

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/WeatherPrediction/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:

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

C:\>hadoop fs -cat /weather/output/part-00000
690190_200602_section1 53.87166666666666 25.899999999999995 7.774999999999998
690190_200602_section2 54.76125000000001 25.900000000000006 7.774999999999999
690190_200602_section3 53.25041666666667 25.899999999999995 7.774999999999996
690190_200602_section4 52.44708333333333 25.900000000000006 7.774999999999999
```

RESULT:

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