Ex No:3 **Roll No: 210701150**

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.

```
C:\Windows\System32>start-all.cmd
This script is Deprecated. Instead use start-dfs.cmd and start-yarn.cmd
starting yarn daemons

C:\Windows\System32>jps
10068 NodeManager
30616 Jps
21308 DataNode
5612 ResourceManager
5836 NameNode
```

2. Create a new directory in the Hadoop file systems using the command and Upload the input text file into the weather directory using the command.

```
C:\Windows\System32>hdfs dfs -mkdir /weather
```

```
C:\Windows\System32>hdfs dfs -put C:\Users\Manoj\Desktop\weather\sample_weather.txt /weather
```

3. Create the mapper and reducer files.

4. To execute the files with Hadoop streaming run the following command.

```
C:\Windows\System32>hadoop jar "C:\hadoop\share\hadoop\tools\lib\hadoop-streaming-3.3.6.jar" ^-input /weather_ex3/sample_weather.txt ^-output /weather_exerer3 ^-mapper "python C:\Users\Manoj\Desktop\weather\mapper.py" ^-reducer "python C:\Users\Manoj\Desktop\weather\reducer.py"
```

MAPPER.PY:

```
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:

```
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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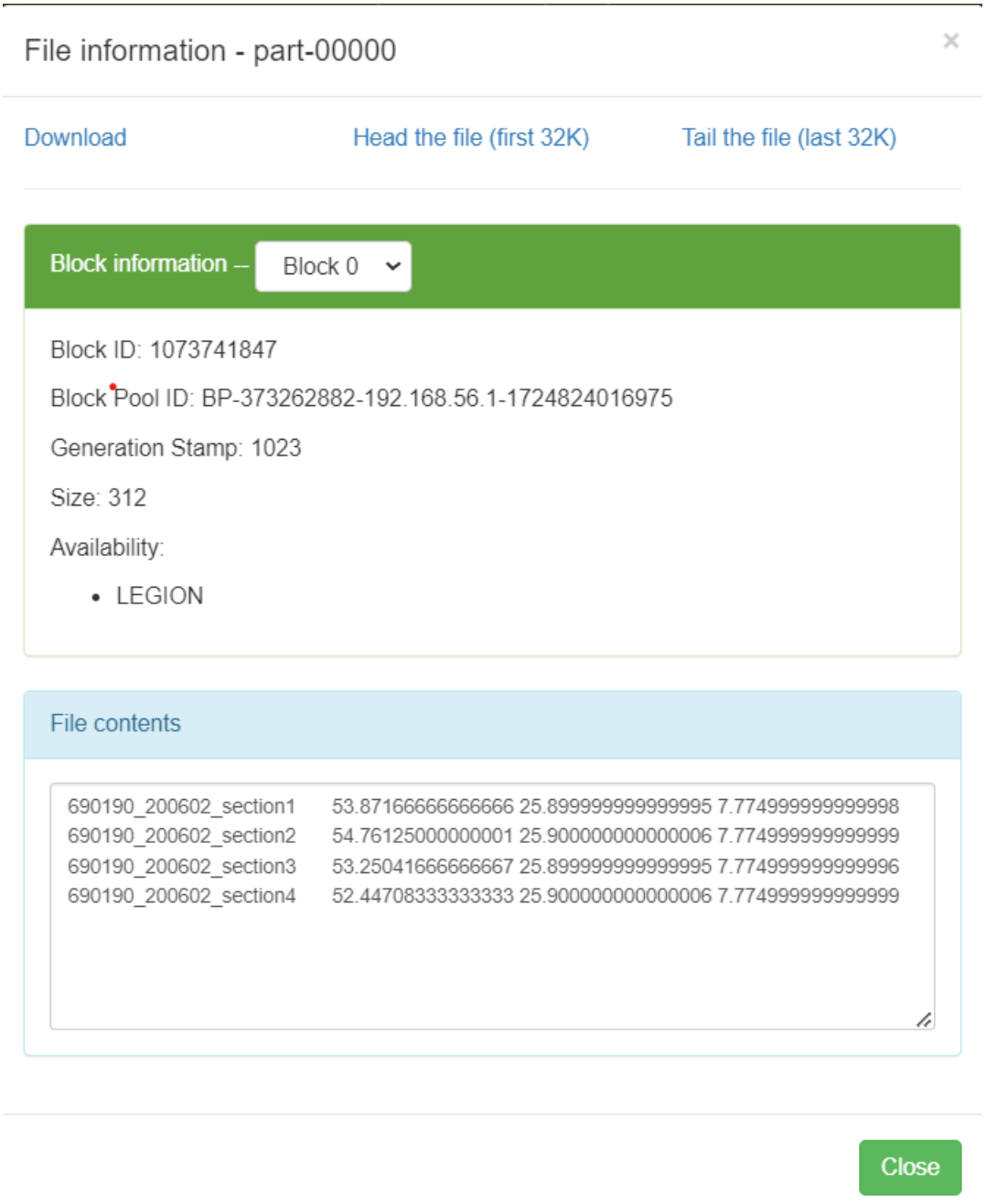
OUTPUT:



RESULT:

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