EXP3 210701249

Map Reduce program to process a weather dataset.

Aim:

ToimplementMapReduceprogram toprocessa weatherdataset

Procedure:

Step1:CreateDataFile:

Create a file named "word_count_data.txt" and populate it with text data that you wish toanalyse.
Loginwith yourhadoop user.

Download thedataset(weatherdata)

Output:

*dataset - Notepad

File Edit Format View Help

23907	20150103	2.423	-98.08	30.62	15.9	2.3	9.1	7.5	3.1	11.00 C	16.4	2.9	7.3	100.0
23907	20150104	2.423	-98.08	30.62	9.2	-1.3	3.9	4.2	0.0	13.24 C	12.4	-0.5	4.9	82.0
23907	20150105	2.423	-98.08	30.62	10.9	-3.7	3.6	2.6	0.0	13.37 C	14.7	-3.0	3.8	77.9
23907	20150106	2.423	-98.08	30.62	20.2	2.9	11.6	10.9	0.0	12.90 C	22.0	1.6	9.9	67.7
23907	20150107	2.423	-98.08	30.62	10.9	-3.4	3.8	4.5	0.0	12.68 C	12.4	-2.1	5.5	82.7
23907	20150108	2.423	-98.08	30.62	0.6	-7.9	-3.6	-3.3	0.0	4.98 C	3.9	-4.8	-0.5	57.7
23907	20150109	2.423	-98.08	30.62	2.0	0.1	1.0	0.8	0.0	2.52 C	4.1	1.2	2.5	87.8
23907	20150110	2.423	-98.08	30.62	0.5	-2.0	-0.8	-0.6	3.9	2.11 C	2.5	-0.1	1.4	99.9
23907	20150111	2.423	-98.08	30.62	10.9	0.0	5.4	4.4	2.6	6.38 C	12.7	1.3	5.8	100.0
23907	20150112	2.423	-98.08	30.62	6.5	1.4	4.0	4.3	0.0	1.55 C	6.9	2.7	5.1	100.0
23907	20150113	2.423	-98.08	30.62	3.0	-0.7	1.1	1.2	0.0	3.26 C	5.6	0.7	2.9	99.7
23907	20150114	2.423	-98.08	30.62	2.9	0.9	1.9	1.8	0.7	1.88 C	4.7	2.0	3.1	99.6
23907	20150115	2.423	-98.08	30.62	13.2	1.2	7.2	6.4	0.0	13.37 C	16.4	1.4	6.7	98.9
23907	20150116	2.423	-98.08	30.62	16.7	3.5	10.1	9.9	0.0	13.68 C	19.2	1.3	8.7	80.2
23907	20150117	2.423	-98.08	30.62	19.5	5.0	12.2	12.3	0.0	10.96 C	20.9	3.3	10.6	87.7
23907	20150118	2.423	-98.08	30.62	20.9	7.6	14.3	13.7	0.0	15.03 C	23.4	3.5	11.9	45.9
23907	20150119	2.423	-98.08	30.62	23.9	6.7	15.3	14.3	0.0	14.10 C	25.6	3.8	12.6	65.3
23907	20150120	2.423	-98.08	30.62	26.0	9.5	17.8	15.9	0.0	14.57 C	27.9	6.5	14.5	88.4
23907	20150121	2.423	-98.08	30.62	11.0	6.9	8.9	8.9	1.7	2.71 C	13.1	6.8	9.7	99.2
23907	20150122	2.423	-98.08	30.62	8.6	3.5	6.1	5.6	40.0	1.28 C	9.1	4.1	6.3	99.6
23907	20150123	2.423	-98.08	30.62	9.4	2.2	5.8	4.2	7.5	6.58 C	11.1	2.0	4.8	98.4
23907	20150124	2.423	-98.08	30.62	16.0	1.4	8.7	8.0	0.0	14.26 C	18.8	0.4	7.7	92.0
23907	20150125	2.423	-98.08	30.62	20.2	6.4	13.3	12.7	0.0	14.99 C	22.0	4.4	11.0	69.2
23907	20150126	2.423	-98.08	30.62	21.5	7.2	14.4	14.1	0.0	12.01 C	22.9	5.5	12.2	56.8

Step2:MapperLogic- mapper.py:

Create a file named "mapper.py" to implement the logic for the mapper. The mapperwillreadinputdatafrom STDIN,splitlinesintowords,andoutputeachwordwithitscount.

nanomapper.py
#Copyand pastethemapper.pycode

```
#!/usr/bin/env

pythonimportsys

#input comesfrom STDIN(standard input)
# the mapper will get daily max temperature and group it by month. so output will be(month,dailymax_temperature)
```

```
forlinein sys.stdin:
    # remove leading and trailing
    whitespaceline=line.strip()
    # split the line into
    wordswords= line.split()
    #See the README hosted on the weather websitewhich help us understand how
eachpositionrepresents a column
    month = line[10:12]daily_max
    = line[38:45]daily_max =
    daily_max.strip()#increasecou
    nters
    forwordinwords:
        #writetheresultstoSTDOUT(standardoutput);
        # what we output here will be go through the shuffle proess and
        then# bethe input fortheReducestep, i.e. the input forreducer.py
        #
        # tab-delimited; month and daily max temperature as
        outputprint('%s\t%s' %(month ,daily_max))
```

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Step3:ReducerLogic-reducer.py:

Create a file named "reducer.py" to implement the logic for the reducer. The reducerwillaggregate theoccurrences of each word and generatethe final output.

```
nanoreducer.py

#Copyand pastethereducer.pycode
```

reducer.py

```
#!/usr/bin/envpython

from operator import
itemgetterimport sys
#reducer will get the input from stdid which will be a collection of key, value(Key=month
,value=daily max temperature)
#reducer logic: will get all the daily max temperature for a month and find max
temperatureforthe month
#shuffle will ensure that key are
sorted(month)current_month= None
current_max =
0month =None

# input comes from
STDINforlinein sys.stdin:
```

```
    # remove leading and trailing
    whitespaceline=line.strip()
    # parse the input we got from
    mapper.pymonth,daily_max
    =line.split('\t', 1)

    # convert daily_max (currently a string) to
    floattry:
        daily_max =
    float(daily_max)exceptValueErr
    or:
        # daily_max was not a number, so
        silently#ignore/discard thisline
        continue

    # this IF-switch only works because Hadoop shuffle process sorts map
    output#by key (here: month)beforeit is passed tothereducer
    ifcurrent_month==month:
        if daily_max >
            current_max:current_max
            =daily_max
    else:
        ifcurrent_month:
            #writeresulttoSTDOUT
            print ('%s\t%s' % (current_month,
        current_max))current_max=daily_max
        current_month=month

 # outputof thelast month
 ifcurrent_month==month:
    print('%s\t%s'%(current_month,current_max))
```

Step4:PrepareHadoopEnvironment:

StarttheHadoop daemonsand createadirectory inHDFS tostoreyourdata.

```
start-all.sh
```

Step6:MakePythonFilesExecutable:

Giveexecutablepermissionstoyourmapper.py andreducer.pyfiles.

```
chmod777mapper.pyreducer.py
```

Step7:RuntheprogramusingHadoopStreaming:

Downloadthelatest hadoop-streamingjarfileandplaceit inalocation youcaneasily access.

Then run the program using

Hadoop Streaming.hadoopfs -

mkdir-p /weatherdata

hadoop fs -copyFromLocal

/home/sx/Downloads/dataset.txt

/weatherdatahdfsdfs -ls /weatherdata

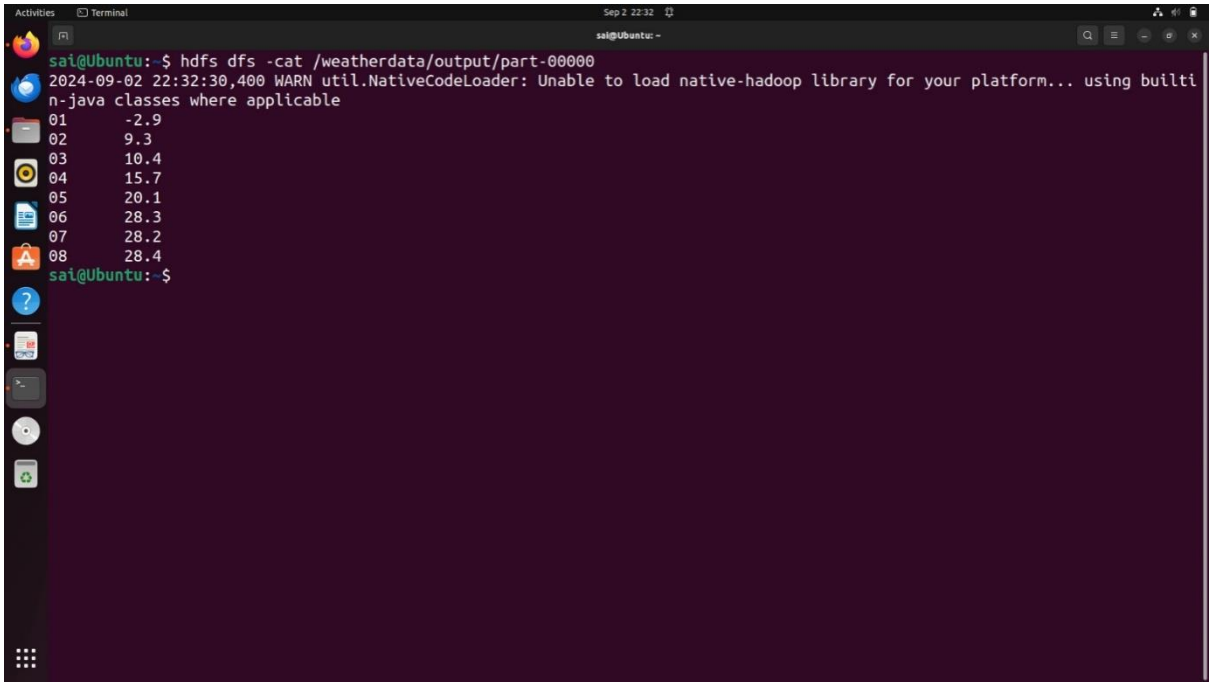
```
hadoopjar/home/sx/hadoop-3.2.3/share/hadoop/tools/lib/hadoop-streaming-
3.2.3.jar\
  -input/weatherdata/dataset.txt\
  -output/weatherdata/output \
  -file"/home/sx/Downloads/mapper.py"\
  -mapper"python3mapper.py"\
  -file"/home/sx/Downloads/reducer.py"\
  -reducer"python3reducer.py"
```

hdfsdfs-text/weatherdata/output/*>/home/sx/Downloads/outputfile.txt

Step8:CheckOutput:

ChecktheoutputoftheprograminthespecifiedHDFSoutput directory.

OUTPUT:



Result:

Thus,theprogramforweatherdatasetusing MapReducehasbeenexecutedsuccessfully.