```
[root@sandbox lab]# hadoop jar /usr/hdp/2.4.0.0-169/hadoop-mapreduce/hadoop-streaming-2.7.1.2.4.0.0-169.jar -file /root/lab/q3_mapper.py -mapper q3_mapper.py -file  /root/lab/q3_reducer.py -reducer q3_red
ucer.py -input /user/root/dept_course.txt -output /user/root/l_streaming2_out
WARNING: Use "yarn jar" to launch YARN applications.
16/10/05 02:58:21 WARN streaming.StreamJob: -file option is deprecated, please use generic option -files instead.
packageJobJar: [/root/lab/q3_mapper.py, /root/lab/q3_reducer.py] [/usr/hdp/2.4.0.0-169/hadoop-mapreduce/hadoop-streaming-2.7.1.2.4.0.0-169.jar] /tmp/streamjob3547891781051037851.jar tmpDir=null
16/10/05 02:58:24 INFO impl.TimelineClientImpl: Timeline service address: http://sandbox.hortonworks.com:8188/ws/v1/timeline/
16/10/05 02:58:25 INFO client.RMProxy: Connecting to ResourceManager at sandbox.hortonworks.com/10.0.2.15:8050
16/10/05 02:58:26 INFO impl.TimelineClientImpl: Timeline service address: http://sandbox.hortonworks.com:8188/ws/v1/timeline/
16/10/05 02:58:26 INFO client.RMProxy: Connecting to ResourceManager at sandbox.hortonworks.com/10.0.2.15:8050
16/10/05 02:58:27 INFO mapred.FileInputFormat: Total input paths to process : 1
16/10/05 02:58:27 INFO mapreduce.JobSubmitter: number of splits:2
16/10/05 02:58:27 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1475591931336_0016
16/10/05 02:58:28 INFO impl.YarnClientImpl: Submitted application application_1475591931336_0016
16/10/05 02:58:28 INFO mapreduce.Job: The url to track the job: http://sandbox.hortonworks.com:8088/proxy/application_1475591931336_0016/
16/10/05 02:58:28 INFO mapreduce.Job: Running job: job_1475591931336_0016
16/10/05 02:58:38 INFO mapreduce.Job: Job job_1475591931336_0016 running in uber mode : false
16/10/05 02:58:38 INFO mapreduce.Job:   map 0% reduce 0%
16/10/05 02:58:47 INFO mapreduce.Job:   map 100% reduce 0%
16/10/05 02:58:55 INFO mapreduce.Job:   map 100% reduce 100%
16/10/05 02:58:55 INFO mapreduce.Job: Job job_1475591931336_0016 completed successfully
16/10/05 02:58:55 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=22279
                FILE: Number of bytes written=451858
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=30633
                HDFS: Number of bytes written=8312
                HDFS: Number of read operations=9
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=2
        Job Counters
                Launched map tasks=2
                Launched reduce tasks=1
                Data-local map tasks=2
                Total time spent by all maps in occupied slots (ms)=14549
                Total time spent by all reduces in occupied slots (ms)=5530
                Total time spent by all map tasks (ms)=14549
                Total time spent by all reduce tasks (ms)=5530
                Total vcore-seconds taken by all map tasks=14549
                Total vcore-seconds taken by all reduce tasks=5530
                Total megabyte-seconds taken by all map tasks=3637250
                Total megabyte-seconds taken by all reduce tasks=1382500
        Map-Reduce Framework
                Map input records=1001
                Map output records=1001
                Map output bytes=20271
                Map output materialized bytes=22285
                Input split bytes=226
                Combine input records=0
                Combine output records=0
                Reduce input groups=988
                Reduce shuffle bytes=22285
                Reduce input records=1001
                Reduce output records=467
                Spilled Records=2002
                Shuffled Maps =2
                Failed Shuffles=0
                Merged Map outputs=2
                GC time elapsed (ms)=160
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        Map-Reduce Framework
                Map input records=1001
                Map output records=1001
                Map output bytes=20271
                Map output materialized bytes=22285
                Input split bytes=226
                Combine input records=0
                Combine output records=0
                Reduce input groups=988
                Reduce shuffle bytes=22285
                Reduce input records=1001
                Reduce output records=467
                Spilled Records=2002
                Shuffled Maps =2
                Failed Shuffles=0
                Merged Map outputs=2
                GC time elapsed (ms)=160
                CPU time spent (ms)=2810
                Physical memory (bytes) snapshot=548683776
                Virtual memory (bytes) snapshot=2528329728
                Total committed heap usage (bytes)=357564416
        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=30407
        File Output Format Counters
                Bytes Written=8312
16/10/05 02:58:55 INFO streaming.StreamJob: Output directory: /user/root/l_streaming2_out
[[root@sandbox lab]# hadoop fs -cat /user/root/l_streaming2_out/part-00000 | tail -n 15
9132    QA      Math
9142    QA      History
9153    Research        Math
9157    Marketing       Math
9219    QA      Math
9263    Marketing       Math
932     Research        Math
944     Sales   Math
9481    QA      Math
9674    Marketing       Math
968     Research        Math
9755    QA      History
9787    Research        Math
9965    Marketing       Math
9968    QA      History
[root@sandbox lab]# hadoop fs -cat /user/root/l_streaming2_out/part-00000 | tail -n 15
```