

## EXP 4: Create UDF in PIG

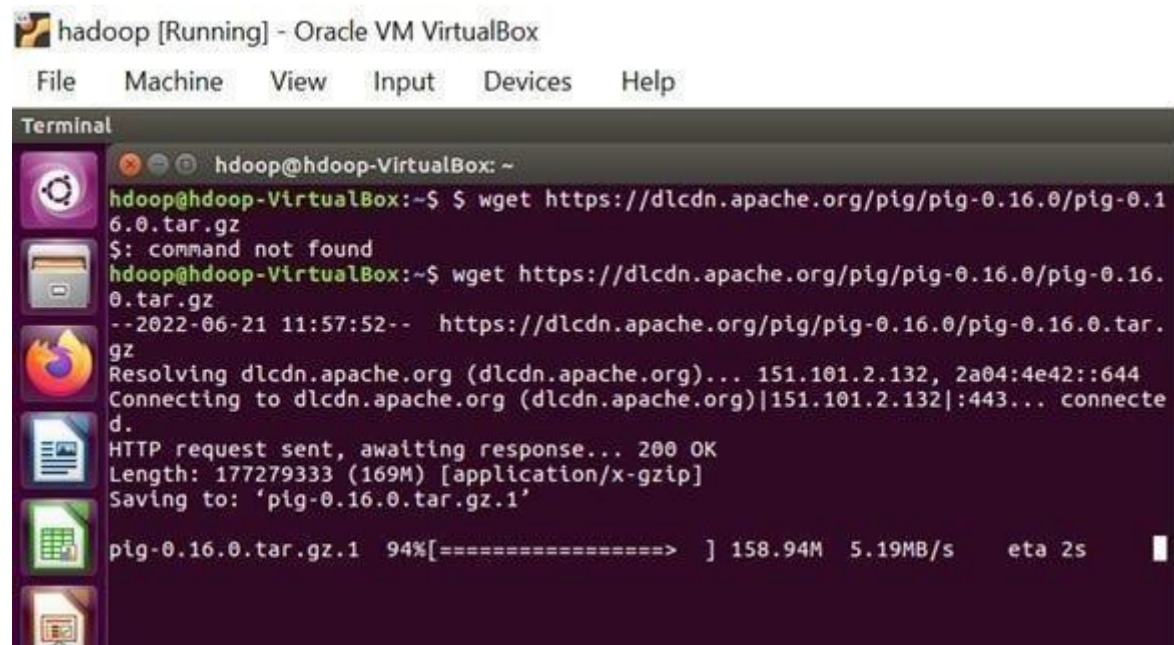
### Step-by-step installation of Apache Pig on Hadoop cluster on Ubuntu

#### 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

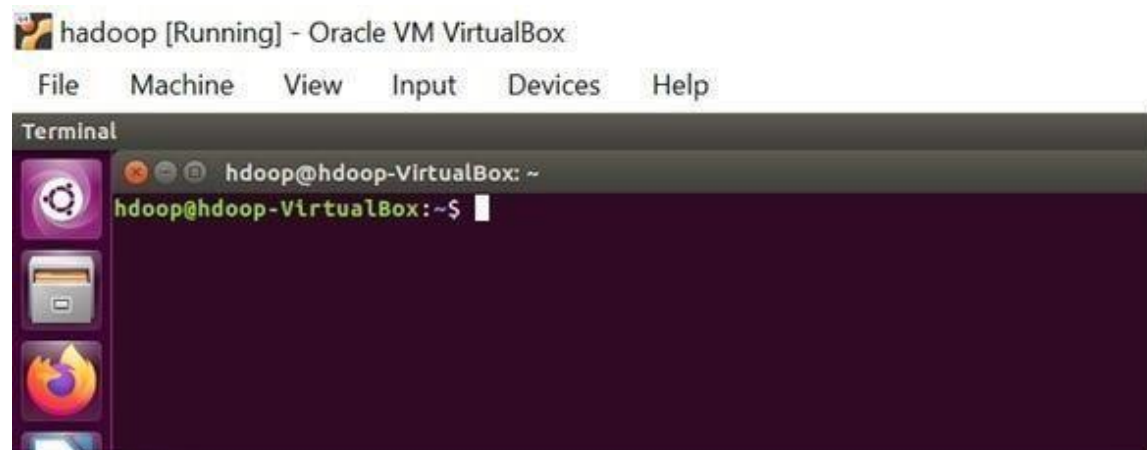


```
hadoop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Terminal
hadoop@hadoop-VirtualBox: ~
hadoop@hadoop-VirtualBox:~$ $ wget https://dclcdn.apache.org/pig/pig-0.16.0/pig-0.16.0.tar.gz
$: command not found
hadoop@hadoop-VirtualBox:~$ wget https://dclcdn.apache.org/pig/pig-0.16.0/pig-0.16.0.tar.gz
--2022-06-21 11:57:52-- https://dclcdn.apache.org/pig/pig-0.16.0/pig-0.16.0.tar.gz
Resolving dclcdn.apache.org (dclcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Connecting to dclcdn.apache.org (dclcdn.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://dclcdn.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
hadoop@hadoop-VirtualBox: ~
hadoop@hadoop-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:

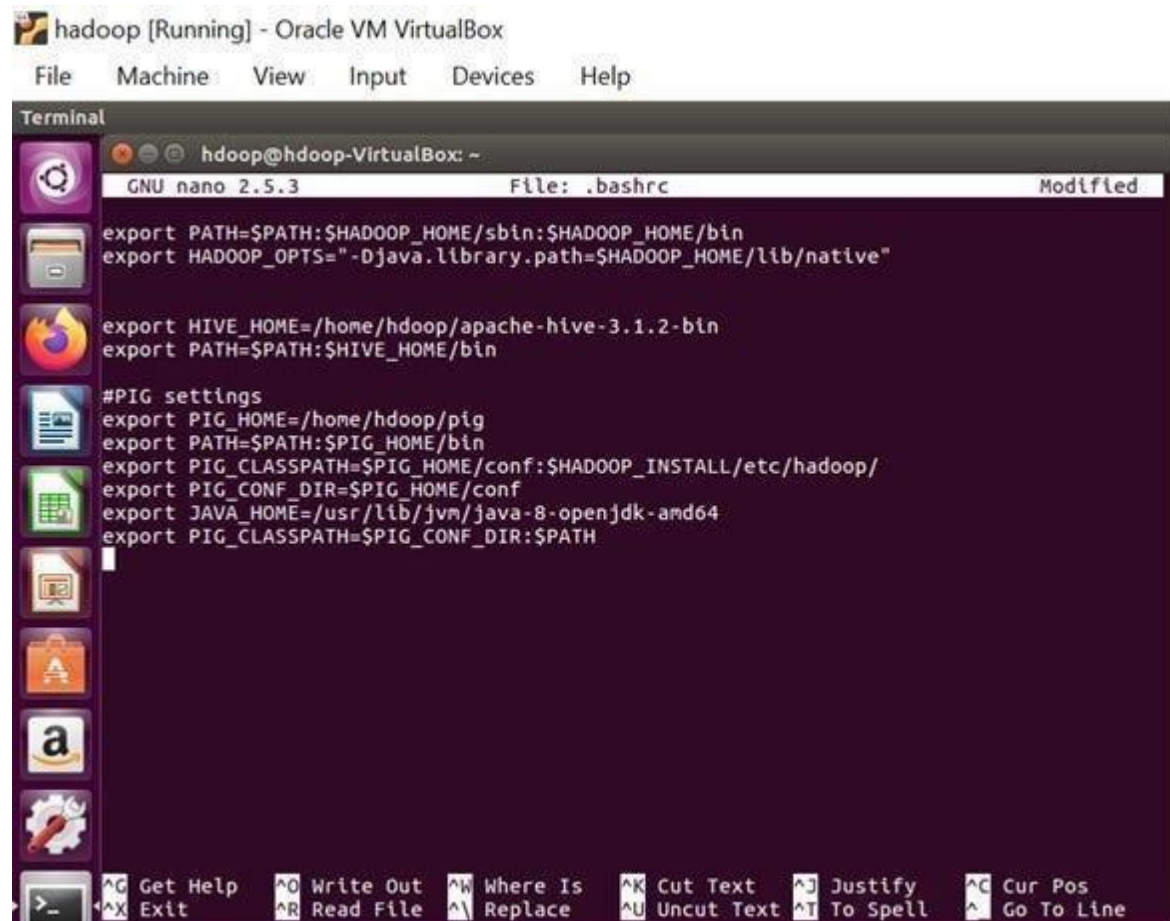
```
$ sudo mv /home/hdoop/pig-0.16.0 /home/hdoop/pig
```

**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 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
#PIG setting ends
```



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

```
$ source .bashrc
```

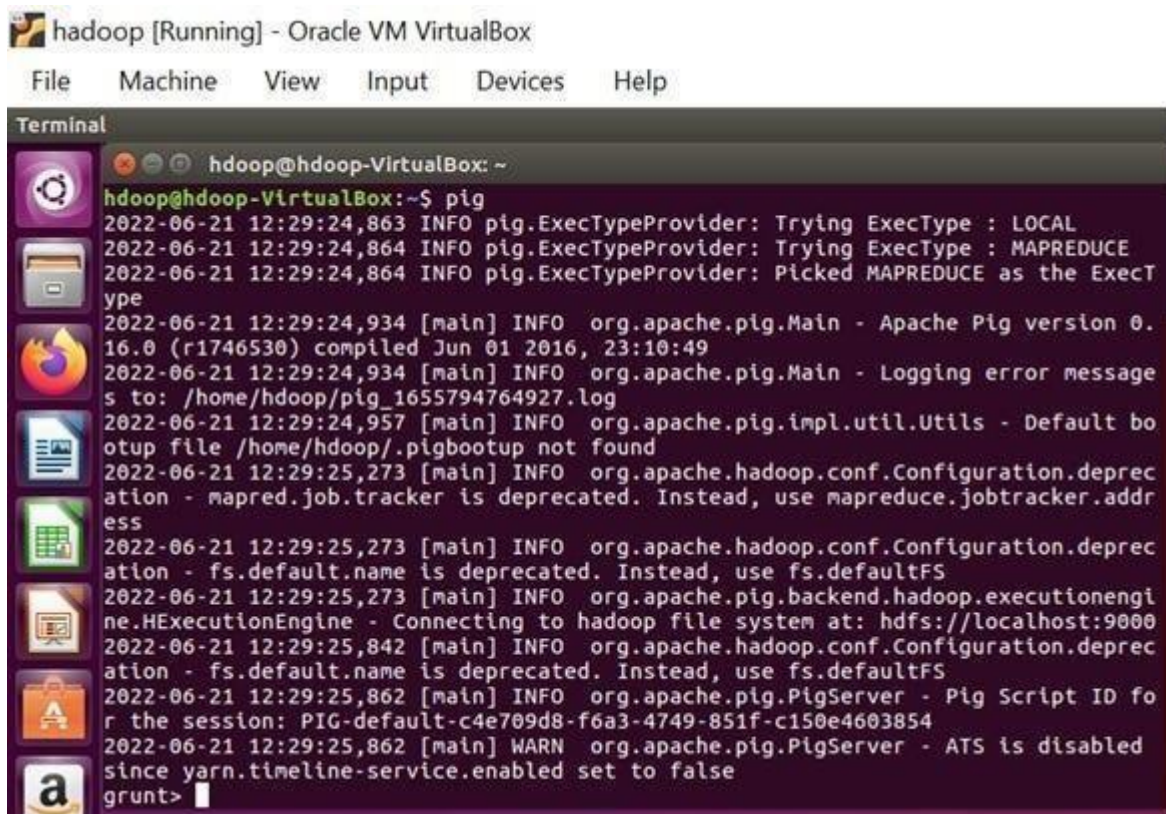
**Step 7:** To start all Hadoop daemons, navigate to the `hadoop-3.2.1/sbin` folder and run the following commands:

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

```
hadoop@hadoop-VirtualBox:~$ cd hadoop-3.2.1/sbin
hadoop@hadoop-VirtualBox:~/hadoop-3.2.1/sbin$ ./start-dfs.sh
Starting namenodes on [localhost]
Starting datanodes
Starting secondary namenodes [hadoop-VirtualBox]
hadoop@hadoop-VirtualBox:~/hadoop-3.2.1/sbin$ ./start-yarn.sh
Starting resourcemanager
Starting nodemanagers
hadoop@hadoop-VirtualBox:~/hadoop-3.2.1/sbin$ jps
4817 DataNode
5298 ResourceManager
5000 SecondaryNameNode
5450 NodeManager
4683 NameNode
5982 Jps
hadoop@hadoop-VirtualBox:~/hadoop-3.2.1/sbin$
```

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

```
$ pig
```



```
hadoop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Terminal
hadoop@hadoop-VirtualBox: ~
hadoop@hadoop-VirtualBox:~$ pig
2022-06-21 12:29:24,863 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2022-06-21 12:29:24,864 INFO pig.ExecTypeProvider: Trying ExecType : MAPREDUCE
2022-06-21 12:29:24,864 INFO pig.ExecTypeProvider: Picked MAPREDUCE as the ExecType
2022-06-21 12:29:24,934 [main] INFO org.apache.pig.Main - Apache Pig version 0.16.0 (r1746530) compiled Jun 01 2016, 23:10:49
2022-06-21 12:29:24,934 [main] INFO org.apache.pig.Main - Logging error messages to: /home/hadoop/pig_1655794764927.log
2022-06-21 12:29:24,957 [main] INFO org.apache.pig.impl.util.Utils - Default bootstrap file /home/hadoop/.pigbootstrap not found
2022-06-21 12:29:25,273 [main] INFO org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2022-06-21 12:29:25,273 [main] INFO org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-06-21 12:29:25,273 [main] INFO org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to hadoop file system at: hdfs://localhost:9000
2022-06-21 12:29:25,842 [main] INFO org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2022-06-21 12:29:25,862 [main] INFO org.apache.pig.PigServer - Pig Script ID for the session: PIG-default-c4e709d8-f6a3-4749-851f-c150e4603854
2022-06-21 12:29:25,862 [main] WARN org.apache.pig.PigServer - ATS is disabled since yarn.timeline-service.enabled set to false
grunt>
```

**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;
```

## CREATE USER DEFINED FUNCTION(UDF)

**Aim :** To create User Define Function in Apache Pig and execute it on map reduce.

### 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.MetricsSystemImpl -

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**

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**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-m-00000**

```

hadoop@osboxes: ~/da/expt4
job_local543617764_0001
2024-09-04 11:57:11,347 [main] WARN org.apache.hadoop.metrics2.impl.MetricsSystemImpl - JobTracker metrics system already initialized!
2024-09-04 11:57:11,365 [main] WARN org.apache.hadoop.metrics2.impl.MetricsSystemImpl - JobTracker metrics system already initialized!
2024-09-04 11:57:11,374 [main] WARN org.apache.hadoop.metrics2.impl.MetricsSystemImpl - JobTracker metrics system already initialized!
2024-09-04 11:57:11,417 [main] INFO org.apache.pig.backend.hadoop.executionengine.mapReduceLayer.MapReduceLauncher - Success!
2024-09-04 11:57:11,422 [main] INFO org.apache.hadoop.conf.Configuration.deprecation - fs.default.name is deprecated. Instead, use fs.defaultFS
2024-09-04 11:57:11,422 [main] WARN org.apache.pig.data.SchemaTupleBackend - SchemaTupleBackend has already been initialized
2024-09-04 11:57:11,476 [main] INFO org.apache.hadoop.mapreduce.lib.input.FileInputFormat - Total input files to process : 1
2024-09-04 11:57:11,477 [main] INFO org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths to process : 1
(1,karishma)
(2,ragav)
(3,kanagashanmugam)
(4,keerts)
(5,kamal)
(6,varsha)
(7,kaarnesh)
(8,jeff)
2024-09-04 11:57:11,857 [main] INFO org.apache.pig.Main - Pig script completed in 23 seconds and 92 milliseconds (23092 ms)
hadoop@osboxes: ~/da/expt4$

```

**Result:**

**Thus the program is executed successfully**