# Практическая работа 3-1. Корпоративные платформы. Cloudera (Гадильшина В.Е., БД-231м)

**Задание к теме: Работа в HDFS в экосистеме cloudera**

**3.1.1. Развернуть виртуальное окружение.**

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**3.1.2. Вывести с помощью команды help описание основных команды shell-клиента.**

```
[cloudera@quickstart ~]$ hdfs dfs -help
Usage: hadoop fs [generic options]
        [-appendToFile <localsrc> ... <dst>]
        [-cat [-ignoreCrc] <src> ...]
        [-checksum <src> ...]
        [-chgrp [-R] GROUP PATH...]
        [-chmod [-R] <MODE[,MODE]... | OCTALMODE> PATH...]
        [-chown [-R] [OWNER][:[GROUP]] PATH...]
        [-copyFromLocal [-f] [-p] [-l] <localsrc> ... <dst>]
        [-copyToLocal [-p] [-ignoreCrc] [-crc] <src> ... <localdst>]
```

**3.1.3. Просмотреть корневую директорию HDFS.**

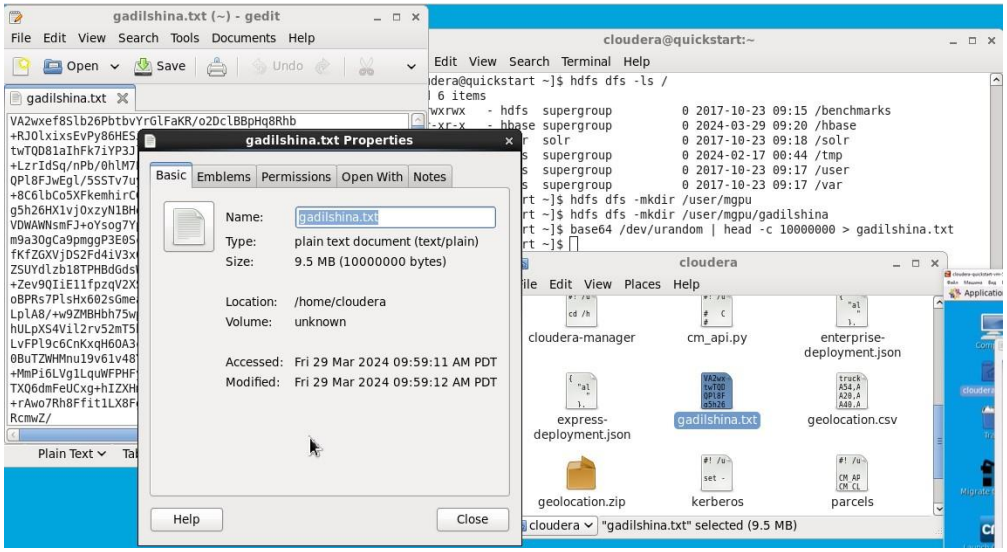
```
[cloudera@quickstart ~]$ hdfs dfs -ls /
Found 6 items
drwxrwxrwx   - hdfs  supergroup          0 2017-10-23 09:15 /benchmarks
drwxr-xr-x   - hbase supergroup          0 2024-03-29 09:20 /hbase
drwxr-xr-x   - solr  solr                0 2017-10-23 09:18 /solr
drwxrwxrwt   - hdfs  supergroup          0 2024-02-17 00:44 /tmp
drwxr-xr-x   - hdfs  supergroup          0 2017-10-23 09:17 /user
drwxr-xr-x   - hdfs  supergroup          0 2017-10-23 09:17 /var
```

**3.1.4. Создать в HDFS в директории /user/mgpu поддиректорию ваше_фио.**

```
[cloudera@quickstart ~]$ hdfs dfs -mkdir /user/mgpu
[cloudera@quickstart ~]$ hdfs dfs -mkdir /user/mgpu/gadilshina
[cloudera@quickstart ~]$
```

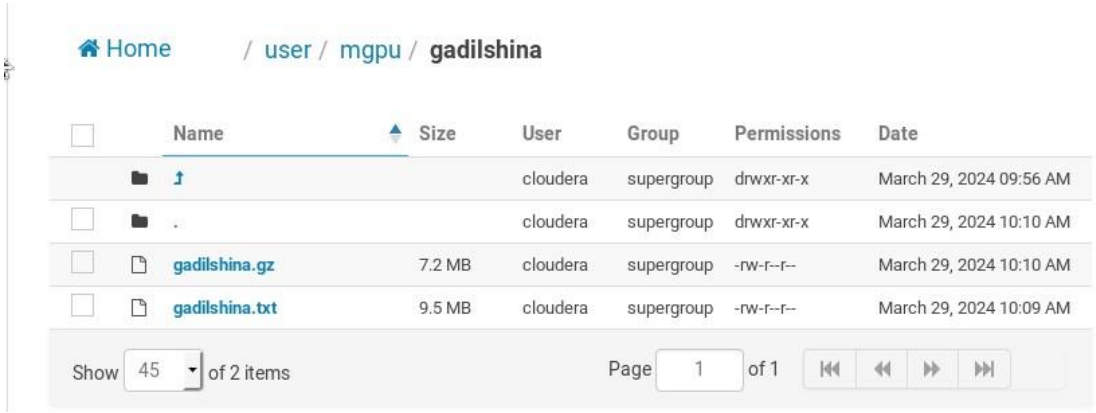
**3.1.5. Создать в локальной файловой системе случайный текстовый файл размером 10 Mb с именем, образованным вашими инициалами base64 /dev/urandom | head -c 10000000 > file.txt**

```
[cloudera@quickstart ~]$ base64 /dev/urandom | head -c 10000000 > gadilshina.txt
[cloudera@quickstart ~]$ ls
cloudera-manager  eclipse                    geolocation.zip  parcels     Videos
cm_api.py         enterprise-deployment.json kerberos         Pictures    workspace
Desktop           express-deployment.json    lib              Public
Documents         gadilshina.txt             __MACOSX         Templates
Downloads         geolocation.csv            Music            trucks.csv
```




### 3.1.6. Заархивировать созданный текстовый файл gzip -c file.txt > file.gz .


### 3.1.7. Скопировать текстовый файл и архив в директорию /user/mgpu/fio HDFS виртуальной машины.



**3.1.8. Просмотреть файл и архив с помощью утилит cat, text в комбинации с каналами и утилитами head, tail -- привести не менее 3 вариантов команд и просмотра файла.**

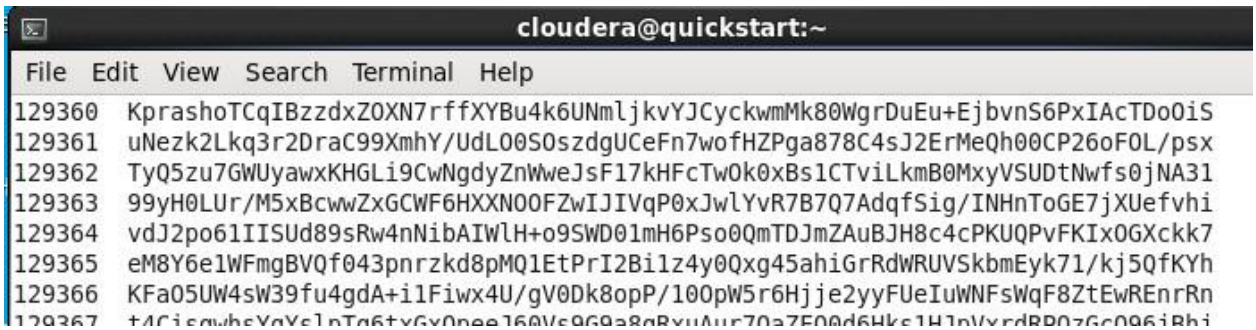
```
[cloudera@quickstart ~]$ cat gadilshina.txt
```

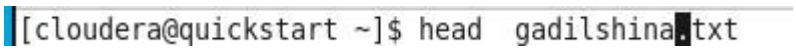
```
KprashoTCqIBzzdxZOXN7rffXYBu4k6UNmljkvYJCyckwmMk80WgrDuEu+EjbvnS6PxIAcTDoOiS
uNezk2Lkq3r2DraC99XmhY/UdLO0SOszdgUCeFn7wofHZPga878C4sJ2ErMeQh00CP26oFOL/psx
TyQ5zu7GWUyawxKHGLi9CwNgdyZnWweJsF17kHFcTwOk0xBs1CTviLkmB0MxyVSUDtNwfs0jNA31
99yH0LUr/M5xBcwwZxGCWF6HXXNOOFZwIJIVqP0xJwlYvR7B7Q7AdqfSig/INHnToGE7jXUefvhi
vdJ2po61IISUd89sRw4nNibAIWlH+o9SWD01mH6Pso0QmTDJmZAuBJH8c4cPKUQPvFKIxOGXckk7
eM8Y6e1WFmgBVQf043pnrzkd8pMQ1EtPrI2Bi1z4y0Qxg45ahiGrRdWRUVSkbmEyk71/kj5QfKYh
KFaO5UW4sW39fu4gdA+i1Fiwx4U/gV0Dk8opP/10OpW5r6Hjje2yyFUeIuWNFsWqF8ZtEwREnrRn
t4CisqwhsYqYslpTq6txGxOpeeJ60Vs9G9a8qRxuAur7OaZFO0d6Hks1HJpVxrdRPQzGcQ96jBhj
21cTx0srG84tG9JX20zhCOniW1CE2iGz+jiVk35sssVYzIkGEXkwc6AFw5qzre+uPQwNZv14bgjg
etCHn2lQNXTyqA7MrwvgpJpqrW8dttZhIUxWZCLPj+Je15FgifD97xXLQS8P8d0cx77PakEOD8qB
yl0SwLggQeVYB7auCT6CvUmq+T1wYmD8nYNFWbjqG91lyrXXerI1ZAQy/uSlW0eLiVrzHpq7vpWV
w9iCTBQfa399PrVbTx4YjcknCh7TeXNvZThdWI+vm/wNCFlJnA+BXL/vI8RNbFvvWP3/YvJ82U1B
jJdgmGIGYVJ6sjkgzIaVkbNSF0UiCf4zn10JxtKN0+KaY9Igf5gAOrJRrdexEfpvd0uhU6WYlOoN
k8fSMs9OUnvd7GyZm4zqrP/oBf5NQpa3Uu4RD+gQltrFRq9jtX/MjId2BJo0fR25QZ1pJubP/2Pk
HWrQGH4imTLQaOr+LfpNdLpThkTlCs1oJOzHiQXiWlqFCPxwVm6qj35/Wc/bFOP9pMVHLUNbCh/r
W+CMK/cWIf4bzcVcQ+uNPOx9d7UYi/09zKbvFQuNR9Fw5rq37eOMaPqgHDXMPiTNvPIjymipR3Zy
QksVY8YRe+hd/bynRk093/elkaGApr7DVSe4D7rVyb1hlCJT5b3Vhxs8LnlFKOdI4WNFm8sXZT1Z
OThQC6OW9j4s3h9WgkVQzg6ovHBkhaXp3V55ZbbdFKIG3xT6oQ7GJVvWB3PHlMYkCuzE3zyVaLZu
BpuNvFa6WVRPE5GHstJxzzV0G8q6i6kLw99Y0TJbuN/8J2XOvAUP32XCRQjycrwxiSFrVwRK+Jp6
D3iM19PXBi78AHikW/7WNsepgCeyoSDcl8XuRlyHDctWRTzKBzmnifa71oM8THP2NDxWaFrJeqjy
Au3Bf4XJXV2Rb/lhKla89C58UelI+01QpEaY7hYEJEH8Gs1082GKQVdrSJkoIQYhRaPutLMk7vDZ
m84wwkJYzP0DK7gaJlaJI7Z0SrDniVDMFPSjes4vMXo+ltgFXzFwR82w30xfBlusMMoApgybsGMe
BqSgDnL4OTnAdDNbDZPhnprPbW7t7TJzCq1OXlwh9eo0hz4XnopMP1L1aP2UdLtraejhEwtTYA3f
dT3//m0IYAPEGKKiGjIO/Uu+e47xkBGr0C2AuQLXKasCPSk8JvLXmqs2jo2o1e8PhUY4qKiH5F1c
```

```
File  Edit  View  Search  Terminal  Help
[cloudera@quickstart ~]$ cat -n gadilshina.txt
```

```
File  Edit  View  Search  Terminal  Help
129360  KprashoTCqIBzzdxZOXN7rffXYBu4k6UNmljkvYJCyckwmMk80WgrDuEu+EjbvnS6PxIAcTDoOiS
129361  uNezk2Lkq3r2DraC99XmhY/UdLO0SOszdgUCeFn7wofHZPga878C4sJ2ErMeQh00CP26oFOL/psx
129362  TyQ5zu7GWUyawxKHGLi9CwNgdyZnWweJsF17kHFcTwOk0xBs1CTviLkmB0MxyVSUDtNwfs0jNA31
129363  99yH0LUr/M5xBcwwZxGCWF6HXXNOOFZwIJIVqP0xJwlYvR7B7Q7AdqfSig/INHnToGE7jXUefvhi
129364  vdJ2po61IISUd89sRw4nNibAIWlH+o9SWD01mH6Pso0QmTDJmZAuBJH8c4cPKUQPvFKIxOGXckk7
129365  eM8Y6e1WFmgBVQf043pnrzkd8pMQ1EtPrI2Bi1z4y0Qxg45ahiGrRdWRUVSkbmEyk71/kj5QfKYh
129366  KFaO5UW4sW39fu4gdA+i1Fiwx4U/gV0Dk8opP/10OpW5r6Hjje2yyFUeIuWNFsWqF8ZtEwREnrRn
129367  t4CisqwhsYqYslpTq6txGxOpeeJ60Vs9G9a8qRxuAur7OaZFO0d6Hks1HJpVxrdRPQzGcQ96jBhj
129368  21cTx0srG84tG9JX20zhCOniW1CE2iGz+jiVk35sssVYzIkGEXkwc6AFw5qzre+uPQwNZv14bgjg
129369  etCHn2lQNXTyqA7MrwvgpJpqrW8dttZhIUxWZCLPj+Je15FgifD97xXLQS8P8d0cx77PakEOD8qB
129370  yl0SwLggQeVYB7auCT6CvUmq+T1wYmD8nYNFWbjqG91lyrXXerI1ZAQy/uSlW0eLiVrzHpq7vpWV
129371  w9iCTBQfa399PrVbTx4YjcknCh7TeXNvZThdWI+vm/wNCFlJnA+BXL/vI8RNbFvvWP3/YvJ82U1B
129372  jJdgmGIGYVJ6sjkgzIaVkbNSF0UiCf4zn10JxtKN0+KaY9Igf5gAOrJRrdexEfpvd0uhU6WYlOoN
```

```
[cloudera@quickstart ~]$  cat -b gadilshina.txt
```




```
[cloudera@quickstart ~]$ head  gadilshina.txt
VA2wxef8Slb26PbtbvYrGlFaKR/o2DclBBpHq8Rhb+RJOlxixsEvPy86HESJLFztpJPcTIDTmuuu
twTQD81aIhFk7iYP3JlIa7ftQBJ+AAd1cAI7rLGc39AtTnL6xl+LzrIdSq/nPb/0hlM7PL8hVkxL
QPl8FJwEgl/5SSTv7uya4W6bAOQ0+Imm2aHmajdIyX+8C6lbCo5XFkemhirCGlOAI0pzFsXfgR2i
g5h26HX1vjOxzyN1BHdf0V9NPaGRg4LuIO/2zKxi1IOlqLU7BMZQl/VDWAWNsmFJ+oYsog7YpzlI
m9a3OgCa9pmggP3E0Sc+d47QLViUioviEFXVKWODVLV/ByvQo/fKfZGXVjDS2Fd4iV3x0W9hzXmz
ZSUYdlzb18TPHBdGdsWuQcC2xCbxlp+g3q+Zev9QIiE11fpzqV2XSNuUCN7YZhNxmNRBx8nnJymC
oBPRs7PlsHx602sGmea5VrV1FKv0CN4vBbjZlA4ZYWbHYCVumSahkG3Fw85RQaqTP99bcxCiU0HG
LplA8/+w9ZMBHbh75wp7ihF/zg/hULpXS4Vil2rv52mT5hr5Bi5BaUbtxEkMlHk1Sg6USeNGYH5U
LvFPl9c6CnKxqH6OA3c7Ueb6fn2hYW7ypoI/6r8qm4N6cyc4GHYfMD9KUdwbXWHHskdDMIQdt8RQ
0BuTZWHMnu19v61v48YnluEE3Ds+MmPi6LVq1LquWFPHFvnQDdih1HIdlK+RyRam134muk6B8qNY
[cloudera@quickstart ~]$  head -n 5 gadilshina.txt
```

VA2wx

```
VA2wxef[cloudera@quickstart ~]$  head -n 5 gadilshina.txt
VA2wxef8Slb26PbtbvYrGlFaKR/o2DclBBpHq8Rhb+RJOlxixsEvPy86HESJLFztpJPcTIDTmuuu
twTQD81aIhFk7iYP3JlIa7ftQBJ+AAd1cAI7rLGc39AtTnL6xl+LzrIdSq/nPb/0hlM7PL8hVkxL
QPl8FJwEgl/5SSTv7uya4W6bAOQ0+Imm2aHmajdIyX+8C6lbCo5XFkemhirCGlOAI0pzFsXfgR2i
g5h26HX1vjOxzyN1BHdf0V9NPaGRg4LuIO/2zKxi1IOlqLU7BMZQl/VDWAWNsmFJ+oYsog7YpzlI
m9a3OgCa9pmggP3E0Sc+d47QLViUioviEFXVKWODVLV/ByvQo/fKfZGXVjDS2Fd4iV3x0W9hzXmz
[cloudera@quickstart ~]$ tail gadilshina.txt
XlPUQHQ+h/QGOi86N4Q8NchXJScp/XQGNnZbz5VTh2U6lg1CiNhD3nkdLY23XRs4xfeN135VfAY6
QFaU+QDg3bOhRcLRK2X8HtBpIb7ETKQy6OncxSUgtKvbT67v8e+lRFWpWlrMn0YiHK8Pf6dwzYB6
0kTYaLHNw1J9gLYEmY64VTDEPZ5EOj1ZmpQDAul3i25C45EH8FBQE0sEFy+kJY0cqxdrrSXG/eVq
X7GgpzekT/N4HgikeeDuS/KzlF8q5VP1+EtUlCdnsEpPE5/GNyXDhREfzDfjxmT2LlQAmoUkZxtZ
79AkSvk8S5M0AZwAdbBueb0mnvr2i7CcJRcL9JkkWRpZUSIYqS3UaK+bojcRsa0t8/Y9YSOMMVHo
lhivALevPEcCHM1OYXQMp8davlModQdLVtZ6mSsle00Yk2GPVSgjKJIbzElmw0EhLetuB2dER6vH
5C+7r6NgtEOlleEBCVe5B1lJQnyb8iA0bNxUxi64+ONt/0QrCAzY6XAlj5sLkDThHAytZs3JQSb8
4j2H1Yyq9fOzh4HVWasnU/dgGsRINMQiSwf4cWk5lwvN5b0w64Mt2J3iDe+uD9MYm9guU76RJKgk
mD/1tjPQCzJXjYjokjOWHuL2D9MQgMgBxXgzRe+geRubhWvsGhdCuW6yrJdWk+LWt3ukjYUVhE9z
jURg/L8hr+[cloudera@quickstart ~]$
```

```
[cloudera@quickstart ~]$ tail -c 5 gadilshina.txt
L8hr+[cloudera@quickstart ~]$
```

```
L8hr+[cloudera@quickstart ~]$ tail -n 5 gadilshina.txt
lhivALevPEcCHM1OYXQMp8davlModQdLVtZ6mSsle00Yk2GPVSgjKJIbzElmw0EhLetuB2dER6vH
5C+7r6NgtEOlleEBCVe5B1lJQnyb8iA0bNxUxi64+ONt/0QrCAzY6XAlj5sLkDThHAytZs3JQSb8
4j2H1Yyq9fOzh4HVWasnU/dgGsRINMQiSwf4cWk5lwvN5b0w64Mt2J3iDe+uD9MYm9guU76RJKgk
mD/1tjPQCzJXjYjokjOWHuL2D9MQgMgBxXgzRe+geRubhWvsGhdCuW6yrJdWk+LWt3ukjYUVhE9z
jURg/L8hr+[cloudera@quickstart ~]$
```

### 3.1.9. Создать копию файла file.txt вида date_file.txt, где в начале имени файла-копии указана текущая дата. Вывести листинг.

```
[cloudera@quickstart ~]$ cp gadilshina.txt 29.03.2024_gadilshina.txt
[cloudera@quickstart ~]$ ls
29.03.2024_gadilshina.txt  Downloads                  gadilshina.txt   __MACOSX  Templates
cloudera-manager           eclipse                    geolocation.csv  Music     trucks.csv
cm_api.py                  enterprise-deployment.json geolocation.zip  parcels   Videos
Desktop                    express-deployment.json    kerberos         Pictures  workspace
Documents                  gadilshina.gz              lib              Public
```

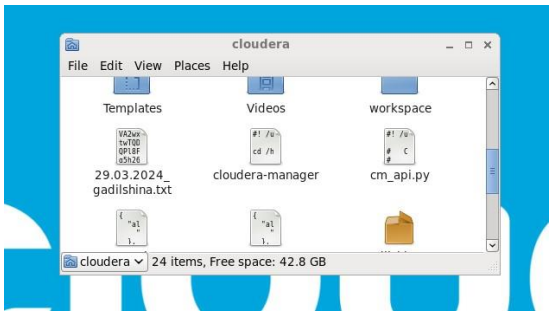
```
[cloudera@quickstart ~]$  hdfs dfs -cp /user/mgpu/gadilshina/gadilshina.txt /user/mgpu/gadilshina/29.03.2024_gadilshina.txt

[cloudera@quickstart ~]$  hdfs dfs -ls /user/mgpu/gadilshina/
Found 3 items
-rw-r--r--   1 cloudera supergroup   10000000 2024-03-29 10:58 /user/mgpu/gadilshina/29.03.2024_gadilshina.txt
-rw-r--r--   1 cloudera supergroup    7599428 2024-03-29 10:10 /user/mgpu/gadilshina/gadilshina.gz
-rw-r--r--   1 cloudera supergroup   10000000 2024-03-29 10:09 /user/mgpu/gadilshina/gadilshina.txt
```

### 3.1.10. Вывести статистику по директории /user/mgpu/fio виртуальной машины.

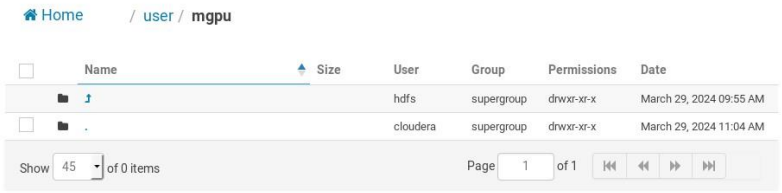
```
[cloudera@quickstart ~]$  hdfs dfs -cp /user/mgpu/gadilshina/gadilshina.txt /user/mgpu/gadilshina/29.03.2024_gadilshina.txt

[cloudera@quickstart ~]$  hdfs dfs -ls /user/mgpu/gadilshina/
Found 3 items
-rw-r--r--   1 cloudera supergroup   10000000 2024-03-29 10:58 /user/mgpu/gadilshina/29.03.2024_gadilshina.txt
-rw-r--r--   1 cloudera supergroup    7599428 2024-03-29 10:10 /user/mgpu/gadilshina/gadilshina.gz
-rw-r--r--   1 cloudera supergroup   10000000 2024-03-29 10:09 /user/mgpu/gadilshina/gadilshina.txt
```

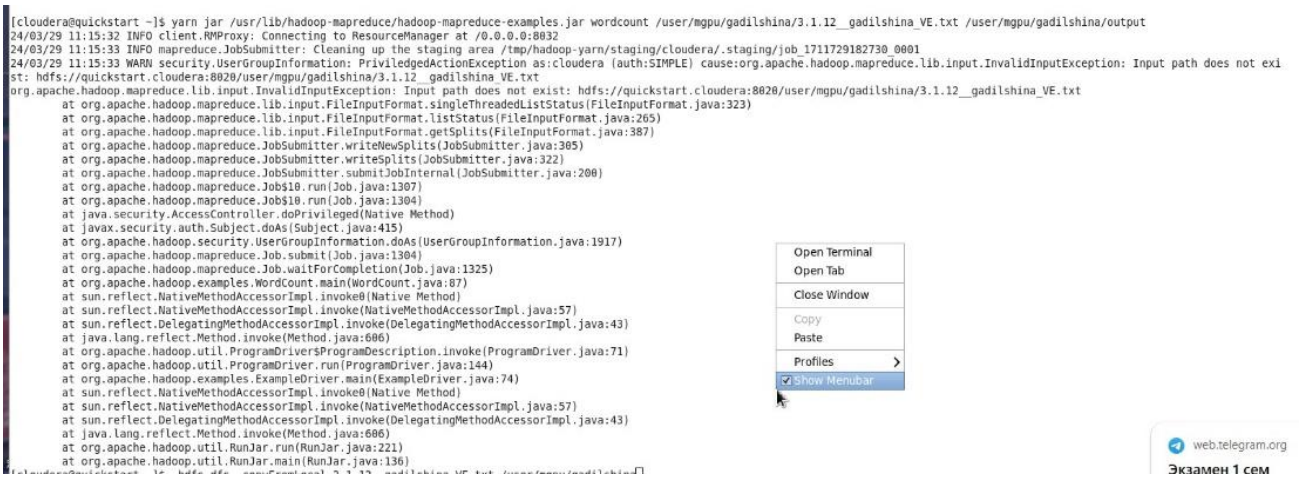




### 3.1.11. Удалить поддиректорию /fio со всем содержимым.

```
-rw-r--r--   1 cloudera supergroup   10000000 2024-03-29 10:09 /u
[cloudera@quickstart ~]$ hdfs dfs -rm -R /user/mgpu/gadilshina
Deleted /user/mgpu/gadilshina
[cloudera@quickstart ~]$
```




### 3.1.12. Подсчитать количество слов в файле внутри HDFS с помощью методологии Map Reduce (размер файла не менее 128 Мб).




### 3.2. Создание таблицы в Hive

1. **Скачать [датасет](#) или [тут](#)**

```
[cloudera@quickstart ~]$ wget https://github.com/BosenkoTM/cloudera-quickstart/b
lob/main/data/athlete.snappy.parquet
--2024-03-29 11:45:30--  https://github.com/BosenkoTM/cloudera-quickstart/blob/m
ain/data/athlete.snappy.parquet
Resolving github.com... 140.82.121.3
Connecting to github.com|140.82.121.3|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: “athlete.snappy.parquet”

    [ <=>                                   ] 147,480     --.-K/s   in 0.1s

2024-03-29 11:45:31 (1.26 MB/s) - “athlete.snappy.parquet” saved [147480]
```

```
[cloudera@quickstart ~]$ ls
29.03.2024_gadilshina.txt  cm_api.py  enterprise-deployment.json  geolocation.zip  parcels     Videos
3.1.12__gadilshina_SV.txt  Desktop    express-deployment.json     kerberos         Pictures    workspace
3.1.12__gadilshina_VE.txt  Documents  gadilshina.gz               lib              Public
athlete.snappy.parquet     Downloads  gadilshina.txt              __MACOSX         Templates
cloudera-manager           eclipse    geolocation.csv             Music            trucks.csv
```

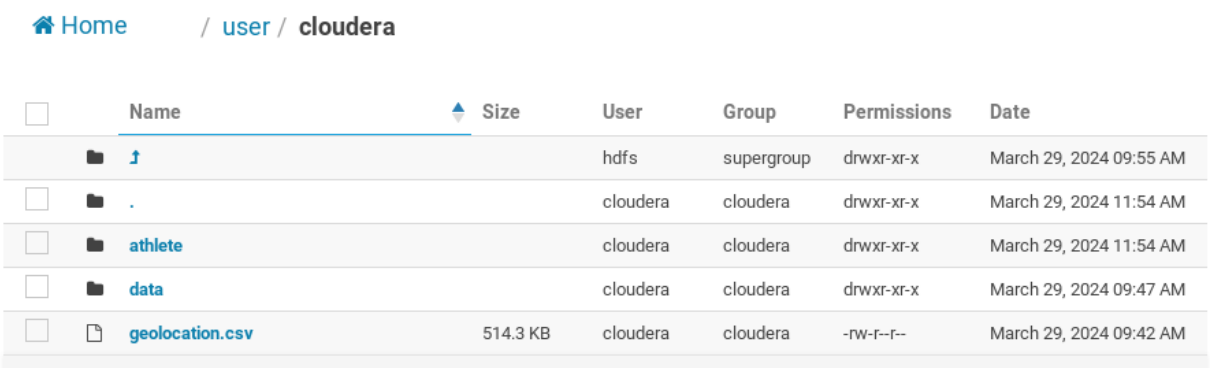
2. **Через HUE загрузите файл в папку /user/cloudera/athlete.**

+

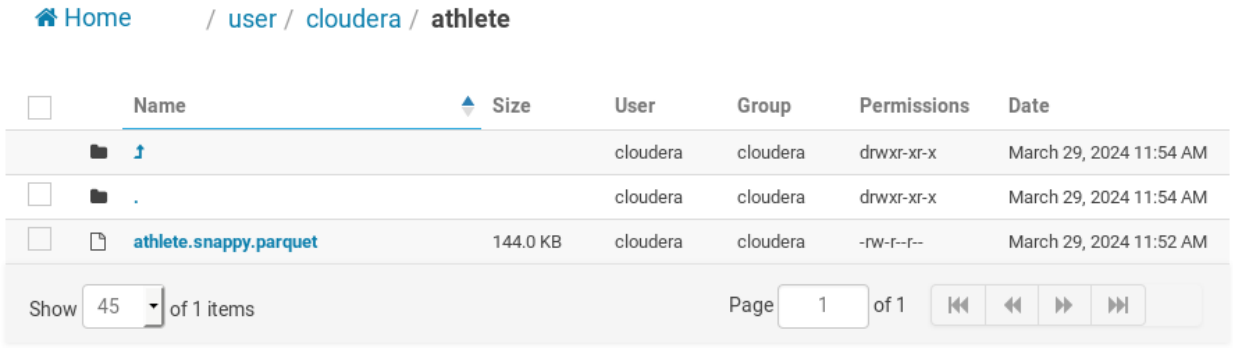
3. **В навигационном меню выберите Files.**

+

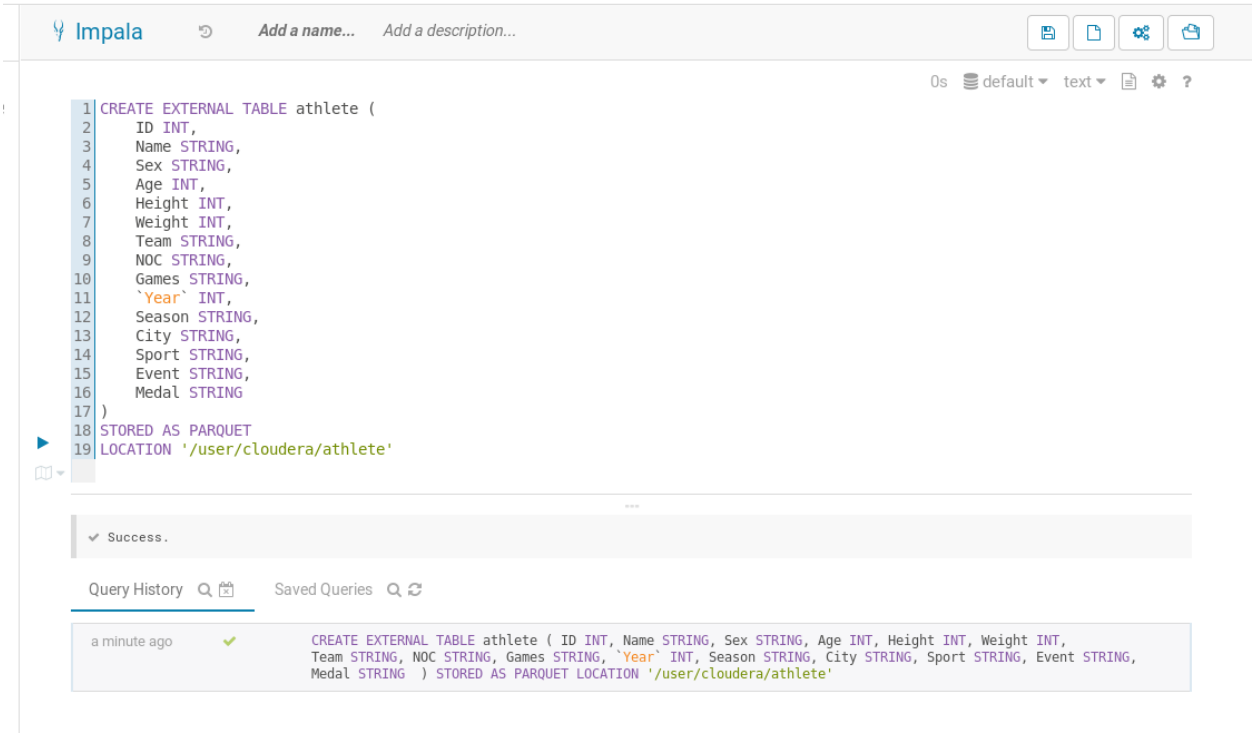
4. **Создайте**

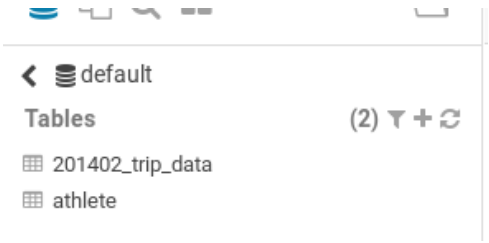



5. **Загрузите файл в HDFS, нажав Upload.**




6. **Перейдите в “Editor > Hive” и выполните запрос:**






### 3.3 Проанализировать и визуализировать данные с помощью Impala (высокоскоростной механизм запросов SQL) или Hive.

- **Загрузить и разархивировать babs_open_data_year_1.zip.**

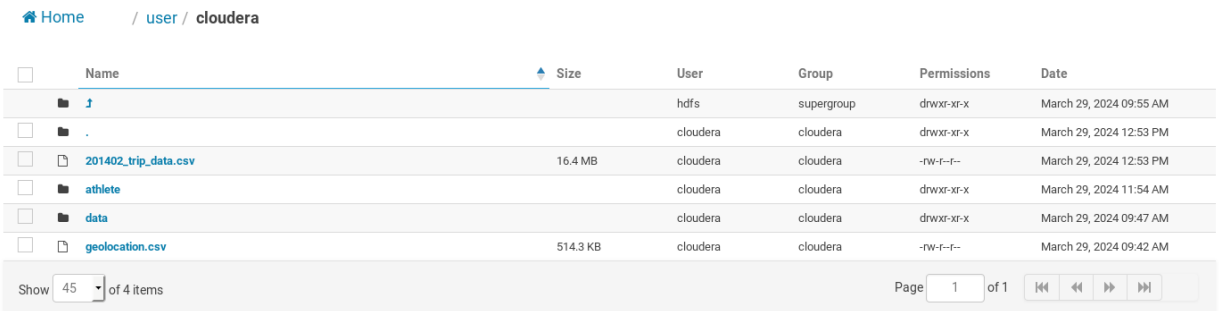
```
[cloudera@quickstart ~]$ wget https://community.cloudera.com/xgkfq28377/attachments/xgkfq28377/Questions/87306/1/babs_open_data_year_1.zip
--2024-03-29 12:38:13--  https://community.cloudera.com/xgkfq28377/attachments/xgkfq28377/Questions/87306/1/babs_open_data_year_1.zip
Resolving community.cloudera.com... 143.204.237.55, 143.204.237.25, 143.204.237.129, ...
Connecting to community.cloudera.com|143.204.237.55|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 74878 (73K) [application/zip]
Saving to: “babs_open_data_year_1.zip”

100%[=======================================================================================================>] 74,878      --.-K/s   in 0.04s

2024-03-29 12:38:15 (1.74 MB/s) - “babs_open_data_year_1.zip” saved [74878/74878]
```

```
[cloudera@quickstart ~]$ ls
29.03.2024_gadilshina.txt  babs_open_data_year_1.zip  Downloads                  gadilshina.txt   __MACOSX  Templates
3.1.12__gadilshina_SV.txt  cloudera-manager           eclipse                    geolocation.csv  Music     trucks.csv
3.1.12__gadilshina_VE.txt  cm_api.py                 enterprise-deployment.json geolocation.zip  parcels   Videos
athlete.snappy.parquet     Desktop                    express-deployment.json    kerberos         Pictures  workspace
babs_open_data_year_1      Documents                  gadilshina.gz              lib              Public
[cloudera@quickstart ~]$ unzip babs_open_data_year_1.zip
Archive:  babs_open_data_year_1.zip
   creating: 201402_babs_open_data/
  inflating: 201402_babs_open_data/201402_station_data.csv
  inflating: 201402_babs_open_data/201402_status_data.csv
  inflating: 201402_babs_open_data/201402_trip_data.csv
  inflating: 201402_babs_open_data/201402_weather_data.csv
  inflating: 201402_babs_open_data/README.txt
   creating: 201408_babs_open_data/
  inflating: 201408_babs_open_data/201408_station_data.csv
  inflating: 201408_babs_open_data/201408_status_data.csv
  inflating: 201408_babs_open_data/201408_trip_data.csv
  inflating: 201408_babs_open_data/201408_weather_data.csv
  inflating: 201408_babs_open_data/README.txt
```

- **Перенести данные 201402_trip_data.csv в HDFS.**




- **Создать таблицу в Hive с привязкой к внешним данным 201402_trip_data.csv.**

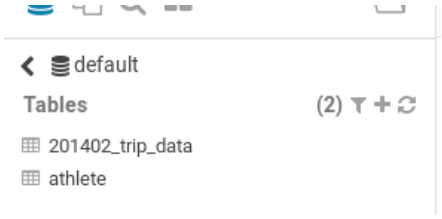
```
CREATE EXTERNAL TABLE 201402_trip_data (
TripID INT,
Duration INT,
StartDate STRING,
startstation STRING,
StartTerminal INT,
EndDate STRING,
endstation STRING,
EndTerminal INT,
Bike INT,
SubscriptionType STRING,
ZipCode STRING
)
ROW FORMAT DELIMITED
FIELDS TERMINATED BY ','
LOCATION '/user/cloudera/trip_data'
```

Success.

Query History  Saved Queries

a few seconds ago

```
CREATE EXTERNAL TABLE 201402_trip_data ( TripID INT, Duration INT, StartDate STRING, startstation STRING,
StartTerminal INT, EndDate STRING, endstation STRING, EndTerminal INT, Bike INT,
SubscriptionType STRING, ZipCode STRING ) ROW FORMAT DELIMITED FIELDS TERMINATED BY ','
LOCATION '/user/cloudera/trip_data'
```




- **выполнить запрос**

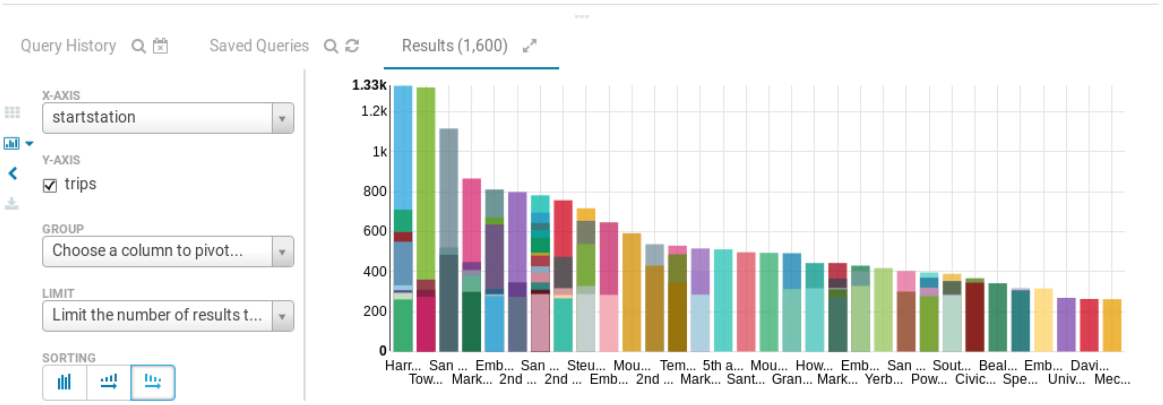
select `startstation`, `endstation`, count(*) as trips
from `default`.`201402_trip_data`
group by `startstation`, `endstation`
order by trips desc;

```
select `startstation`, `endstation`, count(*) as trips
from `default`.`201402_trip_data`
group by `startstation`, `endstation`
order by trips desc;
```

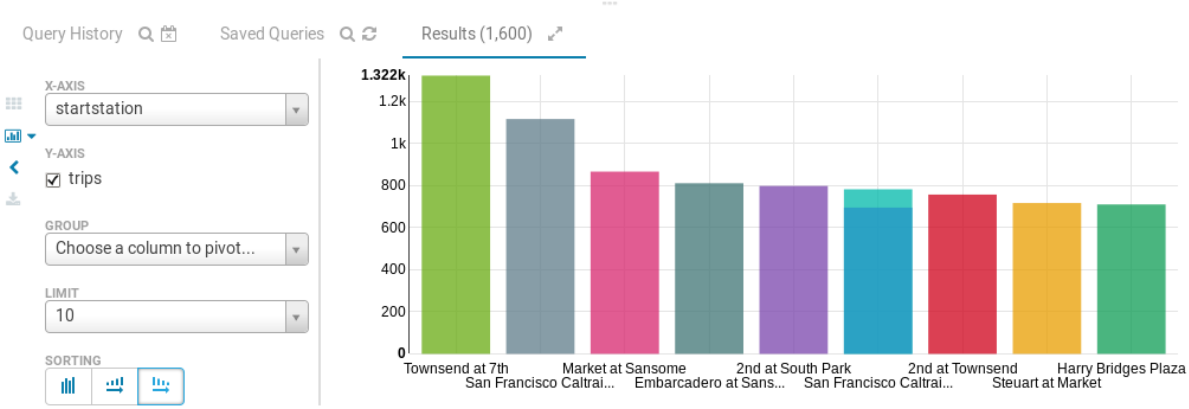
Query History  Saved Queries  Results (1,024+)

| | startstation | endstation | trips |
|---|---|---|---|
| 1 | Harry Bridges Plaza (Ferry Building) | Embarcadero at Sansome | 1330 |
| 2 | Townsend at 7th | San Francisco Caltrain (Townsend at 4th) | 1322 |
| 3 | San Francisco Caltrain 2 (330 Townsend) | Townsend at 7th | 1116 |
| 4 | Market at Sansome | 2nd at South Park | 866 |
| 5 | Embarcadero at Sansome | Steuart at Market | 811 |
| 6 | 2nd at South Park | Market at Sansome | 798 |
| 7 | San Francisco Caltrain (Townsend at 4th) | Harry Bridges Plaza (Ferry Building) | 782 |
| 8 | 2nd at Townsend | Harry Bridges Plaza (Ferry Building) | 757 |
| 9 | Steuart at Market | Embarcadero at Sansome | 717 |
| 10 | Harry Bridges Plaza (Ferry Building) | 2nd at Townsend | 710 |
| 11 | San Francisco Caltrain (Townsend at 4th) | Embarcadero at Folsom | 695 |
| 12 | Embarcadero at Sansome | Harry Bridges Plaza (Ferry Building) | 671 |
| 13 | Steuart at Market | 2nd at Townsend | 654 |
| 14 | Embarcadero at Folsom | San Francisco Caltrain (Townsend at 4th) | 647 |

- **Создать гистограмму, щелкнув значок «Hue Bar»:**




- **Установить ось X в качестве начальной станции, а ось Y — в качестве маршрута. Установить лимит 10.**




- **Выгрузить результаты, выбрав CSV или Excel.**