

1. Hadoop MapReduce Algorithm Implement MapReduce algorithm for finding Facebook common friend's problem and run the MapReduce job on Apache Hadoop. Write a report including your algorithm and result screenshots.

Description:**Algorithm Used:**

Mapper:

Map (person, friends list)

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Step 1: Pair the persons (in all combinations) Say A-> B C D, B-> A C D E, I will pair a combination as AB

Step 2: Map the common friends for A & B, in this case AB -> C, AB -> D

Step 3: Emit (Friends, Common Friends)

}

Reducer:

Reduce (Friends, Common Friends)

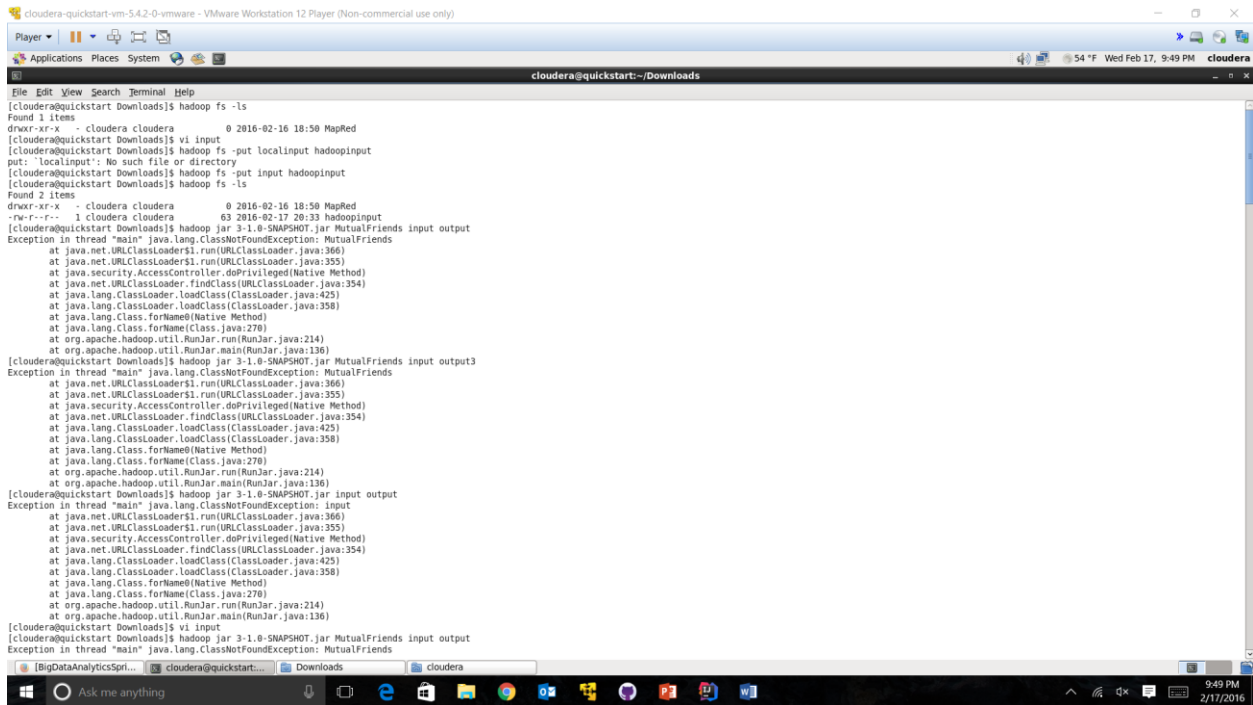
{

Step 1: Reduce the common friends in this case AB -> (C, D)

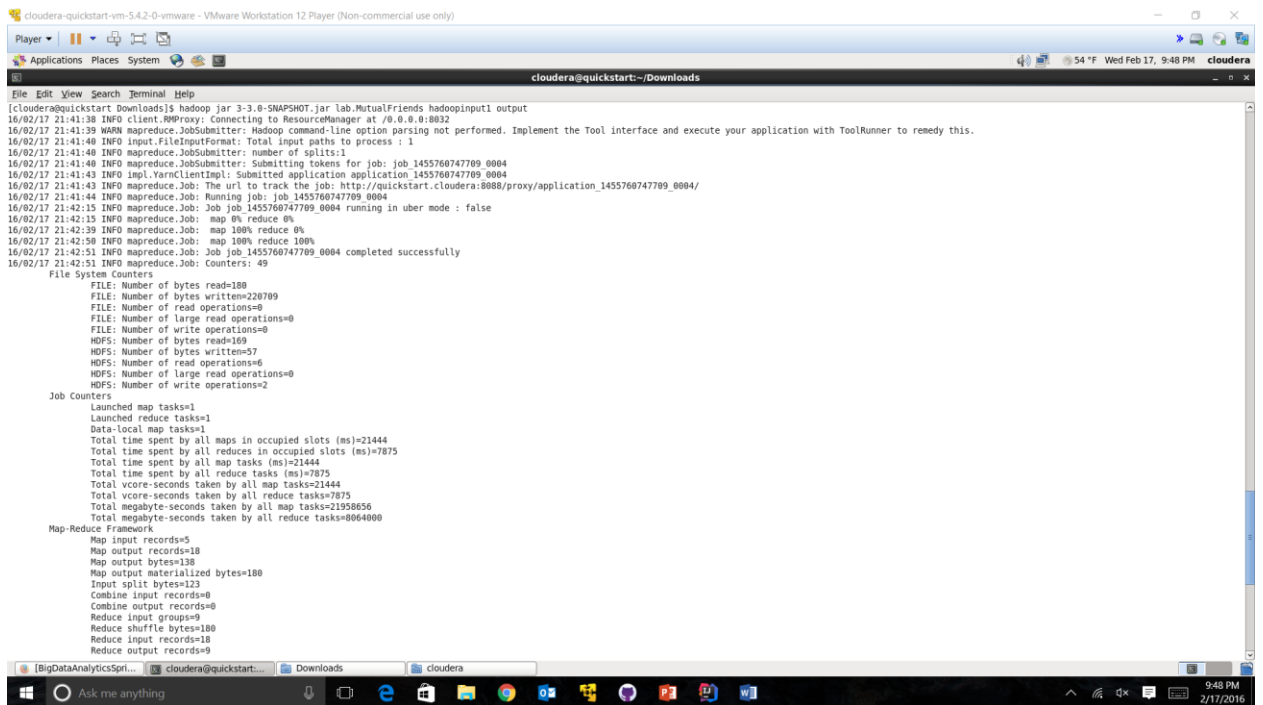
Step 2: Emit (Friends, Common Friends)

}

Screenshots:



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cloudera-quickstart-vm-5.4.2-0-vmware - VMware Workstation 12 Player (Non-commercial use only)
Player
Applications Places System
cloudera@quickstart:~/Downloads
File Edit View Search Terminal Help
[cloudera@quickstart Downloads]$ hadoop fs -ls
Found 1 items
drwxr-xr-x - cloudera cloudera 0 2016-02-16 18:50 MapRed
[cloudera@quickstart Downloads]$ vi input
[cloudera@quickstart Downloads]$ hadoop fs -put localinput hadoopinput
put: localinput: No such file or directory
[cloudera@quickstart Downloads]$ hadoop fs -put input hadoopinput
[cloudera@quickstart Downloads]$ hadoop fs -ls
Found 2 items
drwxr-xr-x - cloudera cloudera 0 2016-02-16 18:50 MapRed
-rw-r--r-- 1 cloudera cloudera 63 2016-02-17 20:33 hadoopinput
[cloudera@quickstart Downloads]$ hadoop jar 3-1.0-SNAPSHOT.jar MutualFriends input output
Exception in thread "main" java.lang.ClassNotFoundException: MutualFriends
    at java.net.URLClassLoader$1.run(URLClassLoader.java:366)
    at java.net.URLClassLoader$1.run(URLClassLoader.java:355)
    at java.security.AccessController.doPrivileged(Native Method)
    at java.net.URLClassLoader.findClass(URLClassLoader.java:354)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:425)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:358)
    at java.lang.Class.forName0(Native Method)
    at java.lang.Class.forName(Class.java:278)
    at org.apache.hadoop.util.RunJar.run(RunJar.java:214)
    at org.apache.hadoop.util.RunJar.main(RunJar.java:136)
[cloudera@quickstart Downloads]$ hadoop jar 3-1.0-SNAPSHOT.jar MutualFriends input output3
Exception in thread "main" java.lang.ClassNotFoundException: MutualFriends
    at java.net.URLClassLoader$1.run(URLClassLoader.java:366)
    at java.net.URLClassLoader$1.run(URLClassLoader.java:355)
    at java.security.AccessController.doPrivileged(Native Method)
    at java.net.URLClassLoader.findClass(URLClassLoader.java:354)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:425)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:358)
    at java.lang.Class.forName0(Native Method)
    at java.lang.Class.forName(Class.java:278)
    at org.apache.hadoop.util.RunJar.run(RunJar.java:214)
    at org.apache.hadoop.util.RunJar.main(RunJar.java:136)
[cloudera@quickstart Downloads]$ hadoop jar 3-1.0-SNAPSHOT.jar input output
Exception in thread "main" java.lang.ClassNotFoundException: input
    at java.net.URLClassLoader$1.run(URLClassLoader.java:366)
    at java.net.URLClassLoader$1.run(URLClassLoader.java:355)
    at java.security.AccessController.doPrivileged(Native Method)
    at java.net.URLClassLoader.findClass(URLClassLoader.java:354)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:425)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:358)
    at java.lang.Class.forName0(Native Method)
    at java.lang.Class.forName(Class.java:278)
    at org.apache.hadoop.util.RunJar.run(RunJar.java:214)
    at org.apache.hadoop.util.RunJar.main(RunJar.java:136)
[cloudera@quickstart Downloads]$ vi input
[cloudera@quickstart Downloads]$ hadoop jar 3-1.0-SNAPSHOT.jar MutualFriends input output
Exception in thread "main" java.lang.ClassNotFoundException: MutualFriends
```



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File Edit View Search Terminal Help
[cloudera@quickstart Downloads]$ hadoop jar 3-3.0-SNAPSHOT.jar lab.MutualFriends hadoopinput1 output
16/02/17 21:41:38 INFO client.RMProxy: Connecting to ResourceManager at /0.0.0.0:8032
16/02/17 21:41:39 WARN mapreduce.JobSubmitter: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
16/02/17 21:41:40 INFO input.FileInputFormat: Total input paths to process : 1
16/02/17 21:41:40 INFO mapreduce.JobSubmitter: number of splits:1
16/02/17 21:41:40 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1455760747709_0004
16/02/17 21:41:43 INFO impl.YarnClientImpl: Submitted application application_1455760747709_0004
16/02/17 21:41:43 INFO mapreduce.Job: The url to track the job: http://quickstart.cloudera:8080/proxy/application_1455760747709_0004/
16/02/17 21:41:44 INFO mapreduce.Job: Running job: job_1455760747709_0004
16/02/17 21:42:15 INFO mapreduce.Job: Job job_1455760747709_0004 running in uber mode : false
16/02/17 21:42:15 INFO mapreduce.Job: map 0% reduce 0%
16/02/17 21:42:39 INFO mapreduce.Job: map 100% reduce 0%
16/02/17 21:42:50 INFO mapreduce.Job: map 100% reduce 100%
16/02/17 21:42:51 INFO mapreduce.Job: Job job_1455760747709_0004 completed successfully
16/02/17 21:42:51 INFO mapreduce.Job: Counters: 49
File System Counters
  FILE: Number of bytes read=180
  FILE: Number of bytes written=228709
  FILE: Number of read operations=0
  FILE: Number of large read operations=0
  FILE: Number of write operations=0
  HDFS: Number of bytes read=169
  HDFS: Number of bytes written=57
  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)=21444
  Total time spent by all reduces in occupied slots (ms)=7875
  Total time spent by all map tasks (ms)=21444
  Total time spent by all reduce tasks (ms)=7875
  Total vcore-seconds taken by all map tasks=21444
  Total vcore-seconds taken by all reduce tasks=7875
  Total megabyte-seconds taken by all map tasks=2158656
  Total megabyte-seconds taken by all reduce tasks=8064000
Map-Reduce Framework
  Map input records=5
  Map output records=18
  Map output bytes=138
  Map output materialized bytes=180
  Input split bytes=123
  Combine input records=0
  Combine output records=0
  Reduce input groups=9
  Reduce shuffle bytes=180
  Reduce input records=18
  Reduce output records=0
```

```

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Total vcore-seconds taken by all reduce tasks=7875
Total megabyte-seconds taken by all map tasks=21958656
Total megabyte-seconds taken by all reduce tasks=8864800
Map-Reduce Framework
  Map input records=5
  Map output records=18
  Map output bytes=138
  Map output materialized bytes=188
  Input split bytes=123
  Combine input records=0
  Combine output records=0
  Reduce input groups=9
  Reduce shuffle bytes=180
  Reduce input records=18
  Reduce output records=9
  Spilled Records=36
  Shuffled Maps =1
  Failed Shuffles=0
  Merged Map outputs=1
  GC time elapsed (ms)=457
  CPU time spent (ms)=7818
  Physical memory (bytes) snapshot=346734592
  Virtual memory (bytes) snapshot=3887365120
  Total committed heap usage (bytes)=226562848
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=46
File Output Format Counters
  Bytes Written=57
[cloudera@quickstart Downloads]$ cat output
cat: output: No such file or directory
[cloudera@quickstart Downloads]$ hadoop cat output
Error: Could not find or load main class cat
[cloudera@quickstart Downloads]$ hadoop fs -cat output/*
AB      CD
AC      BD
AD      BC
BC      ADE
BD      ACE
BE      CD
CD      ABE
CE      BD
DE      BC
[cloudera@quickstart Downloads]$

```

2. Smartphone/Watch Application Implement a smartwatch/smartphone application using existing speech services/image services (e.g., IBM Alchemy api , Face++) related to your project.

Description:

I have created a Smartphone application using Camera API which calls the camera service in our smartphones and captures any image and show it on the screen.

Screenshots:

Screenshots will be provided shortly.