**Exp.No.: 3**

## Map Reduce program to process a weather dataset

**AIM:**

To implement MapReduce program to process a weather dataset.

**Procedure:**

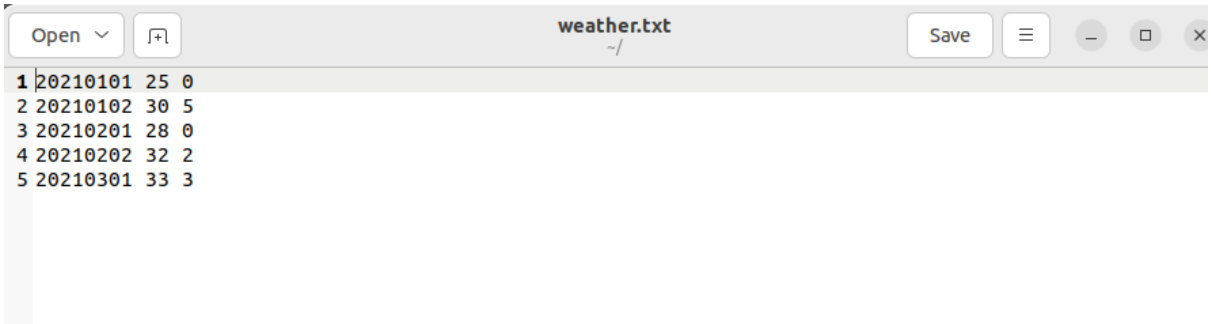
**Step 1: Create Data File:**

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:

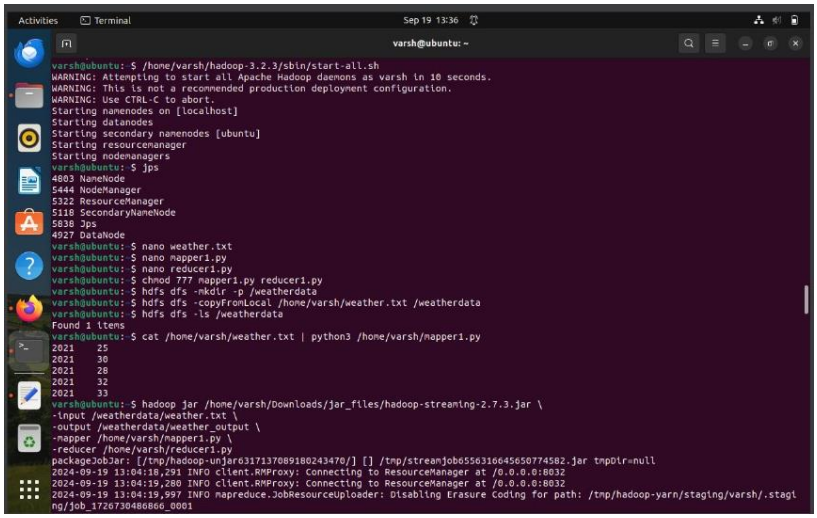
# write the results to STDOUT (standard output);

# 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:**

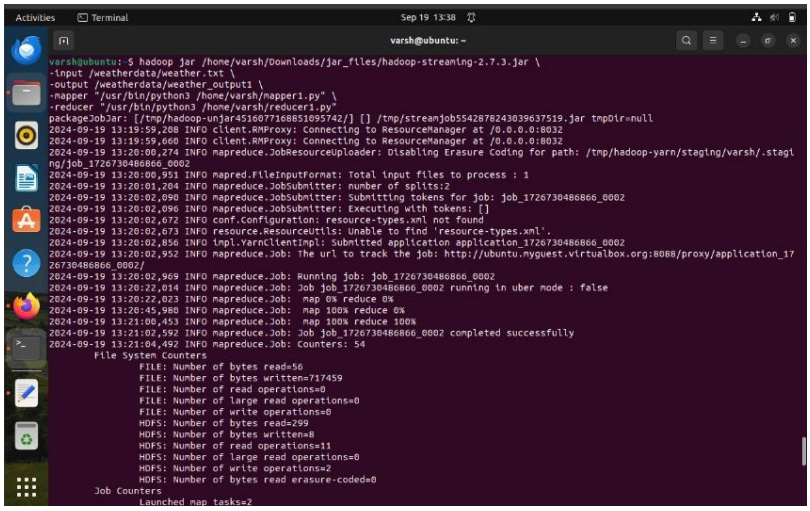
Start the Hadoop daemons and create a directory in HDFS to store your data.

```
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" \

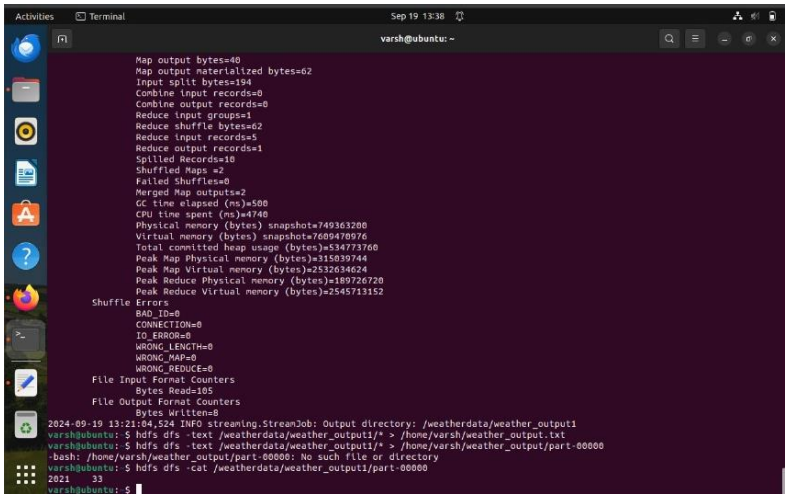
-reducer "python3 reducer.py"

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

**Step 8: Check Output:**

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

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.