

Homework Assignment 3

1. Work *Examples 7-2, 7-3, and 7-4* on CSUEB Hadoop. Type out all the commands in each step of the process and print out a screenshot of the final results in CSUEB Hadoop.

Hint 1: need to create a jar file including five classes: *WholeFileInputFormat.class*, *WholeFileRecordReader.class*, *SmallFilesToSequenceFileConverter.class*, *SmallFilesToSequenceFileConverter\$SequenceFileMapper.class*, and *JobBuilder.class*

Note. *SmallFilesToSequenceFileConverter.class* is the main class.

SmallFilesToSequenceFileConverter\$SequenceFileMapper.class is a nested/inner class of *SmallFilesToSequenceFileConverter.class*.

JobBuilder.java can be found in Hadoop-Book-Master/common/src/main/java

Smallfiles folder can be found in Hadoop-Book-Master/input

Hint 2: *-conf conf/Hadoop-localhost.xml* is not needed in the hadoop jar command. So, your command will be like this: *hadoop jar /home/jwu/hadoop-example.jar*

SmallFilesToSequenceFileConverter -D mapred.reduce.tasks=2 /home/jwu/smallfiles /home/jwu/output11

2. Work *Example 8-1* on CSUEB Hadoop. Type out all the commands in each step of the process and print out a screenshot of the final results (the counters) in CSUEB Hadoop.

Hint: need to create a jar file including five classes: *MaxTemperatureWithCounters.class*, *MaxTemperatureMapperWithCounters.class*, *NcdcRecordParser.class*, *JobBuilder.class*, and *MaxTemperatureReducer.class*.

Note. 1) *NcdcRecordParser.java* can be found in Hadoop-Book-Master/common/src/main/java, 2) you must use the data of year 1930 as input data to run the program (download from the homework page on Canvas or download by pasting the link to your File Explorer: <ftp://ftp.ncdc.noaa.gov/pub/data/noaa/>), and 3) your results shall be different from those run over the complete dataset of 100 years, which are shown on page 265 in the textbook.

Below is an example of my work for *Example 3-1*

Command for compiling Java file:

```
javac -cp src:/hadoop-common-2.6.1.jar:hadoop-mapreduce-client-core-2.6.1.jar:commons-cli-2.0.jar -d . URLCat.java
```

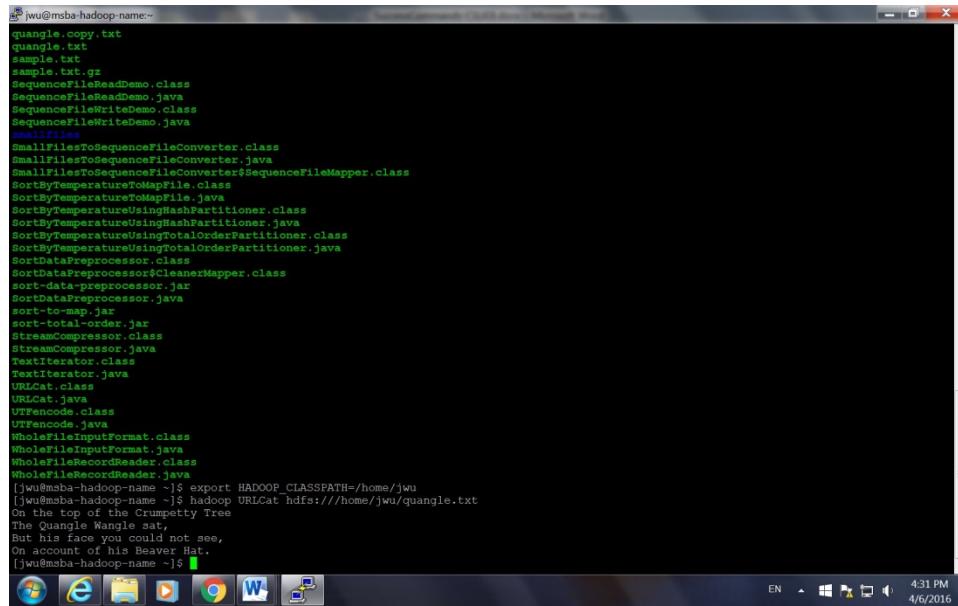
Command for copying a file from local disk to HDFS:

```
hdfs dfs -copyFromLocal quangle.txt .
```

Command for running Java in Hadoop

```
hadoop URLCat hdfs://user/hadoop/quangle.txt
```

Screenshot of final results in EMR:



```
jwu@msba-hadoop-name:~  
quangle_copy.txt  
quangle.txt  
sample.txt  
sample.txt.gz  
SequenceFileReadDemo.class  
SequenceFileReadDemo.java  
SequenceFileWriteDemo.class  
SequenceFileWriteDemo.java  
smallfiles  
smallfilesToSequenceFileConverter.class  
smallfilesToSequenceFileConverter.java  
smallfilesToSequenceFileConverter$SequenceFileMapper.class  
SortByTemperatureToMapFile.class  
SortByTemperatureToMapFile.java  
SortByTemperatureUsingHashPartitioner.class  
SortByTemperatureUsingHashPartitioner.java  
SortByTemperatureUsingTotalOrderPartitioner.class  
SortByTemperatureUsingTotalOrderPartitioner.java  
SortDataPreprocessor.class  
SortDataPreprocessor$cleanerMapper.class  
sort-data-preprocessor.jar  
sort-data-preprocessor.java  
sort-to-map.jar  
sort-total-order.jar  
StreamCompressor.class  
StreamCompressor.java  
TextIterator.class  
TextIterator.java  
URLCat.class  
URLCat.java  
URLCat$1.class  
UTFencode.java  
WholefileInputFormat.class  
WholefileInputFormat.java  
WholefileRecordReader.class  
WholefileRecordReader.java  
[jwu@msba-hadoop-name ~]$ export HADOOP_CLASSPATH=/home/jwu  
[jwu@msba-hadoop-name ~]$ hadoop URLCat hdfs://home/jwu/quangle.txt  
On the top of the Crumpetty Tree  
The Quangle Wangle sits  
But no face you could see  
On account of his Beaver Hat  
[jwu@msba-hadoop-name ~]$
```

1. Work *Examples 7-2, 7-3, and 7-4* on CSUEB Hadoop. Type out all the commands in each step of the process and print out a screenshot of the final results in CSUEB Hadoop.

In Local Disk:

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/WholeFileInputFormat.java"  
student39@134.154.190.204:/home/student39/
```

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/WholeFileRecordReader.java"  
student39@134.154.190.204:/home/student39/
```

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/SmallFilesToSequenceFileConverter.java"  
student39@134.154.190.204:/home/student39/
```

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/common/src/main/java/JobBuilder.java" student39@134.154.190.204:/home/student39/
```

```
scp -r "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/input/smallfiles" student39@134.154.190.204:/home/student39/
```

```
Last login: Thu Apr 17 16:06:48 on ttys000  
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/WholeFileInputFormat.java" student39@134.154.190.204:/home/student39/  
student39@134.154.190.204's password:  
[WholeFileInputFormat.java          100% 976  251.4KB/s  00:00  
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/WholeFileRecordReader.java" student39@134.154.190.204:/home/student39/  
student39@134.154.190.204's password:  
[WholeFileRecordReader.java        100% 2161  574.1KB/s  00:00  
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/SmallFilesToSequenceFileConverter.java" student39@134.154.190.204:/home/student39/  
student39@134.154.190.204's password:  
[SmallFilesToSequenceFileConverter.java 100% 2181  529.6KB/s  00:00  
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/common/src/main/java/JobBuilder.java" student39@134.154.190.204:/home/student39/  
student39@134.154.190.204's password:  
[JobBuilder.java                  100% 3005  923.7KB/s  00:00  
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp -r "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/input/smallfiles" student39@134.154.190.204:/home/student39/  
student39@134.154.190.204's password:  
[a                                100% 10    2.5KB/s  00:00  
[f                                100% 10    2.6KB/s  00:00  
[c                                100% 10    2.6KB/s  00:00  
[d                                100% 10    2.8KB/s  00:00  
[e                                100%   0    0.0KB/s  00:00  
[b                                100% 10    2.7KB/s  00:00  
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % ]
```

In Hadoop:

ssh student39@134.154.190.204

Command for copying a file from local disk to HDFS

```
hdfs dfs -copyFromLocal "/home/student39/WholeFileInputFormat.java" "/user/student39/"
```

```
hdfs dfs -copyFromLocal "/home/student39/WholeFileRecordReader.java" "/user/student39/"
```

```
hdfs dfs -copyFromLocal "/home/student39/SmallFilesToSequenceFileConverter.java" "/user/student39/"
```

```
hdfs dfs -copyFromLocal "/home/student39/JobBuilder.java" "/user/student39/"
```

```
hdfs dfs -copyFromLocal "/home/student39/smallfiles" "/user/student39/"
```

set class path

```
export HADOOP_CLASSPATH=/home/student39
```

Compiling all Java classes:

```
javac -classpath /home/student39/hadoop-common-2.6.1.jar:/home/student39/hadoop-mapreduce-client-core-2.6.1.jar:/home/student39/commons-cli-2.0.jar:/home/student39/commons-logging-1.2.jar -d .
```

```
WholeFileInputFormat.java WholeFileRecordReader.java SmallFilesToSequenceFileConverter.java  
JobBuilder.java
```

Create a Jar file

```
jar cf hadoop-example.jar *.class
```

Verify Your JAR Exists

```
ls hadoop-example.jar
```

deleting existing folder:

```
hdfs dfs -rm -r /user/student39/output11
```

Run the Hadoop job

```
hadoop jar hadoop-example.jar SmallFilesToSequenceFileConverter \
-libjars hadoop-example.jar \
-D mapred.reduce.tasks=2 \
/usr/student39/smallfiles /user/student39/output11
```

```
[student39@msba-hadoop-name ~]$ jar cf hadoop-example.jar *.class
[student39@msba-hadoop-name ~]$ hdfs dfs -rm -r /user/student39/output11
Deleted /user/student39/output11
[student39@msba-hadoop-name ~]$ hadoop jar hadoop-example.jar SmallFilesToSequenceFileConverter \
> -libjars hadoop-example.jar \
> -D mapred.reduce.tasks=2 \
> /user/student39/smallfiles /user/student39/output11
25/04/17 16:28:34 INFO client.RMProxy: Connecting to ResourceManager at /127.0.0.1:8032
25/04/17 16:28:34 WARN mapreduce.JobResourceUploader: No job jar file set. User classes may not be found. See Job or Job#setJar(String).
25/04/17 16:28:34 INFO input.FileInputFormat: Total input files to process : 6
25/04/17 16:28:34 INFO mapreduce.JobSubmitter: number of splits:6
25/04/17 16:28:34 INFO mapreduce.JobSubmitter: mapreduce.job.maps is deprecated. Instead, use mapreduce.job.reduces
25/04/17 16:28:34 INFO Configuration.deprecation: mapreduce.job.maps is deprecated. Instead, use yarn.system-metrics-publisher.enabled
25/04/17 16:28:35 INFO mapred.YARNRunner: Job jar is not present. Not adding any jar to the list of resources.
25/04/17 16:28:35 INFO mapred.YarnClientImpl: Submitted application application_1715113870348_3429
25/04/17 16:28:35 INFO mapreduce.Job: The url to track the job: http://msba-hadoop-name:8088/proxy/application_1715113870348_3429
25/04/17 16:28:40 INFO mapreduce.Job: Running job: job_1715113870348_3429 running in uber mode : false
25/04/17 16:28:40 INFO mapreduce.Job: map 0% reduce 0%
25/04/17 16:28:49 INFO mapreduce.Job: map 83% reduce 0%
25/04/17 16:29:01 INFO mapreduce.Job: map 100% reduce 0%
25/04/17 16:29:04 INFO mapreduce.Job: map 100% reduce 100%
25/04/17 16:29:54 INFO mapreduce.Job: Job job_1715113870348_3429 completed successfully
25/04/17 16:29:54 INFO mapreduce.Job: Counters: 51
  File System Counters
    FILE: Number of bytes read=440
    FILE: Number of bytes written=1623894
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=776
    HDFS: Number of bytes written=438
    HDFS: Number of read operations=24
    HDFS: Number of large read operations=0
    HDFS: Number of write operations=4
  Job Counters
    Killed map tasks=1
    Launched map tasks=6
    Launched reduce tasks=2
    Other local map tasks=1
    Data-local map tasks=5
    Total time spent by all maps in occupied slots (ms)=39067
    Total time spent by all maps in occupied slots (ms)=5406
    Total time spent by all map tasks (ms)=39067
    Total time spent by all reduce tasks (ms)=5406
    Total vcore-milliseconds taken by all map tasks=39067
    Total vcore-milliseconds taken by all reduce tasks=5406
    Total megabyte-milliseconds taken by all map tasks=4004608
    Total megabyte-milliseconds taken by all reduce tasks=5535744
Map-Reduce Framework
```

```
Map-Reduce Framework
  Map input records=6
  Map output records=6
  Map output bytes=416
  Map output materialized bytes=500
  Input split bytes=726
  Combine output records=0
  Combine output groups=0
  Reduce input groups=6
  Reduce shuffle bytes=500
  Reduce input records=6
  Reduce output records=6
  Spilled Records=12
  Shuffled Maps =12
  Failed Shuffles=0
  Merged Map outputs=12
  GC time elapsed (ms)=1709
  CPU time spent (ms)=3880
  Physical memory (bytes) snapshot=2537922569
  Virtual memory (bytes) snapshot=24183862528
  Total committed heap usage (bytes)=2501902336
Errors
  BAD_ID=0
  CONNECTOR=0
  LOADING=0
  WRONG_LENGTH=0
  WRONG_MAP=0
  WRONG_REDUCE=0
File Input Format Counters
  Bytes Read=58
File Output Format Counters
  Bytes Written=638
[student39@msba-hadoop-name ~]$
```

To view results:

```
hdfs dfs -ls /user/student39/output11
```

```
hdfs dfs -text /user/student39/output11/part-r-00000 | head
```

FINAL OUTPUT:

```
File Output Format Counters
Bytes Written=638
[student39@msba-hadoop-name ~]$ hdfs dfs -ls /user/student39/output11
Found 3 items
-rw-r--r-- 5 student39 supergroup 0 2025-04-17 16:20 /user/student39/output11/_SUCCESS
-rw-r--r-- 5 student39 supergroup 324 2025-04-17 16:20 /user/student39/output11/part-r-00000
-rw-r--r-- 5 student39 supergroup 314 2025-04-17 16:20 /user/student39/output11/part-r-00001
[student39@msba-hadoop-name ~]$ hdfs dfs -text /user/student39/output11/part-r-00000 | head
hdfs://msba-hadoop-name:9000/user/student39/smallfiles/b 62 62 62 62 62 62 62 62
hdfs://msba-hadoop-name:9000/user/student39/smallfiles/d 64 64 64 64 64 64 64 64
hdfs://msba-hadoop-name:9000/user/student39/smallfiles/f 66 66 66 66 66 66 66 66
[student39@msba-hadoop-name ~]$
```

2. Work *Example 8-1* on CSUEB Hadoop. Type out all the commands in each step of the process and print out a screenshot of the final results (the counters) in CSUEB Hadoop.

In Local Disk:

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch08/src/main/java/MaxTemperatureWithCounters.java"
student39@134.154.190.204:/home/student39/
```

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch02/src/main/java/MaxTemperatureReducer.java"
student39@134.154.190.204:/home/student39/
```

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/common/src/main/java/NcdcRecordParser.java" student39@134.154.190.204:/home/student39/
```

```
scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/common/src/main/java/JobBuilder.java" student39@134.154.190.204:/home/student39/
```

```
scp -r "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930"
student39@134.154.190.204:/home/student39/
```

```
Last login: Thu Apr 17 16:06:57 on ttys001
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/ MaxTemperatureWithCounters.java" student39@134.154.190.204:/home/student39/
scp: stat local "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch07/src/main/java/ MaxTemperatureWithCounters.java": No such file or directory
(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch08/src/main/java/MaxTemperatureWithCounters.java" student39@134.154.190.204:/home/student39/
4:/home/student39/
student39@134.154.190.204's password:
MaxTemperatureWithCounters.java          100% 2343   458.5KB/s  00:00
(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/ch02/src/main/java/MaxTemperatureReducer.java" student39@134.154.190.204:/home/student39/
student39@134.154.190.204's password:
MaxTemperatureReducer.java      100% 709   171.3KB/s  00:00
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/common/src/main/java/NcdcRecordParser.java" student39@134.154.190.204:/home/student39/
student39@134.154.190.204's password:
NcdcRecordParser.java      100% 2328   509.4KB/s  00:00
(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/hadoop-book-3e/common/src/main/java/JobBuilder.java" student39@134.154.190.204:/home/student39/
student39@134.154.190.204's password:
JobBuilder.java      100% 3005   502.2KB/s  00:00
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930.gz" student39@134.154.190.204:/home/student39/
scp: stat local "/Users/amishafarhanashaik/Desktop/MSBA/BAN": No such file or directory
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930.gz" student39@134.154.190.204:/home/student39/
student39@134.154.190.204's password:
JobBuilder.java      100% 3005   502.2KB/s  00:00
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930 student39@134.154.190.204:/home/student39/
scp: stat local "/Users/amishafarhanashaik/Desktop/MSBA/BAN": No such file or directory
[(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930" student39@134.154.190.204:/home/student39/
student39@134.154.190.204's password:
student39@134.154.190.204: /Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930" is not a regular file
scp: failed to upload file /Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930 to /home/student39/
(base) amishafarhanashaik@Amishas-MacBook-Air-3 ~ % scp -r "/Users/amishafarhanashaik/Desktop/MSBA/BAN 632 - Big Data/Homework 3/1930" student39@134.154.190.204:/home/student39/
student39@134.154.190.204's password:
101200--99999-1938.gz      100% 20KB   1.6MB/s  00:00
060810--99999-1938.gz      100% 11KB   1.6MB/s  00:00
104530--99999-1938.gz      100% 2893   755.2KB/s  00:00
039520--99999-1938.gz      100% 19KB   1.6MB/s  00:00
070090--99999-1938.gz      100% 10KB   1.5MB/s  00:00
```

In Hadoop:

```
ssh student39@134.154.190.204
```

Command for copying a file from local disk to HDFS

```
hdfs dfs -copyFromLocal "/home/student39/MaxTemperatureWithCounters.java" "/user/student39/"  
hdfs dfs -copyFromLocal "/home/student39/MaxTemperatureReducer.java" "/user/student39/"  
hdfs dfs -copyFromLocal "/home/student39/NcdcRecordParser.java" "/user/student39/"  
hdfs dfs -copyFromLocal "/home/student39/JobBuilder.java" "/user/student39/"
```

set class path

```
export HADOOP_CLASSPATH=/home/student39
```

Compiling all Java classes:

```
javac -classpath $(hadoop classpath) -d . MaxTemperatureWithCounters.java  
MaxTemperatureReducer.java NcdcRecordParser.java JobBuilder.java
```

To verify:

```
ls MaxTemperature*.class
```

```
ls NcdcRecordParser.class
```

```
ls JobBuilder.class
```

Create a Jar file

```
jar cf max-temp-counters.jar MaxTemperatureWithCounters.class  
MaxTemperatureWithCounters\$MaxTemperatureMapperWithCounters.class  
MaxTemperatureWithCounters\$Temperature.class MaxTemperatureReducer.class  
NcdcRecordParser.class JobBuilder.class
```

to confirm if jar was created

```
ls max-temp-counters.jar
```

In Hadoop for 1930 folder:

```
hdfs dfs -mkdir -p /user/student39/ncdc1930
```

```
hdfs dfs -copyFromLocal /home/student39/1930/*.gz /user/student39/ncdc1930/
```

```
Last login: Thu Apr 17 16:45:31 on ttys000
(base) amishafarhanashaiq@Amishas-MacBook-Air-3 ~ % ssh student39@134.154.190.204
student39@134.154.190.204's password:
[Last login: Thu Apr 17 16:14:51 2025 from 134.154.76.196
[[student39@msba-hadoop-name ~]$ hdfs dfs -copyFromLocal "/home/student39/MaxTemperatureWithCounters.java" "/user/student39/"
[[student39@msba-hadoop-name ~]$ hdfs dfs -copyFromLocal "/home/student39/MaxTemperatureReducer.java" "/user/student39/"
[[student39@msba-hadoop-name ~]$ hdfs dfs -copyFromLocal "/home/student39/NcdcRecordParser.java" "/user/student39/"
[[student39@msba-hadoop-name ~]$ hdfs dfs -copyFromLocal "/home/student39/JobBuilder.java" "/user/student39/"
copyFromLocal: '/user/student39/JobBuilder.java': File exists
[[student39@msba-hadoop-name ~]$ export HADOOP_CLASSPATH=/home/student39
[[student39@msba-hadoop-name ~]$ javac -classpath $(hadoop classpath) -d . MaxTemperatureWithCounters.java MaxTemperatureReducer.java NcdcRecordParser.java JobBuilder.java
Note: JobBuilder.java uses or overrides a deprecated API.
Note: Recompile with -Xlint:deprecation for details.
[[student39@msba-hadoop-name ~]$ ls MaxTemperature*.class
MaxTemperatureReducer.class MaxTemperatureWithCounters.class MaxTemperatureWithCounters$MaxTemperatureMapperWithCounters.class MaxTemperatureWithCounters$Temperature.class
[[student39@msba-hadoop-name ~]$ ls NcdcRecordParser.class
NcdcRecordParser.class
[[student39@msba-hadoop-name ~]$ ls JobBuilder.class
JobBuilder.class
[[student39@msba-hadoop-name ~]$ jar cf max-temp-counters.jar MaxTemperatureWithCounters.class MaxTemperatureWithCounters$MaxTemperatureMapperWithCounters.class MaxTemperatureWithCounters$Temperature.class
MaxTemperatureReducer.class NcdcRecordParser.class JobBuilder.class
[[student39@msba-hadoop-name ~]$ ls max-temp-counters.jar
max-temp-counters.jar
[[student39@msba-hadoop-name ~]$ hdfs dfs -mkdir -p /user/student39/ncdc1930
[[student39@msba-hadoop-name ~]$ hdfs dfs -copyFromLocal /home/student39/1930/*.gz /user/student39/ncdc1930/]
```

Run the Hadoop job

```
hadoop jar max-temp-counters.jar MaxTemperatureWithCounters -libjars max-temp-counters.jar
/usr/student39/ncdc1930 /user/student39/tempout1930
```

```
[student39@msba-hadoop-name ~]$ hadoop jar max-temp-counters.jar MaxTemperatureWithCounters -libjars max-temp-counters.jar /user/student39/ncdc1930 /user/student39/tempout1930
25/04/17 17:12:24 INFO client.RMProxy: Connecting to ResourceManager at /127.0.0.1:8032
25/04/17 17:12:25 WARN mapreduce.JobResourceUploader: No job jar file set. User classes may not be found. See Job or Job#setJar(String).
25/04/17 17:12:25 INFO input.FileInputFormat: Total input files to process : 121
25/04/17 17:12:25 INFO mapreduce.JobSubmitter: number of splits:121
25/04/17 17:12:25 INFO Configuration.deprecation: yarn.resourcemanager.system-metrics-publisher.enabled is deprecated. Instead, use yarn.system-metrics-publisher.enabled
25/04/17 17:12:25 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1715113870348_3434
25/04/17 17:12:25 INFO mapred.YARNRunner: Job jar is not present. Not adding any jar to the list of resources.
25/04/17 17:12:25 INFO impl.YarnClientImpl: Submitted application application_1715113870348_3434
25/04/17 17:12:25 INFO mapreduce.Job: The url to track the job: http://msba-hadoop-name:8088/proxy/application_1715113870348_3434/
25/04/17 17:12:25 INFO mapreduce.Job: Running job: job_1715113870348_3434
25/04/17 17:12:31 INFO mapreduce.Job: Job job_1715113870348_3434 running in uber mode : false
25/04/17 17:12:31 INFO mapreduce.Job: map 0% reduce 0%
25/04/17 17:12:40 INFO mapreduce.Job: map 2% reduce 0%
25/04/17 17:12:41 INFO mapreduce.Job: map 5% reduce 0%
25/04/17 17:12:47 INFO mapreduce.Job: map 6% reduce 0%
25/04/17 17:12:48 INFO mapreduce.Job: map 8% reduce 0%
25/04/17 17:12:49 INFO mapreduce.Job: map 10% reduce 0%
```

Job completed Successfully:

```
25/04/17 17:15:31 INFO mapreduce.Job: Job job_1715113870348_3434 completed successfully
25/04/17 17:15:31 INFO mapreduce.Job: Counters: 53
  File System Counters
    FILE: Number of bytes read=1172
    FILE: Number of bytes written=24748119
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=1666304
    HDFS: Number of bytes written=9
    HDFS: Number of read operations=366
    HDFS: Number of large read operations=0
    HDFS: Number of write operations=2
```

```
Job Counters
  Launched map tasks=121
  Launched reduce tasks=1
  Data-local map tasks=121
  Total time spent by all maps in occupied slots (ms)=739948
  Total time spent by all reduces in occupied slots (ms)=146091
  Total time spent by all map tasks (ms)=739948
  Total time spent by all reduce tasks (ms)=146091
  Total vcore-milliseconds taken by all map tasks=739948
  Total vcore-milliseconds taken by all reduce tasks=146091
  Total megabyte-milliseconds taken by all map tasks=757706752
  Total megabyte-milliseconds taken by all reduce tasks=149597184
Map-Reduce Framework
  Map input records=89262
  Map output records=85580
  Map output bytes=770220
  Map output materialized bytes=1892
  Input split bytes=16698
  Combine input records=85580
  Combine output records=106
  Reduce input groups=1
  Reduce shuffle bytes=1892
  Reduce input records=106
  Reduce output records=1
  Spilled Records=212
  Shuffled Maps =121
  Failed Shuffles=0
  Merged Map outputs=121
  GC time elapsed (ms)=26440
  CPU time spent (ms)=74250
  Physical memory (bytes) snapshot=41646346240
  Virtual memory (bytes) snapshot=3686318848256
  Total committed heap usage (bytes)=37134270464
```

FINAL OUTPUT:

```
Total committed heap usage (bytes)=37134270464
MaxTemperatureWithCounters$Temperature
    MISSING=3665
Shuffle Errors
    BAD_ID=0
    CONNECTION=0
    IO_ERROR=0
    WRONG_LENGTH=0
    WRONG_MAP=0
    WRONG_REDUCE=0
TemperatureQuality
    1=85580
    2=17
    9=3665
File Input Format Counters
    Bytes Read=1649606
File Output Format Counters
    Bytes Written=9
[student39@msba-hadoop-name ~]$
```