EX.NO.3 **210701506**

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

MAPPER.PY:

```
#!/usr/bin/python3
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()
```

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REDUCER.PY:

```
#!/usr/bin/python3
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()
```

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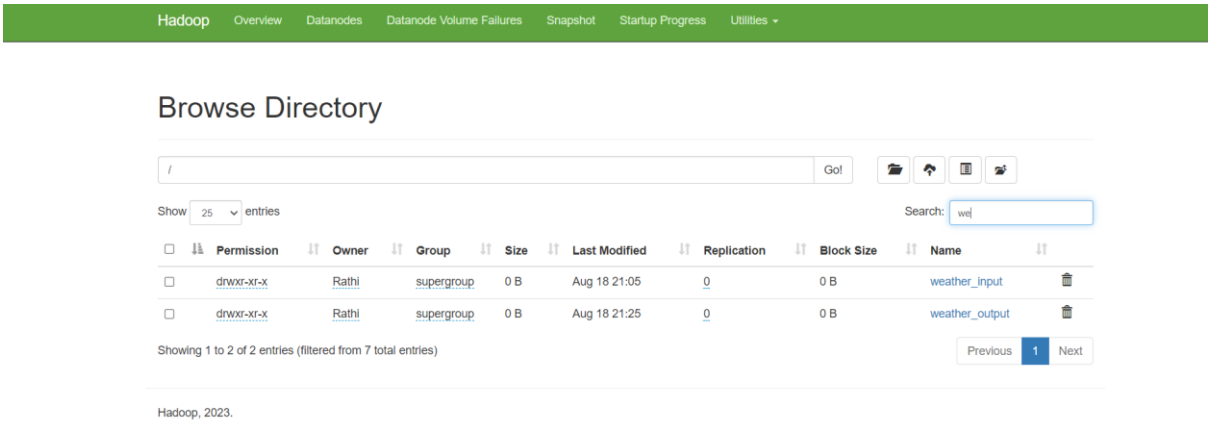
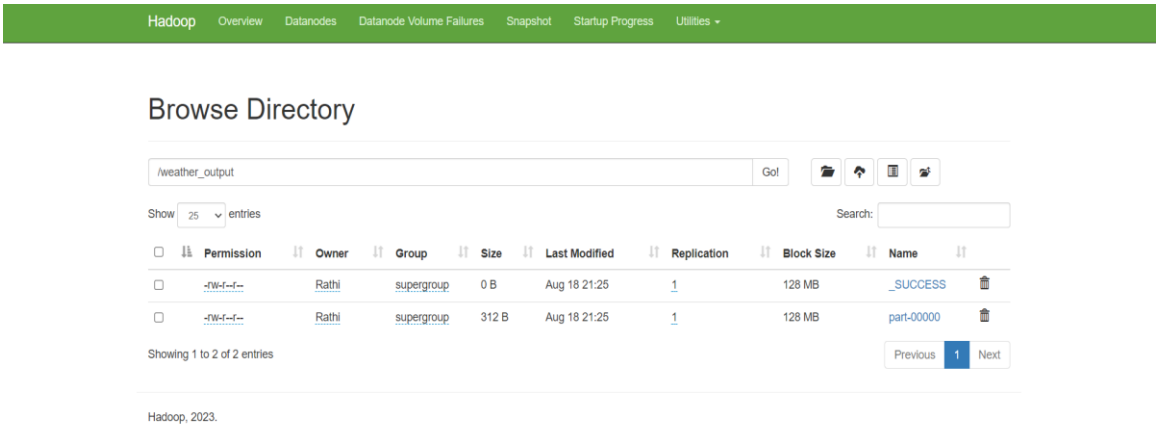
OUTPUT:





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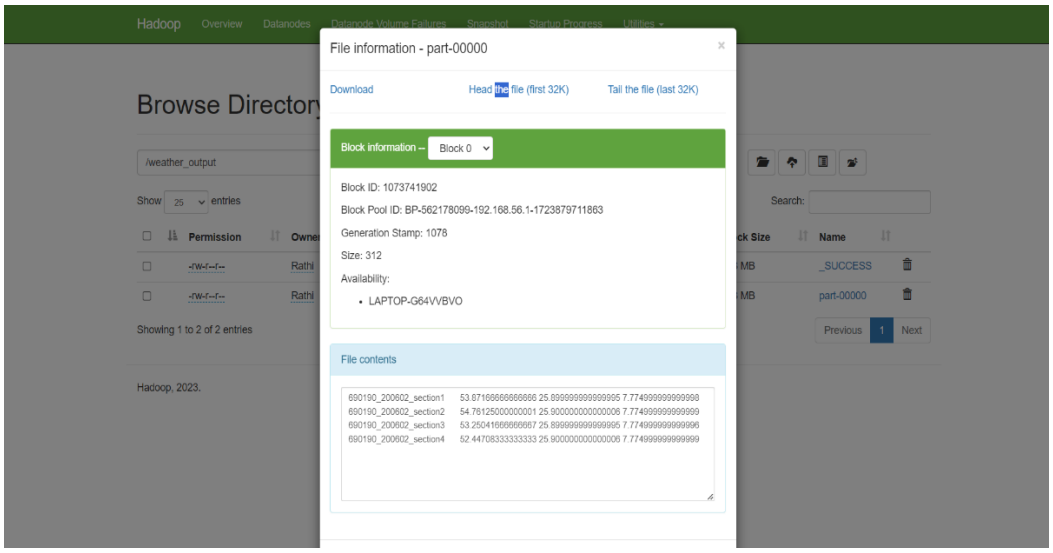

RESULT:

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