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.

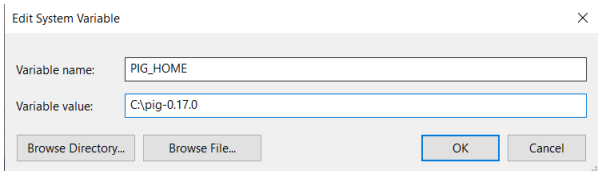
Procedure:

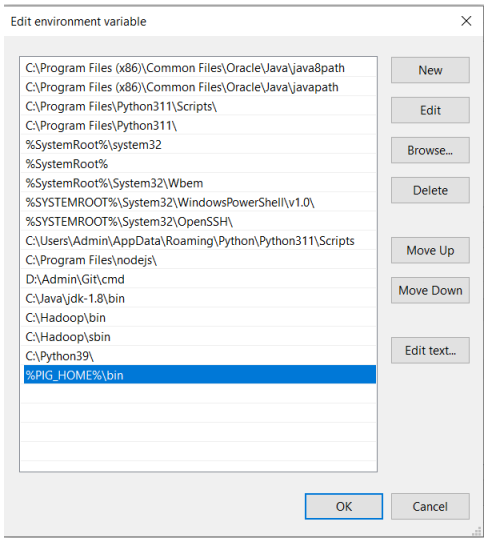
Pig Download and installation:

1. Download Pig:

Download Pig from "https://downloads.apache.org/pig/pig-0.17.0/"

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.

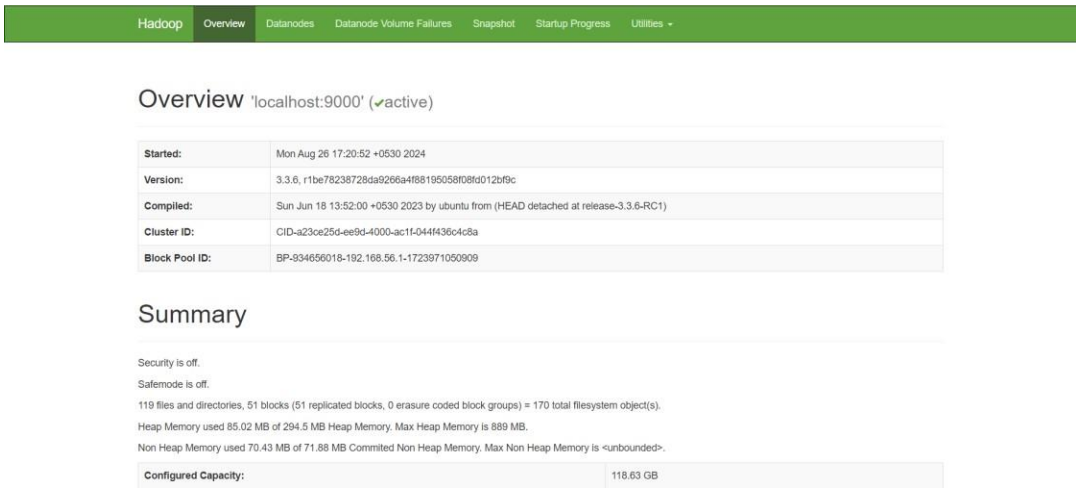
Create UDF:

1. Start Hadoop services:

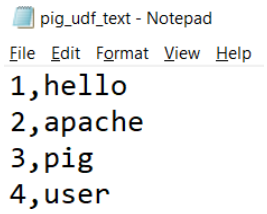
Open command prompt as an administrator

start-dfs.cmd
start-yarn.cmd

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



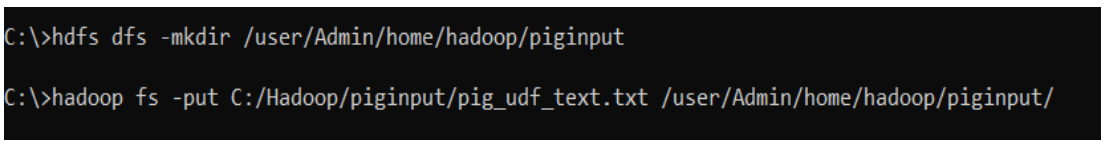
3. Create a text file “pig_udf_text.txt”:



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/



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 bootup file C:\Users\Admin/.pigbootup 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\A
```

```
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

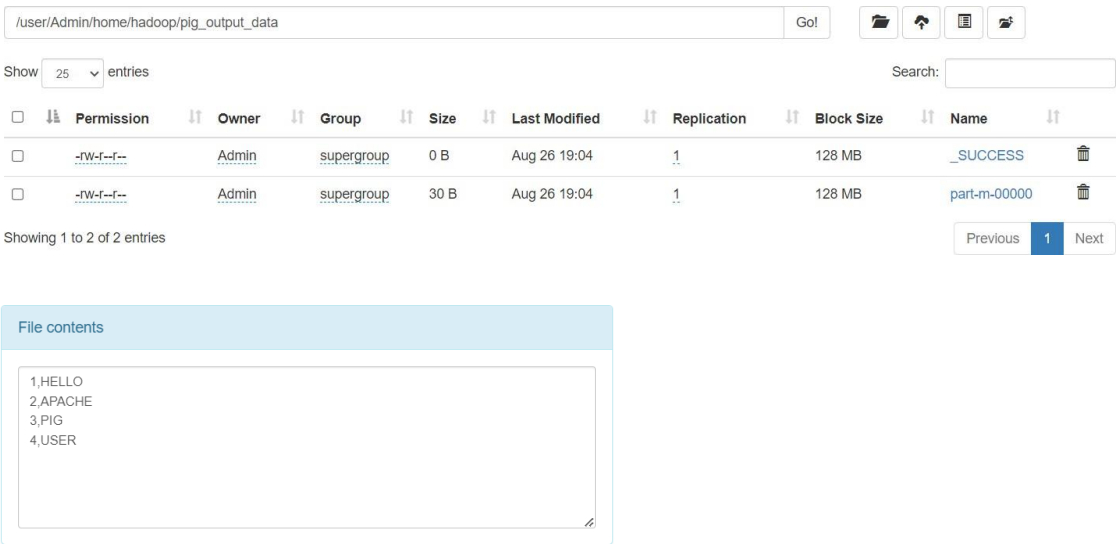
```
C:\hadoop-3.3.6\bin>jps
32512 NameNode
35248 Jps
8816 ResourceManager
26900 NodeManager
32228 DataNode

C:\hadoop-3.3.6\bin>hdfs dfs -cat /pigexp1/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"



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.