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:

```
yzm318@Ubuntu:~$ hdfs dfs -cat /pig_output_data/part-m-00000
2024-10-10 12:39:43,648 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
yzm318@Ubuntu:~$
```

RESULT:

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