# EXP 4: Create UDF (User Defined Functions) in Apache Pigand execute it in MapReduce / HDFS mode

## AIM:

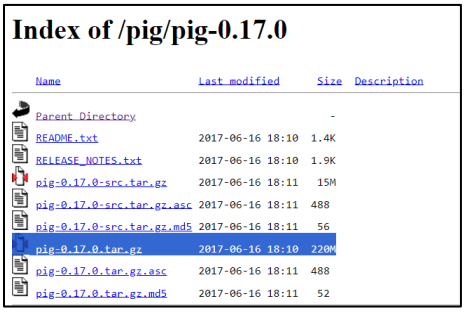
To create UDF in Apache Pig and execute it in MapReduce/HDFS mode.

## PROCEDURE:

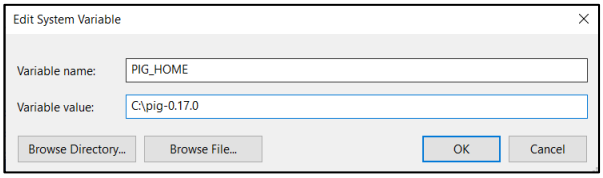
### Pig Download and installation:

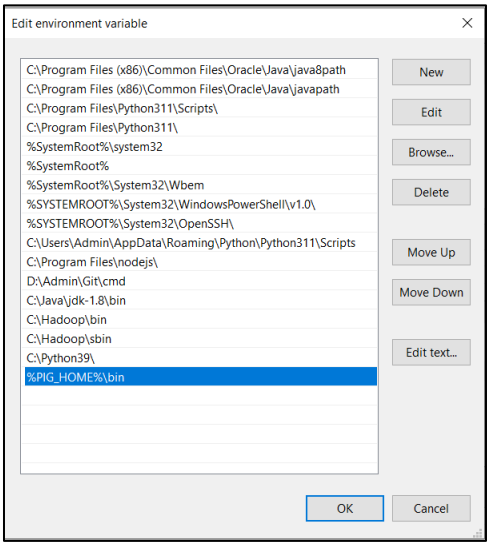
### 1. Download Pig:

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




### 2. Add the environment variable for Pig:



3. Go to C:\pig-0.17.0\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.**

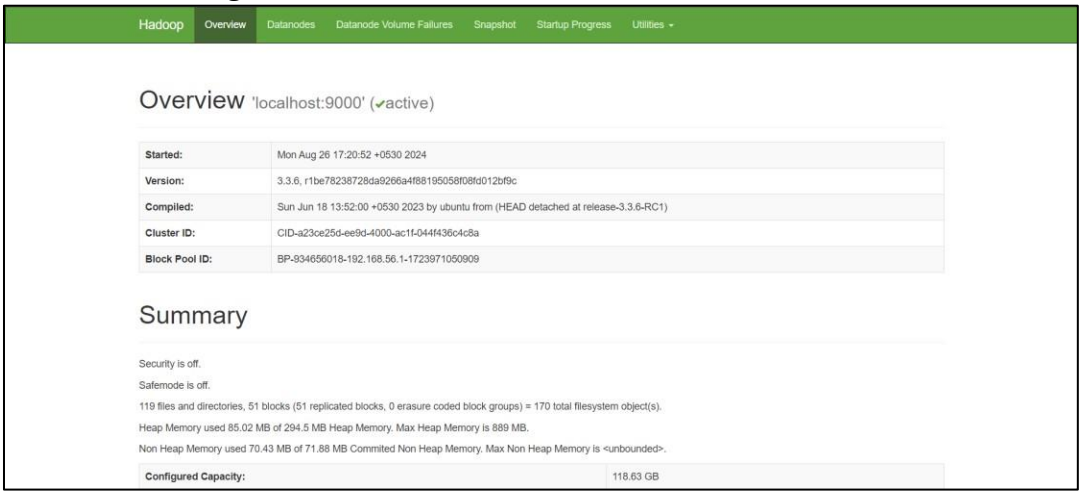
**Create UDF:**

**1. Start Hadoop services:**

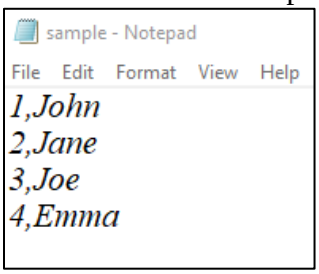
Open command prompt as an administrator

```
start-dfs.cmd
start-yarn.cmd
```

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



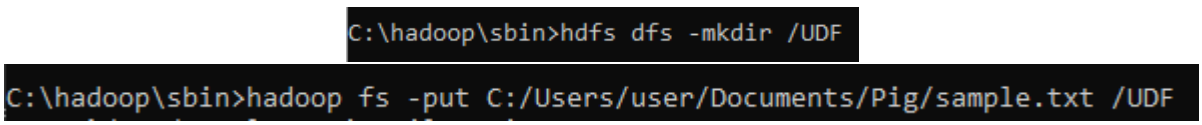

**3.** Create a text file “sample.txt”:




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

```
hdfs dfs –mkdir /UDF
```

```
hadoop fs -put C:/Users/user/Documents/Pig/sample.txt /UDF
```



**5.** Create a Python file “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)
```

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

```
hdfs dfs –mkdir /UDF/udfs
```

```
hadoop fs -put C:/Users/user/Documents/Pig/Uppercase_udf.py /UDF/udfs
```

```
C:\hadoop\sbin>hdfs dfs -mkdir /UDF/udfs
C:\hadoop\sbin>hadoop fs -put C:/Users/user/Documents/Pig /Uppercase_udf.py /UDF/udfs
```

**7.** Create pig file “UDF.pig”:

UDF - Notepad

File Edit Format View Help

```
-- udf_example.pig

-- Register the Python UDF script
REGISTER 'hdfs:///UDF/udfs/Uppercase_udf.py' USING jython AS udf;

-- Load some data
data = LOAD 'hdfs:///UDF/sample.txt' USING PigStorage(',') AS (id:int, name:chararray);

-- Use the Python UDF to convert names to uppercase
uppercased_data = FOREACH data GENERATE id, udf.uppercase(name) AS uppercase_name;

-- Store the result
STORE uppercased_data INTO 'hdfs:///UDF/output' USING PigStorage(',');
```

**8.** Execute Pig file

```
pig -x mapreduce C:/Users/user/Documents/Pig/UDF.pig
```

```
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
```

```
C:\hadoop\sbin>pig -x mapreduce C:/Users/user/Documents/Pig/UDF.pig
2024-09-08 18:57:35,502 INFO pig.ExecTypeProvider: Trying ExecType : LOCAL
2024-09-08 18:57:35,502 INFO pig.ExecTypeProvider: Trying ExecType : MAPREDUCE
2024-09-08 18:57:35,502 INFO pig.ExecTypeProvider: Picked MAPREDUCE as the ExecType
2024-09-08 18:57:36,298 [main] INFO  org.apache.pig.Main - Apache Pig version 0.17.0 (r1797386) compiled Jun 02 2017, 15:41:58
2024-09-08 18:57:36,298 [main] INFO  org.apache.pig.Main - Logging error messages to: C:\hadoop\logs\pig_1725802056283.log
2024-09-08 18:57:37,033 [main] INFO  org.apache.pig.impl.util.Utils - Default bootup file C:\Users\user/.pigbootup not found
2024-09-08 18:57:37,142 [main] INFO  org.apache.hadoop.conf.Configuration.deprecation - mapred.job.tracker is deprecated. Instead, use mapreduce.jobtracker.address
2024-09-08 18:57:37,142 [main] INFO  org.apache.pig.backend.hadoop.executionengine.HExecutionEngine - Connecting to hadoop file system at: hdfs://localhost:9000
2024-09-08 18:57:38,095 [main] INFO  org.apache.pig.PigServer - Pig Script ID for the session: PIG-UDF.pig-8ebf5171-17af-4a4d-9312-0f483160f591
2024-09-08 18:57:38,095 [main] WARN  org.apache.pig.PigServer - ATS is disabled since yarn.timeline-service.enabled set to false
2024-09-08 18:57:40,377 [main] ERROR org.apache.pig.tools.grunt.Grunt - ERROR 2997: Encountered IOException. Call From DESKTOP-DKU83QM/192.168.56.1 to localhost:9000 failed on connection excep
tion: java.net.ConnectException: Connection refused: no further information; For more details see:  http://wiki.apache.org/hadoop/ConnectionRefused
Details at logfile: C:\hadoop\logs\pig_1725802056283.log
2024-09-08 18:57:40,455 [main] INFO  org.apache.pig.Main - Pig script completed in 5 seconds and 156 milliseconds (5156 ms)

C:\hadoop\sbin>hdfs dfs -cat /UDF/output/part-m-00000
1,JOHN
2,JANE
3,JOE
4,EMMA
```

**9.** View the Output

hdfs dfs -ls /UDF/output

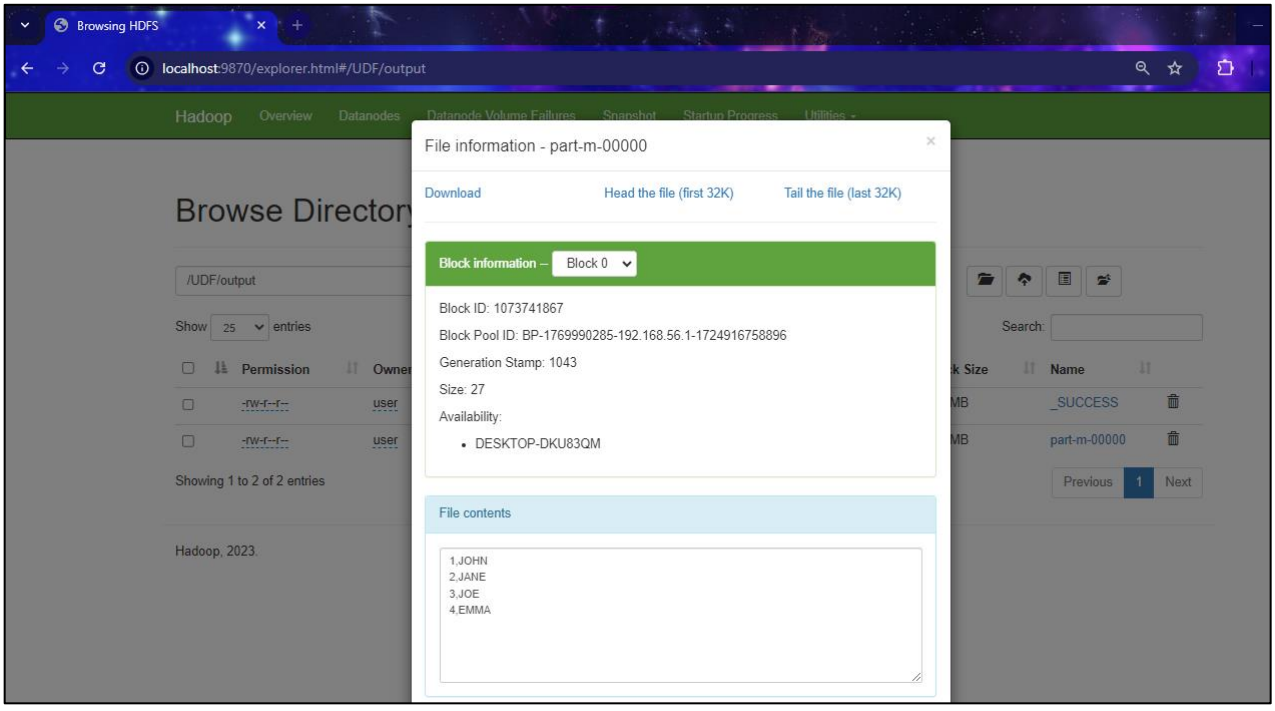
hdfs dfs -cat /UDF/output/part-m-00000

```
C:\hadoop\sbin>hdfs dfs -ls /UDF/output
Found 2 items
-rw-r--r--   1 user supergroup          0 2024-08-29 22:12 /UDF/output/_SUCCESS
-rw-r--r--   1 user supergroup         27 2024-08-29 22:12 /UDF/output/part-m-00000

C:\hadoop\sbin>hdfs dfs -cat /UDF/output/part-m-00000
1,JOHN
2,JANE
3,JOE
4,EMMA
```

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

"/UDF/output/part-m-00000"




## RESULT:

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