ROLL.NO: 210701309

EXP 3: Map Reduce program to process a weather dataset.

AIM:

To implement MapReduce program to process a weather dataset.

Procedure:

Step 1: Create Data File:

Create a file named "word_count_data.txt" and populate it with text data that you wish to analyse.
Login with your hadoop user.

Download the dataset (weather data)

Output:

Step 2: Mapper Logic - mapper.py:

Create a file named "mapper.py" to implement the logic for the mapper. The mapper will read input data from STDIN, split lines into words, and output each word with its count.

```
nano mapper.py
# Copy and paste the mapper.py code
```

```
#!/usr/bin/env python

import sys

# input comes from STDIN (standard input)
# the mapper will get daily max temperature and group it by month. so output will be
(month,dailymax_temperature)

for line in sys.stdin:
   # remove leading and trailing whitespace
   line = line.strip()     #
split the line into words
words = line.split()
   #See the README hosted on the weather website  which help us understand how each
position represents a column     month = line[10:12]     daily_max = line[38:45]
daily_max = daily_max.strip()
   # increase counters
for word in words:
        # write the results to STDOUT (standard output);
        # what we output here will be go through the shuffle proess and then
        # be the input for the Reduce step, i.e. the input for reducer.py
        #
        # tab-delimited; month and daily max temperature as output
print ('%s\t%s' % (month ,daily_max))

          .
```

Step 3: Reducer Logic - reducer.py:

Create a file named "reducer.py" to implement the logic for the reducer. The reducer will aggregate the occurrences of each word and generate the final output.

```
nano reducer.py
# Copy and paste the reducer.py code
```

reducer.py

```
#!/usr/bin/env python

from operator import itemgetter import
sys
#reducer will get the input from stdid which will be a collection of key, value(Key=month ,
value= daily max temperature)
#reducer logic: will get all the daily max temperature for a month and find max temperature
for the month
#shuffle will ensure that key are sorted(month)
current_month = None
current_max = 0 month
= None

# input comes from STDIN for
line in sys.stdin:
    # remove leading and trailing whitespace
line = line.strip()
    # parse the input we got from mapper.py
month, daily_max = line.split('\t', 1)

    # convert daily_max (currently a string) to float
try:
        daily_max = float(daily_max)
except ValueError:
        # daily_max was not a number, so silently
        # ignore/discard this line
continue

    # this IF-switch only works because Hadoop shuffle process sorts map output
    # by key (here: month) before it is passed to the reducer
if current_month == month:         if daily_max >
```

```
current_max:            current_max = daily_max     else:
if current_month:
            # write result to STDOUT
            print ('%s\t%s' % (current_month, current_max))
current_max = daily_max
        current_month = month

# output of the last month if current_month ==
month:     print ('%s\t%s' % (current_month,
current_max))
```

Step 4: Prepare Hadoop Environment:

Start the Hadoop daemons and create a directory in HDFS to store your data.

```
start-all.sh
```

Step 6: Make Python Files Executable:

Give executable permissions to your mapper.py and reducer.py files.

```
chmod 777 mapper.py reducer.py
```

Step 7: Run the program using Hadoop Streaming:

Download the latest hadoop-streaming jar file and place it in a location you can easily access.

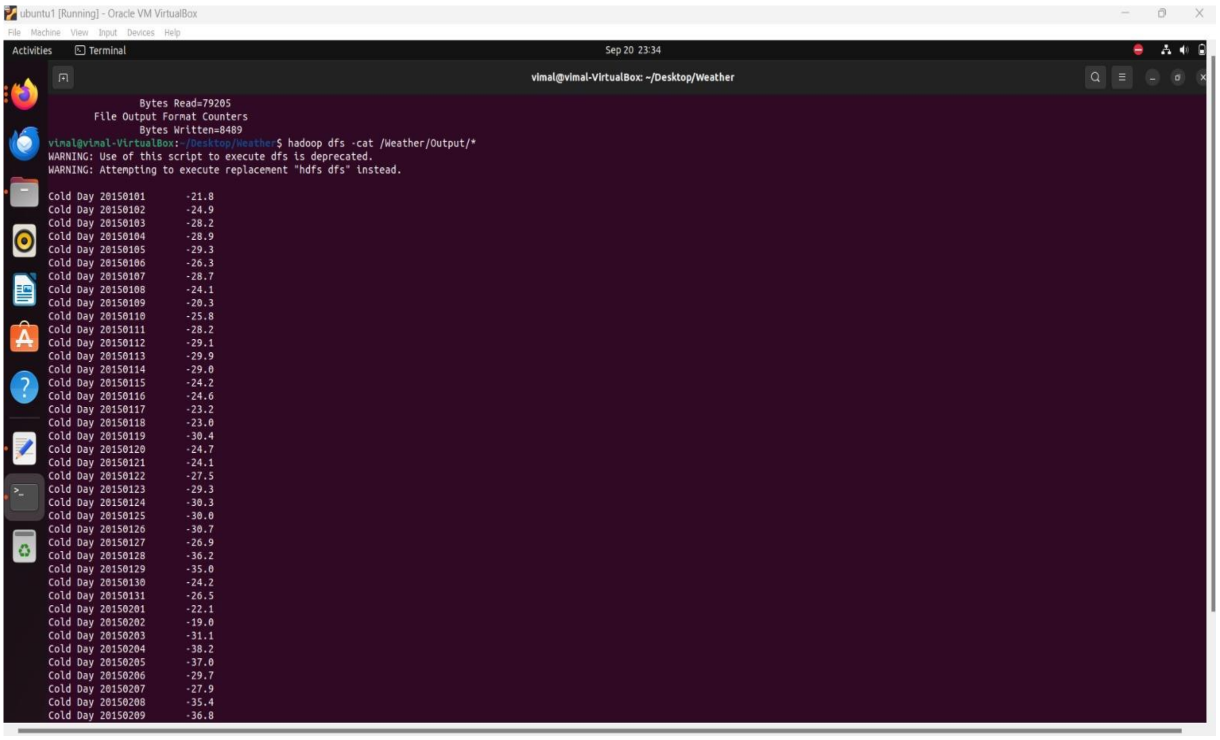
Then run the program using Hadoop Streaming.

```
hadoop fs -mkdir -p /weatherdata

hadoop fs -copyFromLocal /home/sx/Downloads/dataset.txt /weatherdata

hdfs dfs -ls /weatherdata

hadoop jar /home/sx/hadoop-3.2.3/share/hadoop/tools/lib/hadoop-streaming-3.2.3.jar \
  -input /weatherdata/dataset.txt \
  -output /weatherdata/output \
  -file "/home/sx/Downloads/mapper.py" \
  -mapper "python3 mapper.py" \
  -file "/home/sx/Downloads/reducer.py" \
  -reducer "python3 reducer.py"

hdfs dfs -text /weatherdata/output/* > /home/sx/Downloads/outputfile.txt
```

Step 8: Check Output:

Check the output of the program in the specified HDFS output directory.

hdfs dfs -text /weatherdata/output/* > /home/sx/Downloads/output/ /part-00000



ubuntu1 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Sep 20 23:34
vimal@vimal-VirtualBox: ~/Desktop/Weather

```
                Bytes Read=79205
        File Output Format Counters
                Bytes Written=8489
vimal@vimal-VirtualBox:~/Desktop/Weather$ hadoop dfs -cat /Weather/Output/*
WARNING: Use of this script to execute dfs is deprecated.
WARNING: Attempting to execute replacement "hdfs dfs" instead.

Cold Day 20150101       -21.8
Cold Day 20150102       -24.9
Cold Day 20150103       -28.2
Cold Day 20150104       -28.9
Cold Day 20150105       -29.3
Cold Day 20150106       -26.3
Cold Day 20150107       -28.7
Cold Day 20150108       -24.1
Cold Day 20150109       -20.3
Cold Day 20150110       -25.8
Cold Day 20150111       -28.2
Cold Day 20150112       -29.1
Cold Day 20150113       -29.9
Cold Day 20150114       -29.0
Cold Day 20150115       -24.2
Cold Day 20150116       -24.6
Cold Day 20150117       -23.2
Cold Day 20150118       -23.0
Cold Day 20150119       -30.4
Cold Day 20150120       -24.7
Cold Day 20150121       -24.1
Cold Day 20150122       -27.5
Cold Day 20150123       -29.3
Cold Day 20150124       -30.3
Cold Day 20150125       -30.0
Cold Day 20150126       -30.7
Cold Day 20150127       -26.9
Cold Day 20150128       -36.2
Cold Day 20150129       -35.0
Cold Day 20150130       -24.2
Cold Day 20150131       -26.5
Cold Day 20150201       -22.1
Cold Day 20150202       -19.0
Cold Day 20150203       -31.1
Cold Day 20150204       -38.2
Cold Day 20150205       -37.0
Cold Day 20150206       -29.7
Cold Day 20150207       -27.9
Cold Day 20150208       -35.4
Cold Day 20150209       -36.8
```

After copy and paste the above output in your local file give the below command to remove the directory from hdfs : hadoop fs -rm -r /weatherdata/output

Result:

Thus, the program for weather dataset using Map Reduce has been executed successfully.