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/gjega/OneDrive/Documents/hadoop_weather/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/gjega/Documents/ hadoop_weather /WeatherPrediction/mapper.py ^ -file
C:/Users/gjega/Documents/ hadoop_weather /WeatherPrediciton/reducer.py ^ -input
/weather/sample_weather.txt ^ -output /weather/output ^ -mapper "python mapper.py" ^ -
reducer "python reducer.py"
```

MAPPER.PY:

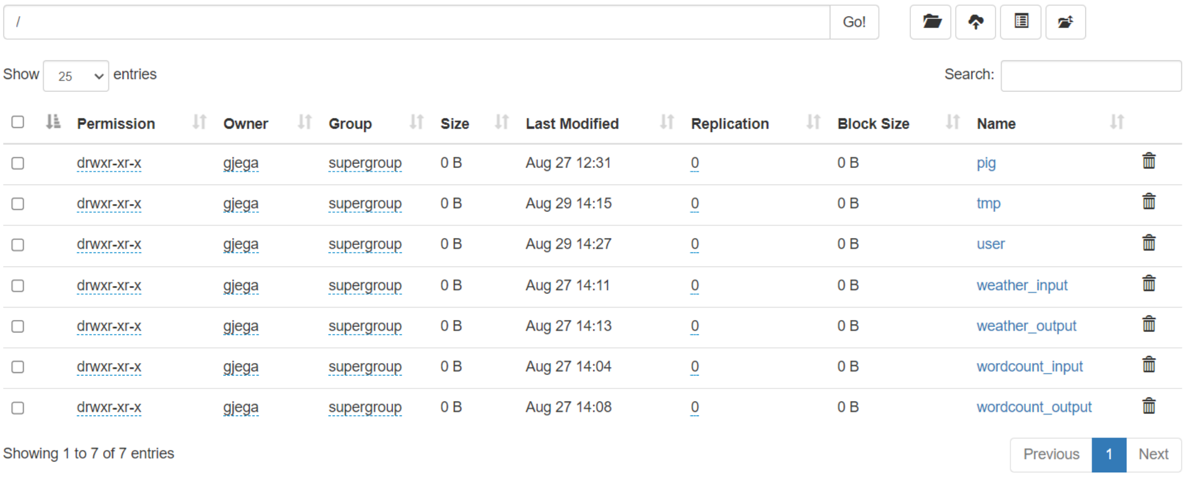
```
import sys
for line in sys.stdin:
# Strip whitespace and skip empty lines
line = line.strip()
if not line:
continue

fields = line.split(',')
if len(fields) < 2:
continue # Skip lines that don't have enough fields
```

```
date = fields[0]

year = date[:4] # Extract the year (first 4 characters of date)

temperature = fields[1]


# Print the year and temperature

print(f"{year}\t{temperature}")
```

REDUCER.PY:

```
import sys

current_year = None
current_sum = 0.0
current_count = 0

for line in sys.stdin:
line = line.strip()
year, temperature = line.split('\t')

# Skip non-numeric temperatures
try:
temperature = float(temperature)
except ValueError:
continue

if current_year == year:
current_sum += temperature
current_count += 1
else:
if current_year:
# Output the average temperature for the previous year
print(f"{current_year}\t{current_sum / current_count:.2f}")

current_year = year
current_sum = temperature
current_count = 1

# Output the average temperature for the last year
if current_year == year:
print(f"{current_year}\t{current_sum / current_count:.2f}")
```

OUTPUT:



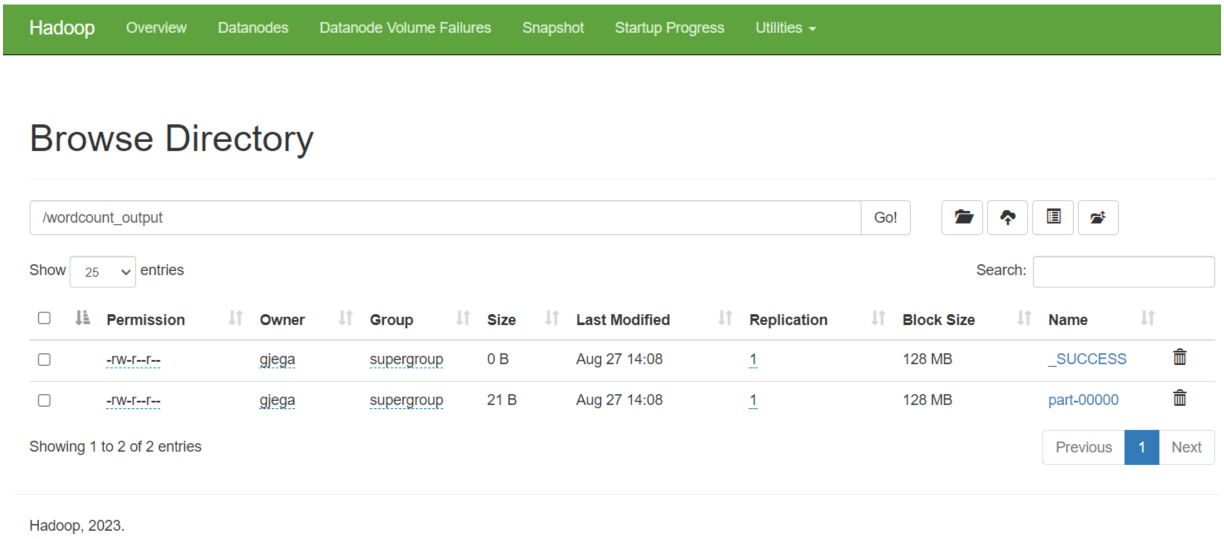
/ Go!

Show 25 entries

Search:

□	Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name	
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 27 12:31	0	0 B	pig	🗑
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 29 14:15	0	0 B	tmp	🗑
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 29 14:27	0	0 B	user	🗑
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 27 14:11	0	0 B	weather_input	🗑
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 27 14:13	0	0 B	weather_output	🗑
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 27 14:04	0	0 B	wordcount_input	🗑
□	drwxr-xr-x	gjega	supergroup	0 B	Aug 27 14:08	0	0 B	wordcount_output	🗑

Showing 1 to 7 of 7 entries



Browse Directory

/wordcount_output Go!

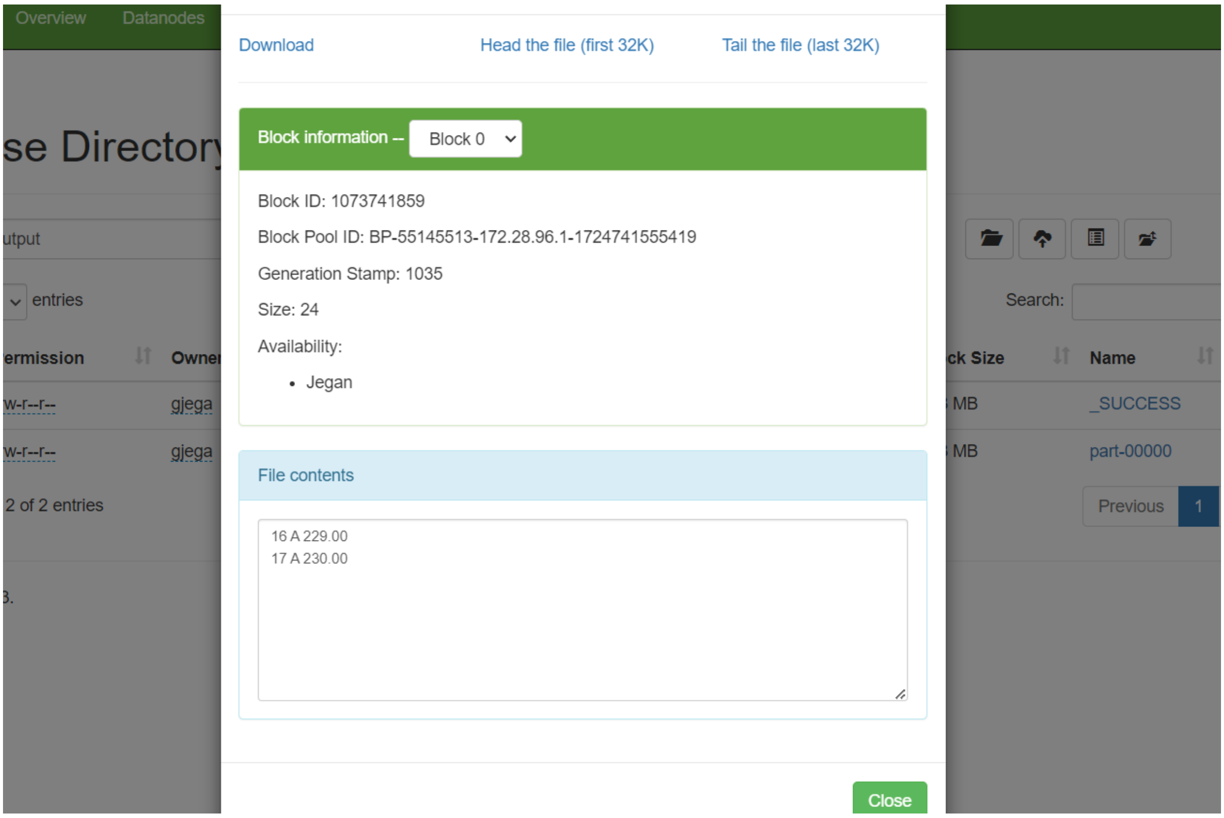
Show 25 entries

Search:

□	Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name	
□	-rw-r--r--	gjega	supergroup	0 B	Aug 27 14:08	1	128 MB	_SUCCESS	🗑
□	-rw-r--r--	gjega	supergroup	21 B	Aug 27 14:08	1	128 MB	part-00000	🗑

Showing 1 to 2 of 2 entries

Hadoop, 2023.



Block ID: 1073741859

Block Pool ID: BP-55145513-172.28.96.1-1724741555419

Generation Stamp: 1035

Size: 24

Availability:

- Jegan

```
16 A 229.00
17 A 230.00
```

RESULT:

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