

Create UDF (User Defined Functions) in Apache Pig and execute it in MapReduce / HDFS mode

Aim:

To create UDF in Apache Pig and execute it in MapReduce/HDFS mode.

Procedure:

Pig Download and installation:

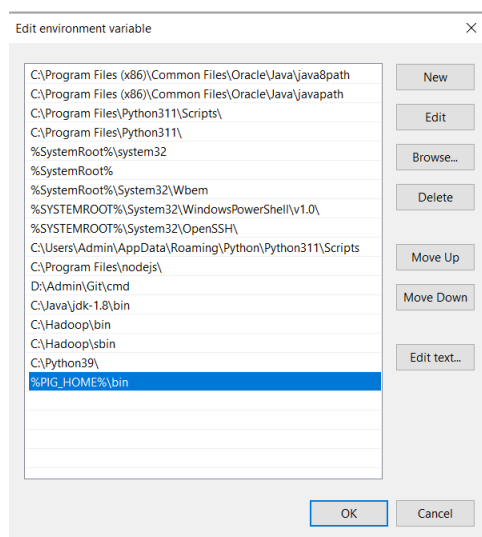
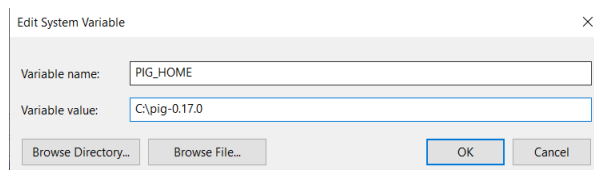
1. Download Pig:

Download Pig from “<https://downloads.apache.org/pig/pig-0.17.0/>”

Index of /pig/pig-0.17.0

Name	Last modified	Size	Description
Parent Directory	-	-	-
README.txt	2017-06-16 18:10	1.4K	
RELEASE_NOTES.txt	2017-06-16 18:10	1.9K	
pig-0.17.0-src.tar.gz	2017-06-16 18:11	15M	
pig-0.17.0-src.tar.gz.asc	2017-06-16 18:11	488	
pig-0.17.0-src.tar.gz.md5	2017-06-16 18:11	56	
pig-0.17.0.tar.gz	2017-06-16 18:10	220M	
pig-0.17.0.tar.gz.asc	2017-06-16 18:11	488	
pig-0.17.0.tar.gz.md5	2017-06-16 18:11	52	

2. Add the environment variable for Pig:



3. Go to C:\pig-0.16.0\bin and open pig (Windows Command Script)

```
set HADOOP_BIN_PATH=%HADOOP_HOME%\libexec
```

4. Open Windows Powershell and type “pig -x local” and check whether pig grunt appears.

Pig is successfully installed.

Create UDF:

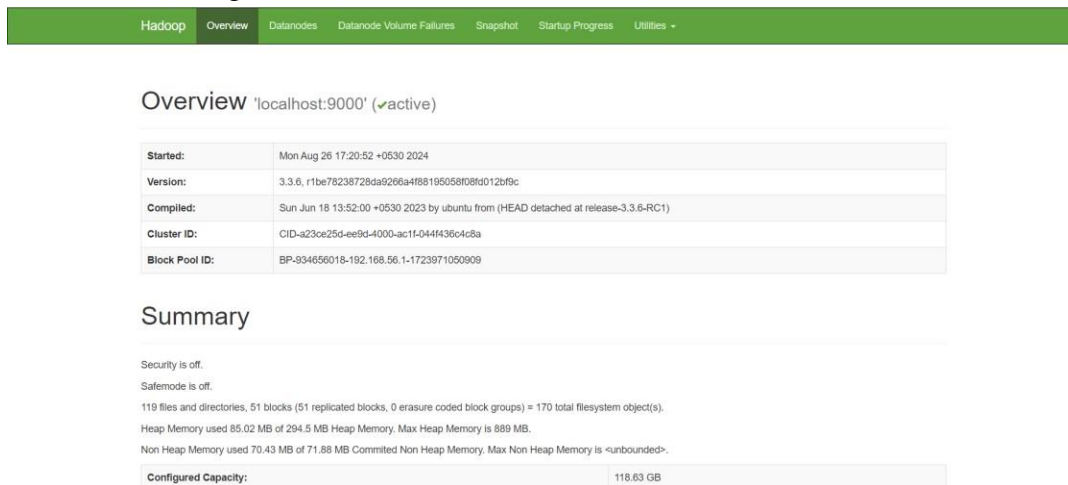
1. Start Hadoop services:

Open command prompt as an administrator

```
start-dfs.cmd
```

```
start-yarn.cmd
```

2. Open the browser and go to the URL “localhost:9870”



Overview 'localhost:9000' (✓active)

Started:	Mon Aug 26 17:20:52 +0530 2024
Version:	3.3.6, r1be78238728da9266a4f861950508f0d012bf9c
Compiled:	Sun Jun 18 13:52:00 +0530 2023 by ubuntu from (HEAD detached at release-3.3.6-RC1)
Cluster ID:	CID-a23ce25d-ee9d-4000-ac1f-044f436c4c8a
Block Pool ID:	BP-934656018-192.168.56.1-1723971050909

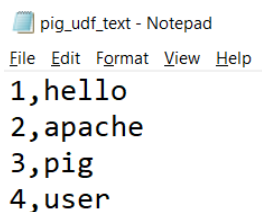
Summary

Security is off.
Safemode is off.

119 files and directories, 51 blocks (51 replicated blocks, 0 erasure coded block groups) = 170 total filesystem object(s).
Heap Memory used 85.02 MB of 294.5 MB Heap Memory. Max Heap Memory is 889 MB.
Non Heap Memory used 70.43 MB of 71.88 MB Committed Non Heap Memory. Max Non Heap Memory is <unbounded>.

Configured Capacity: 118.63 GB

3. Create a text file “pig_udf_text.txt”:



```
1,hello
2,apache
3,pig
4,user
```

4. Create a Directory in HDFS and copy the Input File to HDFS

```
hdfs dfs -mkdir /user/Admin/home/hadoop/piginput
```

```
hadoop fs -put C:/Hadoop/piginput/pig_udf_text.txt /user/Admin/home/hadoop/piginput/
```

```
C:\>hdfs dfs -mkdir /user/Admin/home/hadoop/piginput
```

```
C:\>hadoop fs -put C:/Hadoop/piginput/pig_udf_text.txt /user/Admin/home/hadoop/piginput/
```

5. Create a Python file “uppercase_udf.py”:

```
uppercase_udf - Notepad
File Edit Format View Help
def uppercase(text):
    return text.upper()

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

6. Create a Directory in HDFS and copy the Input File to HDFS

```
hdfs dfs -mkdir /user/Admin/home/hadoop/udfs
```

```
hadoop fs -put C:/Users/Admin/uppercase_udf.py /user/Admin/home/hadoop/udfs/
```

```
C:\>hdfs dfs -mkdir /user/Admin/home/hadoop/udfs
C:\>hadoop fs -put C:/Users/Admin/uppercase_udf.py /user/Admin/home/hadoop/udfs/
```

7. Create pig file “script.pig”:

```
script - Notepad
File Edit Format View Help
-- Register the Python UDF script
REGISTER 'hdfs:///user/Admin/home/hadoop/udfs/uppercase_udf.py' USING jython AS udf;
-- Load some data
data = LOAD 'hdfs:///user/Admin/home/hadoop/piginput/pig_udf_text.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:///user/Admin/home/hadoop/pig_output_data';
```

8. Execute Pig file:

```
pig -f C:/Users/Admin/script.pig
```

```
C:\>pig -f C:/Users/Admin/script.pig
2024-08-26 19:02:52,575 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2024-08-26 19:02:52,578 INFO pig.ExecTypeProvider: Trying ExecType : MAPREDUCE
2024-08-26 19:02:52,579 INFO pig.ExecTypeProvider: Picked MAPREDUCE as the ExecType
2024-08-26 19:02:53,142 [main] INFO org.apache.pig.Main - Apache Pig version 0.17.0 (r1797386) compiled Jun 02 2017, 15:41:58
2024-08-26 19:02:53,142 [main] INFO org.apache.pig.Main - Logging error messages to: C:\Hadoop\logs\pig.1724679173133.log
2024-08-26 19:02:53,674 [main] INFO org.apache.pig.impl.util.Utils - Default bootstrap file C:\Users\Admin/.pigbootstrap not found
2024-08-26 19:02:53,794 [main] INFO org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use
2024-08-26 19:02:53,794 [main] INFO org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to hadoop file system
2024-08-26 19:02:54,842 [main] INFO org.apache.pig.PigServer - Pig Script ID for the session: PIG-script.pig-d6bf1250-8d4f-4b65-8519-
2024-08-26 19:02:54,846 [main] WARN org.apache.pig.PigServer - ATS is disabled since yarn.timeline-service.enabled set to false
2024-08-26 19:02:55,554 [main] INFO org.apache.pig.scripting.jython.JythonScriptEngine - created tmp python.cachedir=C:\Users\Admin\
2024-08-26 19:03:11,501 [JobControl] INFO org.apache.hadoop.mapreduce.lib.input.FileInputFormat - Total input files to process : 1
2024-08-26 19:03:11,502 [JobControl] INFO org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths to process : 1
2024-08-26 19:03:11,540 [JobControl] INFO org.apache.pig.backend.hadoop.executionengine.util.MapRedUtil - Total input paths (combined) to process : 1
2024-08-26 19:03:12,073 [JobControl] INFO org.apache.hadoop.mapreduce.JobSubmitter - number of splits:1
```

9. View the Output

```
hdfs dfs -ls /user/Admin/home/hadoop/pig_output_data
```

```
C:\>hdfs dfs -ls /user/Admin/home/hadoop/pig_output_data
Found 2 items
-rw-r--r--  1 Admin supergroup      0 2024-08-26 19:04 /user/Admin/home/hadoop/pig_output_data/_SUCCESS
-rw-r--r--  1 Admin supergroup    30 2024-08-26 19:04 /user/Admin/home/hadoop/pig_output_data/part-m-00000
```

```
hdfs dfs -cat /user/Admin/home/hadoop/pig_output_data/part-m-00000
```

```
C:\hadoop-3.3.6\bin>jps
32512 NameNode
35248 Jps
8816 ResourceManager
26900 NodeManager
32228 DataNode

C:\hadoop-3.3.6\bin>hdfs dfs -cat /pigexpl/pig_output_data/part-m-00000
1      JOHN
2      JANE
3      JOE
4      EMMA

C:\hadoop-3.3.6\bin>
```

10. Once the map reduce operations are performed successfully, the output will be present in the specified directory.

“/user/Admin/home/hadoop/pig_output_data/part-m-00000”

/user/Admin/home/hadoop/pig_output_data

Go!

Show 25 entries

Search:

Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name
-rw-r--r--	Admin	supergroup	0 B	Aug 26 19:04	1	128 MB	_SUCCESS
-rw-r--r--	Admin	supergroup	30 B	Aug 26 19:04	1	128 MB	part-m-00000

Showing 1 to 2 of 2 entries

Previous 1 Next

File contents

```
1,HELLO
2,APACHE
3,PIG
4,USER
```

11. Stop Hadoop Services

```
stop-dfs.cmd
```

```
stop-yarn.cmd
```

Result:

Thus, UDF in Apache Pig has been created and executed in MapReduce/HDFS mode successfully.