

Expt-4

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:

Step 1: Install and Configure Apache Pig

1. Download Apache Pig:

Download the latest version of Pig from the official website:

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

2. Extract Pig:

```
tar xvzf pig-0.16.0.tar.gz
```

3. Move Pig Directory:

Move the extracted Pig files to a dedicated folder:

```
sudo mv pig-0.16.0 /usr/local/pig
```

4. Set Environment Variables:

Edit the .bashrc file to set up Pig environment variables:

```
nano ~/.bashrc
```

Append the following lines:

```
export PIG_HOME=/usr/local/pig
```

```
export PATH=$PATH:$PIG_HOME/bin
```

```
export PIG_CLASSPATH=$HADOOP_HOME/conf
```

Apply the changes:

```
source ~/.bashrc
```

5. Verify Pig Installation:

Run the following command to verify if Pig has been installed correctly:

```
pig -version
```

Step 2: Create Sample Data for the Pig Job

1. **Create a Sample Data File:** Create a sample text file (sample.txt) with some dummy data:

```
nano sample.txt
```

Add the following content:

```
1,John
```

```
2,Jane
```

```
3,Joe
```

```
4,Emma
```

2. **Upload the Data File to HDFS:** Upload the sample file to Hadoop's distributed file system (HDFS):

```
hdfs dfs -mkdir /piginput
```

```
hdfs dfs -put sample.txt /piginput
```

Step 3: Write Pig Script for the UDF

1. **Create the Pig Script:**

Create a new Pig script (demo_pig.pig):

```
nano demo_pig.pig
```

Write the following code in the script to load and display the data:

```
pig
```

```
-- Load data from HDFS
```

```
data = LOAD '/piginput/sample.txt' USING PigStorage(',') AS (id:int,  
name:chararray);
```

```
-- Display the loaded data
```

```
DUMP data;
```

Step 4: Write the UDF in Python

1. **Create the Python UDF:**

Create a Python file (uppercase_udf.py) to convert text to uppercase:

```
nano uppercase_udf.py
```

```
def uppercase(text):  
    return text.upper()  
  
if __name__ == "__main__":  
    import sys  
    for line in sys.stdin:  
        line = line.strip()  
        print(uppercase(line))
```

2. Upload the Python UDF to HDFS:

Upload the UDF to HDFS:

```
hdfs dfs -mkdir /udfs  
hdfs dfs -put uppercase_udf.py /udfs
```

Step 5: Update Pig Script to Use UDF

1. Modify the Pig Script to Include UDF:

Edit the demo_pig.pig script to register the UDF and process the data:

```
nano demo_pig.pig  
  
Modify the script as follows:  
  
pig  
  
-- Register the Python UDF script  
REGISTER 'udfs/uppercase_udf.py' USING jython AS myudf;  
  
-- Load data from HDFS  
data = LOAD '/piginput/sample.txt' USING PigStorage(',') AS (id:int,  
name:chararray)  
  
-- Apply UDF to convert names to uppercase  
uppercased_data = FOREACH data GENERATE  
myudf.uppercase(name);  
  
-- Display the transformed data  
DUMP uppercased_data;
```

Step 6: Run the Pig Script

1. Run the Pig Script:

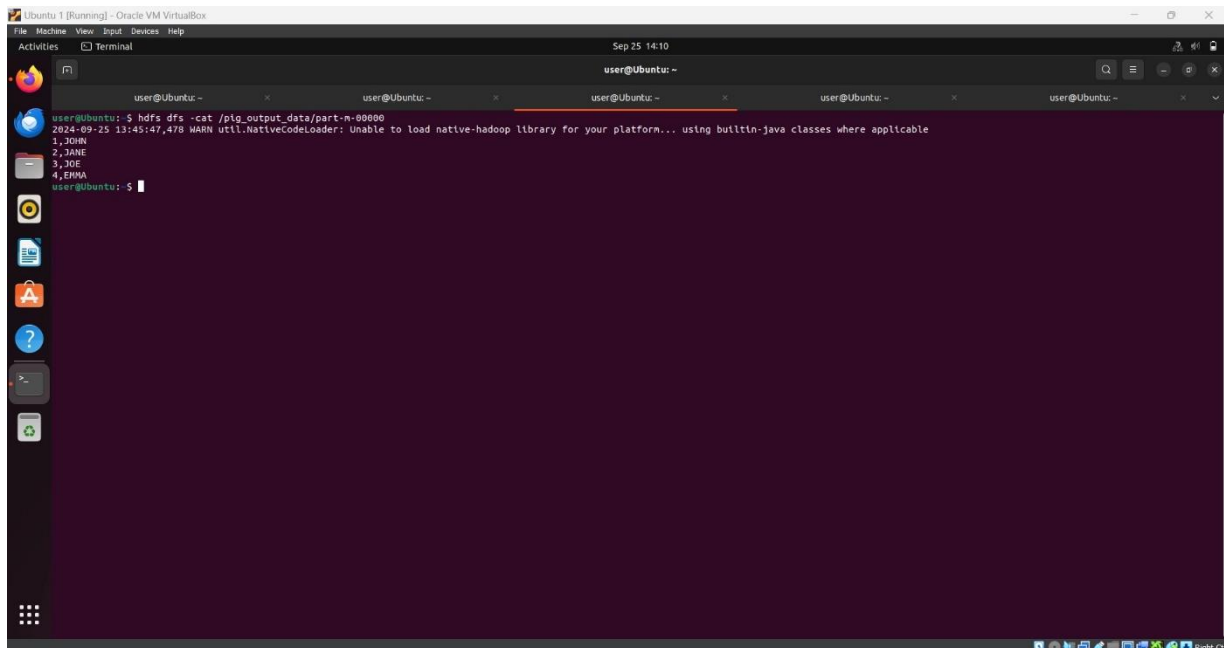
Run the Pig script using the following command:

```
pig -x mapreduce demo_pig.pig
```

2. View Output

```
hdfs dfs -cat /pigoutput/part-m-00000
```

OUTPUT:



The screenshot shows a terminal window titled "Ubuntu 1 (Running) - Oracle VM VirtualBox". The terminal displays the following output:

```
user@Ubuntu: ~  
$ hdfs dfs -cat /pig_output_data/part-m-00000  
2024-09-25 13:45:47,478 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable  
1,JOHN  
2,JANE  
3,JOE  
4,EMMA  
user@Ubuntu: ~
```

RESULT:

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