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Институт цифрового образования
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ДИСЦИПЛИНА:
«Инструменты для хранения и обработки больших данных»

пр_06

Тема:

«Introduction to Yarn + Hive»

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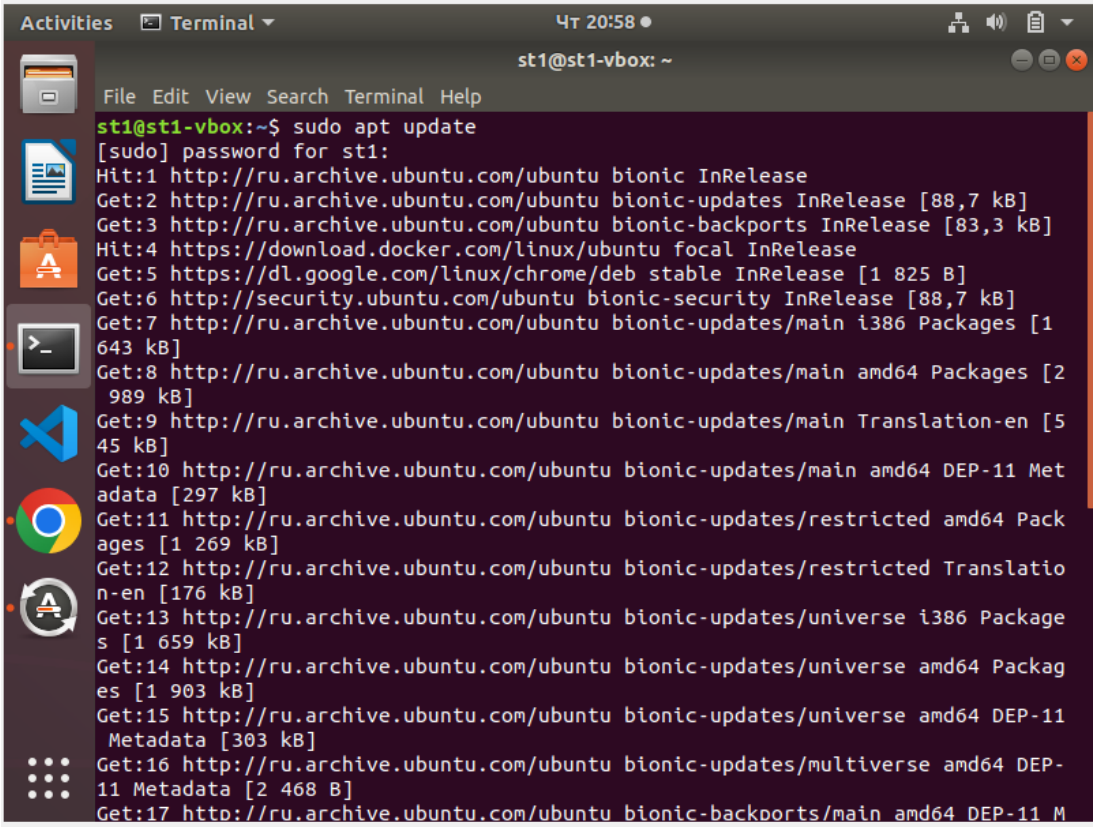
Москва
2023

УСТАНОВКА DOCKER




```
st1@st1-vbox:~$ sudo apt install apt-transport-https ca-certificates curl softw
are-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (20211016ubuntu0.18.04.1).
curl is already the newest version (7.58.0-2ubuntu3.24).
The following packages were automatically installed and are no longer required:
  gir1.2-goa-1.0 gir1.2-snapd-1 linux-hwe-5.4-headers-5.4.0-84
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  python3-software-properties software-properties-gtk
  ubuntu-advantage-desktop-daemon ubuntu-advantage-tools
The following NEW packages will be installed:
  ubuntu-advantage-desktop-daemon
The following packages will be upgraded:
  apt-transport-https python3-software-properties software-properties-common
  software-properties-gtk ubuntu-advantage-tools
5 upgraded, 1 newly installed, 0 to remove and 28 not upgraded.
Need to get 294 kB of archives.
After this operation, 1 964 kB disk space will be freed.
Do you want to continue? [Y/n]
```

```
st1@st1-vbox:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo
apt-key add -
OK
st1@st1-vbox:~$
```

```
st1@st1-vbox:~$ sudo add-apt-repository "deb [arch=amd64] https://download.dock
er.com/linux/ubuntu focal stable"
Hit:1 http://ru.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://ru.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://ru.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 https://download.docker.com/linux/ubuntu focal InRelease
Hit:5 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:6 http://security.ubuntu.com/ubuntu bionic-security InRelease
```

```
st1@st1-vbox:~$ sudo apt update
Hit:1 http://ru.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://ru.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://ru.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 https://download.docker.com/linux/ubuntu focal InRelease
Hit:6 http://security.ubuntu.com/ubuntu bionic-security InRelease
Reading package lists... Done
Building dependency tree
Reading state information... Done
28 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

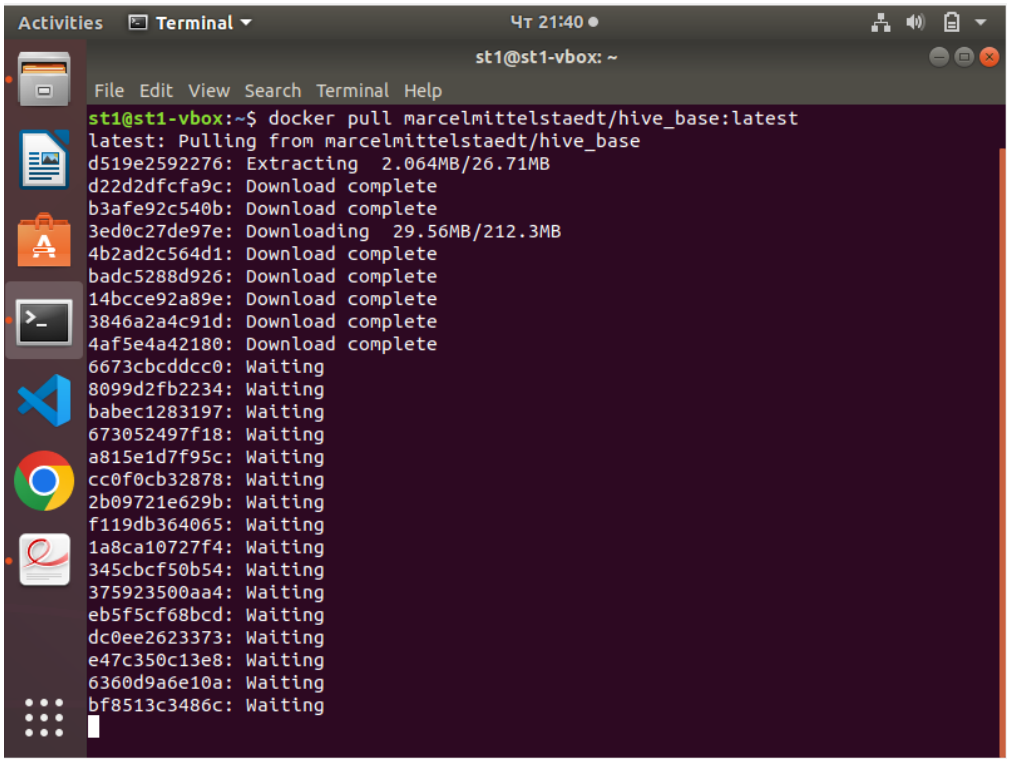
```
st1@st1-vbox:~$ apt-cache policy docker-ce
docker-ce:
  Installed: 5:20.10.16~3-0~ubuntu-focal
  Candidate: 5:23.0.5-1~ubuntu.20.04~focal
  Version table:
     5:23.0.5-1~ubuntu.20.04~focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:23.0.4-1~ubuntu.20.04~focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:23.0.3-1~ubuntu.20.04~focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:23.0.2-1~ubuntu.20.04~focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:23.0.1-1~ubuntu.20.04~focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:23.0.0-1~ubuntu.20.04~focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:20.10.24~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
s
     5:20.10.23~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Package
```

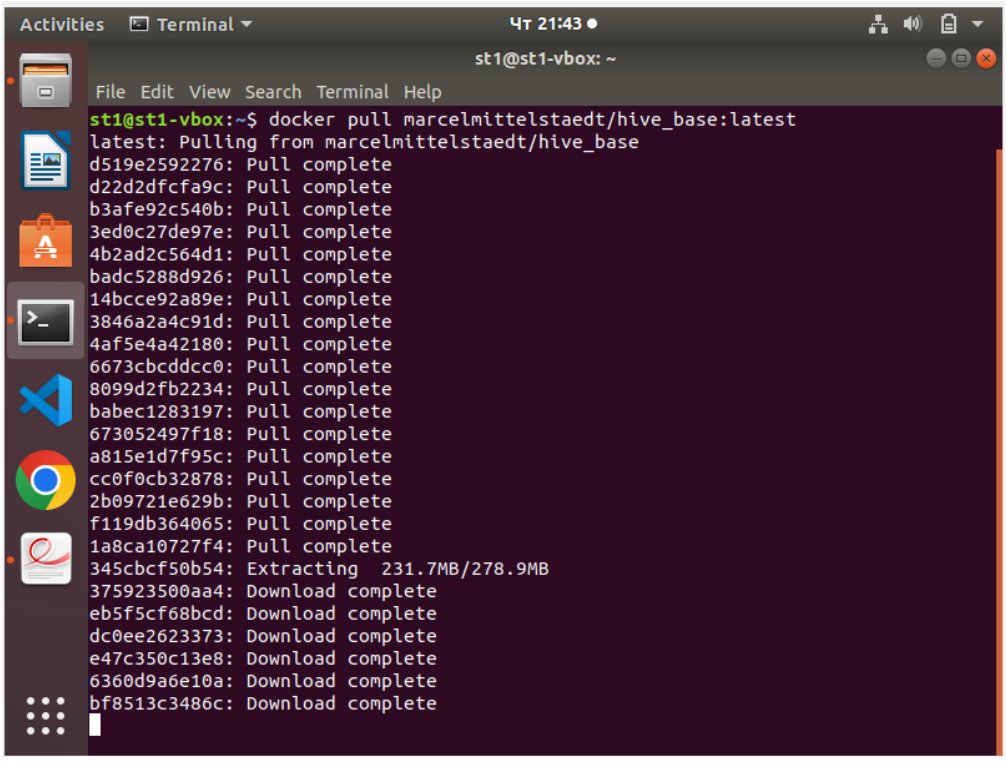
```
st1@st1-vbox:~$ sudo apt install docker-ce
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  gir1.2-goa-1.0 gir1.2-snapd-1 linux-hwe-5.4-headers-5.4.0-84
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
The following packages will be upgraded:
  docker-ce
1 upgraded, 0 newly installed, 0 to remove and 27 not upgraded.
Need to get 22,0 MB of archives.
After this operation, 1 584 kB disk space will be freed.
Get:1 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-ce amd
64 5:23.0.5-1~ubuntu.20.04~focal [22,0 MB]
Fetched 22,0 MB in 2s (8 909 kB/s)
(Reading database ... 75%
```

```
st1@st1-vbox:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset:
   Active: active (running) since Thu 2023-05-04 21:04:21 MSK; 52s ago
     Docs: https://docs.docker.com
 Main PID: 7214 (dockerd)
    Tasks: 8
   CGroup: /system.slice/docker.service
           └─7214 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/contai

мая 04 21:04:20 st1-vbox dockerd[7214]: time="2023-05-04T21:04:20.838374140+03:
мая 04 21:04:20 st1-vbox dockerd[7214]: time="2023-05-04T21:04:20.870200035+03:
мая 04 21:04:20 st1-vbox dockerd[7214]: time="2023-05-04T21:04:20.874058087+03:
мая 04 21:04:21 st1-vbox dockerd[7214]: time="2023-05-04T21:04:21.242196030+03:
мая 04 21:04:21 st1-vbox dockerd[7214]: time="2023-05-04T21:04:21.439072761+03:
мая 04 21:04:21 st1-vbox dockerd[7214]: time="2023-05-04T21:04:21.624174073+03:
мая 04 21:04:21 st1-vbox dockerd[7214]: time="2023-05-04T21:04:21.626728860+03:
мая 04 21:04:21 st1-vbox dockerd[7214]: time="2023-05-04T21:04:21.630481295+03:
мая 04 21:04:21 st1-vbox systemd[1]: Started Docker Application Container Engin
мая 04 21:04:21 st1-vbox dockerd[7214]: time="2023-05-04T21:04:21.688697418+03:
lines 1-19/19 (END)
```

```
st1@st1-vbox:~$ docker

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers

Options:
      --config string      Location of client config files (default
                           "/home/st1/.docker")
  -c, --context string     Name of the context to use to connect to the
                           daemon (overrides DOCKER_HOST env var and
                           default context set with "docker context use")
  -D, --debug              Enable debug mode
  -H, --host list          Daemon socket(s) to connect to
  -l, --log-level string   Set the logging level
                           ("debug"|"info"|"warn"|"error"|"fatal")
                           (default "info")
      --tls                Use TLS; implied by --tlsverify
      --tlscacert string   Trust certs signed only by this CA (default
                           "/home/st1/.docker/ca.pem")
      --tlscert string     Path to TLS certificate file (default
                           "/home/st1/.docker/cert.pem")
      --tlskey string      Path to TLS key file (default
                           "/home/st1/.docker/key.pem")
      --tlsverify          Use TLS and verify the remote
  -v, --version            Print version information and quit
```

```
st1@st1-vbox:~$ sudo usermod -aG docker $USER
[sudo] password for st1:
st1@st1-vbox:~$
```






```
st1@st1-vbox:~$ docker run -dit --name hive_base_container -p 8088:8088 -p 9870
:9870 -p 9864:9864 marcelmittelstaedt/hive_base:latest
3e08b75870b9cd7551102170dbc6e8a0e4929fc12e64190cb0c7845cd0999f59
st1@st1-vbox:~$
```

```
st1@st1-vbox:~$ docker ps -a
CONTAINER ID   IMAGE                                COMMAND         CREATED
       STATUS          PORTS
                                                                          NAMES
3e08b75870b9   marcelmittelstaedt/hive_base:latest   "/startup.sh"   53 seconds
 ago   Up 50 seconds   0.0.0.0:8088->8088/tcp, :::8088->8088/tcp, 0.0.0.0:9864-
>9864/tcp, :::9864->9864/tcp, 0.0.0.0:9870->9870/tcp, :::9870->9870/tcp   hive_
base_container
```

```
st1@st1-vbox:~$ docker logs hive_base_container
 * Restarting OpenBSD Secure Shell server sshd                            [ OK ]
First start of container.
Format HDFS.
Switched to User:
hadoop
WARNING: /home/hadoop/hadoop/logs does not exist. Creating.
2023-05-04 18:44:40,992 INFO namenode.NameNode: STARTUP_MSG:
/************************************************************
STARTUP_MSG: Starting NameNode
STARTUP_MSG:   host = 3e08b75870b9/172.17.0.2
STARTUP_MSG:   args = [-format]
STARTUP_MSG:   version = 3.1.2
STARTUP_MSG:   classpath = /home/hadoop/hadoop/etc/hadoop:/home/hadoop/hadoop/s
hare/hadoop/common/lib/snappy-java-1.0.5.jar:/home/hadoop/hadoop/share/hadoop/c
ommon/lib/jsr311-api-1.1.1.jar:/home/hadoop/hadoop/share/hadoop/common/lib/jett
y-server-9.3.24.v20180605.jar:/home/hadoop/hadoop/share/hadoop/common/lib/token
-provider-1.0.1.jar:/home/hadoop/hadoop/share/hadoop/common/lib/htrace-core4-4.
1.0-incubating.jar:/home/hadoop/hadoop/share/hadoop/common/lib/kerb-simplekdc-1
.0.1.jar:/home/hadoop/hadoop/share/hadoop/common/lib/jetty-servlet-9.3.24.v2018
0605.jar:/home/hadoop/hadoop/share/hadoop/common/lib/re2j-1.1.jar:/home/hadoop/
hadoop/share/hadoop/common/lib/jackson-annotations-2.7.8.jar:/home/hadoop/hadoo
p/share/hadoop/common/lib/zookeeper-3.4.13.jar:/home/hadoop/hadoop/share/hadoop
/common/lib/commons-io-2.5.jar:/home/hadoop/hadoop/share/hadoop/common/lib/jett
y-util-9.3.24.v20180605.jar:/home/hadoop/hadoop/share/hadoop/common/lib/woodsto
x-core-5.0.3.jar:/home/hadoop/hadoop/share/hadoop/common/lib/kerb-crypto-1.0.1.
```

```
st1@st1-vbox:~$ docker exec -it hive_base_container bash
root@3e08b75870b9:/#
```

```
st1@st1-vbox:~$ docker exec -it hive_base_container bash
root@3e08b75870b9:/# sudo su hadoop
hadoop@3e08b75870b9:/$ cd hadoop@c821a0e1bdcf:~$
```

```
st1@st1-vbox:~$ docker exec -it hive_base_container bash
root@3e08b75870b9:/# sudo su hadoop
hadoop@3e08b75870b9:/$ cd hadoop@c821a0e1bdcf:~$
bash: cd: hadoop@c821a0e1bdcf:~$: No such file or directory
hadoop@3e08b75870b9:/$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
```

```
hadoop@3e08b75870b9:/$ hive
SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/home/hadoop/hive/lib/log4j-slf4j-impl-2.10.0
.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/home/hadoop/hadoop/share/hadoop/common/lib/s
lf4j-log4j12-1.7.25.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation
.
SLF4J: Actual binding is of type [org.apache.logging.slf4j.Log4jLoggerFactory]
Hive Session ID = db222454-f9fd-430b-88c0-e185779ef1c3

Logging initialized using configuration in jar:file:/home/hadoop/hive/lib/hive-
common-3.1.2.jar!/hive-log4j2.properties Async: true
Thu May 04 18:51:41 GMT 2023 Thread[db222454-f9fd-430b-88c0-e185779ef1c3 main,5
,main] java.io.FileNotFoundException: derby.log (Permission denied)
Thu May 04 18:51:41 GMT 2023 Thread[db222454-f9fd-430b-88c0-e185779ef1c3 main,5
,main] Ignored duplicate property derby.module.replication.master in jar:file:/
home/hadoop/hive/lib/hive-druid-handler-3.1.2.jar!/org/apache/derby/modules.pro
perties
Thu May 04 18:51:41 GMT 2023 Thread[db222454-f9fd-430b-88c0-e185779ef1c3 main,5
,main] Ignored duplicate property derby.module.resultSetStatisticsFactory in ja
r:file:/home/hadoop/hive/lib/hive-druid-handler-3.1.2.jar!/org/apache/derby/mod
ules.properties
Thu May 04 18:51:41 GMT 2023 Thread[db222454-f9fd-430b-88c0-e185779ef1c3 main,5
,main] Ignored duplicate property derby.module.NoneAuthentication in jar:file:/
home/hadoop/hive/lib/hive-druid-handler-3.1.2.jar!/org/apache/derby/modules.pro
perties
```

```
hive> show databases;
OK
default
Time taken: 1.44 seconds, Fetched: 1 row(s)
hive>
```

```
hive> exit
    >
    > hadoop@3e08b75870b9:/$ ;
bash: syntax error near unexpected token `;'
hadoop@3e08b75870b9:/$ exit
exit
root@3e08b75870b9:/# exit
exit
st1@st1-vbox:~$ wget https://datasets.imdbws.com/title.basics.tsv.gz
--2023-05-04 21:56:13--  https://datasets.imdbws.com/title.basics.tsv.gz
Resolving datasets.imdbws.com (datasets.imdbws.com)... 18.165.122.124, 18.165.1
22.50, 18.165.122.39, ...
Connecting to datasets.imdbws.com (datasets.imdbws.com)|18.165.122.124|:443...
connected.
HTTP request sent, awaiting response... 200 OK
Length: 171570495 (164M) [binary/octet-stream]
Saving to: ‘title.basics.tsv.gz’

title.basics.tsv.gz  28%[====>              ]  46,37M  10,2MB/s    eta 12s
```

??7

```
st1@st1-vbox:~$ wget https://datasets.imdbws.com/title.ratings.tsv.gz
--2023-05-04 21:57:48--  https://datasets.imdbws.com/title.ratings.tsv.gz
Resolving datasets.imdbws.com (datasets.imdbws.com)... 18.165.122.50, 18.165.12
2.47, 18.165.122.39, ...
Connecting to datasets.imdbws.com (datasets.imdbws.com)|18.165.122.50|:443... c
onnected.
HTTP request sent, awaiting response... 200 OK
Length: 6562168 (6,3M) [binary/octet-stream]
Saving to: ‘title.ratings.tsv.gz’

title.ratings.tsv.g 100%[==================>]   6,26M  8,66MB/s    in 0,7s

2023-05-04 21:57:49 (8,66 MB/s) - ‘title.ratings.tsv.gz’ saved [6562168/6562168
]

st1@st1-vbox:~$
```

```
st1@st1-vbox:~$ gunzip title.basics.tsv.gz
st1@st1-vbox:~$ gunzip title.ratings.tsv.gz
```

```
st1@st1-vbox:~$ $HADOOP_HOME/bin/hadoop fs -mkdir /user/hadoop/imdb
mkdir: `hdfs://localhost:9000/user/hadoop': No such file or directory
st1@st1-vbox:~$ $HADOOP_HOME/bin/hadoop fs -mkdir -p /user/hadoop/imdb
st1@st1-vbox:~$ $HADOOP_HOME/bin/hadoop fs -mkdir -p /user/hadoop/imdb/title_ba
sics
st1@st1-vbox:~$ $HADOOP_HOME/bin/hadoop fs -mkdir -p /user/hadoop/imdb/title_ra
tings
st1@st1-vbox:~$
```

```
st1@st1-vbox:~$ $HADOOP_HOME/bin/hadoop fs -put title.basics.tsv /user/hadoop/i
mdb/title_basics/title.basics.tsv
st1@st1-vbox:~$ $HADOOP_HOME/bin/hadoop fs -put title.ratings.tsv /user/hadoop/
imdb/title_ratings/title.ratings.tsv
st1@st1-vbox:~$
```

??????????????????????????????????

```
st1@st1-vbox:~$ docker exec -it hive_base_container bash
root@a92ae4c95e66:/# sudo su hadoop
hadoop@a92ae4c95e66:/$ ls
CONTAINER_ALREADY_INITIALIZED  dev   lib    mnt   root  srv         tmp
bin                            etc   lib64  opt   run   startup.sh  usr
boot                           home  media  proc  sbin  sys         var
hadoop@a92ae4c95e66:/$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [a92ae4c95e66]
Starting resourcemanager
Starting nodemanagers
hadoop@a92ae4c95e66:/$
```

```
root@a92ae4c95e66:/# wget https://datasets.imdbws.com/title.basics.tsv.gz
--2023-05-04 20:35:31--  https://datasets.imdbws.com/title.basics.tsv.gz
Resolving datasets.imdbws.com (datasets.imdbws.com)... 18.165.122.39, 18.165.12
2.124, 18.165.122.50, ...
Connecting to datasets.imdbws.com (datasets.imdbws.com)|18.165.122.39|:443... c
onnected.
HTTP request sent, awaiting response... 200 OK
Length: 171570495 (164M) [binary/octet-stream]
Saving to: 'title.basics.tsv.gz'

title.basics.tsv.gz 100%[==================>] 163.62M  10.9MB/s    in 16s

2023-05-04 20:35:47 (10.2 MB/s) - 'title.basics.tsv.gz' saved [171570495/171570
495]

root@a92ae4c95e66:/#
```

```
root@a92ae4c95e66:/# wget https://datasets.imdbws.com/title.ratings.tsv.gz
--2023-05-04 20:36:57--  https://datasets.imdbws.com/title.ratings.tsv.gz
Resolving datasets.imdbws.com (datasets.imdbws.com)... 18.165.122.39, 18.165.12
2.124, 18.165.122.50, ...
Connecting to datasets.imdbws.com (datasets.imdbws.com)|18.165.122.39|:443... c
onnected.
HTTP request sent, awaiting response... 200 OK
Length: 6562168 (6.3M) [binary/octet-stream]
Saving to: 'title.ratings.tsv.gz'

title.ratings.tsv.g 100%[==================>]   6.26M  8.56MB/s    in 0.7s

2023-05-04 20:36:58 (8.56 MB/s) - 'title.ratings.tsv.gz' saved [6562168/6562168
]
```

```
root@a92ae4c95e66:/# gunzip title.basics.tsv.gz
root@a92ae4c95e66:/# gunzip title.ratings.tsv.gz
```

```
root@a92ae4c95e66:/# sudo su hadoop
hadoop@a92ae4c95e66:/$ hadoop fs -mkdir /user/hadoop/imdb
hadoop@a92ae4c95e66:/$ hadoop fs -mkdir /user/hadoop/imdb/title_basics
hadoop@a92ae4c95e66:/$ hadoop fs -mkdir /user/hadoop/imdb/title_ratings
hadoop@a92ae4c95e66:/$
```

```
hadoop@a92ae4c95e66:/$ hadoop fs -put title.basics.tsv /user/hadoop/imdb/title_
basics/title.basics.tsv
hadoop@a92ae4c95e66:/$ hadoop fs -put title.ratings.tsv /user/hadoop/imdb/title
_ratings/title.ratings.tsv
hadoop@a92ae4c95e66:/$
```

```
hive> CREATE EXTERNAL TABLE IF NOT EXISTS title_ratings(
    > tconst STRING,
    > average_rating DECIMAL(2,1),
    > num_votes BIGINT
    > ) COMMENT 'IMDb Ratings'
    > ROW FORMAT DELIMITED FIELDS TERMINATED BY '\t' STORED AS
    > TEXTFILE LOCATION '/user/hadoop/imdb/title_ratings'
    > TBLPROPERTIES ('skip.header.line.count'='1');
OK
Time taken: 2.463 seconds
hive>
```

```
hive> CREATE EXTERNAL TABLE IF NOT EXISTS title_basics (
    > tconst STRING,
    > title_type STRING,
    > primary_title STRING,
    > original_title STRING,
    > is_adult DECIMAL(1,0),
    > start_year DECIMAL(4,0),
    > end_year STRING,
    > runtime_minutes INT,
    > genres STRING
    > ) COMMENT 'IMDb Movies' ROW FORMAT DELIMITED FIELDS TERMINATED BY
    > '\t' STORED AS TEXTFILE LOCATION '/user/hadoop/imdb/title_basics'
    > TBLPROPERTIES ('skip.header.line.count'='1');
OK
Time taken: 0.298 seconds
hive>
```

```
hive> select * from title_basics limit 3;
OK
tt0000001       short   Carmencita      Carmencita      0       1894    NULL  1
Documentary,Short
tt0000002       short   Le clown et ses chiens  Le clown et ses chiens  0     1
892     NULL    5       Animation,Short
tt0000003       short   Pauvre Pierrot  Pauvre Pierrot  0       1892    NULL  4
Animation,Comedy,Romance
Time taken: 7.196 seconds, Fetched: 3 row(s)
hive>
```

```
hive> select * from title_basics limit 3;
OK
tt0000001       short   Carmencita      Carmencita      0       1894    NULL  1
Documentary,Short
tt0000002       short   Le clown et ses chiens  Le clown et ses chiens  0     1
892     NULL    5       Animation,Short
tt0000003       short   Pauvre Pierrot  Pauvre Pierrot  0       1892    NULL  4
Animation,Comedy,Romance
Time taken: 7.196 seconds, Fetched: 3 row(s)
hive> select * from title_ratings limit 3;
OK
tt0000001       5.7     1967
tt0000002       5.8     264
tt0000003       6.5     1811
Time taken: 0.375 seconds, Fetched: 3 row(s)
hive>
```

```
hive> SELECT * FROM title_basics b JOIN title_ratings r ON (b.tconst=r.tconst)
WHERE original_title = 'The Dark Knight' and title_type='movie';
Query ID = hadoop_20230504205745_92d40761-e1a1-410f-ab51-f50117588de3
Total jobs = 2
Stage-5 is selected by condition resolver.
Stage-1 is filtered out by condition resolver.
SLF4J: Actual binding is of type [org.apache.logging.slf4j.Log4jLoggerFactory]
```

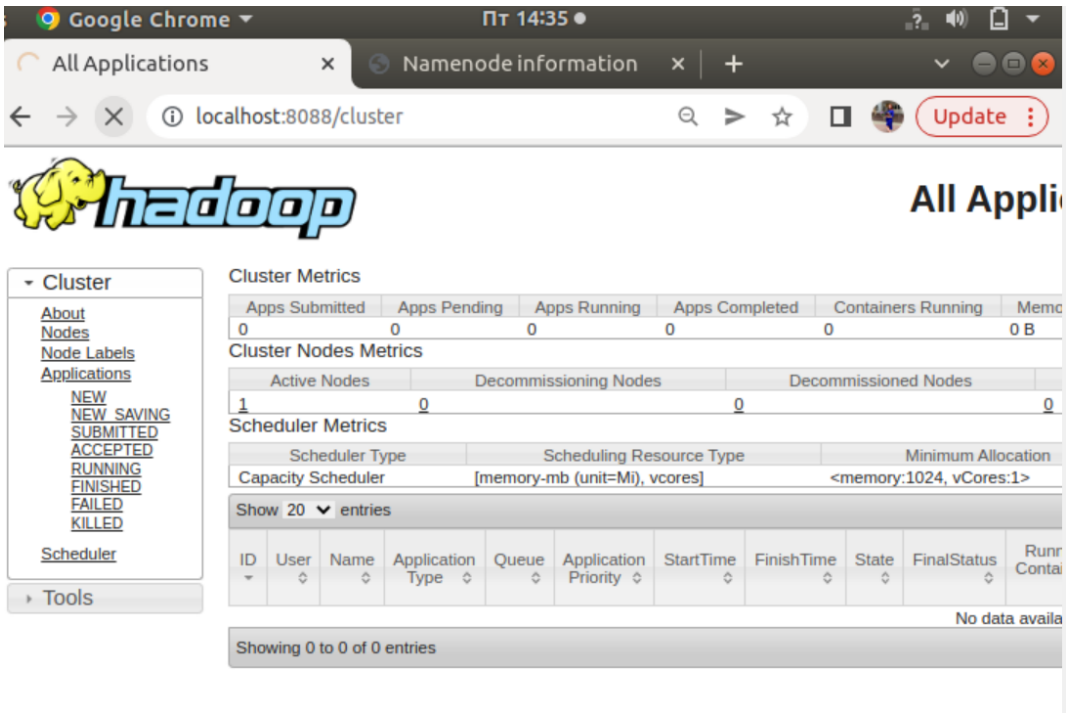
Пришлось удалить все контейнеры, поскольку он не дает зайти в них после выключения машины

```
st1@st1-vbox:~$ docker stop hive_base_container
hive_base_container
st1@st1-vbox:~$ docker rm $(docker ps -qa)
a92ae4c95e66
st1@st1-vbox:~$ docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
st1@st1-vbox:~$
```

Создание и запуск заново

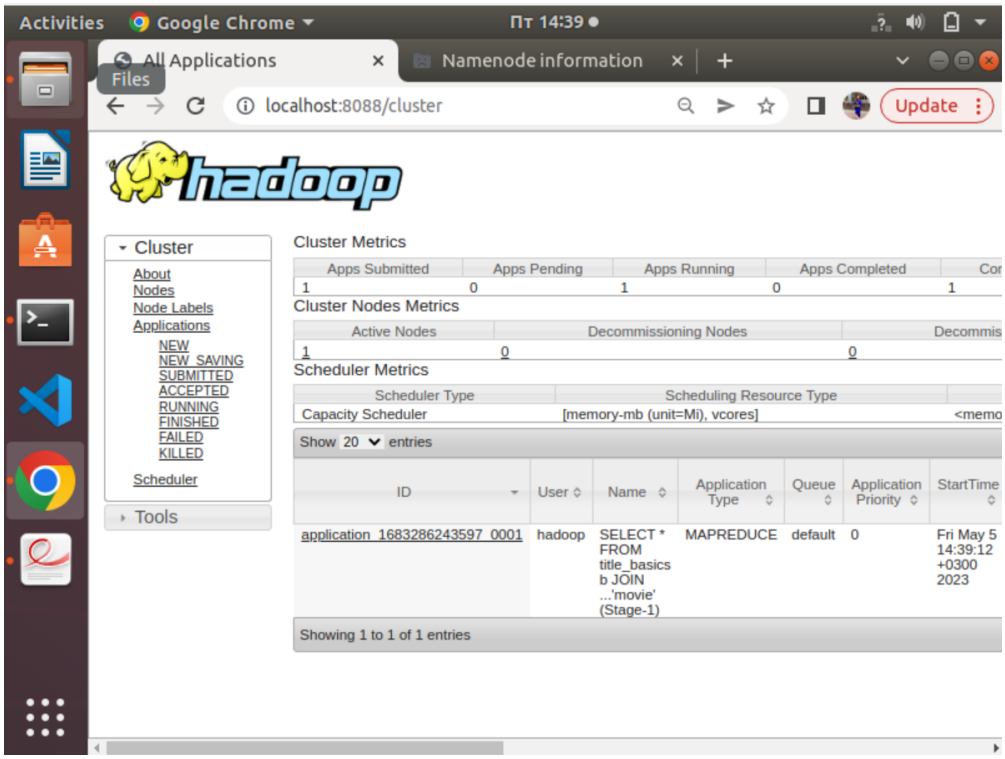
```
st1@st1-vbox:~$ docker run -dit --name hive_base_container -p 8088:8088 -p 9870
:9870 -p 9864:9864 marcelmittelstaedt/hive_base:latest
df81d624add6a46ab6da92c34b407d568f1fbc76089ee2d8b995ee3a25e2d455
st1@st1-vbox:~$ docker ps -a
CONTAINER ID   IMAGE                                COMMAND         CREATED
       STATUS          PORTS
                                                                        NAMES
df81d624add6   marcelmittelstaedt/hive_base:latest   "/startup.sh"   20 seconds
 ago   Up 16 seconds   0.0.0.0:8088->8088/tcp, :::8088->8088/tcp, 0.0.0.0:9864-
>9864/tcp, :::9864->9864/tcp, 0.0.0.0:9870->9870/tcp, :::9870->9870/tcp   hive_
base_container
```

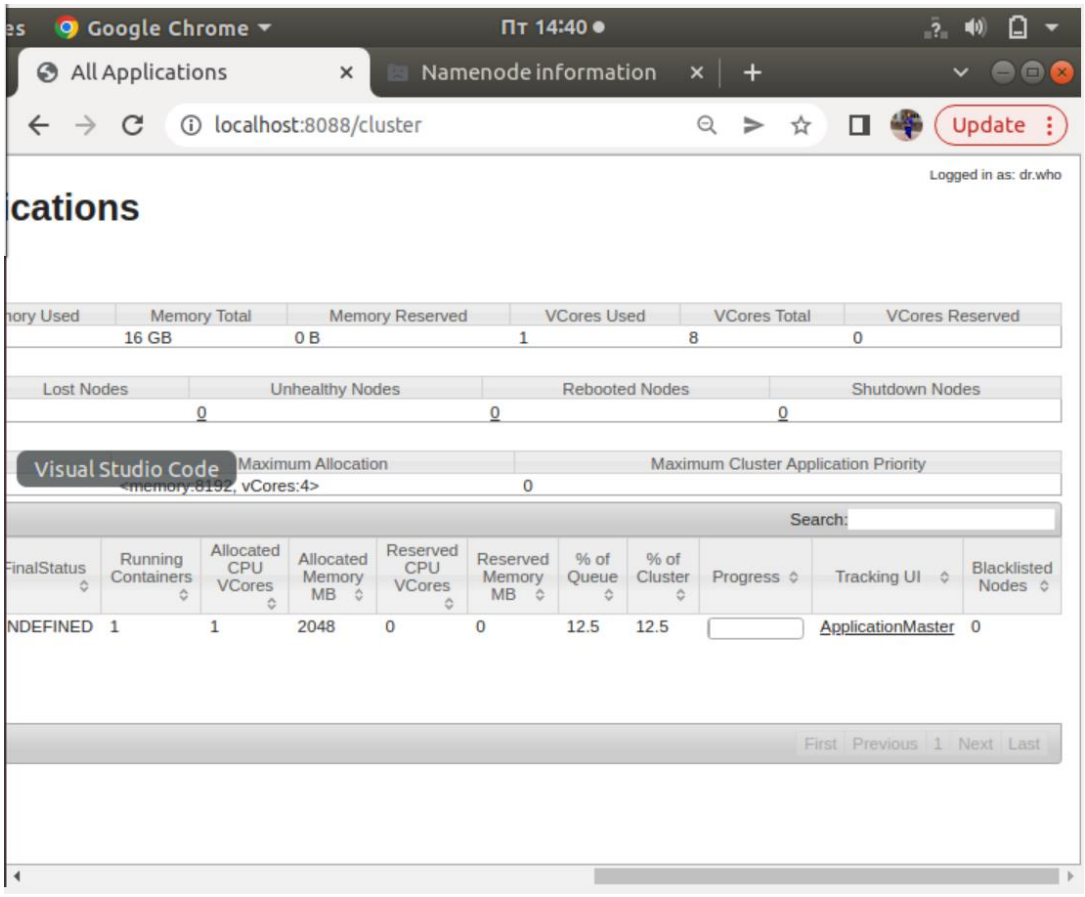
```
hive> SELECT * FROM title_basics b JOIN title_ratings r ON (b.tconst=r.tconst)
WHERE original_title = 'The Dark Knight' and title_type = 'movie';
```

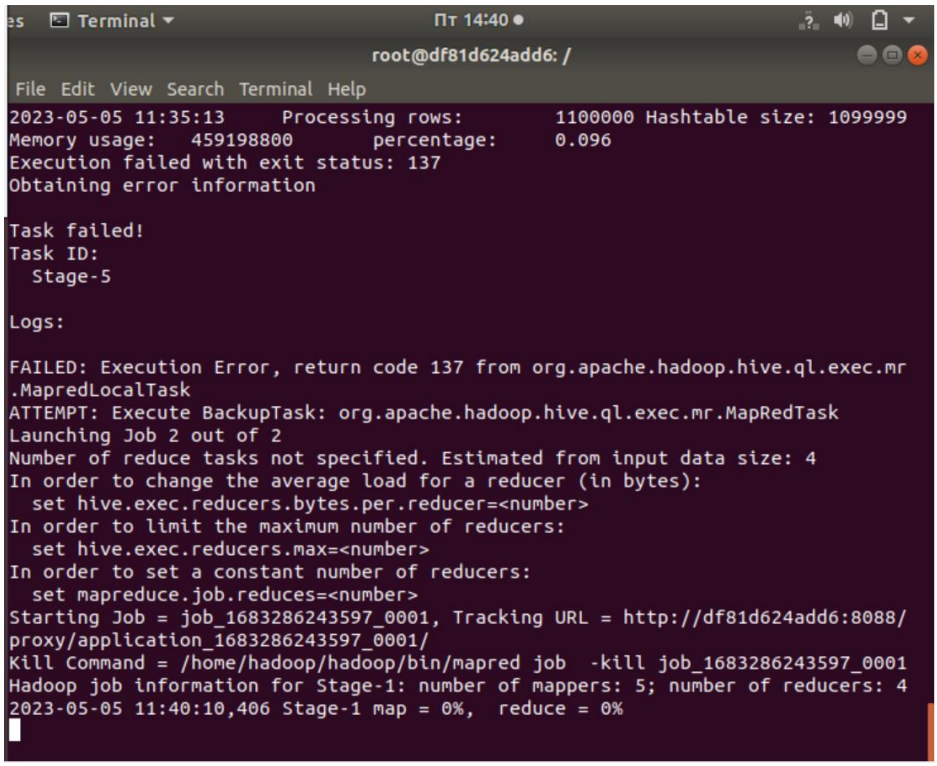


К сожалению, не хватает оперативной памяти для выполнения данной задачи, поэтому уже третий раз виртуальная машина зависает.

МАШИНА ОЖИЛА







На этом окончательно зависло

Часть 2

```
root@df81d624add6:/# wget https://datasets.imdbws.com/name.basics.tsv.gz
--2023-05-09 15:01:27--  https://datasets.imdbws.com/name.basics.tsv.gz
Resolving datasets.imdbws.com (datasets.imdbws.com)... 18.165.122.47, 18.165.12
2.39, 18.165.122.50, ...
Connecting to datasets.imdbws.com (datasets.imdbws.com)|18.165.122.47|:443... c
onnected.
HTTP request sent, awaiting response... 200 OK
Length: 245176378 (234M) [binary/octet-stream]
Saving to: 'name.basics.tsv.gz'

name.basics.tsv.gz  100%[==================>] 233.82M  10.7MB/s    in 22s

2023-05-09 15:01:49 (10.6 MB/s) - 'name.basics.tsv.gz' saved [245176378/2451763
78]

root@df81d624add6:/# gunzip name.basics.tsv.gz
root@df81d624add6:/#
```

```
root@df81d624add6:/# sudo su hadoop
hadoop@df81d624add6:/$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
localhost: namenode is running as process 223.  Stop it first.
pdsh@df81d624add6: localhost: ssh exited with exit code 1
Starting datanodes
localhost: datanode is running as process 328.  Stop it first.
pdsh@df81d624add6: localhost: ssh exited with exit code 1
Starting secondary namenodes [df81d624add6]
df81d624add6: secondarynamenode is running as process 502.  Stop it first.
pdsh@df81d624add6: df81d624add6: ssh exited with exit code 1
Starting resourcemanager
resourcemanager is running as process 795.  Stop it first.
Starting nodemanagers
localhost: nodemanager is running as process 906.  Stop it first.
pdsh@df81d624add6: localhost: ssh exited with exit code 1
hadoop@df81d624add6:/$ hadoop fs -mkdir /user/hadoop/imdb/name_basics
hadoop@df81d624add6:/$
```

```
hadoop@df81d624add6:/$ hadoop fs -put name.basics.tsv /user/hadoop/imdb/name_ba
sics/name.basics.tsv
```

Задание 4

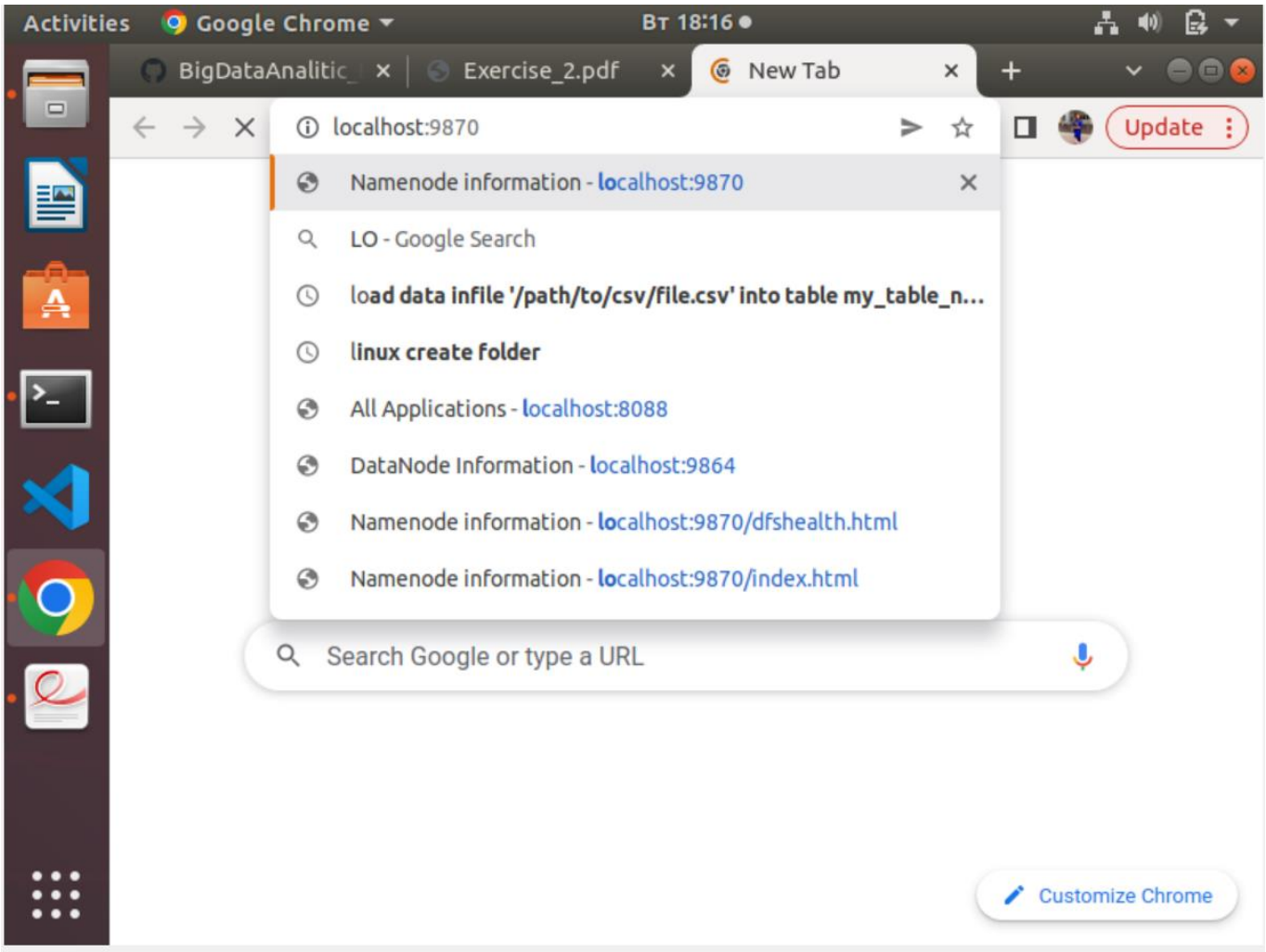
```
hive> CREATE EXTERNAL TABLE IF NOT EXISTS name_basics(
    > nconst STRING,
    > primary_name STRING,
    > birth_year INT,
    > death_year STRING,
    > primary_profession STRING,
    > known_for_titles STRING
    > ) COMMENT 'IMDb Actors' ROW FORMAT DELIMITED FIELDS TERMINATED BY '\t' ST
ORED AS TEXTFILE LOCATION '/user/hadoop/imdb/name_basics'
    > TBLPROPERTIES ('skip.header.line.count'='1');
OK
Time taken: 1.744 seconds
hive>
```

Задание 5

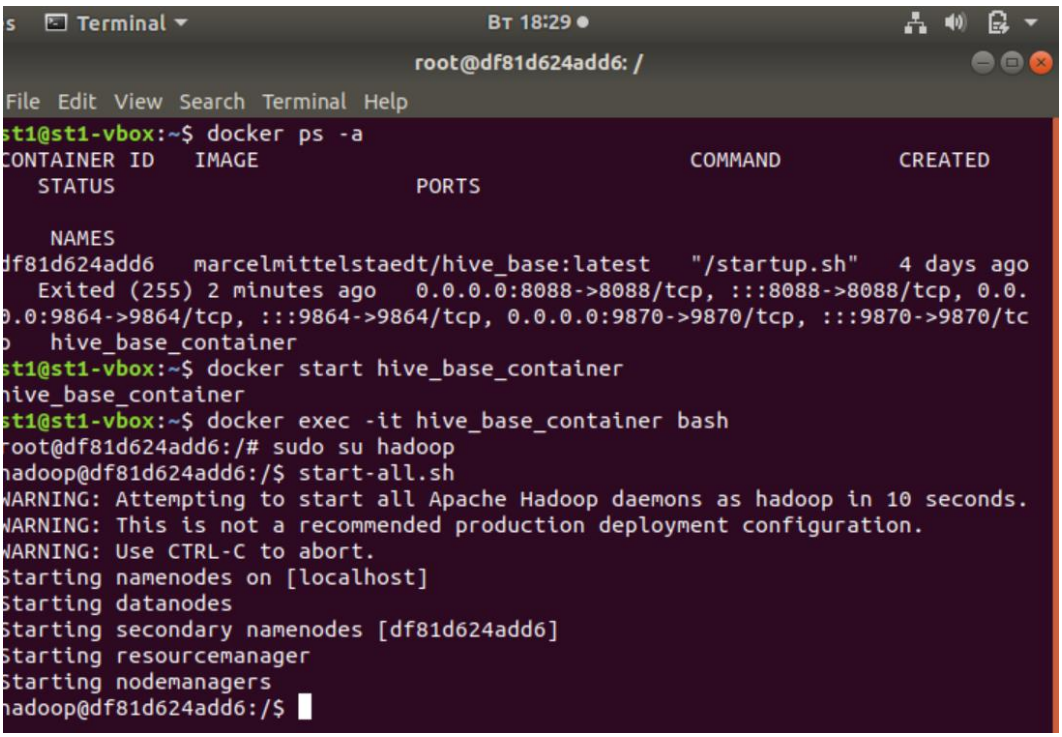
a) Сколько фильмов и сериалов находится в наборе данных IMDB?

```
hive> SELECT m.title_type, count(*)
    > FROM title_basics m GROUP BY m.title_type;
Query ID = hadoop_20230509151423_1db2e3b9-d8fe-4789-a857-8134128927a7
Total jobs = 1
Launching Job 1 out of 1
Number of reduce tasks not specified. Estimated from input data size: 4
In order to change the average load for a reducer (in bytes):
  set hive.exec.reducers.bytes.per.reducer=<number>
In order to limit the maximum number of reducers:
  set hive.exec.reducers.max=<number>
In order to set a constant number of reducers:
  set mapreduce.job.reduces=<number>
Starting Job = job_1683320683135_0001, Tracking URL = http://df81d624add6:8088/
proxy/application_1683320683135_0001/
Kill Command = /home/hadoop/hadoop/bin/mapred job  -kill job_1683320683135_0001
```

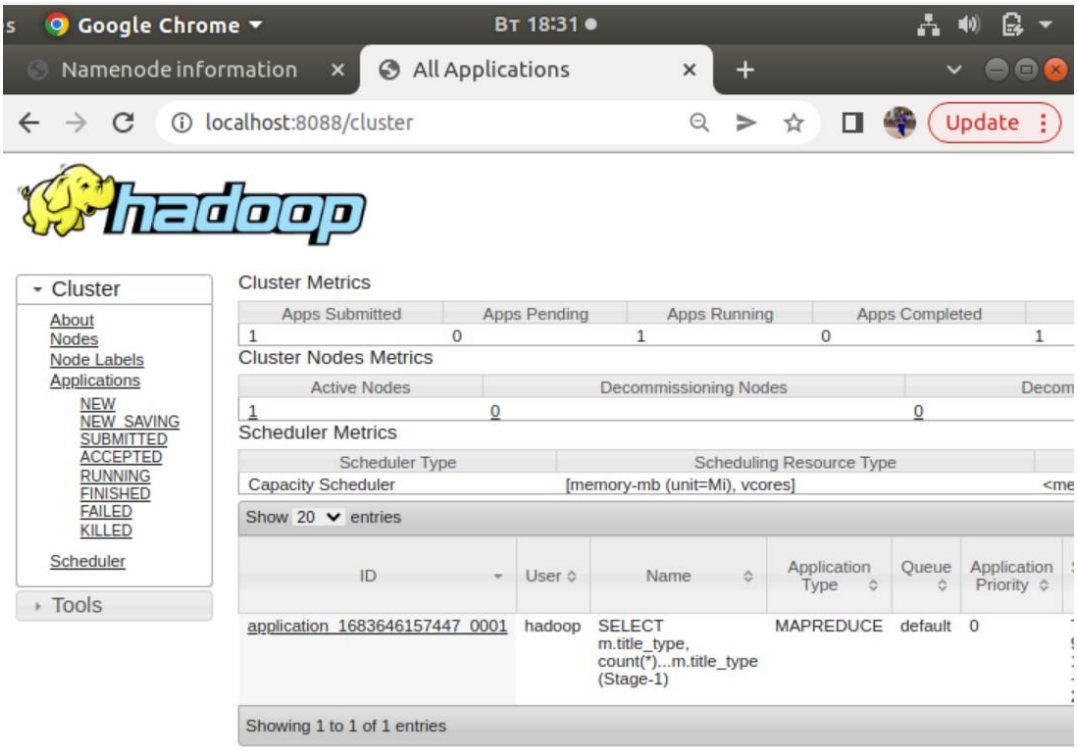
Зависло

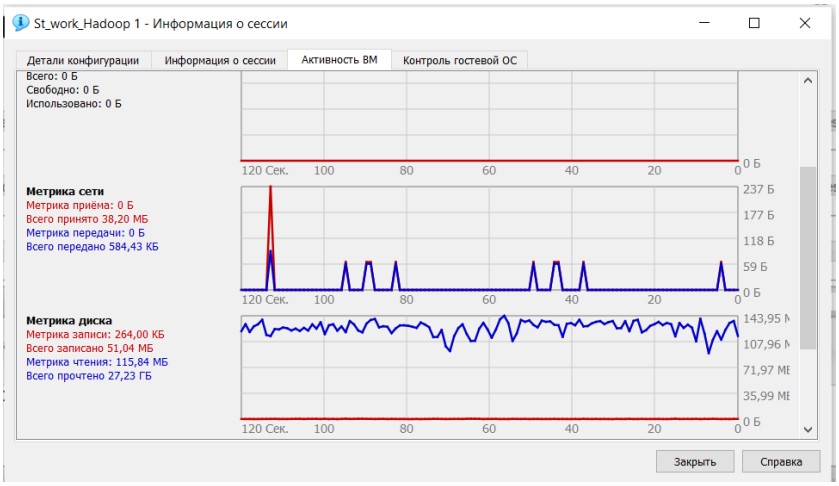


Перезапуск

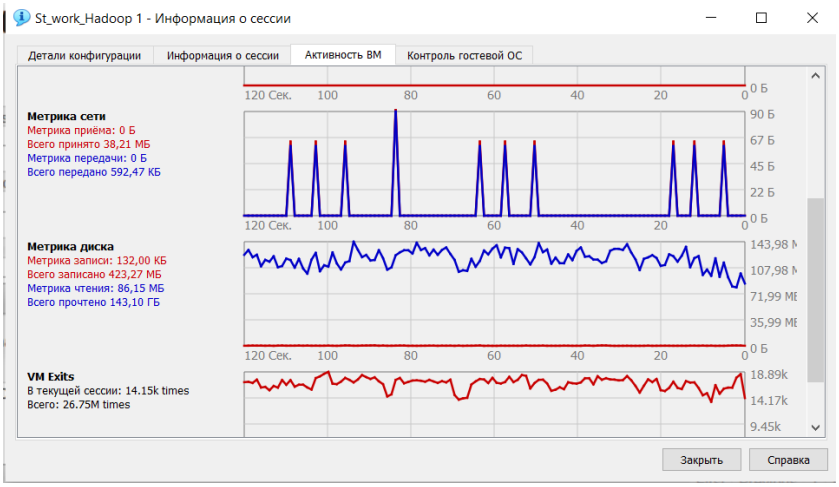


Задача зарегистрирована, но опять зависло





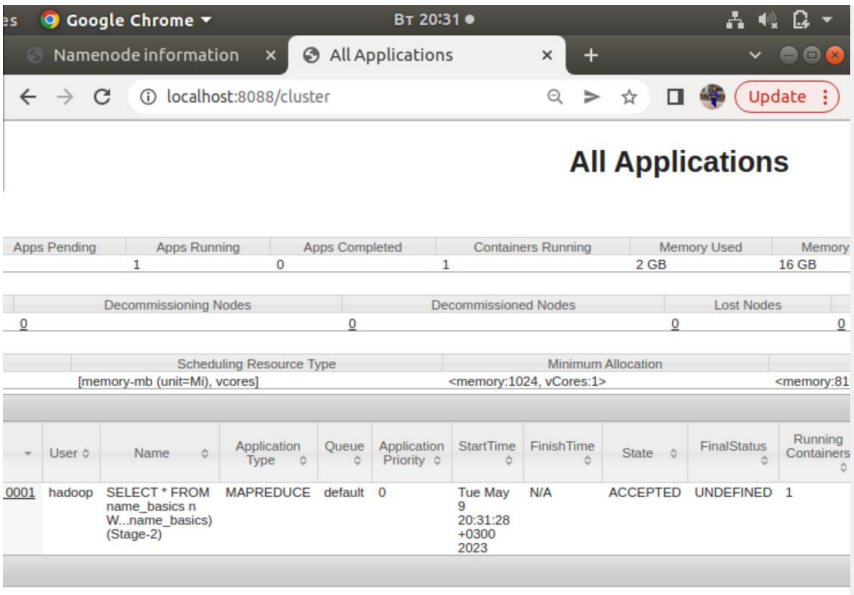
Спустя 25 минут не отвисло

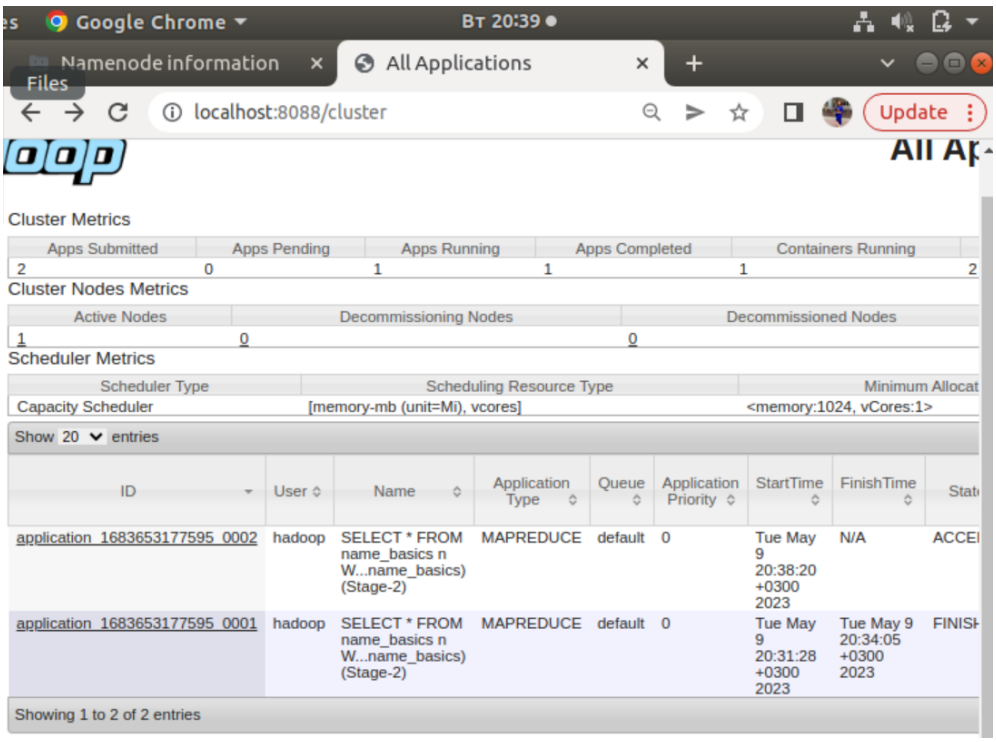


b) Кто самый молодой актер/сценарист/... в наборе данных?

```
hive> SELECT * FROM name_basics n
    > WHERE n.birth_year = ( SELECT MAX(birth_year) FROM name_basics);
```

Задача зарегистрирована

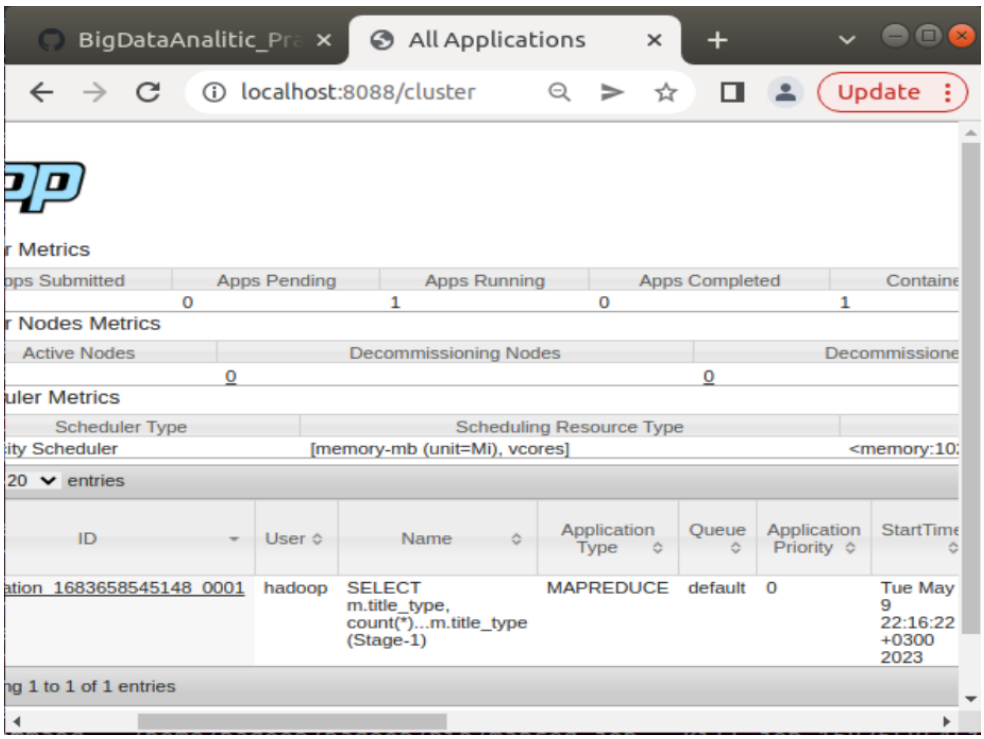


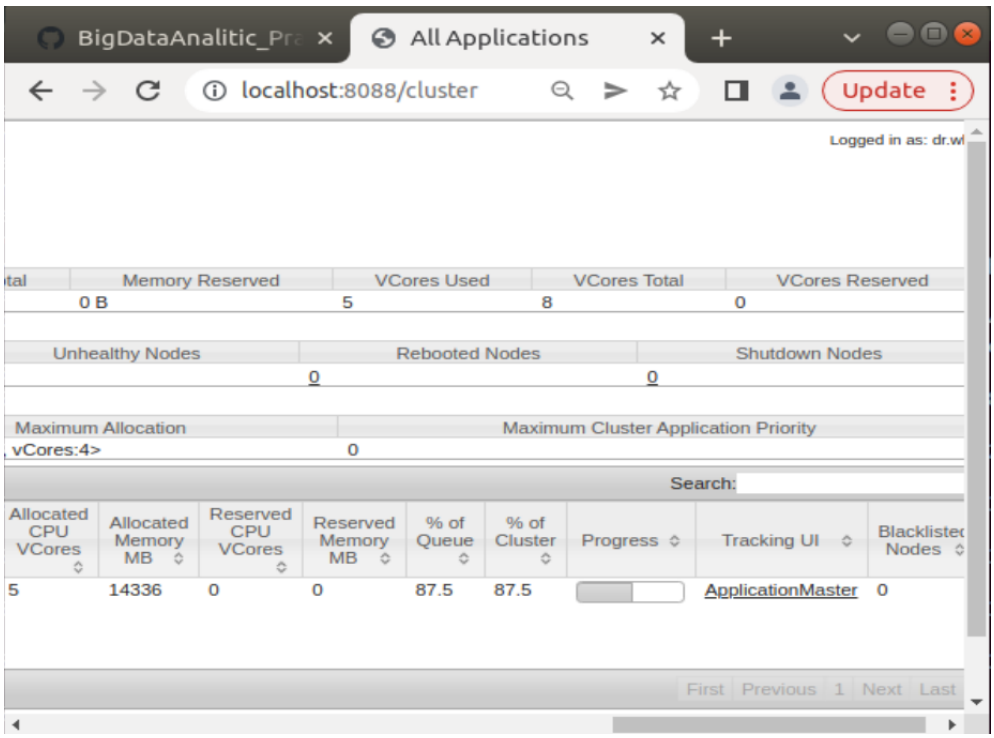


Выполнение на другом компьютере

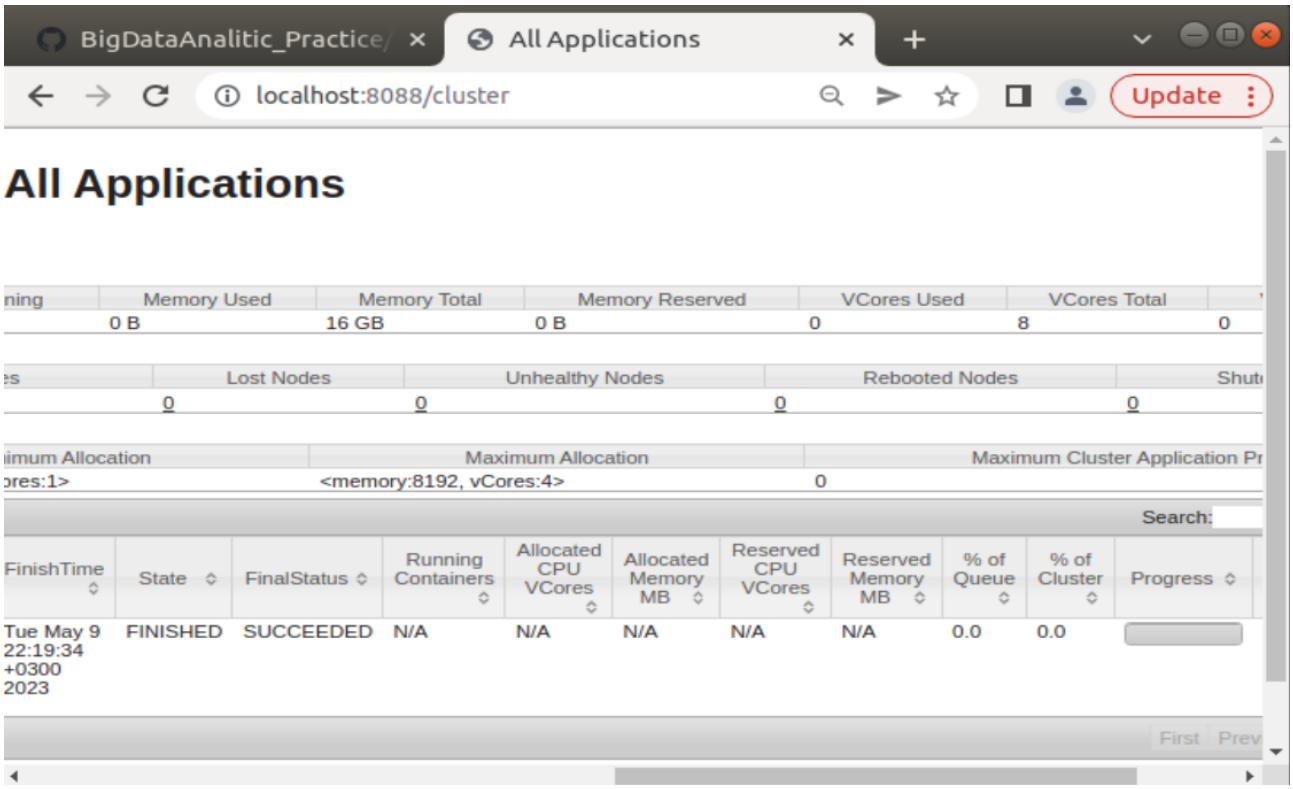
а) Сколько фильмов и сериалов находится в наборе данных IMDB?

```
hive> SELECT m.title_type, count(*)
    > FROM title_basics m GROUP BY m.title_type;
```





Успешное выполнение задачи



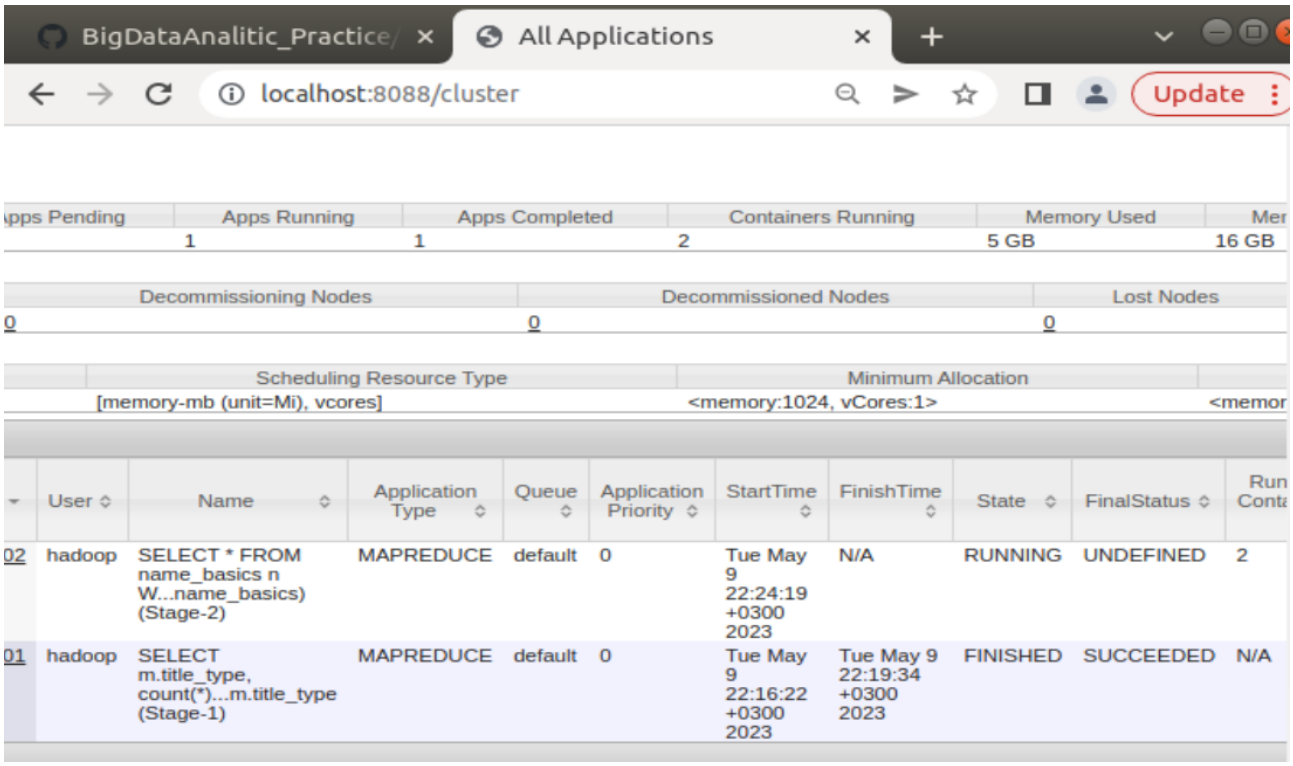
```
Ended Job = job_1683658545148_0001
MapReduce Jobs Launched:
Stage-Stage-1: Map: 4  Reduce: 4   Cumulative CPU: 74.35 sec   HDFS Read: 84259
5831 HDFS Write: 643 SUCCESS
Total MapReduce CPU Time Spent: 1 minutes 14 seconds 350 msec
OK
movie   644471
short   929121
tvMiniSeries    48463
tvEpisode       7471167
tvSeries        243107
videoGame       34480
tvMovie 141421
tvPilot 1
tvShort 10093
tvSpecial       41497
video   273907
Time taken: 219.126 seconds, Fetched: 11 row(s)
hive>
```

Show Applications

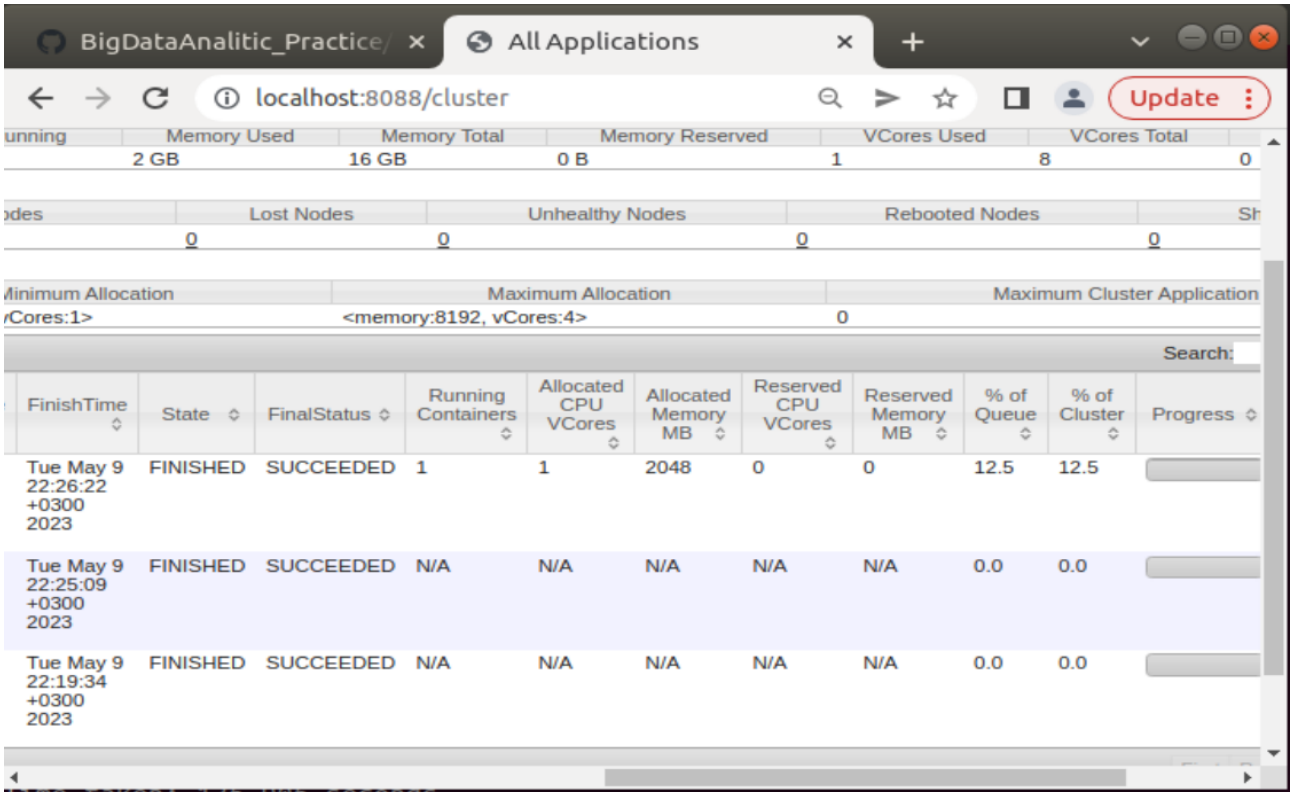
b) Кто самый молодой актер/сценарист/... в наборе данных?

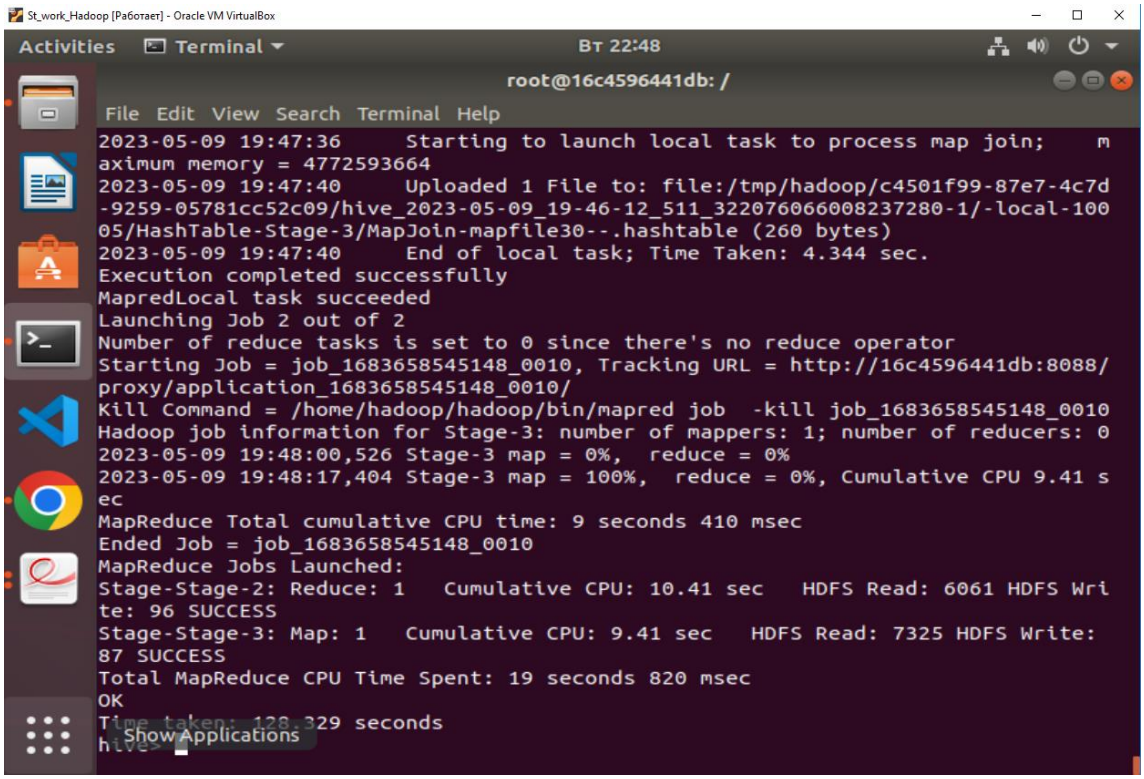
```
hive> SELECT * FROM name_basics n
    > WHERE n.birth_year = ( SELECT MAX(birth_year) FROM name_basics);
Query ID = hadoop_20230509192408_913ff0d1-8591-4ddf-9f94-f7a804a3cd0e
Total jobs = 2
Launching Job 1 out of 2
Number of reduce tasks determined at compile time: 1
In order to change the average load for a reducer (in bytes):
  set hive.exec.reducers.bytes.per.reducer=<number>
In order to limit the maximum number of reducers:
  set hive.exec.reducers.max=<number>
In order to set a constant number of reducers:
  set mapreduce.job.reduces=<number>
```

Задача зарегистрирована



Успешное выполнение задачи

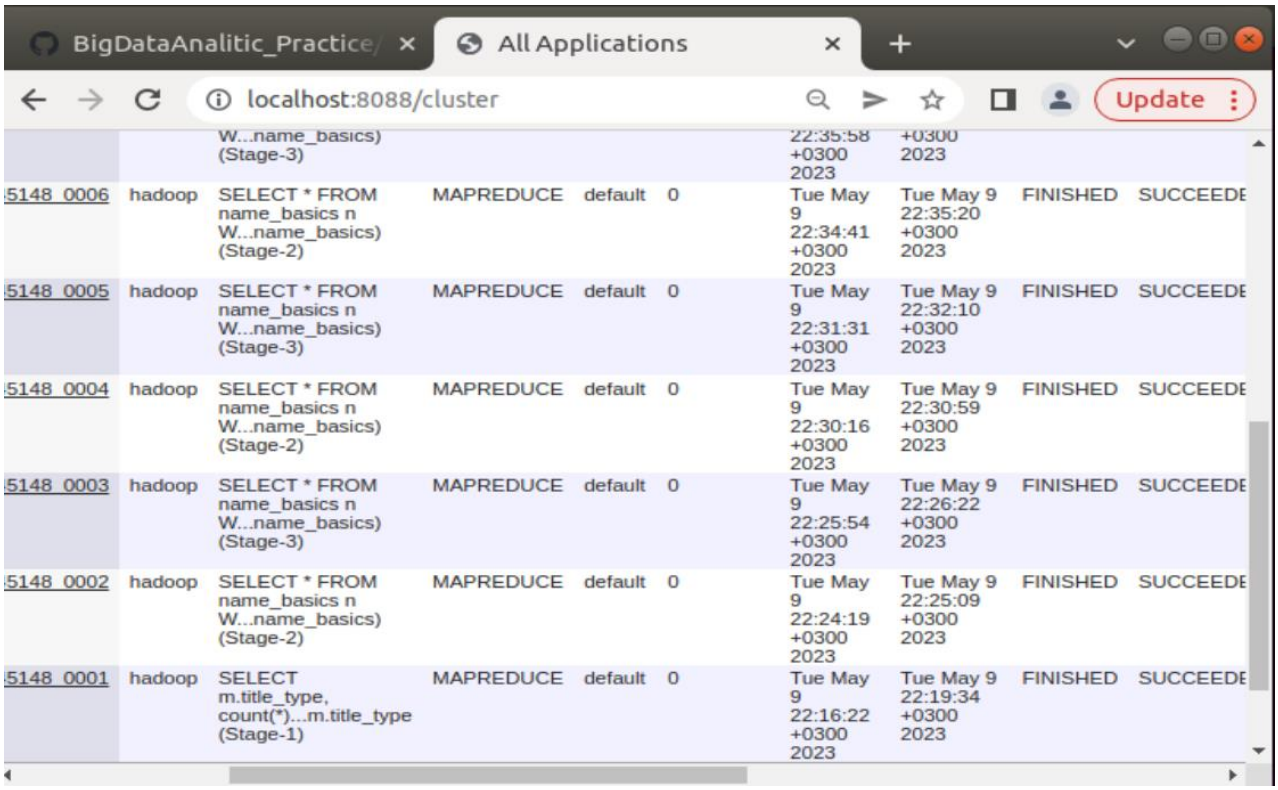




c) Создайте список (tconst, original_title, start_year, average_rating, num_votes), который сосстоит из: - фильм выщел в 2010 году или позднее; - фильм имеет средний рейтинг, равный или превышающий 8,1 - проголосовали более 100 000 раз

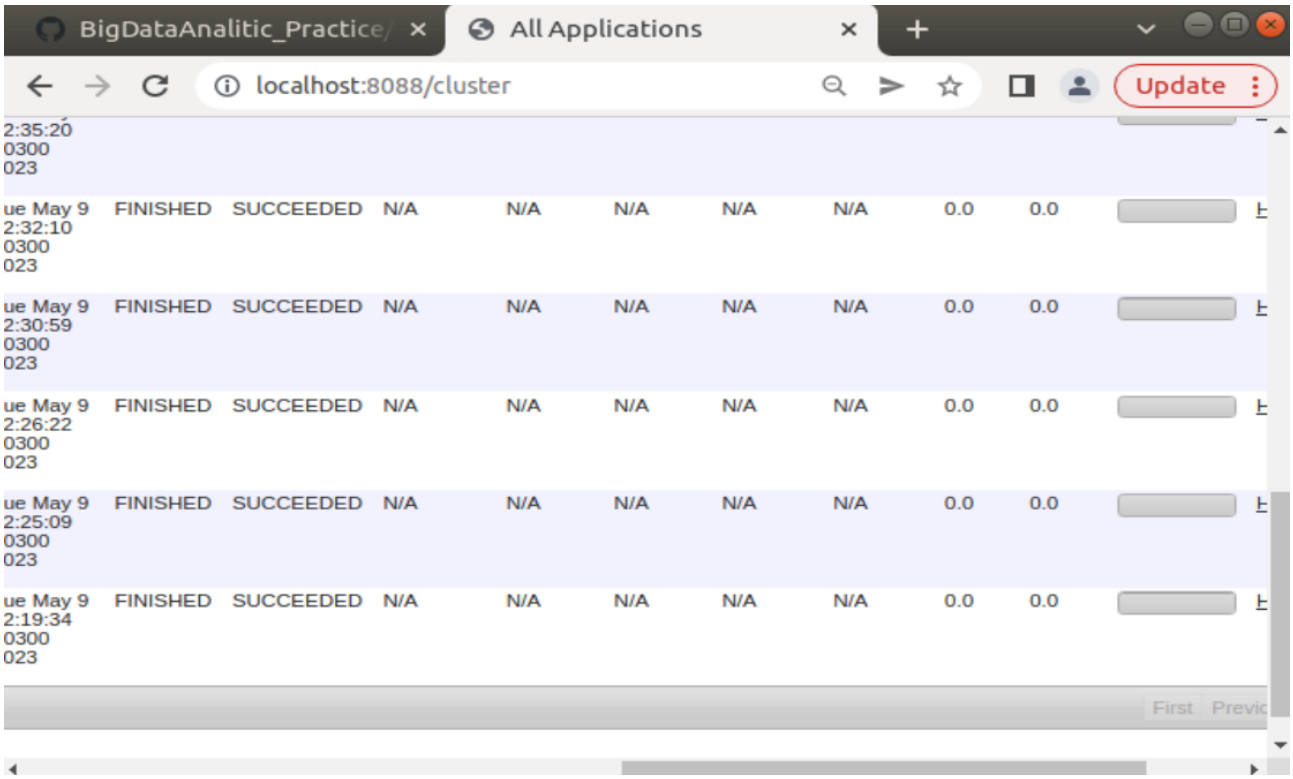
```
hive> SELECT m.tconst, m.original_title, m.start_year, r.average_rating, r.num_
votes
    > FROM title_basics m JOIN title_ratings r on (m.tconst = r.tconst)
    > WHERE r.average_rating >= 8.1 and m.start_year >= 2010 and m.title_type =
 'movie'
    > and r.num_votes > 100000
    > ORDER BY r.average_rating desc, r.num_votes DESC;
```

Задача зарегистрирована

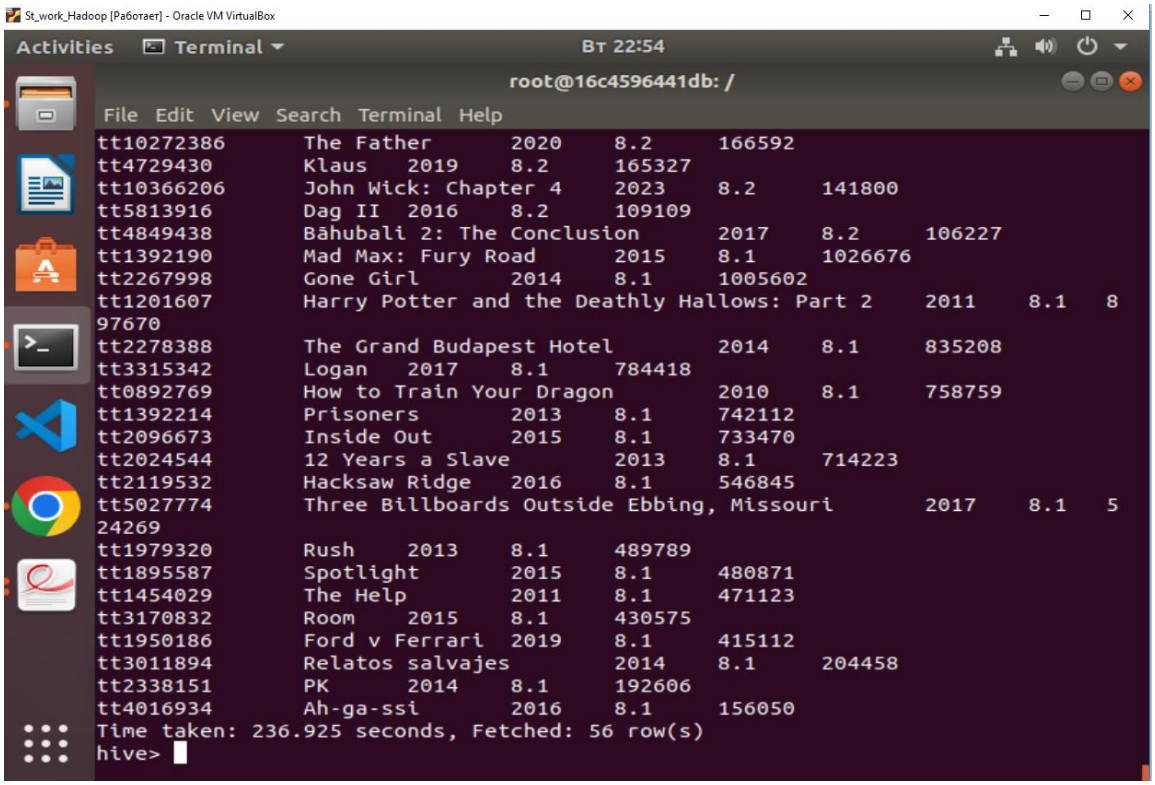


5148_0006	hadoop	SELECT * FROM name_basics n W...name_basics) (Stage-2)	MAPREDUCE	default	0	Tue May 9 22:34:41 +0300 2023	Tue May 9 22:35:20 +0300 2023	FINISHED	SUCCEEDE
5148_0005	hadoop	SELECT * FROM name_basics n W...name_basics) (Stage-3)	MAPREDUCE	default	0	Tue May 9 22:31:31 +0300 2023	Tue May 9 22:32:10 +0300 2023	FINISHED	SUCCEEDE
5148_0004	hadoop	SELECT * FROM name_basics n W...name_basics) (Stage-2)	MAPREDUCE	default	0	Tue May 9 22:30:16 +0300 2023	Tue May 9 22:30:59 +0300 2023	FINISHED	SUCCEEDE
5148_0003	hadoop	SELECT * FROM name_basics n W...name_basics) (Stage-3)	MAPREDUCE	default	0	Tue May 9 22:25:54 +0300 2023	Tue May 9 22:26:22 +0300 2023	FINISHED	SUCCEEDE
5148_0002	hadoop	SELECT * FROM name_basics n W...name_basics) (Stage-2)	MAPREDUCE	default	0	Tue May 9 22:24:19 +0300 2023	Tue May 9 22:25:09 +0300 2023	FINISHED	SUCCEEDE
5148_0001	hadoop	SELECT m.title_type, count(*)...m.title_type (Stage-1)	MAPREDUCE	default	0	Tue May 9 22:16:22 +0300 2023	Tue May 9 22:19:34 +0300 2023	FINISHED	SUCCEEDE

Успешное выполнение задачи



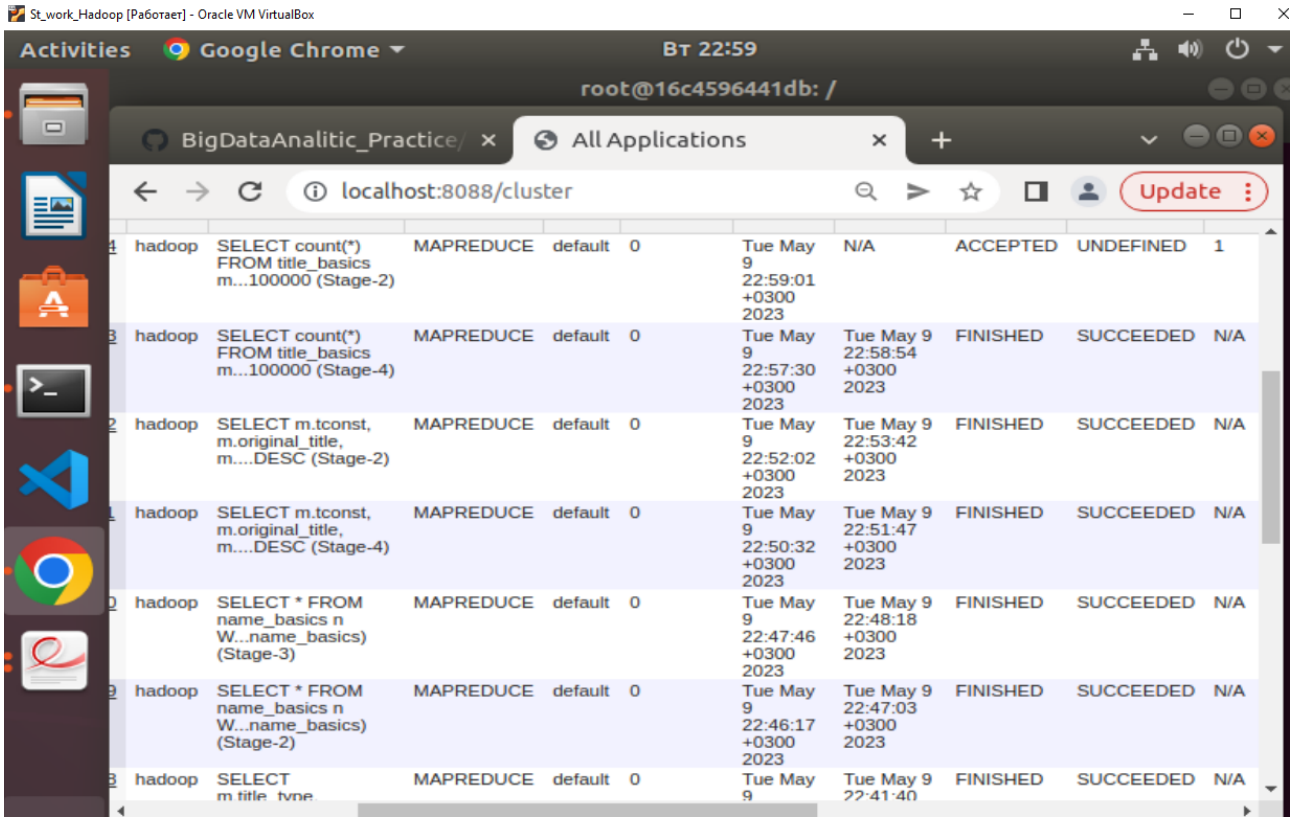
ue May 9 2:32:10 0300 023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0
ue May 9 2:30:59 0300 023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0
ue May 9 2:26:22 0300 023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0
ue May 9 2:25:09 0300 023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0
ue May 9 2:19:34 0300 023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0

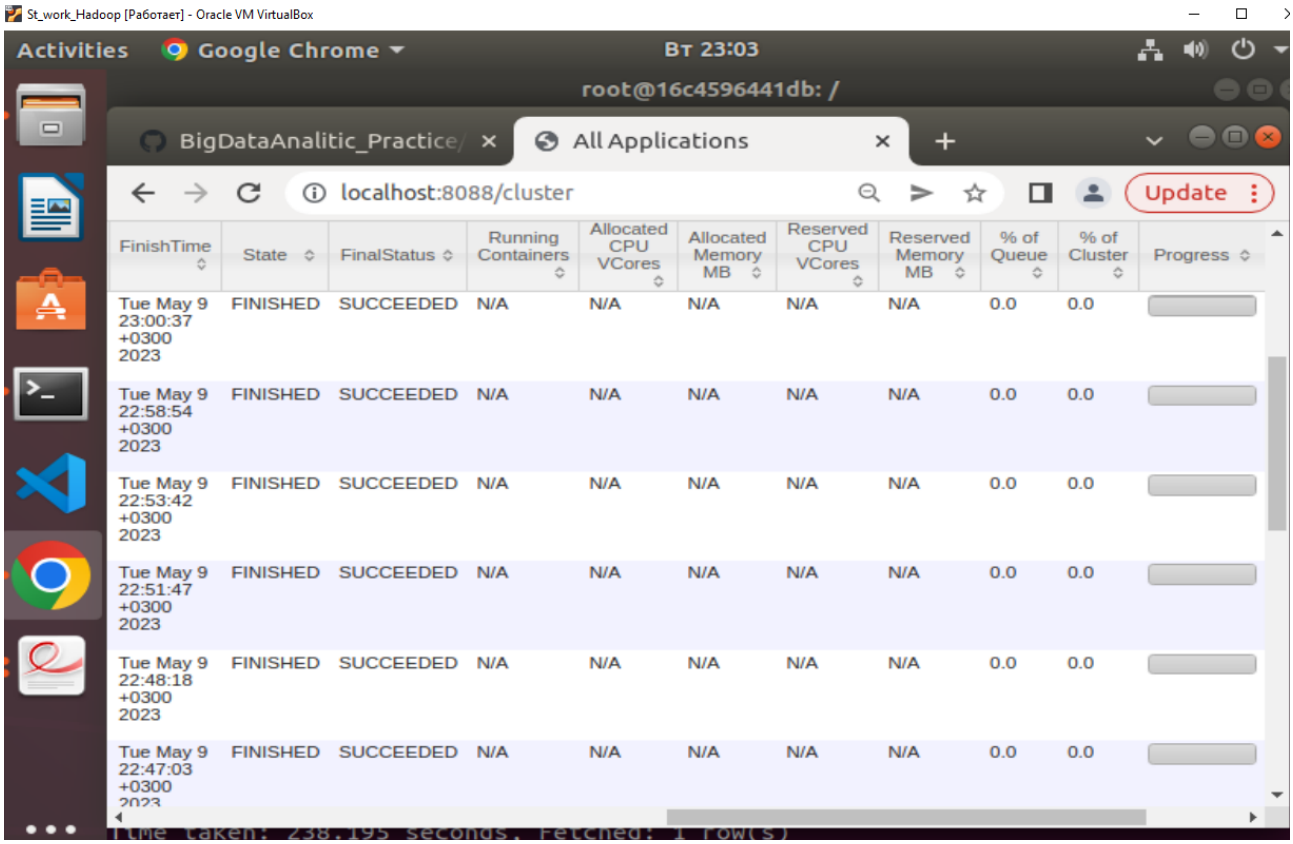


d) Сколько фильмов находится в списке c)?

```
hive> SELECT count(*)
    > FROM title_basics m JOIN title_ratings r on (m.tconst = r.tconst)
    > WHERE r.average_rating >= 8.1 and m.start_year >= 2010 and m.title_type =
'movie'
    > and r.num_votes > 100000;
```

Задача зарегистрирована и выполнена






```
Ended Job = job_1683658545148_0014
MapReduce Jobs Launched:
Stage-Stage-4: Map: 4   Cumulative CPU: 54.4 sec   HDFS Read: 842586363 HDFS Wr
ite: 456 SUCCESS
Stage-Stage-2: Map: 1  Reduce: 1   Cumulative CPU: 13.3 sec   HDFS Read: 8104 H
DFS Write: 102 SUCCESS
Total MapReduce CPU Time Spent: 1 minutes 7 seconds 700 msec
OK
56
Time taken: 238.195 seconds, Fetched: 1 row(s)
hive>
```

e) Мы хотим знать, какие годы были великими для кинематографа. Создайте список с одной строкой в год и соответствующим количеством фильмов, которые: - имеют средний рейтинг выше 8; - были проголосованы более 100 000 раз в порядке убывания количества фильмов.

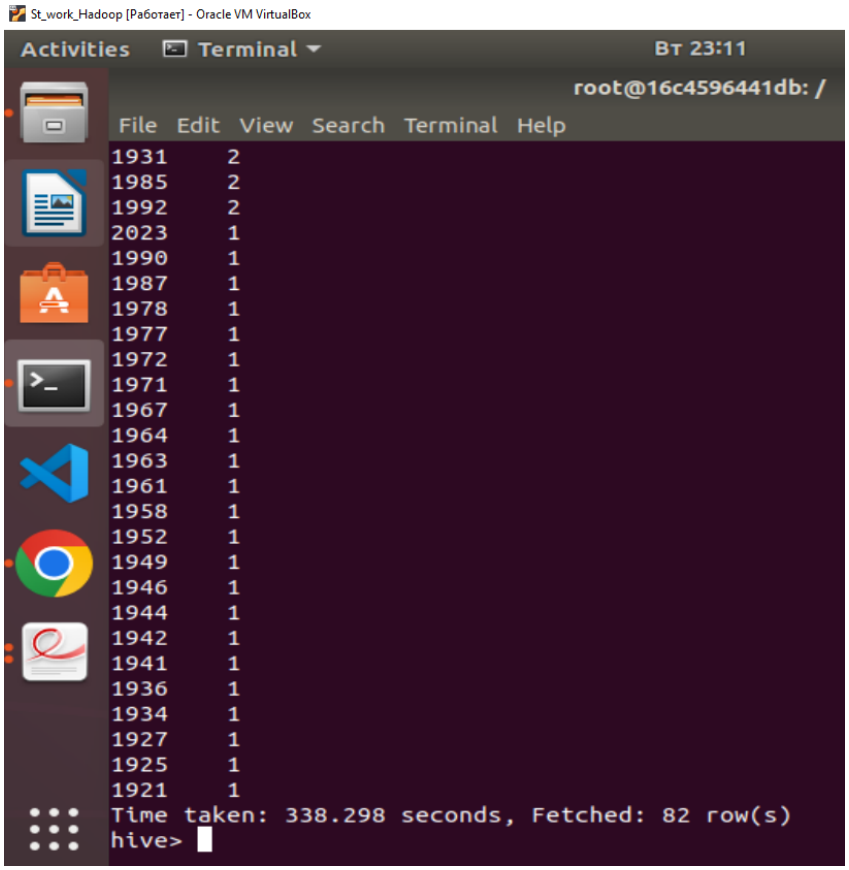
```
hive> SELECT m.start_year, count(*)
    > FROM title_basics m JOIN title_ratings r on (m.tconst = r.tconst)
    > WHERE r.average_rating > 8 AND m.title_type = 'movie'
    > AND r.num_votes > 100000
    > GROUP BY m.start_year
    > ORDER BY count(*) DESC;
Query ID = hadoop_20230509200557_46f91165-505b-49bb-99c8-666073f9bc11
Total jobs = 4
Stage-7 is selected by condition resolver.
Stage-1 is filtered out by condition resolver.
SLF4J: Found binding in [jar:file:/home/hadoop/hive/lib/log4j-slf4j-impl-2.10.0
.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/home/hadoop/hadoop/share/hadoop/common/lib/s
lf4j-log4j12-1.7.25.jar!/org/slf4j/impl/StaticLoggerBinder.class]
```

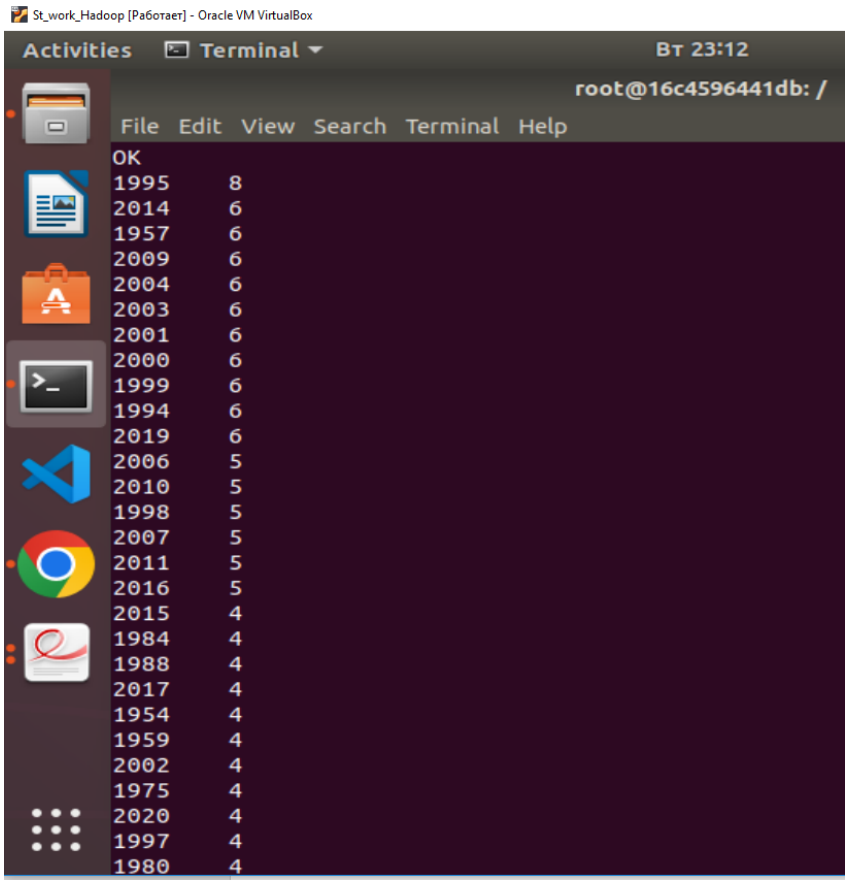
Задача зарегистрирована

SELECT m.start_year, count(*) FROM ti...DESC (Stage-5)	MAPREDUCE	default	0	Tue May 9 23:06:49 +0300 2023	N/A	ACCEPTED	UNDEFINED	1	1
SELECT count(*) FROM title_basics m...100000 (Stage-2)	MAPREDUCE	default	0	Tue May 9 22:59:01 +0300 2023	Tue May 9 23:00:37 +0300 2023	FINISHED	SUCCEEDED	N/A	N/
SELECT count(*) FROM title_basics m...100000 (Stage-4)	MAPREDUCE	default	0	Tue May 9 22:57:30 +0300 2023	Tue May 9 22:58:54 +0300 2023	FINISHED	SUCCEEDED	N/A	N/
SELECT m.tconst, m.original_title, m....DESC (Stage-2)	MAPREDUCE	default	0	Tue May 9 22:52:02 +0300 2023	Tue May 9 22:53:42 +0300 2023	FINISHED	SUCCEEDED	N/A	N/
SELECT m.tconst, m.original_title, m....DESC (Stage-4)	MAPREDUCE	default	0	Tue May 9 22:50:32 +0300 2023	Tue May 9 22:51:47 +0300 2023	FINISHED	SUCCEEDED	N/A	N/
SELECT * FROM name_basics n W...name_basics) (Stage-3)	MAPREDUCE	default	0	Tue May 9 22:47:46 +0300 2023	Tue May 9 22:48:18 +0300 2023	FINISHED	SUCCEEDED	N/A	N/
SELECT * FROM	MAPREDUCE	default	0	Tue May	Tue May 9	FINISHED	SUCCEEDED	N/A	N/

Успешное выполнение задачи

Tue May 9 23:10:30 +0300 2023	FINISHED	SUCCEEDED	1	1	2048	0	0	12.5	12.5	
Tue May 9 23:08:59 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 23:00:37 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 22:58:54 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 22:53:42 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 22:51:47	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	





So 1995 seems to be a really good year for cinema, 8 really good movies have been releases, but which are they?

```
hive> SELECT
    > m.tconst, m.original_title, m.start_year, r.average_rating,
    > r.num_votes
    > FROM title_basics m JOIN title_ratings r ON (m.tconst = r.tconst)
    > WHERE
    > r.average_rating > 8 AND m.title_type = 'movie'
    > AND r.num_votes > 100000 AND m.start_year = 1995
    > ORDER BY r.average_rating DESC;
Query ID = hadoop_20230509201356_62117f35-e47b-40bb-a7f5-5b1256de0dac
Total jobs = 3
Stage-6 is selected by condition resolver.
```

Задача зарегистрирована

Show 20 entries

ID	User	Name	Application Type	Queue	Application Priority	StartTime	FinishTime
application_1683658545148_0018	hadoop	SELECT m.tconst, m.original_title, m....DESC (Stage-4)	MAPREDUCE	default	0	Tue May 9 23:14:44 +0300 2023	N/A
application_1683658545148_0017	hadoop	SELECT m.start_year, count(*) FROM ti...DESC (Stage-3)	MAPREDUCE	default	0	Tue May 9 23:10:34 +0300 2023	Tue May 9 23:11:34 +0300 2023
application_1683658545148_0016	hadoop	SELECT m.start_year, count(*) FROM ti...DESC (Stage-2)	MAPREDUCE	default	0	Tue May 9 23:09:10 +0300 2023	Tue May 9 23:10:30 +0300 2023
application_1683658545148_0015	hadoop	SELECT m.start_year, count(*) FROM ti...DESC (Stage-5)	MAPREDUCE	default	0	Tue May 9 23:06:49 +0300 2023	Tue May 9 23:08:59 +0300 2023
application_1683658545148_0014	hadoop	SELECT count(*) FROM title_basics m...100000 (Stage-2)	MAPREDUCE	default	0	Tue May 9 22:59:01 +0300	Tue May 9 23:00:37 +0300 2023

Успешное выполнение задачи

FinishTime	State	FinalStatus	Running Containers	Allocated CPU VCores	Allocated Memory MB	Reserved CPU VCores	Reserved Memory MB	% of Queue	% of Cluster	Progress
Tue May 9 23:18:11 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 23:16:33 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 23:11:34 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 23:10:30 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 23:08:59 +0300 2023	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	
Tue May 9 23:00:37	FINISHED	SUCCEEDED	N/A	N/A	N/A	N/A	N/A	0.0	0.0	

```
Ended Job = job_1683658545148_0019
MapReduce Jobs Launched:
Stage-Stage-4: Map: 4   Cumulative CPU: 87.06 sec   HDFS Read: 842584195 HDFS W
rite: 738 SUCCESS
Stage-Stage-2: Map: 1  Reduce: 1   Cumulative CPU: 19.21 sec   HDFS Read: 10310
 HDFS Write: 477 SUCCESS
Total MapReduce CPU Time Spent: 1 minutes 46 seconds 270 msec
OK
tt0114369       Se7en   1995    8.6     1691579
tt0114814       The Usual Suspects      1995    8.5     1101917
tt0112573       Braveheart      1995    8.4     1053495
tt0114709       Toy Story       1995    8.3     1014798
tt0113277       Heat    1995    8.3     671467
tt0112641       Casino  1995    8.2     532882
tt0113247       La haine        1995    8.1     180616
tt0112471       Before Sunrise  1995    8.1     319139
Time taken: 256.133 seconds, Fetched: 8 row(s)
```

```
hive> SELECT * FROM title_basics b JOIN title_ratings r ON (b.tconst=r.tconst)
WHERE original_title = 'The Dark Knight' and title_type='movie';
Query ID = hadoop_20230509202109_ed613400-2b11-4b78-b6a5-ff4c5af5917a
Total jobs = 2
Stage-5 is selected by condition resolver.
Stage-1 is filtered out by condition resolver.
```

Задача зарегистрирована

	User	Name	Application Type	Queue	Application Priority	StartTime	FinishTime	State	FinalStatus
0020	hadoop	SELECT * FROM title_bas...title_type='movie' (Stage-3)	MAPREDUCE	default	0	Tue May 9 23:22:04 +0300 2023	N/A	ACCEPTED	UNDEFINE