EXP 4: **210701144**

Create UDF in PIG

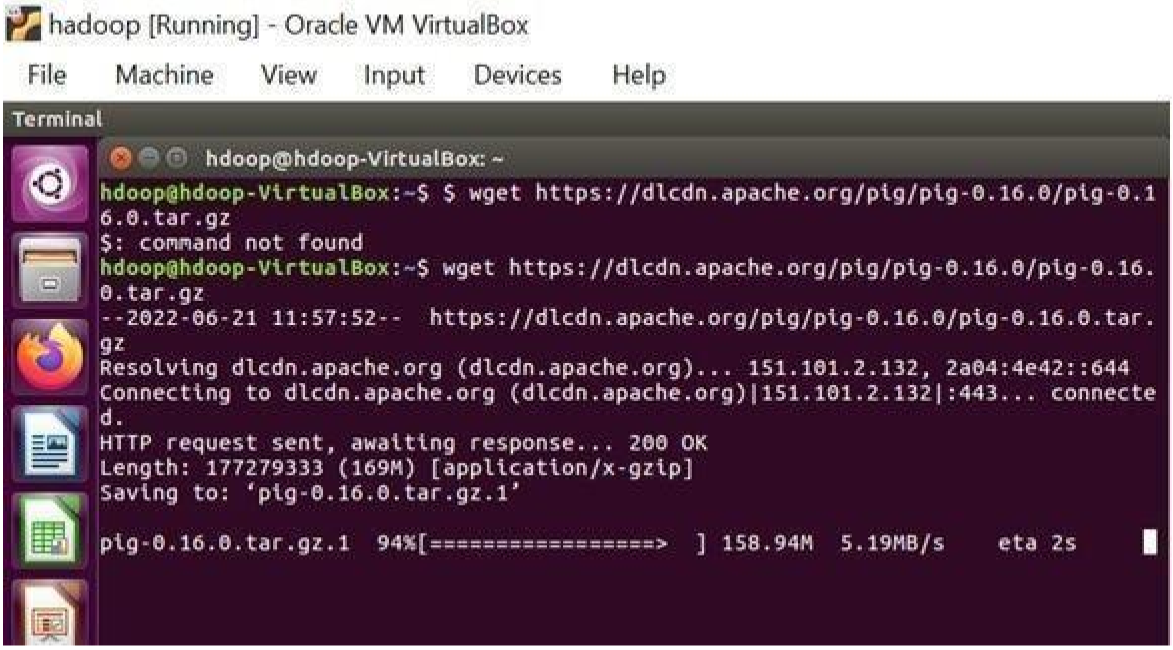
Step-by-step installation of Apache Pig on Hadoop cluster on Ubuntu Pre-requisite:

· Ubuntu 16.04 or higher version running (I have installed Ubuntu on Oracle VM (Virtual Machine) VirtualBox),

· Run Hadoop on ubuntu (I have installed Hadoop 3.2.1 on Ubuntu 16.04). You may refer to my blog "How to install Hadoop installation" click here for Hadoop installation).

Pig installation steps

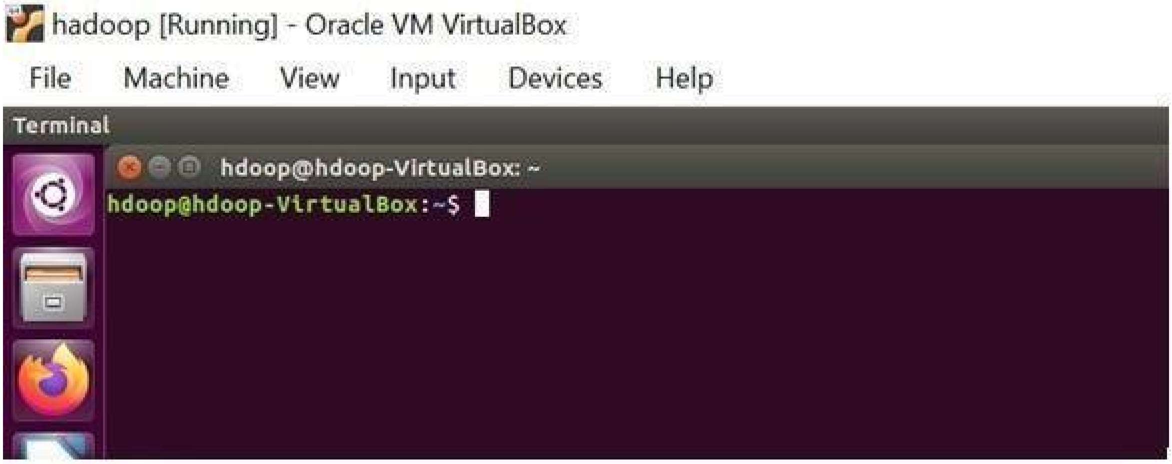
Step 1: Login into Ubuntu


hadoop [Running] - Oracle VM VirtualBox
File
Machine
View
Input
Devices
Help
Terminal
hdoop@hdoop-VirtualBox: ~

```
hdoop@hdoop-VirtualBox:~$ $ wget https://dlcdn.apache.org/pig/pig-0.16.0/pig-0.1
6.0.tar.gz
$: command not found
hdoop@hdoop-VirtualBox:~$ wget https://dlcdn.apache.org/pig/pig-0.16.0/pig-0.16.
0.tar.gz
--2022-06-21 11:57:52--  https://dlcdn.apache.org/pig/pig-0.16.0/pig-0.16.0.tar.
gz
Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Connecting to dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:443... connecte
d.
HTTP request sent, awaiting response... 200 OK
Length: 177279333 (169M) [application/x-gzip]
Saving to: 'pig-0.16.0.tar.gz.1'

pig-0.16.0.tar.gz.1  94%[=================>  ] 158.94M  5.19MB/s    eta 2s
```

Step 2: Go to https://pig.apache.org/releases.html and copy the path of the latest version of pig that you want to install. Run the following comment to download Apache Pig in Ubuntu:

$ wget https://dlcdn.apache.org/pig/pig-0.16.0/pig-0.16.0.tar.gz


hadoop [Running] - Oracle VM VirtualBox
File
Machine
View
Input
Devices
Help
Terminal
hdoop@hdoop-VirtualBox: ~

```
hdoop@hdoop-VirtualBox:~$
```

Step 3: To untar pig-0.16.0.tar.gz file run the following command:

$ tar xvzf pig-0.16.0.tar.gz

Step 4: To create a pig folder and move pig-0.16.0 to the pig folder, execute the following command:

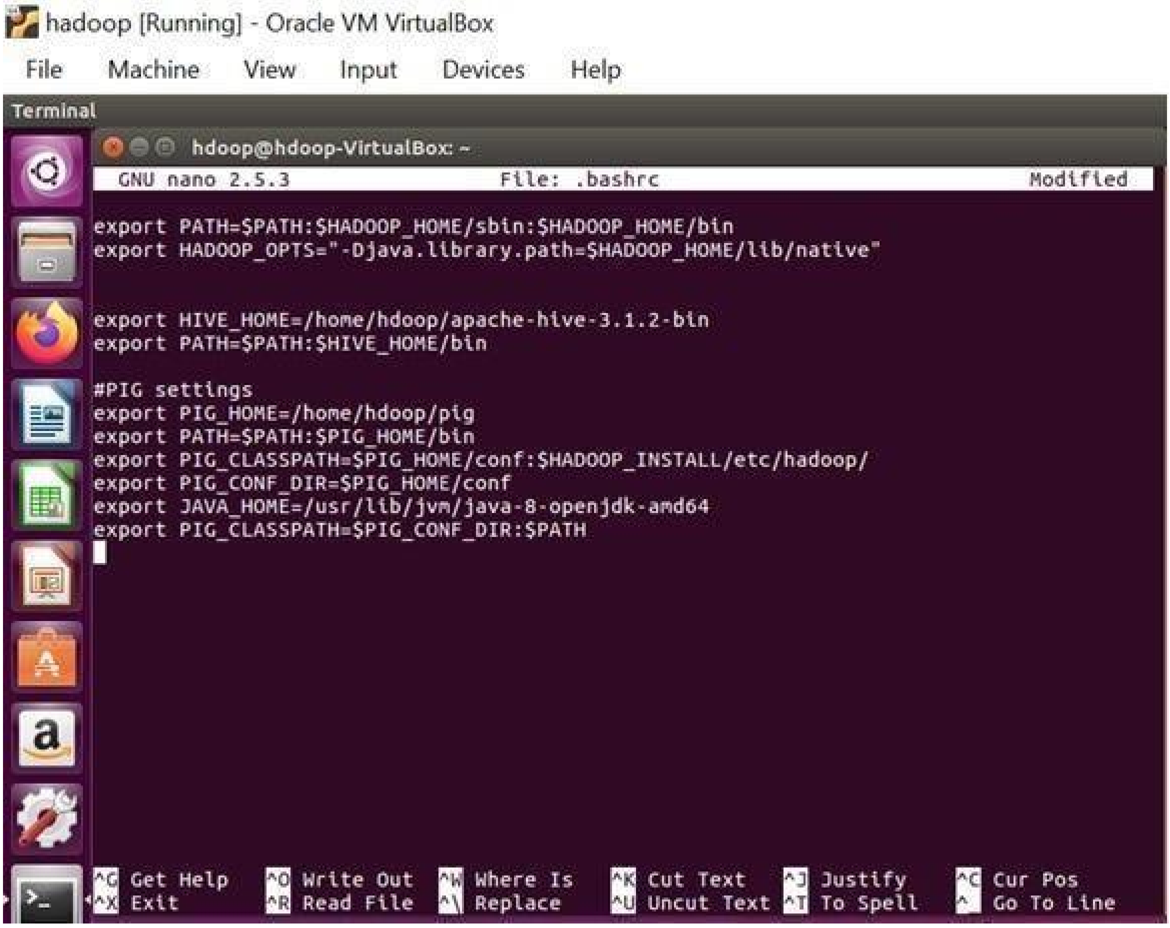
$ sudo mv /home/hdoop/pig-0.16.0 /home/hdoop/pig

Step 5: Now open the .bashrc file to edit the path and variables/settings for pig. Run the following command:

$ sudo nano .bashrc

Add the below given to .bashrc file at the end and save the file.

#PIG settingsexport PIG_HOME=/home/hdoop/pigexport PATH=$PATH:$PIG_HOME/binexport PIG_CLASSPATH=$PIG_HOME/conf:$HADOOP_INSTALL/etc/hadoop/export PIG_CONF_DIR=$PIG_HOME/confexport JAVA_HOME=/usr/lib/jvm/java-8-openjdkamd64export PIG_CLASSPATH=$PIG_CONF_DIR:$PATH#PIG setting ends


hadoop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Terminal
hdoop@hdoop-VirtualBox: ~

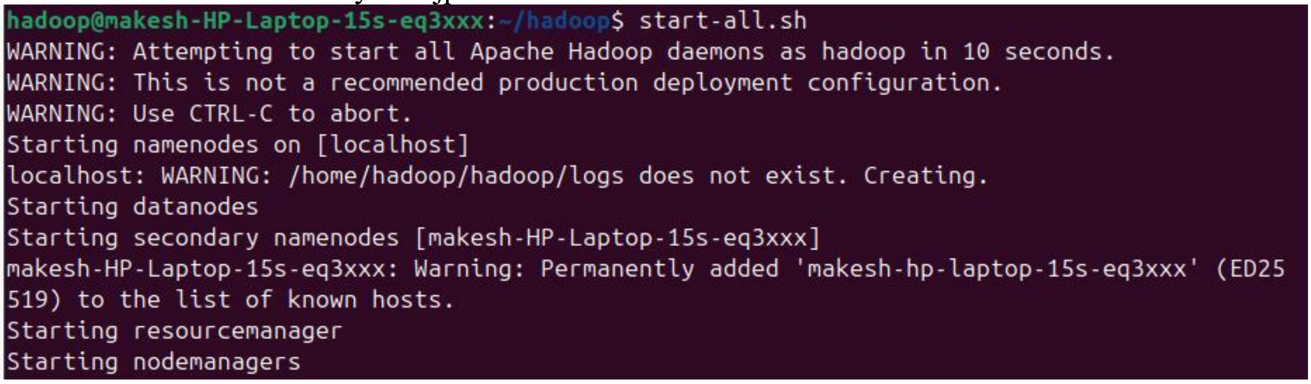
```
  GNU nano 2.5.3                  File: .bashrc                          Modified

export PATH=$PATH:$HADOOP_HOME/sbin:$HADOOP_HOME/bin
export HADOOP_OPTS="-Djava.library.path=$HADOOP_HOME/lib/native"


export HIVE_HOME=/home/hdoop/apache-hive-3.1.2-bin
export PATH=$PATH:$HIVE_HOME/bin

#PIG settings
export PIG_HOME=/home/hdoop/pig
export PATH=$PATH:$PIG_HOME/bin
export PIG_CLASSPATH=$PIG_HOME/conf:$HADOOP_INSTALL/etc/hadoop/
export PIG_CONF_DIR=$PIG_HOME/conf
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
export PIG_CLASSPATH=$PIG_CONF_DIR:$PATH
```

Step 6: Run the following command to make the changes effective in the .bashrc file:

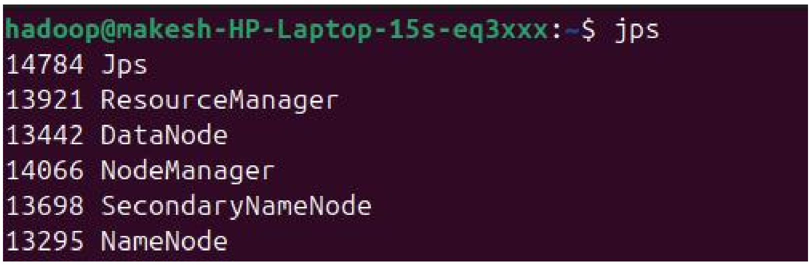
$ source .bashrc

Step 7: To start all Hadoop daemons, navigate to the hadoop-3.2.1/sbin folder and run the following commands:

$ ./start-dfs.sh$ ./start-yarn$ jps



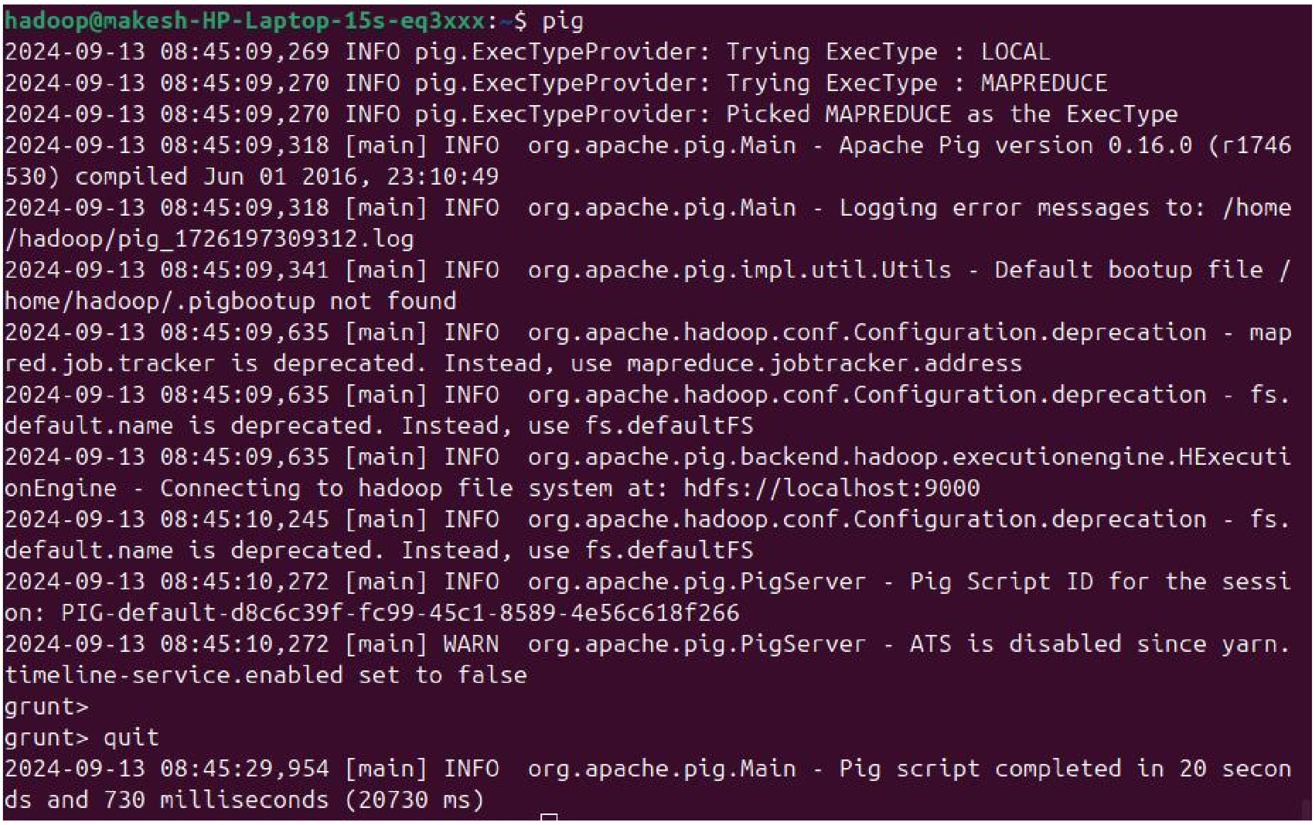
```
hadoop@makesh-HP-Laptop-15s-eq3xxx:~/hadoop$ start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as hadoop in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [localhost]
localhost: WARNING: /home/hadoop/hadoop/logs does not exist. Creating.
Starting datanodes
Starting secondary namenodes [makesh-HP-Laptop-15s-eq3xxx]
makesh-HP-Laptop-15s-eq3xxx: Warning: Permanently added 'makesh-hp-laptop-15s-eq3xxx' (ED25
519) to the list of known hosts.
Starting resourcemanager
Starting nodemanagers
```



```
hadoop@makesh-HP-Laptop-15s-eq3xxx:~$ jps
14784 Jps
13921 ResourceManager
13442 DataNode
14066 NodeManager
13698 SecondaryNameNode
13295 NameNode
```

Step 8: Now you can launch pig by executing the following

command: $ pig



```
hadoop@makesh-HP-Laptop-15s-eq3xxx:~$ pig
2024-09-13 08:45:09,269 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2024-09-13 08:45:09,270 INFO pig.ExecTypeProvider: Trying ExecType : MAPREDUCE
2024-09-13 08:45:09,270 INFO pig.ExecTypeProvider: Picked MAPREDUCE as the ExecType
2024-09-13 08:45:09,318 [main] INFO  org.apache.pig.Main - Apache Pig version 0.16.0 (r1746
530) compiled Jun 01 2016, 23:10:49
2024-09-13 08:45:09,318 [main] INFO  org.apache.pig.Main - Logging error messages to: /home
/hadoop/pig_1726197309312.log
2024-09-13 08:45:09,341 [main] INFO  org.apache.pig.impl.util.Utils - Default bootup file /
home/hadoop/.pigbootup not found
2024-09-13 08:45:09,635 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - map
red.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2024-09-13 08:45:09,635 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.
default.name is deprecated. Instead, use fs.defaultFS
2024-09-13 08:45:09,635 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecuti
onEngine - Connecting to hadoop file system at: hdfs://localhost:9000
2024-09-13 08:45:10,245 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - fs.
default.name is deprecated. Instead, use fs.defaultFS
2024-09-13 08:45:10,272 [main] INFO  org.apache.pig.PigServer - Pig Script ID for the sessi
on: PIG-default-d8c6c39f-fc99-45c1-8589-4e56c618f266
2024-09-13 08:45:10,272 [main] WARN  org.apache.pig.PigServer - ATS is disabled since yarn.
timeline-service.enabled set to false
grunt>
grunt> quit
2024-09-13 08:45:29,954 [main] INFO  org.apache.pig.Main - Pig script completed in 20 secon
ds and 730 milliseconds (20730 ms)
```

Step 9: Now you are in pig and can perform your desired tasks on pig. You can come out of the pig by the quit command:

> quit;

Procedure:

Create a sample text file

hadoop@Ubuntu:~/Documents$ nano sample.txt

Paste the below content to sample.txt

1,John

2,Jane

3,Joe

4,Emma

hadoop@Ubuntu:~/Documents$ hadoop fs -put sample.txt /home/hadoop/piginput/

Create PIG File

```
hadoop@Ubuntu:~/Documents$ nano demo_pig.pig
```

paste the below the content to demo_pig.pig

```
-- Load the data from HDFS
data = LOAD '/home/hadoop/piginput/sample.txt' USING PigStorage(',') AS (id:int>

-- Dump the data to check if it was loaded correctly
DUMP data;
```

Run the above file

```
hadoop@Ubuntu:~/Documents$ pig demo_pig.pig

2024-08-07 12:13:08,791 [main] INFO
org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil
- Total input paths to process : 1
(1,John)
(2,Jane)
(3,Joe)
(4,Emma)
```

Create udf file an save as uppercase_udf.py

uppercase_udf.py

```
------ def uppercase(text): return text.upper()

if _name___== "_main_":
import sys for
line in
sys.stdin:
        line = line.strip()
        result =
        uppercase(line)
        print(result)
```

Create the udfs folder on hadoop

```
hadoop@Ubuntu:~/Documents$ hadoop fs -mkdir /home/hadoop/udfs
```

put the upppercase_udf.py in to the abv folder

```
hadoop@Ubuntu:~/Documents$ hdfs dfs -put uppercase_udf.py /home/hadoop/udfs/
```

```
hadoop@Ubuntu:~/Documents$ nano udf_example.pig
```

copy and paste the below content on udf_example.pig

```
-- Register the Python UDF script
REGISTER 'hdfs:///home/hadoop/udfs/uppercase_udf.py' USING jython AS udf;

-- Load some data
data = LOAD 'hdfs:///home/hadoop/sample.txt' AS (text:chararray);

-- Use the Python UDF
uppercased_data = FOREACH data GENERATE udf.uppercase(text) AS uppercase_text;

-- Store the result
STORE uppercased_data INTO 'hdfs:///home/hadoop/pig_output_data';
```

```
---
```

place sample.txt file on hadoop

```
hadoop@Ubuntu:~/Documents$ hadoop fs -put sample.txt /home/hadoop/
```

To Run the pig file

```
hadoop@Ubuntu:~/Documents$ pig -f udf_example.pig
```

finally u get

```
Success!
Job Stats (time in seconds):
JobId Maps Reduces MaxMapTimeMinMapTime AvgMapTime MedianMapTime
MaxReduceTime MinReduceTime AvgReduceTime MedianReducetime
Alias Feature Outputs

job_local1786848041_0001 1 0 n/a n/a n/a n/a 00 0 0
data,uppercased_data MAP_ONLY hdfs:///home/hadoop/pig_output_data,

Input(s):
Successfully read 4 records (42778068 bytes) from: "hdfs:///home/hadoop/sample.txt"
Output(s):
Successfully stored 4 records (42777870 bytes) in:
"hdfs:///home/hadoop/pig_output_data"

Counters:
Total records written : 4
Total bytes written : 42777870
Spillable Memory Manager spill count : 0
Total bags proactively spilled: 0
Total records proactively spilled: 0

Job DAG:
job_local1786848041_0001

2024-08-07 13:33:04,631 [main] WARN
org.apache.hadoop.metrics2.impl.MetricsSystemImpl -
JobTracker metrics system already initialized!
```

```
2024-08-07 13:33:04,639 [main] WARN
org.apache.hadoop.metrics2.impl.MetricsSystemImpl -
JobTracker metrics system already initialized!
2024-08-07 13:33:04,644 [main] WARN
org.apache.hadoop.metrics2.impl.MetricsSystemImp
l - JobTracker metrics system already initialized!
2024-08-07 13:33:04,667 [main] INFO
org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher
- Success!
```

Note :

If any error check jython package is installed and check the path specified on the above steps are give correctly

---

-- To check the output file is created

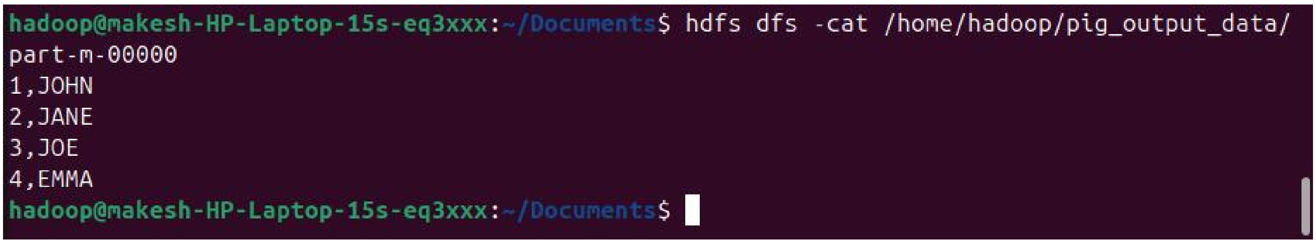
```
hadoop@Ubuntu:~/Documents$ hdfs dfs -ls /home/hadoop/pig_output_data
Found 2 items
```

If you need to examine the files in the output folder,

use: **To view the output**

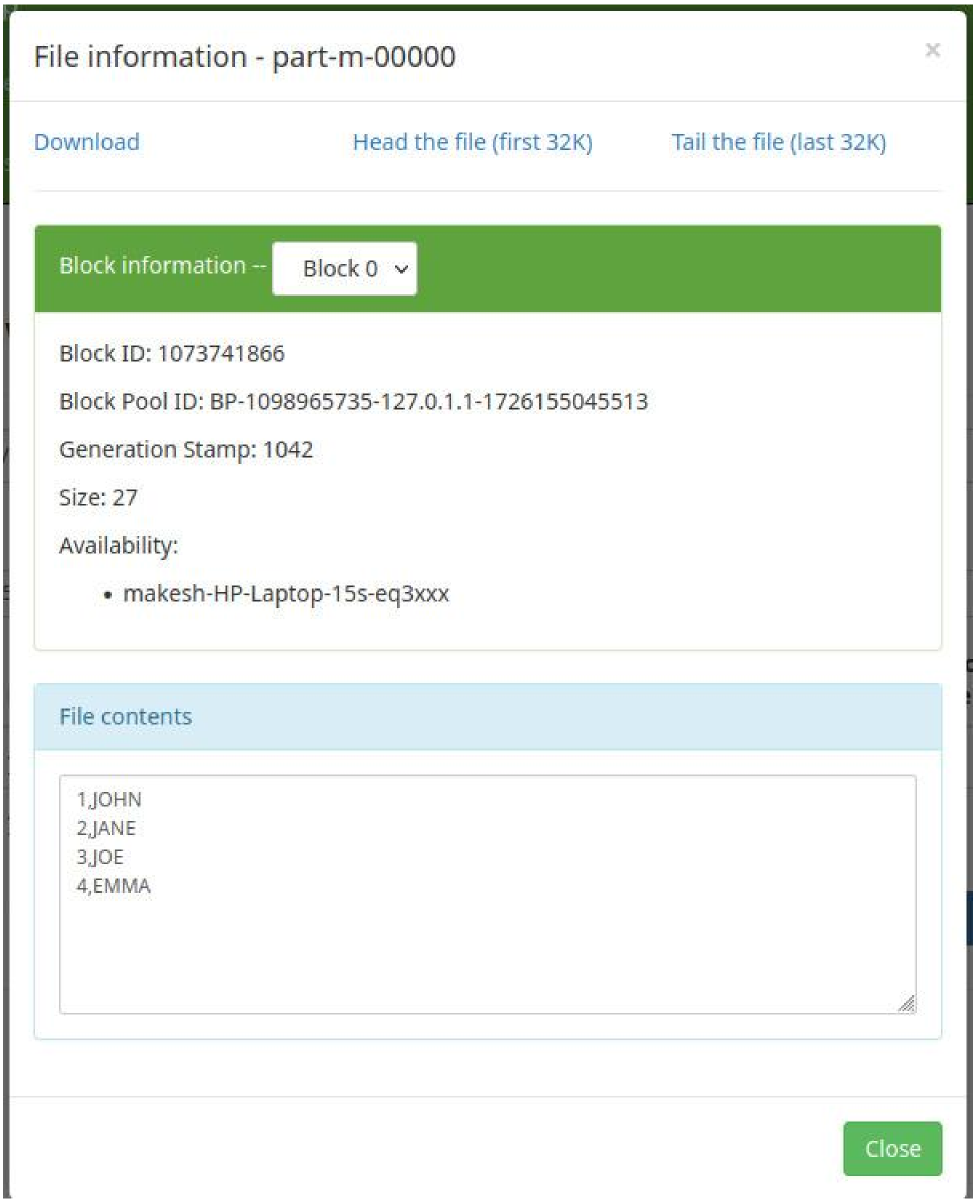
hadoop@Ubuntu:~/Documents$ hdfs dfs -cat /home/hadoop/pig_output_data/part-m00000

```
1,JOHN
2,JANE
3,JOE
4,EMMA
```



```
hadoop@makesh-HP-Laptop-15s-eq3xxx:~/Documents$ hdfs dfs -cat /home/hadoop/pig_output_data/
part-m-00000
1,JOHN
2,JANE
3,JOE
4,EMMA
hadoop@makesh-HP-Laptop-15s-eq3xxx:~/Documents$
```

Output:



File information - part-m-00000

Block ID: 1073741866

Block Pool ID: BP-1098965735-127.0.1.1-1726155045513

Generation Stamp: 1042

Size: 27

Availability:

- makesh-HP-Laptop-15s-eq3xxx

File contents

```
1,JOHN
2,JANE
3,JOE
4,EMMA
```

Result:

Thus the UDF in Apache PIG has been created and executed in Mapreduce/HDFS mode Successfully.