EX.NO.3 **210701701**

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()
```

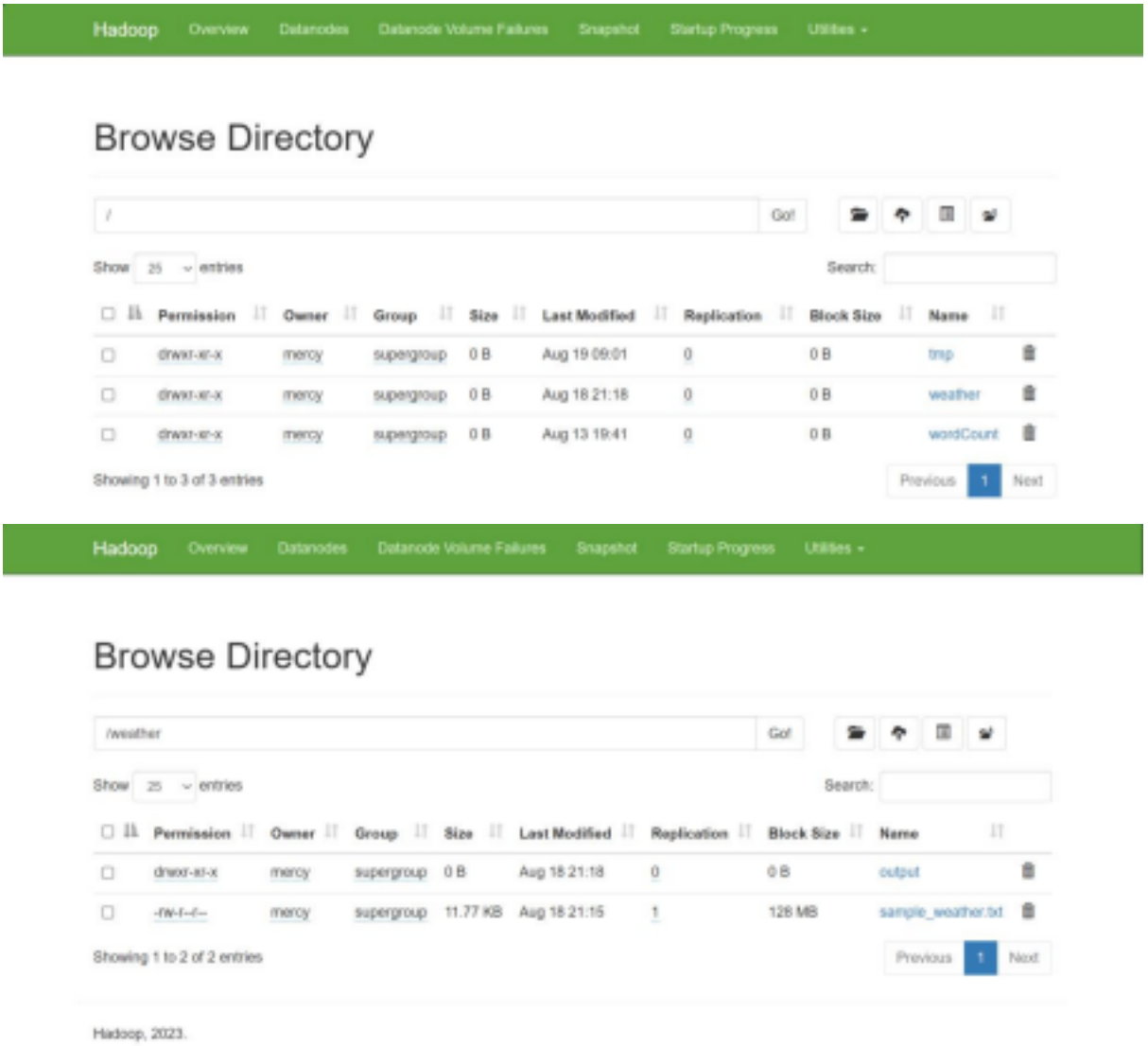
REDUCER.PY:

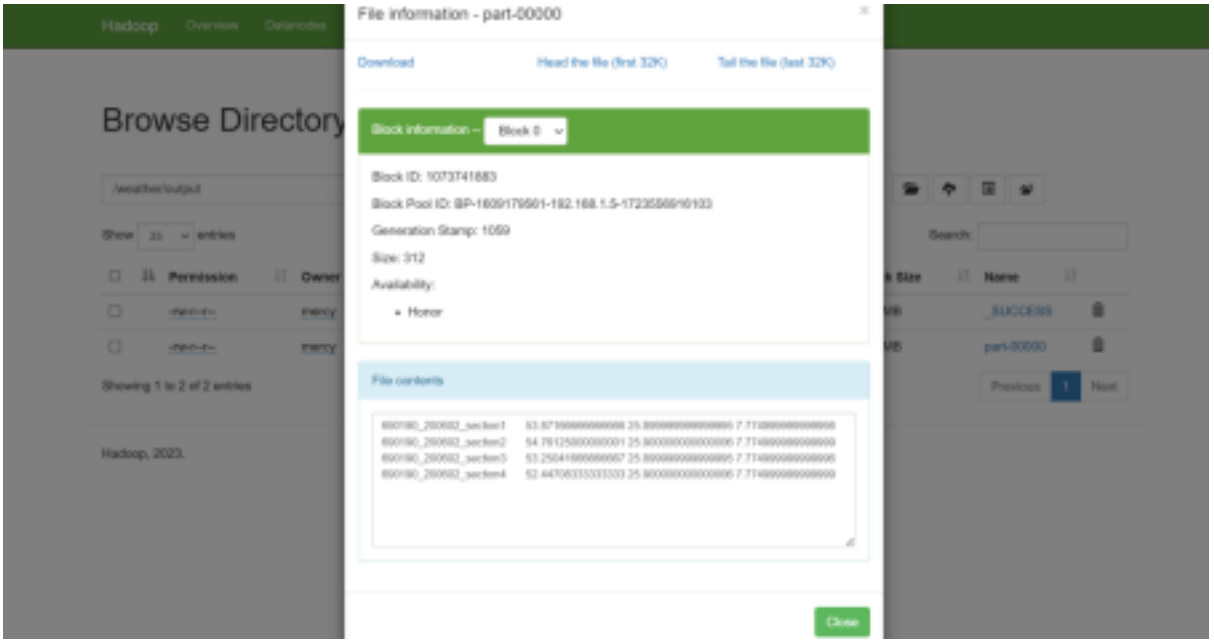
```
#!C:/ProgramData/chocolatey/bin/python3.exe
import sys
def reduce1():
    current_key = None
```

```
    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:


Hadoop
Overview
Datanodes
Datanode Volume Failures
Snapshot
Startup Progress
Utilities
Browse Directory
/
Go!
Show 25 entries
Search:
Permission
Owner
Group
Size
Last Modified
Replication
Block Size
Name
drwxr-xr-x
mercy
supergroup
0 B
Aug 19 09:01
0
0 B
tmp
drwxr-xr-x
mercy
supergroup
0 B
Aug 18 21:18
0
0 B
weather
drwxr-xr-x
mercy
supergroup
0 B
Aug 13 19:41
0
0 B
wordCount
Showing 1 to 3 of 3 entries
Previous
1
Next
Hadoop
Overview
Datanodes
Datanode Volume Failures
Snapshot
Startup Progress
Utilities
Browse Directory
/weather
Go!
Show 25 entries
Search:
Permission
Owner
Group
Size
Last Modified
Replication
Block Size
Name
drwxr-xr-x
mercy
supergroup
0 B
Aug 18 21:18
0
0 B
output
-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
Previous
1
Next
Hadoop, 2023.



RESULT:

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