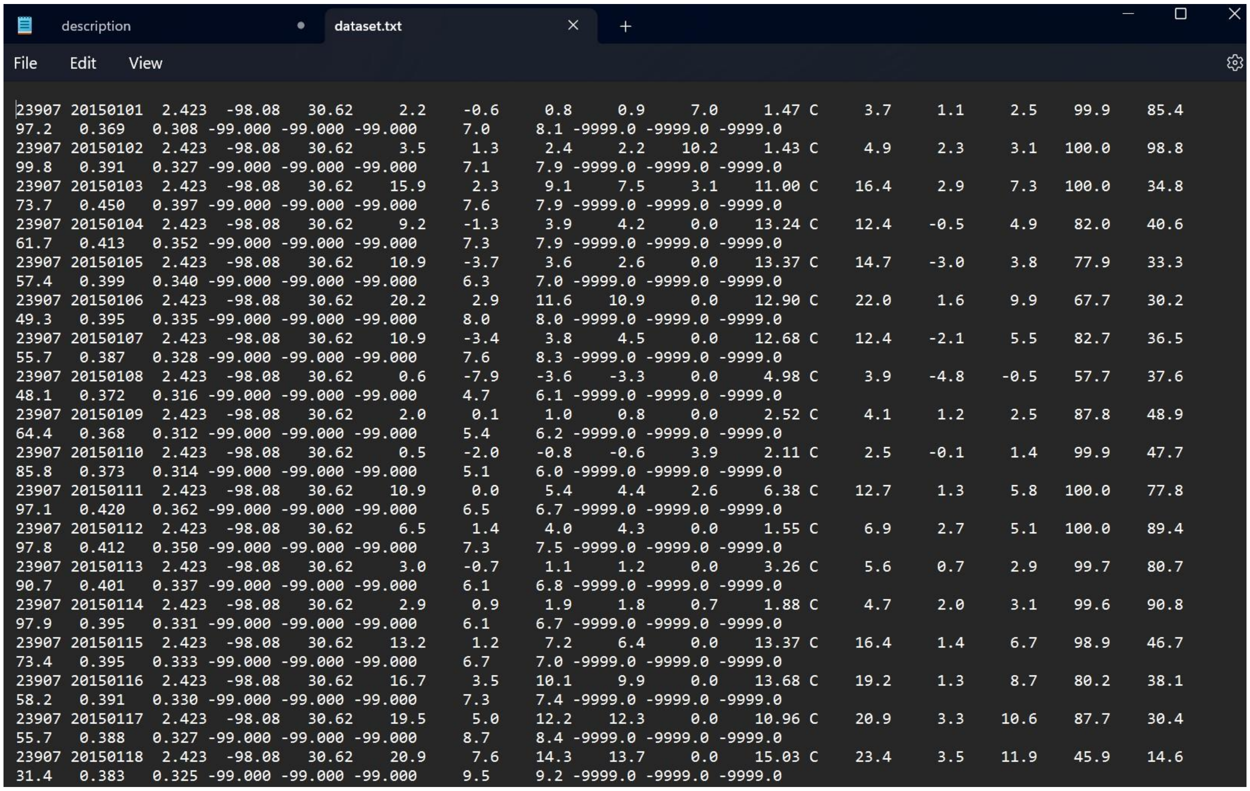


```
23907 20150101  2.423  -98.08   30.62     2.2    -0.6     0.8     0.9     7.0    1.47 C      3.7     1.1     2.5    99.9    85.4
97.2   0.369   0.308 -99.000 -99.000 -99.000     7.0     8.1 -9999.0 -9999.0 -9999.0
23907 20150102  2.423  -98.08   30.62     3.5     1.3     2.4     2.2    10.2    1.43 C      4.9     2.3     3.1   100.0    98.8
99.8   0.391   0.327 -99.000 -99.000 -99.000     7.1     7.9 -9999.0 -9999.0 -9999.0
23907 20150103  2.423  -98.08   30.62    15.9     2.3     9.1     7.5     3.1   11.00 C     16.4     2.9     7.3   100.0    34.8
73.7   0.450   0.397 -99.000 -99.000 -99.000     7.6     7.9 -9999.0 -9999.0 -9999.0
23907 20150104  2.423  -98.08   30.62     9.2    -1.3     3.9     4.2     0.0   13.24 C     12.4    -0.5     4.9    82.0    40.6
61.7   0.413   0.352 -99.000 -99.000 -99.000     7.3     7.9 -9999.0 -9999.0 -9999.0
23907 20150105  2.423  -98.08   30.62    10.9    -3.7     3.6     2.6     0.0   13.37 C     14.7    -3.0     3.8    77.9    33.3
57.4   0.399   0.340 -99.000 -99.000 -99.000     6.3     7.0 -9999.0 -9999.0 -9999.0
23907 20150106  2.423  -98.08   30.62    20.2     2.9    11.6    10.9     0.0   12.90 C     22.0     1.6     9.9    67.7    30.2
49.3   0.395   0.335 -99.000 -99.000 -99.000     8.0     8.0 -9999.0 -9999.0 -9999.0
23907 20150107  2.423  -98.08   30.62    10.9    -3.4     3.8     4.5     0.0   12.68 C     12.4    -2.1     5.5    82.7    36.5
55.7   0.387   0.328 -99.000 -99.000 -99.000     7.6     8.3 -9999.0 -9999.0 -9999.0
23907 20150108  2.423  -98.08   30.62     0.6    -7.9    -3.6    -3.3     0.0    4.98 C      3.9    -4.8    -0.5    57.7    37.6
48.1   0.372   0.316 -99.000 -99.000 -99.000     4.7     6.1 -9999.0 -9999.0 -9999.0
23907 20150109  2.423  -98.08   30.62     2.0     0.1     1.0     0.8     0.0    2.52 C      4.1     1.2     2.5    87.8    48.9
64.4   0.368   0.312 -99.000 -99.000 -99.000     5.4     6.2 -9999.0 -9999.0 -9999.0
23907 20150110  2.423  -98.08   30.62     0.5    -2.0    -0.8    -0.6     3.9    2.11 C      2.5    -0.1     1.4    99.9    47.7
85.8   0.373   0.314 -99.000 -99.000 -99.000     5.1     6.0 -9999.0 -9999.0 -9999.0
23907 20150111  2.423  -98.08   30.62    10.9     0.0     5.4     4.4     2.6    6.38 C     12.7     1.3     5.8   100.0    77.8
97.1   0.420   0.362 -99.000 -99.000 -99.000     6.5     6.7 -9999.0 -9999.0 -9999.0
23907 20150112  2.423  -98.08   30.62     6.5     1.4     4.0     4.3     0.0    1.55 C      6.9     2.7     5.1   100.0    89.4
97.8   0.412   0.350 -99.000 -99.000 -99.000     7.3     7.5 -9999.0 -9999.0 -9999.0
23907 20150113  2.423  -98.08   30.62     3.0    -0.7     1.1     1.2     0.0    3.26 C      5.6     0.7     2.9    99.7    80.7
90.7   0.401   0.337 -99.000 -99.000 -99.000     6.1     6.8 -9999.0 -9999.0 -9999.0
23907 20150114  2.423  -98.08   30.62     2.9     0.9     1.9     1.8     0.7    1.88 C      4.7     2.0     3.1    99.6    90.8
97.9   0.395   0.331 -99.000 -99.000 -99.000     6.1     6.7 -9999.0 -9999.0 -9999.0
23907 20150115  2.423  -98.08   30.62    13.2     1.2     7.2     6.4     0.0   13.37 C     16.4     1.4     6.7    98.9    46.7
73.4   0.395   0.333 -99.000 -99.000 -99.000     6.7     7.0 -9999.0 -9999.0 -9999.0
23907 20150116  2.423  -98.08   30.62    16.7     3.5    10.1     9.9     0.0   13.68 C     19.2     1.3     8.7    80.2    38.1
58.2   0.391   0.330 -99.000 -99.000 -99.000     7.3     7.4 -9999.0 -9999.0 -9999.0
23907 20150117  2.423  -98.08   30.62    19.5     5.0    12.2    12.3     0.0   10.96 C     20.9     3.3    10.6    87.7    30.4
55.7   0.388   0.327 -99.000 -99.000 -99.000     8.7     8.4 -9999.0 -9999.0 -9999.0
23907 20150118  2.423  -98.08   30.62    20.9     7.6    14.3    13.7     0.0   15.03 C     23.4     3.5    11.9    45.9    14.6
31.4   0.383   0.325 -99.000 -99.000 -99.000     9.5     9.2 -9999.0 -9999.0 -9999.0
```

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.

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)
Download the dataset (weather data) 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 5: Make Python Files Executable:

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

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

Step 6: 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.

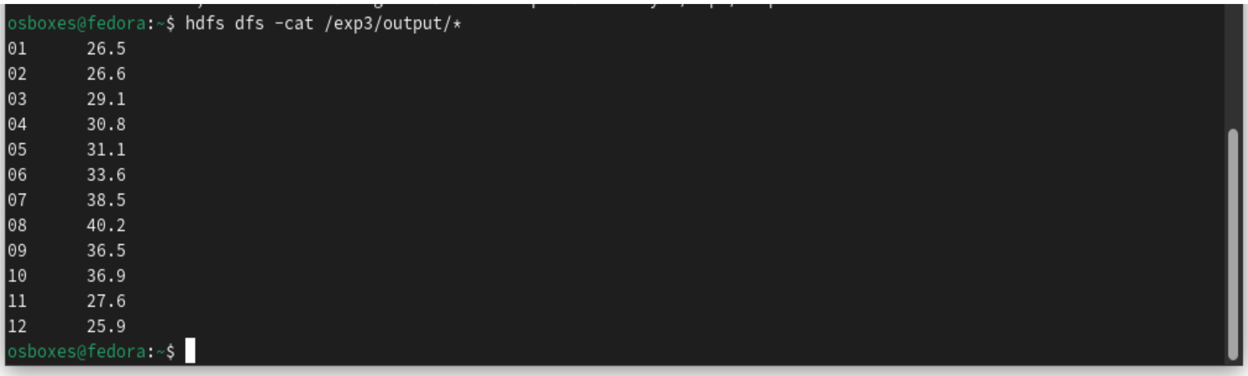
```
hadoop fs -mkdir -p /weatherdata
hadoop fs -copyFromLocal /home/sx/Downloads/dataset.txt /weatherdata hdfs
dfs -ls /weatherdata
hadoop jar /home/sx/hadoop-3.2.3/share/hadoop/tools/lib/hadoop-streaming-3.2.3.jar \
 -input /weatherdata/dataset.txt \
 -output /weatherdata/output \
 -file "/home/sx/Downloads/mapper.py" \
 -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 7: 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



```
osboxes@fedora:~$ hdfs dfs -cat /exp3/output/*
01      26.5
02      26.6
03      29.1
04      30.8
05      31.1
06      33.6
07      38.5
08      40.2
09      36.5
10      36.9
11      27.6
12      25.9
osboxes@fedora:~$
```

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.