

Государственное автономное образовательное
учреждение высшего образования «Московский городской педагогический
университет»

Институт цифрового образования
Департамент информатики, управления и технологий

Отчет по практической работе № 4.3

Выполнил: студент БД-231
Кряжева К.С.

2024 г

Tutorial no Clickhouse

Установка

```
root@LAPTOP-R3DS0AIA: ~  
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.15.146.1-microsoft-standard-WSL2 x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
This message is shown once a day. To disable it please create the  
/root/.hushlogin file.  
root@LAPTOP-R3DS0AIA:~# sudo apt-get install -y apt-transport-https ca-certificates dirmngr  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Note, selecting 'apt' instead of 'apt-transport-https'  
apt is already the newest version (2.4.9).  
apt set to manually installed.  
ca-certificates is already the newest version (20211016ubuntu0.22.04.1).  
ca-certificates set to manually installed.  
dirmngr is already the newest version (2.2.27-3ubuntu2.1).  
dirmngr set to manually installed.  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
root@LAPTOP-R3DS0AIA:~# sudo apt-key adv --keyserver hkps://keyserver.ubuntu.com:80 --recv 8919F6BD2B48D754  
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).  
Executing: /tmp/apt-key-gpghome.pISQRwtvUW/gpg.1.sh --keyserver hkps://keyserver.ubuntu.com:80 --recv 8919F6BD2B48D754  
gpg: key 8919F6BD2B48D754: public key "ClickHouse Inc. Repositories Key <packages@clickhouse.com>" imported  
gpg: Total number processed: 1  
gpg:               imported: 1  
root@LAPTOP-R3DS0AIA:~#
```

```
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
root@LAPTOP-R3DS0AIA:~# sudo apt-key adv --keyserver hkps://keyserver.ubuntu.com:80 --recv 8919F6BD2B48D754  
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).  
Executing: /tmp/apt-key-gpghome.pISQRwtvUW/gpg.1.sh --keyserver hkps://keyserver.ubuntu.com:80 --recv 8919F6BD2B48D754  
gpg: key 8919F6BD2B48D754: public key "ClickHouse Inc. Repositories Key <packages@clickhouse.com>" imported  
gpg: Total number processed: 1  
gpg:               imported: 1  
root@LAPTOP-R3DS0AIA:~# echo "deb https://packages.clickhouse.com/deb stable main" | sudo tee \  
/etc/apt/sources.list.d/clickhouse.list  
deb https://packages.clickhouse.com/deb stable main  
root@LAPTOP-R3DS0AIA:~# sudo apt-get update  
Get:1 https://packages.clickhouse.com/deb stable InRelease [2490 B]  
Hit:2 http://archive.ubuntu.com/ubuntu jammy InRelease  
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]  
Get:4 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]  
Get:5 https://packages.clickhouse.com/deb stable/main amd64 Packages [125 kB]  
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1343 kB]  
Get:7 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]  
Get:8 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]  
Get:9 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [237 kB]  
Get:10 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [11.4 kB]  
Get:11 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [1670 kB]  
Get:12 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [280 kB]  
Get:13 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 c-n-f Metadata [520 B]
```

```

Enter password for the default user:
Password for the default user is saved in file /etc/clickhouse-server/users.d/default-password.xml.
Setting capabilities for clickhouse binary. This is optional.
  chown -R clickhouse:clickhouse '/etc/clickhouse-server'

ClickHouse has been successfully installed.

Start clickhouse-server with:
  sudo clickhouse start

Start clickhouse-client with:
  clickhouse-client --password

Synchronizing state of clickhouse-server.service with SysV service script with /lib/systemd/systemd-sy
Executing: /lib/systemd/systemd-sysv-install enable clickhouse-server
Created symlink /etc/systemd/system/multi-user.target.wants/clickhouse-server.service → /lib/systemd/s
server.service.
Setting up clickhouse-client (24.3.2.23) ...
root@LAPTOP-R3DS0AIA:~# sudo service clickhouse-server start
root@LAPTOP-R3DS0AIA:~# clickhouse-client
ClickHouse client version 24.3.2.23 (official build).
Connecting to localhost:9000 as user default.
Password for user (default):

```

Тестовый запрос

```

LAPTOP-R3DS0AIA. :) SELECT 1

SELECT 1

Query id: 10d71f13-47c6-45f5-995f-25e8df15456e

1.  

|   |
|---|
| 1 |
|---|



1 row in set. Elapsed: 0.002 sec.

LAPTOP-R3DS0AIA. :)

```

Создание таблиц

```

LAPTOP-R3DS0AIA. :) CREATE DATABASE IF NOT EXISTS tutorial

CREATE DATABASE IF NOT EXISTS tutorial

Query id: 1a7e9d03-fef0-4e26-9814-5cf79b98ed60

Ok.

0 rows in set. Elapsed: 0.011 sec.

LAPTOP-R3DS0AIA. :)

```

```

LAPTOP-R3DS0AIA. :) CREATE TABLE tutorial.hits_v1
(
  `WatchID` UInt64,
  `JavaEnable` UInt8,
  `Title` String,
  `GoodEvent` Int16,
  `EventTime` DateTime,
  `EventDate` Date,
  `CounterID` UInt32,
  `ClientIP` UInt32,
  `ClientIP6` FixedString(16),
  `RegionID` UInt32,
  `UserID` UInt64,
  `CounterClass` Int8,
  `OS` UInt8,
  `UserAgent` UInt8,
  `URL` String,
  `Referer` String,
  `URLDomain` String,
  `RefererDomain` String,
  `Refresh` UInt8,
  `IsRobot` UInt8,
  `RefererCategories` Array(UInt16),
  `URLCategories` Array(UInt16),
  `URLRegions` Array(UInt32),
  `RefererRegions` Array(UInt32),
  `ResolutionWidth` UInt16,
  `ResolutionHeight` UInt16,
  `ResolutionDepth` UInt8,

```

```

root@LAPTOP-R3DS0AIA: ~  +  v
  `UTMMedium` String,
  `UTMCampaign` String,
  `UTMContent` String,
  `UTMTerm` String,
  `FromTag` String,
  `HasGCLID` UInt8,
  `RefererHash` UInt64,
  `URLHash` UInt64,
  `CLID` UInt32,
  `YCLID` UInt64,
  `ShareService` String,
  `ShareURL` String,
  `ShareTitle` String,
  `ParsedParams` Nested(Key1 String, Key2 String, Key3 String),
  `IslandID` FixedString(16),
  `RequestNum` UInt32,
  `RequestTry` UInt8
)
ENGINE = MergeTree
PARTITION BY toYYYYMM(EventDate)
ORDER BY (CounterID, EventDate, intHash32(UserID))
SAMPLE BY intHash32(UserID)

Query id: 9347a2bb-4b71-4170-8197-4971e0126bb9

Ok.

0 rows in set. Elapsed: 0.021 sec.

```

```
CREATE TABLE tutorial.visits_v1
(
  `CounterID` UInt32,
  `StartDate` Date,
  `Sign` Int8,
  `IsNew` UInt8,
  `VisitID` UInt64,
  `UserID` UInt64,
  `StartTime` DateTime,
  `Duration` UInt32,
  `UTCStartTime` DateTime,
  `PageViews` Int32,
  `Hits` Int32,
  `IsBounce` UInt8,
  `Referer` String,
  `StartURL` String,
  `RefererDomain` String,
  `StartURLDomain` String,
  `EndURL` String,
```

```
  `URLScheme` UInt64,
  `OpenstatServiceNameHash` UInt64,
  `OpenstatCampaignIDHash` UInt64,
  `OpenstatAdIDHash` UInt64,
  `OpenstatSourceIDHash` UInt64,
  `UTMSourceHash` UInt64,
  `UTMMediumHash` UInt64,
  `UTMCampaignHash` UInt64,
  `UTMContentHash` UInt64,
  `UTMTermHash` UInt64,
  `FromHash` UInt64,
  `WebVisorEnabled` UInt8,
  `WebVisorActivity` UInt32,
  `ParsedParams` Nested(Key1 String, Key2 String, Value1 String, Value2 String),
  `Market` Nested(Type UInt8, GoalID UInt32, GoalName String),
  `OrderID` UInt32, `DirectBannerID` UInt32, `GoalID` UInt32,
  `IslandID` FixedString(16)
)
ENGINE = CollapsingMergeTree(Sign)
PARTITION BY toYYYYMM(StartDate)
ORDER BY (CounterID, StartDate, intHash32(CounterID))
SAMPLE BY intHash32(UserID)
```

Query id: 9ed18d2a-1890-433b-984d-4decf0d8

Ok.

0 rows in set. Elapsed: 0.022 sec.

```
LAPTOP-R3DS0AIA. :) SELECT name, value, changed, description
FROM system.settings
WHERE name LIKE '%max_insert_b%'
FORMAT TSV

SELECT
    name,
    value,
    changed,
    description
FROM system.settings
WHERE name LIKE '%max_insert_b%'
FORMAT TSV

Query id: 39a386a8-1ccf-40c8-87b1-da0cb2439d49

max_insert_block_size    1048449 0          The maximum block size for insertion, if we control the creation of blocks for i
nsertion.

1 row in set. Elapsed: 0.007 sec. Processed 1.01 thousand rows, 222.85 KB (137.92 thousand rows/s., 30.43 MB/s.)
Peak memory usage: 0.00 B.
```

Импорт данных

```
root@LAPTOP-R3DS0AIA:~# clickhouse-client --user default --database tutorial --ask-password --query "INS
ERT INTO tutorial.hits_v1 FORMAT TSV" --max_insert_block_size=100000 < hits_v1.tsv
Password for user (default):
root@LAPTOP-R3DS0AIA:~# clickhouse-client --user default --database tutorial --ask-password --query "INS
ERT INTO tutorial.visits_v1 FORMAT TSV" --max_insert_block_size=100000 < visits_v1.tsv
Password for user (default):
root@LAPTOP-R3DS0AIA:~#
```

Запросы

```
LAPTOP-R3DS0AIA. :) SELECT COUNT(*) FROM tutorial.hits_v1

SELECT COUNT(*)
FROM tutorial.hits_v1

Query id: c3b47fc5-59d4-46ad-a4bc-25e432ff5c24

1. COUNT()
   8873898 -- 8.87 million

1 row in set. Elapsed: 0.028 sec.
```

```
LAPTOP-R3DS0AIA. :) SELECT COUNT(*) FROM tutorial.visits_v1

SELECT COUNT(*)
FROM tutorial.visits_v1

Query id: 86e22243-6bcf-4fad-8002-45a3b71d95a0

1. COUNT()
   1680609 -- 1.68 million

1 row in set. Elapsed: 0.011 sec.

LAPTOP-R3DS0AIA. :) |
```

```
root@LAPTOP-R3DS0AIA: ~  
SELECT  
    StartURL AS URL,  
    AVG(Duration) AS AvgDuration  
FROM tutorial.visits_v1  
WHERE (StartDate >= '2014-03-23') AND (StartDate <= '2014-03-30')  
GROUP BY URL  
ORDER BY AvgDuration DESC  
LIMIT 10  
  
Query id: eb190cc0-9d6d-4de9-a9cd-7fe760afc4dd  
  
┌─URL─┐┌─AvgDuration─┐  
1. | http://itpalanija-pri-patrivative=0&ads_app_user | 60127 |  
2. | http://renaul-myd-ukraine | 58938 |  
3. | http://e.mail=on&default?abid=2061&scd=yes&option?r=city_inter.com/menu&site=zaferio.ru/c/m.ensor.net/ru/login= | 51378 |  
4. | https://moda/vyikrorable.com/notification | 48828.6 |  
5. | http://karta/Futbol/dynas.com/haberler.ru/messages.yandsearchives/494503_lte_13800200319 | 48484.666666666664 |  
6. | https://moda/vyikroforum1/top.ru/moscow/delo-product/trend_sms/multitryaset/news/2014/03/201000 | 41531.666666666664 |  
7. | http:%2F%2Fallback/angleNews | 38878.29268292683 |  
8. | http://xmusic/vstreatings of speeds | 36925 |
```

```
LAPTOP-R3DS0AIA. :) SELECT  
    sum(Sign) AS visits,  
    sumIf(Sign, has(Goals.ID, 1105530)) AS goal_visits,  
    (100. * goal_visits) / visits AS goal_percent  
FROM tutorial.visits_v1  
WHERE (CounterID = 912887) AND (toYYYYMM(StartDate) = 201403)  
  
SELECT  
    sum(Sign) AS visits,  
    sumIf(Sign, has(Goals.ID, 1105530)) AS goal_visits,  
    (100. * goal_visits) / visits AS goal_percent  
FROM tutorial.visits_v1  
WHERE (CounterID = 912887) AND (toYYYYMM(StartDate) = 201403)  
  
Query id: 7225bbc6-cf70-4a5d-85cd-f3456147a0e2  
  
1. | visits | goal_visits | goal_percent |  
   | 10545 | 8554 | 81.1190137505927 |  
  
1 row in set. Elapsed: 0.044 sec. Processed 46.57 thousand rows, 1.25 MB (1.06 million rows/s., 28.45 MB/s.)  
Peak memory usage: 124.77 KiB.
```

