

## 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.exe
```

```
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.exe

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:

HadoopOverviewDatanodesDatanode Volume FailuresSnapshotStartup ProgressUtilities

### Browse Directory

Go!

Show 25 entries

Search:

	Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name	
<input type="checkbox"/>	drwxr-xr-x	mercy	supergroup	0 B	Aug 19 09:01	0	0 B	tmp	
<input type="checkbox"/>	drwxr-xr-x	mercy	supergroup	0 B	Aug 18 21:18	0	0 B	weather	
<input type="checkbox"/>	drwxr-xr-x	mercy	supergroup	0 B	Aug 13 19:41	0	0 B	wordCount	

Showing 1 to 3 of 3 entries

Previous1Next

HadoopOverviewDatanodesDatanode Volume FailuresSnapshotStartup ProgressUtilities

### Browse Directory

Go!

Show 25 entries

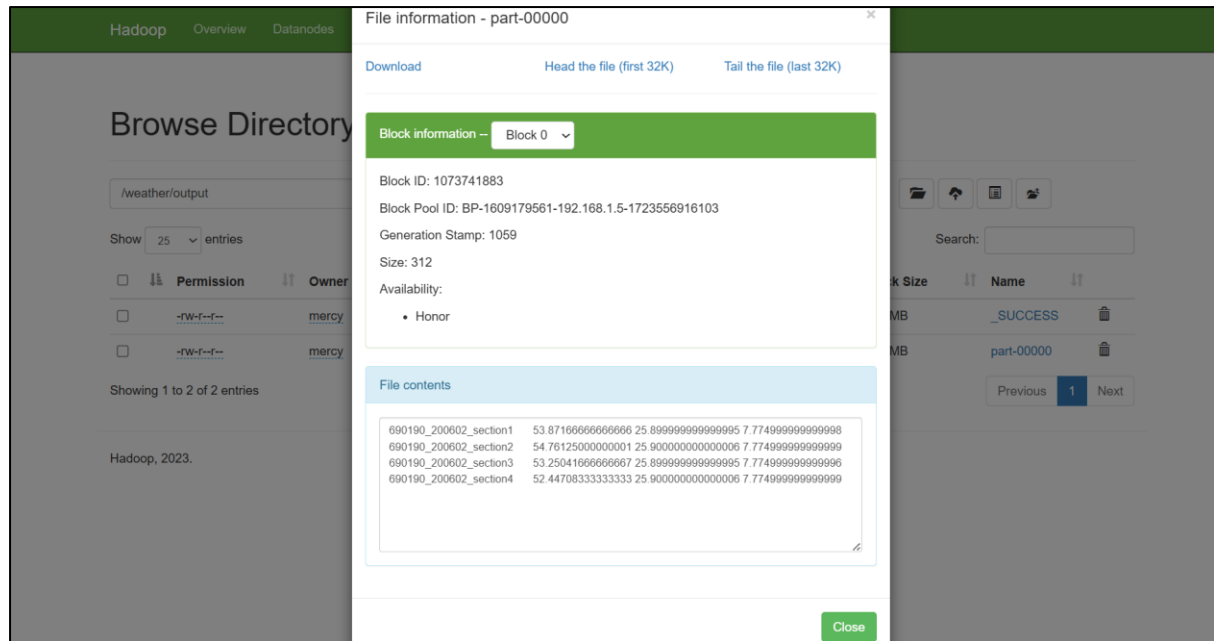
Search:

	Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name	
<input type="checkbox"/>	drwxr-xr-x	mercy	supergroup	0 B	Aug 18 21:18	0	0 B	output	
<input type="checkbox"/>	-rw-r--r--	mercy	supergroup	11.77 KB	Aug 18 21:15	1	128 MB	sample_weather.txt	

Showing 1 to 2 of 2 entries

Previous1Next

Hadoop, 2023.



## RESULT:

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