Problm Statement 5 :

Dataset is sample data of songs heard by users on an online streaming platform. The Description of data set attached in musicdata.txt is as follows: -

1st Column - UserId
2nd Column - TrackId
3rd Column - Songs Share status (1 for shared, 0 for not shared)
4th Column - Listening Platform (Radio or Web - 0 for radio, 1 for web)
5th Column - Song Listening Status (0 for skipped, 1 for fully heard)

Write Map Reduce program for following tasks.

File Name : musicdata.txt

Task 1
Find the number of unique listeners in the data set.

Solution 1:

1. Eclipse code:

```
package com.acadgild.mapreduce.assignment.task4;

import java.io.IOException;

import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.NullWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.Mapper;
import org.apache.hadoop.mapreduce.Reducer;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;


public class UniqueListener {
      public static class UniqueMapper
    extends Mapper<LongWritable, Text, Text, Text>{

 public void map(LongWritable key, Text value, Context context
                 ) throws IOException, InterruptedException {
```

```
        String valueString = value.toString();
        String[] SingleMusicData = valueString.split("\\|");

         context.write(new Text(SingleMusicData[0]),value);

 }
}

      public static class UniqueReducer
    extends Reducer<Text,Text,NullWritable,Text> {

 public void reduce(Text key, Iterable<Text> values,
                    Context context
                    ) throws IOException, InterruptedException {

       for (Text val : values) {
   context.write(NullWritable.get(), val);
   break;
 }
}
}


      public static void main(String[] args) throws Exception {
              Configuration conf = new Configuration();
              Job job = Job.getInstance(conf, "unique listener");
              job.setJarByClass(UniqueListener.class);
              job.setMapperClass(UniqueMapper.class);
              job.setReducerClass(UniqueReducer.class);
              job.setOutputKeyClass(Text.class);
              job.setOutputValueClass(Text.class);
              FileInputFormat.addInputPath(job, new Path(args[0]));
              FileOutputFormat.setOutputPath(job, new Path(args[1]));
              System.exit(job.waitForCompletion(true) ? 0 : 1);
            }
}
```

2. Created Jar Name : UniqueListener.jar

3.Terminal Execution:

[acadgild@localhost ~]$ jps
7764 Jps
6911
[acadgild@localhost ~]$ sudo service sshd start
[sudo] password for acadgild:
[acadgild@localhost ~]$ start-all.sh

```
This script is Deprecated. Instead use start-dfs.sh and start-yarn.sh
18/06/29 20:44:19 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
Starting namenodes on [localhost]
localhost: starting namenode, logging to
/home/acadgild/install/hadoop/hadoop-2.6.5/logs/hadoop-acadgild-namenode-localhost.localdomain.ou
t
localhost: starting datanode, logging to
/home/acadgild/install/hadoop/hadoop-2.6.5/logs/hadoop-acadgild-datanode-localhost.localdomain.out
Starting secondary namenodes [0.0.0.0]
0.0.0.0: starting secondarynamenode, logging to
/home/acadgild/install/hadoop/hadoop-2.6.5/logs/hadoop-acadgild-secondarynamenode-localhost.local
domain.out
18/06/29 20:44:58 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
starting yarn daemons
starting resourcemanager, logging to
/home/acadgild/install/hadoop/hadoop-2.6.5/logs/yarn-acadgild-resourcemanager-localhost.localdomai
n.out
localhost: starting nodemanager, logging to
/home/acadgild/install/hadoop/hadoop-2.6.5/logs/yarn-acadgild-nodemanager-localhost.localdomain.ou
t
[acadgild@localhost ~]$ jps
8342 ResourceManager
8008 DataNode
7912 NameNode
8168 SecondaryNameNode
8764 Jps
8444 NodeManager
6911
[acadgild@localhost ~]$ hdfs dfs -ls /user/acadgild/
18/06/29 20:46:01 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
Found 1 items
drwxr-xr-x   - acadgild supergroup          0 2018-06-27 03:44 /user/acadgild/hadoopdata
[acadgild@localhost ~]$ hdfs dfs -ls /user/acadgild/hadoopdata/
18/06/29 20:46:31 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
Found 4 items
drwxr-xr-x   - acadgild supergroup          0 2018-06-27 03:45 /user/acadgild/hadoopdata/assignment
drwxr-xr-x   - acadgild supergroup          0 2018-06-25 01:33 /user/acadgild/hadoopdata/assignment3
-rw-r--r--   1 acadgild supergroup       1147 2018-06-24 19:35 /user/acadgild/hadoopdata/file.txt
drwxr-xr-x   - acadgild supergroup          0 2018-06-24 19:39 /user/acadgild/hadoopdata/hdfs
[acadgild@localhost ~]$ hdfs dfs -mkdir /user/acadgild/hadoopdata/assignment4
18/06/29 20:47:13 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
[acadgild@localhost ~]$ hdfs dfs -put /home/acadgild/Desktop/musicdata.txt
/user/acadgild/hadoopdata/assignment4
18/06/29 20:48:58 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
```

platform... using builtin-java classes where applicable
[acadgild@localhost ~]$ hdfs dfs -put /home/acadgild/Desktop/musicdata.txt
/user/acadgild/hadoopdata/assignment4/
18/06/29 20:49:14 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
put: `/user/acadgild/hadoopdata/assignment4/musicdata.txt': File exists
[acadgild@localhost ~]$ hdfs dfs -ls /user/acadgild/hadoopdata/assignment4
18/06/29 20:50:18 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
Found 1 items
-rw-r--r--   1 acadgild supergroup   73 2018-06-29 20:49
/user/acadgild/hadoopdata/assignment4/musicdata.txt
[acadgild@localhost ~]$ hdfs dfs -cat /user/acadgild/hadoopdata/assignment4
18/06/29 20:50:32 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
cat: `/user/acadgild/hadoopdata/assignment4': Is a directory
[acadgild@localhost ~]$ hdfs dfs -cat /user/acadgild/hadoopdata/assignment4/musicdata.txt
18/06/29 20:51:00 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
111115|222|0|1|0
111113|225|1|0|0
111117|223|0|1|1
111115|225|1|0|0[acadgild@localhost ~]$

[acadgild@localhost ~]$ hadoop jar /home/acadgild/Desktop/UniqueListener.jar
com.acadgild.mapreduce.assignment.task4.UniqueListener
/user/acadgild/hadoopdata/assignment4/musicdata.txt
/user/acadgild/hadoopdata/assignment4/OutPutDistinct
18/06/30 00:14:51 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
18/06/30 00:14:53 INFO client.RMProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/06/30 00:14:55 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not
performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
18/06/30 00:14:55 INFO input.FileInputFormat: Total input paths to process : 1
18/06/30 00:14:56 INFO mapreduce.JobSubmitter: number of splits:1
18/06/30 00:14:56 INFO mapreduce.JobSubmitter: Submitting tokens for job:
job_1530285310196_0003
18/06/30 00:14:57 INFO impl.YarnClientImpl: Submitted application
application_1530285310196_0003
18/06/30 00:14:58 INFO mapreduce.Job: The url to track the job:
http://localhost:8088/proxy/application_1530285310196_0003/
18/06/30 00:14:58 INFO mapreduce.Job: Running job: job_1530285310196_0003
18/06/30 00:15:10 INFO mapreduce.Job: Job job_1530285310196_0003 running in uber mode : false
18/06/30 00:15:10 INFO mapreduce.Job: map 0% reduce 0%
18/06/30 00:15:19 INFO mapreduce.Job: map 100% reduce 0%
18/06/30 00:15:31 INFO mapreduce.Job: map 100% reduce 100%
18/06/30 00:15:32 INFO mapreduce.Job: Job job_1530285310196_0003 completed successfully
18/06/30 00:15:32 INFO mapreduce.Job: Counters: 49
        File System Counters

FILE: Number of bytes read=110
FILE: Number of bytes written=215087
FILE: Number of read operations=0
FILE: Number of large read operations=0
FILE: Number of write operations=0
HDFS: Number of bytes read=210
HDFS: Number of bytes written=51
HDFS: Number of read operations=6
HDFS: Number of large read operations=0
HDFS: Number of write operations=2

Job Counters

Launched map tasks=1
Launched reduce tasks=1
Data-local map tasks=1
Total time spent by all maps in occupied slots (ms)=6897
Total time spent by all reduces in occupied slots (ms)=8670
Total time spent by all map tasks (ms)=6897
Total time spent by all reduce tasks (ms)=8670
Total vcore-milliseconds taken by all map tasks=6897
Total vcore-milliseconds taken by all reduce tasks=8670
Total megabyte-milliseconds taken by all map tasks=7062528
Total megabyte-milliseconds taken by all reduce tasks=8878080

Map-Reduce Framework

Map input records=4
Map output records=4
Map output bytes=96
Map output materialized bytes=110
Input split bytes=137
Combine input records=0
Combine output records=0
Reduce input groups=3
Reduce shuffle bytes=110
Reduce input records=4
Reduce output records=3
Spilled Records=8
Shuffled Maps =1
Failed Shuffles=0
Merged Map outputs=1
GC time elapsed (ms)=324
CPU time spent (ms)=2080
Physical memory (bytes) snapshot=236277760
Virtual memory (bytes) snapshot=680697856
Total committed heap usage (bytes)=140271616

Shuffle Errors

BAD_ID=0
CONNECTION=0
IO_ERROR=0
WRONG_LENGTH=0
WRONG_MAP=0

WRONG_REDUCE=0
File Input Format Counters
Bytes Read=73
File Output Format Counters
Bytes Written=51

[acadgild@localhost ~]$ hdfs dfs -ls /user/acadgild/hadoopdata/assignment4/OutPutDistinct
18/06/30 00:16:56 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Found 2 items
-rw-r--r-- 1 acadgild supergroup 0 2018-06-30 00:15 /user/acadgild/hadoopdata/assignment4/OutPutDistinct/_SUCCESS
-rw-r--r-- 1 acadgild supergroup 51 2018-06-30 00:15 /user/acadgild/hadoopdata/assignment4/OutPutDistinct/part-r-00000
[acadgild@localhost ~]$ hdfs dfs -cat /user/acadgild/hadoopdata/assignment4/OutPutDistinct/part-r-00000
18/06/30 00:17:25 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
111113|225|1|0|0
111115|225|1|0|0
111117|223|0|1|1

Explaination : Here, we are getting number of unique listeners only.

Task 2

What are the number of times a song was heard fully.

Solution 2:

1. Eclipse code:

```
package com.acadgild.mapreduce.assignment.task5;

import java.io.IOException;

import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.Mapper;
import org.apache.hadoop.mapreduce.Reducer;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
```

```
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;

public class FullSongListener {

      public static class FullSongMapper
    extends Mapper<LongWritable, Text, Text, IntWritable>{

private final static IntWritable zero = new IntWritable(0);
private final static IntWritable one = new IntWritable(1);

 public void map(LongWritable key, Text value, Context context
                 ) throws IOException, InterruptedException {

        String valueString = value.toString();
        String[] FullSongData = valueString.split("\\|");

        if(Integer.parseInt(FullSongData[4]) == 1)
         context.write(new Text(FullSongData[1]),one);
        else
              context.write(new Text(FullSongData[1]), zero);

 }
}

      public static class FullSongSumReducer
    extends Reducer<Text,IntWritable,Text,IntWritable> {
 private IntWritable result = new IntWritable();

 public void reduce(Text key, Iterable<IntWritable> values, Context context
                    ) throws IOException, InterruptedException {
   int sum = 0;
   for (IntWritable val : values) {
     sum += val.get();
   }
   result.set(sum);
   context.write(key, result);
 }
}


      public static void main(String[] args) throws Exception {
              Configuration conf = new Configuration();
              Job job = Job.getInstance(conf, "filter television");
              job.setJarByClass(FullSongListener.class);
              job.setMapperClass(FullSongMapper.class);
              job.setReducerClass(FullSongSumReducer.class);
              job.setOutputKeyClass(Text.class);
              job.setOutputValueClass(IntWritable.class);
              FileInputFormat.addInputPath(job, new Path(args[0]));
              FileOutputFormat.setOutputPath(job, new Path(args[1]));
              System.exit(job.waitForCompletion(true) ? 0 : 1);
            }

}
```

2. Created Jar Name : FullSongListener.jar

3.Terminal Execution:

```
[acadgild@localhost ~]$ hadoop jar /home/acadgild/Desktop/FullSongListener.jar
com.acadgild.mapreduce.assignment.task5.FullSongListener
/user/acadgild/hadoopdata/assignment4/musicdata.txt
/user/acadgild/hadoopdata/assignment4/OutPutFullSongs
18/06/30 02:37:35 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
18/06/30 02:37:37 INFO client.RMProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/06/30 02:37:38 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not
performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
18/06/30 02:37:39 INFO input.FileInputFormat: Total input paths to process : 1
18/06/30 02:37:39 INFO mapreduce.JobSubmitter: number of splits:1
18/06/30 02:37:39 INFO mapreduce.JobSubmitter: Submitting tokens for job:
job_1530285310196_0006
18/06/30 02:37:40 INFO impl.YarnClientImpl: Submitted application
application_1530285310196_0006
18/06/30 02:37:40 INFO mapreduce.Job: The url to track the job:
http://localhost:8088/proxy/application_1530285310196_0006/
18/06/30 02:37:40 INFO mapreduce.Job: Running job: job_1530285310196_0006
18/06/30 02:37:53 INFO mapreduce.Job: Job job_1530285310196_0006 running in uber mode : false
18/06/30 02:37:53 INFO mapreduce.Job:  map 0% reduce 0%
18/06/30 02:38:02 INFO mapreduce.Job:  map 100% reduce 0%
18/06/30 02:38:12 INFO mapreduce.Job:  map 100% reduce 100%
18/06/30 02:38:13 INFO mapreduce.Job: Job job_1530285310196_0006 completed successfully
18/06/30 02:38:13 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=46
                FILE: Number of bytes written=215001
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=210
                HDFS: Number of bytes written=18
                HDFS: Number of read operations=6
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
        Job Counters
                Launched map tasks=1
                Launched reduce tasks=1
                Data-local map tasks=1
                Total time spent by all maps in occupied slots (ms)=6774
                Total time spent by all reduces in occupied slots (ms)=7231
                Total time spent by all map tasks (ms)=6774
```

```
		Total time spent by all reduce tasks (ms)=7231
		Total vcore-milliseconds taken by all map tasks=6774
		Total vcore-milliseconds taken by all reduce tasks=7231
		Total megabyte-milliseconds taken by all map tasks=6936576
		Total megabyte-milliseconds taken by all reduce tasks=7404544
	Map-Reduce Framework
		Map input records=4
		Map output records=4
		Map output bytes=32
		Map output materialized bytes=46
		Input split bytes=137
		Combine input records=0
		Combine output records=0
		Reduce input groups=3
		Reduce shuffle bytes=46
		Reduce input records=4
		Reduce output records=3
		Spilled Records=8
		Shuffled Maps =1
		Failed Shuffles=0
		Merged Map outputs=1
		GC time elapsed (ms)=298
		CPU time spent (ms)=2020
		Physical memory (bytes) snapshot=236535808
		Virtual memory (bytes) snapshot=681746432
		Total committed heap usage (bytes)=140013568
	Shuffle Errors
		BAD_ID=0
		CONNECTION=0
		IO_ERROR=0
		WRONG_LENGTH=0
		WRONG_MAP=0
		WRONG_REDUCE=0
	File Input Format Counters
		Bytes Read=73
	File Output Format Counters
		Bytes Written=18
[acadgild@localhost ~]$ hdfs dfs -ls /user/acadgild/hadoopdata/assignment4/OutPutFullSongs
18/06/30 02:38:52 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
Found 2 items
-rw-r--r--   1 acadgild supergroup          0 2018-06-30 02:38
/user/acadgild/hadoopdata/assignment4/OutPutFullSongs/_SUCCESS
-rw-r--r--   1 acadgild supergroup         18 2018-06-30 02:38
/user/acadgild/hadoopdata/assignment4/OutPutFullSongs/part-r-00000
[acadgild@localhost ~]$ hdfs dfs -cat
/user/acadgild/hadoopdata/assignment4/OutPutFullSongs/part-r-00000
18/06/30 02:39:29 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
```

222 0
223 1
225 0

Task 3

What are the number of times a song was shared.

Solution 3:

1. Eclipse code:

```
package com.acadgild.mapreduce.assignment.task6;

import java.io.IOException;

import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapreduce.Job;
import org.apache.hadoop.mapreduce.Mapper;
import org.apache.hadoop.mapreduce.Reducer;
import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;
import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;


public class SongShared {
      public static class SongSharedMapper
    extends Mapper<LongWritable, Text, Text, IntWritable>{

private final static IntWritable one = new IntWritable(1);
private final static IntWritable zero = new IntWritable(0);
 public void map(LongWritable key, Text value, Context context
                 ) throws IOException, InterruptedException {

        String valueString = value.toString();
        String[] SharedSongData = valueString.split("\\|");

        if(Integer.parseInt(SharedSongData[2]) == 1)
         context.write(new Text(SharedSongData[1]),one);
        else
         context.write(new Text(SharedSongData[1]),zero);
 }
}

      public static class SongSharedSumReducer
```

```
    extends Reducer<Text,IntWritable,Text,IntWritable> {
 private IntWritable result = new IntWritable();

 public void reduce(Text key, Iterable<IntWritable> values, Context context
                    ) throws IOException, InterruptedException {
   int sum = 0;
   for (IntWritable val : values) {
     sum += val.get();
   }
   result.set(sum);
   context.write(key, result);
 }
}


      public static void main(String[] args) throws Exception {
              Configuration conf = new Configuration();
              Job job = Job.getInstance(conf, "filter television");
              job.setJarByClass(SongShared.class);
              job.setMapperClass(SongSharedMapper.class);
              job.setReducerClass(SongSharedSumReducer.class);
              job.setOutputKeyClass(Text.class);
              job.setOutputValueClass(IntWritable.class);
              FileInputFormat.addInputPath(job, new Path(args[0]));
              FileOutputFormat.setOutputPath(job, new Path(args[1]));
              System.exit(job.waitForCompletion(true) ? 0 : 1);
            }

}
```

2. Created Jar Name : SharedSong.jar

3.Terminal Execution:

[acadgild@localhost ~]$ hadoop jar /home/acadgild/Desktop/SharedSong.jar com.acadgild.mapreduce.assignment.task6.SongShared /user/acadgild/hadoopdata/assignment4/musicdata.txt /user/acadgild/hadoopdata/assignment4/OutPutSharedSong
18/06/30 02:29:12 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/06/30 02:29:14 INFO client.RMProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/06/30 02:29:16 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
18/06/30 02:29:17 INFO input.FileInputFormat: Total input paths to process : 1
18/06/30 02:29:17 INFO mapreduce.JobSubmitter: number of splits:1
18/06/30 02:29:17 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1530285310196_0005

```
18/06/30 02:29:18 INFO impl.YarnClientImpl: Submitted application
application_1530285310196_0005
18/06/30 02:29:18 INFO mapreduce.Job: The url to track the job:
http://localhost:8088/proxy/application_1530285310196_0005/
18/06/30 02:29:18 INFO mapreduce.Job: Running job: job_1530285310196_0005
18/06/30 02:29:30 INFO mapreduce.Job: Job job_1530285310196_0005 running in uber mode : false
18/06/30 02:29:30 INFO mapreduce.Job:  map 0% reduce 0%
18/06/30 02:29:40 INFO mapreduce.Job:  map 100% reduce 0%
18/06/30 02:29:51 INFO mapreduce.Job:  map 100% reduce 100%
18/06/30 02:29:52 INFO mapreduce.Job: Job job_1530285310196_0005 completed successfully
18/06/30 02:29:52 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=46
                FILE: Number of bytes written=214987
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=210
                HDFS: Number of bytes written=18
                HDFS: Number of read operations=6
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
        Job Counters
                Launched map tasks=1
                Launched reduce tasks=1
                Data-local map tasks=1
                Total time spent by all maps in occupied slots (ms)=6512
                Total time spent by all reduces in occupied slots (ms)=8480
                Total time spent by all map tasks (ms)=6512
                Total time spent by all reduce tasks (ms)=8480
                Total vcore-milliseconds taken by all map tasks=6512
                Total vcore-milliseconds taken by all reduce tasks=8480
                Total megabyte-milliseconds taken by all map tasks=6668288
                Total megabyte-milliseconds taken by all reduce tasks=8683520
        Map-Reduce Framework
                Map input records=4
                Map output records=4
                Map output bytes=32
                Map output materialized bytes=46
                Input split bytes=137
                Combine input records=0
                Combine output records=0
                Reduce input groups=3
                Reduce shuffle bytes=46
                Reduce input records=4
                Reduce output records=3
                Spilled Records=8
                Shuffled Maps =1
                Failed Shuffles=0
```

```
		Merged Map outputs=1
		GC time elapsed (ms)=290
		CPU time spent (ms)=2010
		Physical memory (bytes) snapshot=236339200
		Virtual memory (bytes) snapshot=681746432
		Total committed heap usage (bytes)=139726848
	Shuffle Errors
		BAD_ID=0
		CONNECTION=0
		IO_ERROR=0
		WRONG_LENGTH=0
		WRONG_MAP=0
		WRONG_REDUCE=0
	File Input Format Counters
		Bytes Read=73
	File Output Format Counters
		Bytes Written=18
[acadgild@localhost ~]$ hdfs dfs -ls /user/acadgild/hadoopdata/assignment4/OutPutSharedSong
18/06/30 02:30:38 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
Found 2 items
-rw-r--r--   1 acadgild supergroup          0 2018-06-30 02:29
/user/acadgild/hadoopdata/assignment4/OutPutSharedSong/_SUCCESS
-rw-r--r--   1 acadgild supergroup         18 2018-06-30 02:29
/user/acadgild/hadoopdata/assignment4/OutPutSharedSong/part-r-00000
[acadgild@localhost ~]$ hdfs dfs -cat
/user/acadgild/hadoopdata/assignment4/OutPutSharedSong/part-r-00000
18/06/30 02:31:09 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your
platform... using builtin-java classes where applicable
222	0
223	0
225	2
```