**EX.NO.10** **Roll no: 210701518**

# 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:

**start-all.cmd**

2. Create a new directory in the Hadoop file systems using the command:

**hadoop fs -mkdir /weather**

3. Upload the input text file into the weather directory using the command: **hadoop fs -put**

**C:/Users/mercy/OneDrive/Documents/DataAnalytics/WeatherPrediction/sample_weather.txt /weather**

4. Create the mapper and reducer files.

5. To execute the files with Hadoop streaming run the following command:

```
hadoop jar C:/hadoop-3.3.6/share/hadoop/tools/lib/hadoop-streaming-
3.3.6.jar ^ -file
C:/Users/mercy/Documents/DataAnalytics/WeatherPrediction/mapper.py
^ -file
C:/Users/mercy/Documents/DataAnalytics/WeatherPrediciton/reducer.py
^ -input /weather/sample_weather.txt ^ -output /weather/output ^ -mapper
"python mapper.py" ^ -reducer "python reducer.py"
```

## MAPPER.PY:

```
#!C:/ProgramData/chocolatey/bin/python3.ex

e import sys def map1():

for line in sys.stdin:
```

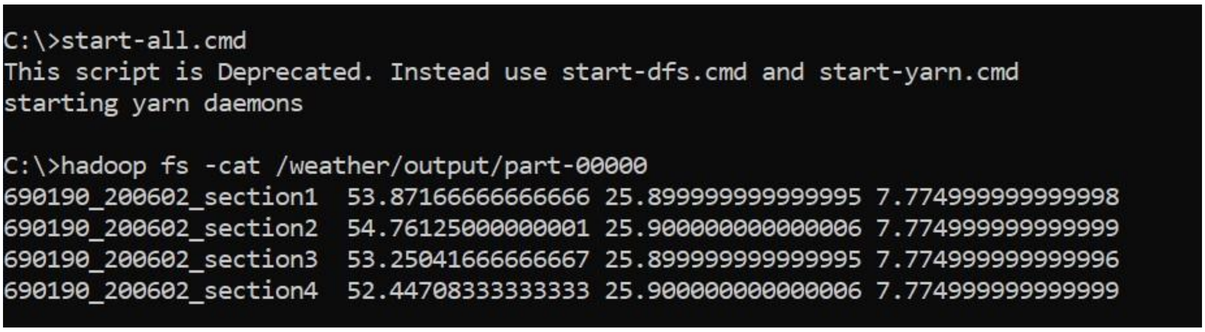
```
tokens = line.strip().split() if len(tokens) < 13: continue
station = tokens[0] if "STN" in station: continue date_hour =
tokens[2] temp = tokens[3] dew = tokens[4] wind =
tokens[12] if temp == "9999.9" or dew == "9999.9" or wind
== "999.9":
continue hour = int(date_hour.split("_")[-
1]) date =
date_hour[:date_hour.rfind("_")-2] 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:**

```
#!C:/ProgramData/chocolatey/bin/python3.ex
e 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:**



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

C:\>hadoop fs -cat /weather/output/part-00000
690190_200602_section1  53.87166666666666 25.899999999999995 7.774999999999998
690190_200602_section2  54.76125000000001 25.900000000000006 7.774999999999999
690190_200602_section3  53.25041666666667 25.899999999999995 7.774999999999996
690190_200602_section4  52.44708333333333 25.900000000000006 7.774999999999999
```

**RESULT:**

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