	6	SHREWSBURY	285 000
9	6	BEDFORD	285 000
10	6	LIVERPOOL	285 000
11	6	LUTON	285 000
12	6	CARDIFF	285 000
13	5	YORK	285 000
14	5	BASILDON	285 000
15	5	MILTON KEYNES	285 000

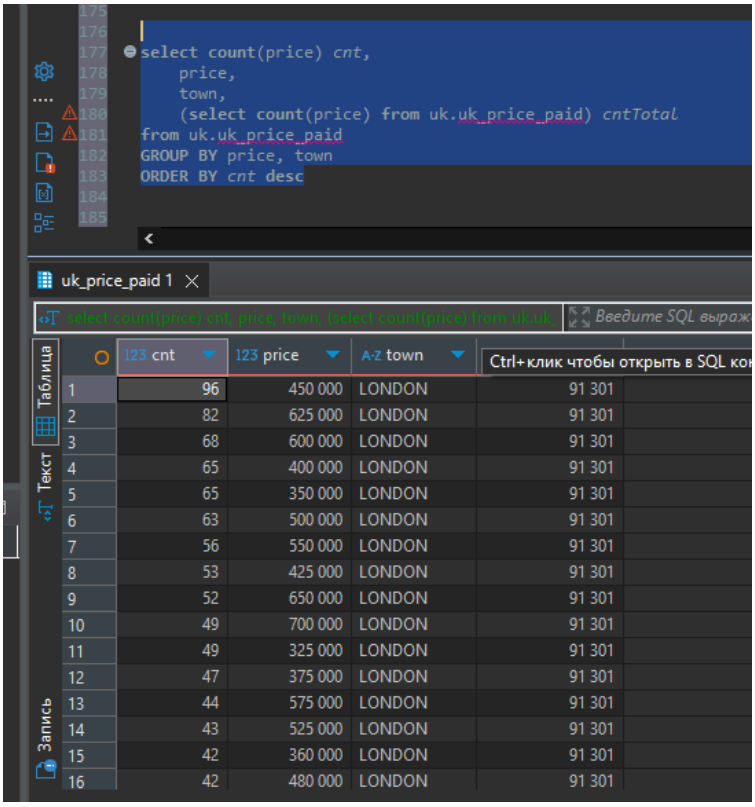
3. Bug number with trend line – выборка кол-ва жилья по годам, цена которого находится в массиве значений.



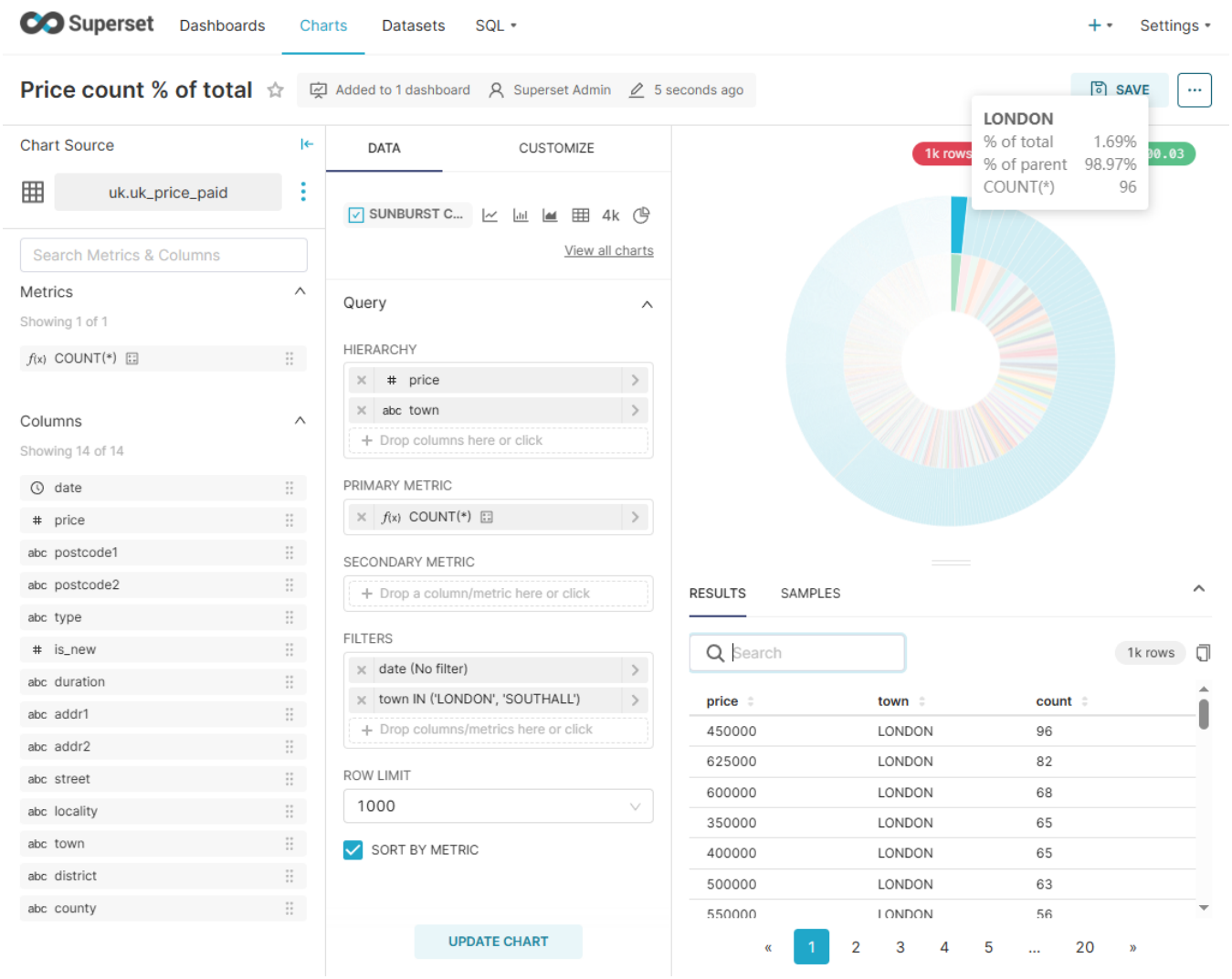


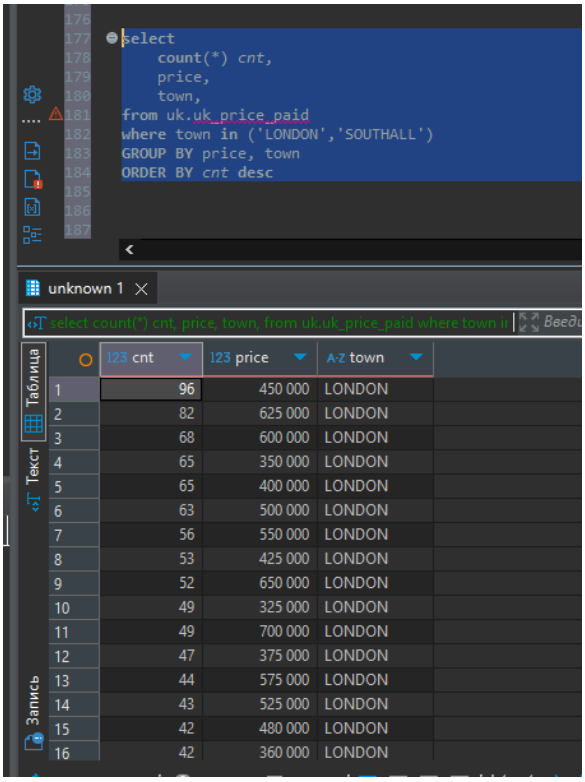
4. Table – выборка кол-ва цен жилья относительно города.





5. Sunburst chart – выборка кол-ва цен жилья относительно города.





```
select
    count(*) cnt,
    price,
    town,
from uk.uk_price_paid
where town in ('LONDON','SOUTHALL')
GROUP BY price, town
ORDER BY cnt desc
```

unknown 1

select count(*) cnt, price, town, from uk.uk_price_paid where town in

	cnt	price	town
1	96	450 000	LONDON
2	82	625 000	LONDON
3	68	600 000	LONDON
4	65	350 000	LONDON
5	65	400 000	LONDON
6	63	500 000	LONDON
7	56	550 000	LONDON
8	53	425 000	LONDON
9	52	650 000	LONDON
10	49	325 000	LONDON
11	49	700 000	LONDON
12	47	375 000	LONDON
13	44	575 000	LONDON
14	43	525 000	LONDON
15	42	480 000	LONDON
16	42	360 000	LONDON