Lab 1

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Aim: Word Count Using Map Reduce

Objectives:

1.To run Java command.

2. Copy Data file from Local to HDFS.

3. Generate a Word count query.

4. Display Word count of the file

Code & Output:

1. make a text file with some random words in it.

1.1 move file to hdfs

a. hadoop fs -put random.TXT NAME_OF_YOUR_FILE_1.TXT

2. Open terminal in that directory

3. CREATE TABLE FILES (line STRING);

4. LOAD DATA INPATH 'NAME_OF_YOUR_FILE_1.TXT' OVERWRITE INTO TABLE FILES;

5.
```
CREATE TABLE word_count AS
SELECT w.word, count(1) AS count from
(SELECT explode(split(line, ' '))) as WORDS from FILES) w
GROUP BY w.word
ORDER BY w.word;
```

6. SELECT * FROM word_count;

WCDriver

```
//Driver:

// Importing libraries

import java.io.IOException;

import org.apache.hadoop.conf.Configured;

import org.apache.hadoop.fs.Path;

import org.apache.hadoop.io.IntWritable;

import org.apache.hadoop.io.Text;

import org.apache.hadoop.mapred.FileInputFormat;

import org.apache.hadoop.mapred.FileOutputFormat;

import org.apache.hadoop.mapred.JobClient;

import org.apache.hadoop.mapred.JobConf;

import org.apache.hadoop.util.Tool;

import org.apache.hadoop.util.ToolRunner;


public class WCDriver extends Configured implements Tool {


        public int run(String args[]) throws IOException

        {

                if (args.length < 2)

                {

                        System.out.println("Please give valid inputs");

                        return -1;

                }


                JobConf conf = new JobConf(WCDriver.class);

                FileInputFormat.setInputPaths(conf, new Path(args[0]));

                FileOutputFormat.setOutputPath(conf, new Path(args[1]));

                conf.setMapperClass(WCMapper.class);

                conf.setReducerClass(WCReducer.class);

                conf.setMapOutputKeyClass(Text.class);

                conf.setMapOutputValueClass(IntWritable.class);

                conf.setOutputKeyClass(Text.class);

                conf.setOutputValueClass(IntWritable.class);

                JobClient.runJob(conf);
                return 0;
        }

        // Main Method
        public static void main(String args[]) throws Exception
        {
                int exitCode = ToolRunner.run(new WCDriver(), args);
                System.out.println(exitCode);
        }
}
```

WCMapper

Mapper:

```
// Importing libraries
import java.io.IOException;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.LongWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapred.MapReduceBase;
import org.apache.hadoop.mapred.Mapper;
import org.apache.hadoop.mapred.OutputCollector;
import org.apache.hadoop.mapred.Reporter;

public class WCMapper extends MapReduceBase implements Mapper<LongWritable,
                        Text, Text, IntWritable> {

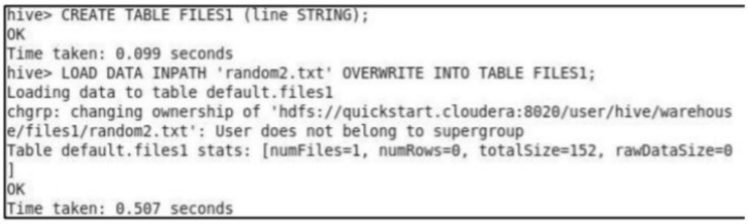
  // Map function
  public void map(LongWritable key, Text value, OutputCollector<Text,
         IntWritable> output, Reporter rep) throws IOException
  {
    String line = value.toString();
    // Splitting the line on spaces
    for (String word : line.split(" "))
    {
      if (word.length() > 0)
      {
            output.collect(new Text(word), new IntWritable(1));
         }
      }
   }
}
```

WCReducer

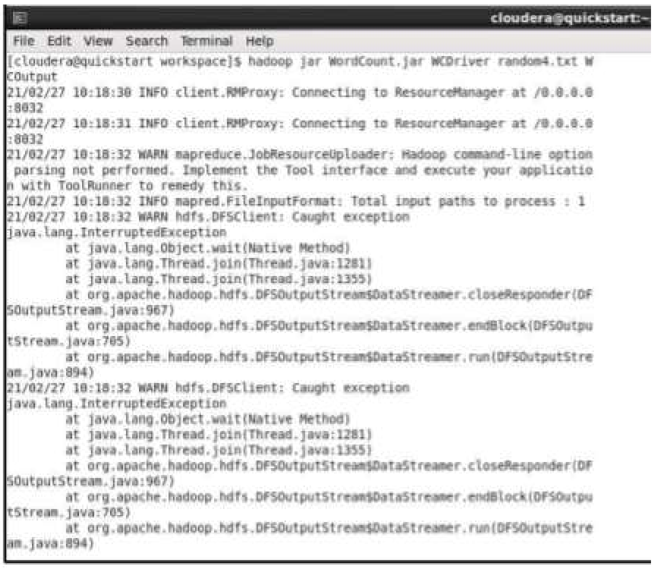
```
//Reducer:

// Importing libraries
import java.io.IOException;
import java.util.Iterator;
import org.apache.hadoop.io.IntWritable;
import org.apache.hadoop.io.Text;
import org.apache.hadoop.mapred.MapReduceBase;
import org.apache.hadoop.mapred.OutputCollector;
import org.apache.hadoop.mapred.Reducer;
import org.apache.hadoop.mapred.Reporter;

public class WCReducer extends MapReduceBase implements Reducer<Text,
                                    IntWritable, Text, IntWritable> {
    // Reduce function
    public void reduce(Text key, Iterator<IntWritable> value,
                OutputCollector<Text, IntWritable> output,
                            Reporter rep) throws IOException
    {
        int count = 0;
        // Counting the frequency of each words
        while (value.hasNext())
        {
            IntWritable i = value.next();
            count += i.get();
        }
        output.collect(key, new IntWritable(count));
    }
}
```



```
hive> CREATE TABLE FILES1 (line STRING);
OK
Time taken: 0.099 seconds
hive> LOAD DATA INPATH 'random2.txt' OVERWRITE INTO TABLE FILES1;
Loading data to table default.files1
chgrp: changing ownership of 'hdfs://quickstart.cloudera:8020/user/hive/warehous
e/files1/random2.txt': User does not belong to supergroup
Table default.files1 stats: [numFiles=1, numRows=0, totalSize=152, rawDataSize=0
]
OK
Time taken: 0.507 seconds
```



```
[cloudera@quickstart workspace]$ hadoop jar WordCount.jar WCDriver random4.txt W
COutput
21/02/27 10:18:30 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0
:8032
21/02/27 10:18:31 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0
:8032
21/02/27 10:18:32 WARN mapreduce.JobResourceUploader: Hadoop command-line option
 parsing not performed. Implement the Tool interface and execute your applicatio
n with ToolRunner to remedy this.
21/02/27 10:18:32 INFO mapred.FileInputFormat: Total input paths to process : 1
21/02/27 10:18:32 WARN hdfs.DFSClient: Caught exception
java.lang.InterruptedException
        at java.lang.Object.wait(Native Method)
        at java.lang.Thread.join(Thread.java:1281)
        at java.lang.Thread.join(Thread.java:1355)
        at org.apache.hadoop.hdfs.DFSOutputStream$DataStreamer.closeResponder(DF
SOutputStream.java:967)
        at org.apache.hadoop.hdfs.DFSOutputStream$DataStreamer.endBlock(DFSOutpu
tStream.java:705)
        at org.apache.hadoop.hdfs.DFSOutputStream$DataStreamer.run(DFSOutputStre
am.java:894)
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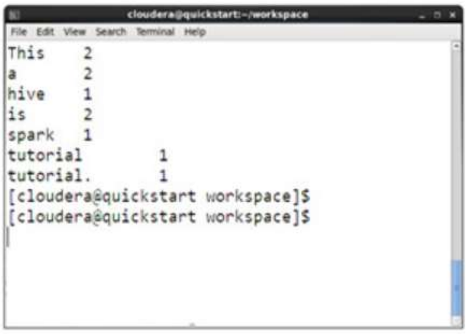

cloudera@quickstart:~/workspace
File Edit View Search Terminal Help

```
This    2
a       2
hive    1
is      2
spark   1
tutorial        1
tutorial.       1
[cloudera@quickstart workspace]$
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```