

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;
```

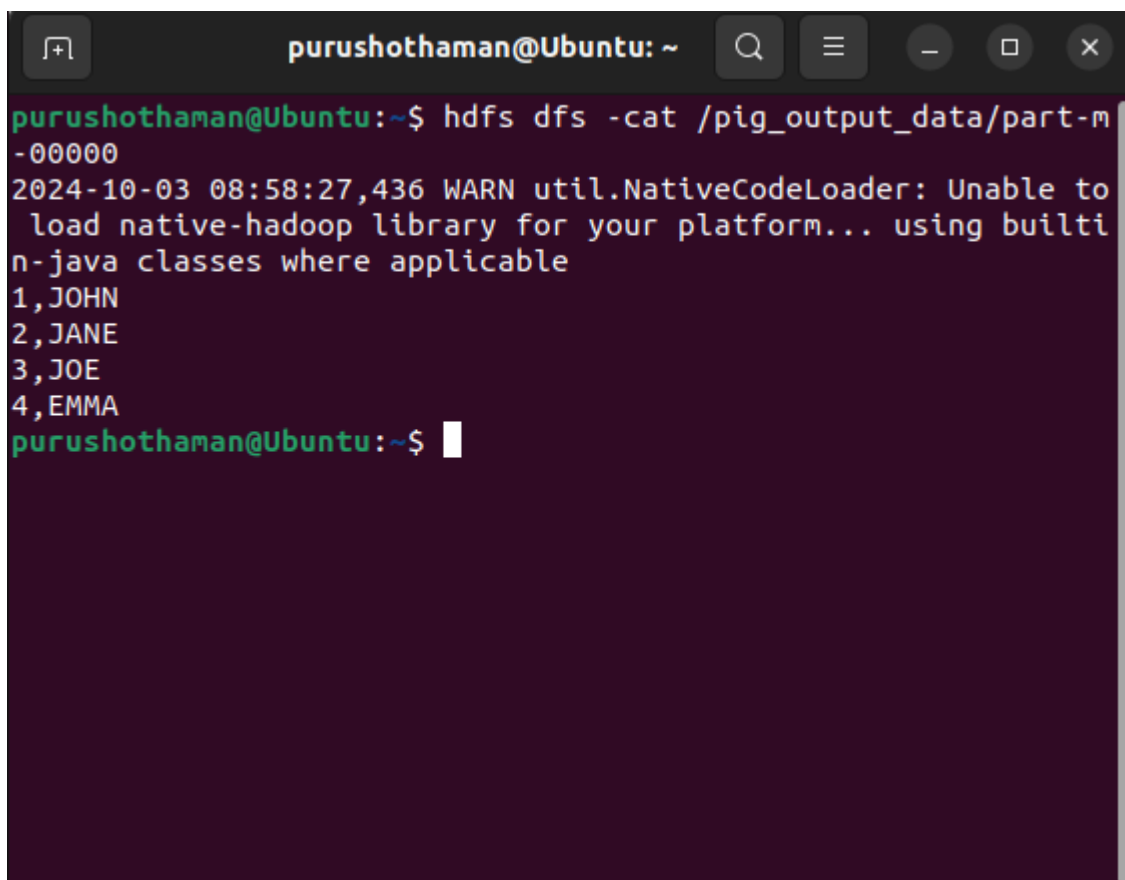
**Step 6: Run the Pig Script****1. Run the Pig Script:**

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:**A terminal window titled 'purushothaman@Ubuntu: ~' with standard window controls. The terminal shows the command 'hdfs dfs -cat /pig\_output\_data/part-m-00000' being executed. The output includes a warning message from 'util.NativeCodeLoader' and a list of four records: '1,JOHN', '2,JANE', '3,JOE', and '4,EMMA'. The prompt 'purushothaman@Ubuntu:~\$' is visible at the bottom.

```
purushothaman@Ubuntu:~$ hdfs dfs -cat /pig_output_data/part-m-00000
2024-10-03 08:58:27,436 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
purushothaman@Ubuntu:~$
```

**RESULT:**

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