

## IMPLEMENT A MAPREDUCE PROGRAM TO PROCESS A WEATHER DATASET

### AIM:

To implement a MapReduce python program to process a weather dataset in Hadoop.

### PROCEDURE:

1. Open command prompt as administrator and start the Hadoop by using the command.

```
C:\Windows\System32>start-all.cmd
This script is Deprecated. Instead use start-dfs.cmd and start-yarn.cmd
starting yarn daemons

C:\Windows\System32>jps
10068 NodeManager
30616 Jps
21308 DataNode
5612 ResourceManager
5836 NameNode
```

2. Create a new directory in the Hadoop file systems using the command and Upload the input text file into the weather directory using the command.

```
C:\Windows\System32>hdfs dfs -mkdir /weather
```

```
C:\Windows\System32>hdfs dfs -put C:\Users\Manoj\Desktop\weather\sample_weather.txt /weather_
```

3. Create the mapper and reducer files.
4. To execute the files with Hadoop streaming run the following command.

```
C:\Windows\System32>hadoop jar "C:\hadoop\share\hadoop\tools\lib\hadoop-streaming-3.3.6.jar" ^-input /weather_ex3/sample_weather.txt ^-output /weather_exer3 ^-mapper "python C:\Users\Manoj\Desktop\weather\mapper.py" ^-reducer "python C:\Users\Manoj\Desktop\weather\reducer.py"
```

### MAPPER.PY:

```
import sys

def map1():
    for line in sys.stdin:
        tokens = line.strip().split()
        if len(tokens) < 13:
            continue
        station = tokens[0]
```

```
if "STN" in station:
    continue

date_hour = tokens[2]
temp = tokens[3]
dew = tokens[4]
wind = tokens[12]

if temp == "9999.9" or dew == "9999.9" or wind == "999.9":
    continue

hour = int(date_hour.split("_")[-1])
date = date_hour[:date_hour.rfind("_")-2]

if 4 < hour <= 10:
    section = "section1"
elif 10 < hour <= 16:
    section = "section2"
elif 16 < hour <= 22:
    section = "section3"
else:
    section = "section4"

key_out = f"{station}_{date}_{section}"
value_out = f"{temp} {dew} {wind}"
print(f"{key_out}\t{value_out}")

if __name__ == "__main__":
    map1()
```

**REDUCER.PY:**

```
import sys

def reduce1():
    current_key = None

    sum_temp, sum_dew, sum_wind = 0, 0, 0
```

```
count = 0
for line in sys.stdin:
    key, value = line.strip().split("\t")
    temp, dew, wind = map(float, value.split())
    if current_key is None:
        current_key = key
    if key == current_key:
        sum_temp += temp
        sum_dew += dew
        sum_wind += wind
        count += 1
    else:
        avg_temp = sum_temp / count
        avg_dew = sum_dew / count
        avg_wind = sum_wind / count
        print(f"{current_key}\t{avg_temp} {avg_dew} {avg_wind}")
        current_key = key
        sum_temp, sum_dew, sum_wind = temp, dew, wind
        count = 1
if current_key is not None:
    avg_temp = sum_temp / count
    avg_dew = sum_dew / count
    avg_wind = sum_wind / count
    print(f"{current_key}\t{avg_temp} {avg_dew} {avg_wind}")
if __name__ == "__main__":
    reduce1()
```

**OUTPUT:**

File information - part-00000

Download

Head the file (first 32K)

Tail the file (last 32K)

Block information -- Block 0

Block ID: 1073741847

Block Pool ID: BP-373262882-192.168.56.1-1724824016975

Generation Stamp: 1023

Size: 312

Availability:

- LEGION

File contents

690190_200602_section1	53.87166666666666	25.899999999999995	7.774999999999998
690190_200602_section2	54.761250000000001	25.900000000000006	7.774999999999999
690190_200602_section3	53.25041666666667	25.899999999999995	7.774999999999996
690190_200602_section4	52.44708333333333	25.900000000000006	7.774999999999999

Close

**RESULT:**

Thus the implementation of the MapReduce python program to process a weather dataset in Hadoop is executed successfully.