

Big Data



Big Data Engineering with Hadoop & Spark

Assignment on YARN



Session 3: Assignment 3.1

This assignment is aimed at consolidating the concepts that was learned during the YARN session of the course.

Task 1:

- Execute WordMedian, WordMean, WordStandardDeviation programs using “hadoop-mapreduce-examples-2.9.0.jar” files present in your AcadGild VM.

Solution:

- 2 files were considered for the execution of programs.
 - **NewText.txt** which was less than **1MB**
 - **file327.txt** which was of **327MB** in size
- Command to execute **WordMedian**
`hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordmedian <input path> <output path>`
- Command to execute **WordMean**
`hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordmean <input path> <output path>`
- Command to execute **WordStandardDeviation**
`hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordstandarddeviation <input path> <output path>`

- Output Screenshots for “*NewText.txt*”
 - **WordMedian** program execution

```
[acadgild@localhost ~]$
[acadgild@localhost ~]$ hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordmedian NewText.txt /NWOutput
18/07/11 15:55:53 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/07/11 15:55:57 INFO client.RMProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/07/11 15:56:00 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
18/07/11 15:56:02 INFO input.FileInputFormat: Total input paths to process : 1
18/07/11 15:56:02 INFO mapreduce.JobSubmitter: number of splits:1
18/07/11 15:56:03 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1531291900377_0007
18/07/11 15:56:04 INFO impl.YarnClientImpl: Submitted application application_1531291900377_0007
18/07/11 15:56:04 INFO mapreduce.Job: The url to track the job: http://localhost:8088/proxy/application_1531291900377_0007/
18/07/11 15:56:04 INFO mapreduce.Job: Running job: job_1531291900377_0007
18/07/11 15:56:37 INFO mapreduce.Job: Job job_1531291900377_0007 running in uber mode : false
18/07/11 15:56:37 INFO mapreduce.Job: map 0% reduce 0%
18/07/11 15:56:56 INFO mapreduce.Job: map 100% reduce 0%
18/07/11 15:57:18 INFO mapreduce.Job: map 100% reduce 100%
18/07/11 15:57:19 INFO mapreduce.Job: Job job_1531291900377_0007 completed successfully
18/07/11 15:57:20 INFO mapreduce.Job: Counters: 49
  File System Counters
    FILE: Number of bytes read=76
    FILE: Number of bytes written=215227
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=187
    HDFS: Number of bytes written=28
    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)=16927
    Total time spent by all reduces in occupied slots (ms)=18221
    Total time spent by all map tasks (ms)=16927
    Total time spent by all reduce tasks (ms)=18221
```

```
    Total vcore-milliseconds taken by all map tasks=16927
    Total vcore-milliseconds taken by all reduce tasks=18221
    Total megabyte-milliseconds taken by all map tasks=17333248
    Total megabyte-milliseconds taken by all reduce tasks=18658304
  Map-Reduce Framework
    Map input records=2
    Map output records=12
    Map output bytes=96
    Map output materialized bytes=76
    Input split bytes=112
    Combine input records=12
    Combine output records=7
    Reduce input groups=7
    Reduce shuffle bytes=76
    Reduce input records=7
    Reduce output records=7
    Spilled Records=14
    Shuffled Maps =1
    Failed Shuffles=0
    Merged Map outputs=1
    GC time elapsed (ms)=556
    CPU time spent (ms)=4720
    Physical memory (bytes) snapshot=320262144
    Virtual memory (bytes) snapshot=4118237184
    Total committed heap usage (bytes)=222429184
  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=75
  File Output Format Counters
    Bytes Written=28
The median is: 5
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$
```


○ WordMean program execution

```
[acadgild@localhost ~]$
[acadgild@localhost ~]$ hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordmean NewText.txt /NWOutputMean
18/07/11 16:00:03 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/07/11 16:00:07 INFO client.RMPProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/07/11 16:00:12 INFO input.FileInputFormat: Total input paths to process : 1
18/07/11 16:00:13 INFO mapreduce.JobSubmitter: number of splits:1
18/07/11 16:00:13 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1531291900377_0008
18/07/11 16:00:14 INFO impl.YarnClientImpl: Submitted application application_1531291900377_0008
18/07/11 16:00:15 INFO mapreduce.Job: The url to track the job: http://localhost:8088/proxy/application_1531291900377_0008/
18/07/11 16:00:15 INFO mapreduce.Job: Running job: job_1531291900377_0008
18/07/11 16:00:42 INFO mapreduce.Job: Job job_1531291900377_0008 running in uber mode : false
18/07/11 16:00:42 INFO mapreduce.Job: map 0% reduce 0%
18/07/11 16:01:02 INFO mapreduce.Job: map 100% reduce 0%
18/07/11 16:01:22 INFO mapreduce.Job: map 100% reduce 100%
18/07/11 16:01:23 INFO mapreduce.Job: Job job_1531291900377_0008 completed successfully
18/07/11 16:01:24 INFO mapreduce.Job: Counters: 49
  File System Counters
    FILE: Number of bytes read=39
    FILE: Number of bytes written=215425
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=187
    HDFS: Number of bytes written=19
    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)=16311
    Total time spent by all reduces in occupied slots (ms)=18014
    Total time spent by all map tasks (ms)=16311
    Total time spent by all reduce tasks (ms)=18014
    Total vcore-milliseconds taken by all map tasks=16311
    Total vcore-milliseconds taken by all reduce tasks=18014
```

```
    Total vcore-milliseconds taken by all map tasks=16311
    Total vcore-milliseconds taken by all reduce tasks=18014
    Total megabyte-milliseconds taken by all map tasks=16702464
    Total megabyte-milliseconds taken by all reduce tasks=18446336
  Map-Reduce Framework
    Map input records=2
    Map output records=24
    Map output bytes=348
    Map output materialized bytes=39
    Input split bytes=112
    Combine input records=24
    Combine output records=2
    Reduce input groups=2
    Reduce shuffle bytes=39
    Reduce input records=2
    Reduce output records=2
    Spilled Records=4
    Shuffled Maps =1
    Failed Shuffles=0
    Merged Map outputs=1
    GC time elapsed (ms)=453
    CPU time spent (ms)=4470
    Physical memory (bytes) snapshot=320102400
    Virtual memory (bytes) snapshot=4117938176
    Total committed heap usage (bytes)=222429184
  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=75
  File Output Format Counters
    Bytes Written=19
The mean is: 5.166666666666667
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$
```

○ WordStandardDeviation program execution

```
[acadgild@localhost ~]$
[acadgild@localhost ~]$ hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordstandarddeviation NewText.txt /NWOutputSD
18/07/11 16:03:42 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/07/11 16:03:46 INFO client.RMProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/07/11 16:03:51 INFO input.FileInputFormat: Total input paths to process : 1
18/07/11 16:03:51 INFO mapreduce.JobSubmitter: number of splits:1
18/07/11 16:03:52 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1531291900377_0009
18/07/11 16:03:53 INFO impl.YarnClientImpl: Submitted application application_1531291900377_0009
18/07/11 16:03:53 INFO mapreduce.Job: The url to track the job: http://localhost:8088/proxy/application_1531291900377_0009/
18/07/11 16:03:53 INFO mapreduce.Job: Running job: job_1531291900377_0009
18/07/11 16:04:21 INFO mapreduce.Job: Job job_1531291900377_0009 running in uber mode : false
18/07/11 16:04:21 INFO mapreduce.Job: map 0% reduce 0%
18/07/11 16:04:40 INFO mapreduce.Job: map 100% reduce 0%
18/07/11 16:05:02 INFO mapreduce.Job: map 100% reduce 100%
18/07/11 16:05:03 INFO mapreduce.Job: Job job_1531291900377_0009 completed successfully
18/07/11 16:05:04 INFO mapreduce.Job: Counters: 49

  File System Counters
    FILE: Number of bytes read=56
    FILE: Number of bytes written=215615
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=187
    HDFS: Number of bytes written=30
    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)=15989
    Total time spent by all reduces in occupied slots (ms)=17920
    Total time spent by all map tasks (ms)=15989
    Total time spent by all reduce tasks (ms)=17920
    Total vcore-milliseconds taken by all map tasks=15989
    Total vcore-milliseconds taken by all reduce tasks=17920
```

```
    Total vcore-milliseconds taken by all map tasks=15989
    Total vcore-milliseconds taken by all reduce tasks=17920
    Total megabyte-milliseconds taken by all map tasks=16372736
    Total megabyte-milliseconds taken by all reduce tasks=18350080

  Map-Reduce Framework
    Map input records=2
    Map output records=36
    Map output bytes=528
    Map output materialized bytes=56
    Input split bytes=112
    Combine input records=36
    Combine output records=3
    Reduce input groups=3
    Reduce shuffle bytes=56
    Reduce input records=3
    Reduce output records=3
    Spilled Records=6
    Shuffled Maps =1
    Failed Shuffles=0
    Merged Map outputs=1
    GC time elapsed (ms)=456
    CPU time spent (ms)=4620
    Physical memory (bytes) snapshot=320851968
    Virtual memory (bytes) snapshot=4118224896
    Total committed heap usage (bytes)=222429184

  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=75
  File Output Format Counters
    Bytes Written=30
The standard deviation is: 2.074983266331455
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$
```

– Output Screenshots for “file327.txt”

○ WordMedian program execution

```
[acadgild@localhost ~]$
[acadgild@localhost ~]$ hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordmedian /hadoopdata/wordcount/file327.txt /hadoopdata/F327WM
18/07/11 16:13:30 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/07/11 16:13:33 INFO client.RMPProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/07/11 16:13:37 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool interface and execute your application with ToolRunner to remedy this.
18/07/11 16:13:38 INFO input.FileInputFormat: Total input paths to process : 1
18/07/11 16:13:39 INFO mapreduce.JobSubmitter: number of splits:3
18/07/11 16:13:40 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1531291900377_0010
18/07/11 16:13:41 INFO impl.YarnClientImpl: Submitted application application_1531291900377_0010
18/07/11 16:13:41 INFO mapreduce.Job: The url to track the job: http://localhost:8088/proxy/application_1531291900377_0010/
18/07/11 16:13:41 INFO mapreduce.Job: Running job: job_1531291900377_0010
18/07/11 16:14:08 INFO mapreduce.Job: Job job_1531291900377_0010 running in uber mode : false
18/07/11 16:14:08 INFO mapreduce.Job: map 0% reduce 0%
18/07/11 16:15:05 INFO mapreduce.Job: map 1% reduce 0%
18/07/11 16:15:12 INFO mapreduce.Job: map 2% reduce 0%
18/07/11 16:15:16 INFO mapreduce.Job: map 4% reduce 0%
18/07/11 16:15:19 INFO mapreduce.Job: map 5% reduce 0%
18/07/11 16:15:23 INFO mapreduce.Job: map 7% reduce 0%
18/07/11 16:15:26 INFO mapreduce.Job: map 9% reduce 0%
18/07/11 16:15:30 INFO mapreduce.Job: map 10% reduce 0%
18/07/11 16:15:33 INFO mapreduce.Job: map 12% reduce 0%
18/07/11 16:15:37 INFO mapreduce.Job: map 13% reduce 0%
18/07/11 16:15:40 INFO mapreduce.Job: map 14% reduce 0%
18/07/11 16:16:03 INFO mapreduce.Job: map 15% reduce 0%
18/07/11 16:16:07 INFO mapreduce.Job: map 16% reduce 0%
18/07/11 16:16:08 INFO mapreduce.Job: map 17% reduce 0%
18/07/11 16:16:10 INFO mapreduce.Job: map 19% reduce 0%
18/07/11 16:16:11 INFO mapreduce.Job: map 20% reduce 0%
18/07/11 16:16:15 INFO mapreduce.Job: map 21% reduce 0%
18/07/11 16:16:17 INFO mapreduce.Job: map 22% reduce 0%
18/07/11 16:16:20 INFO mapreduce.Job: map 23% reduce 0%
18/07/11 16:16:21 INFO mapreduce.Job: map 24% reduce 0%
18/07/11 16:16:25 INFO mapreduce.Job: map 25% reduce 0%
18/07/11 16:16:28 INFO mapreduce.Job: map 26% reduce 0%
18/07/11 16:16:50 INFO mapreduce.Job: map 28% reduce 0%
18/07/11 16:16:51 INFO mapreduce.Job: map 30% reduce 0%
```

```
18/07/11 16:16:51 INFO mapreduce.Job: map 30% reduce 0%
18/07/11 16:16:53 INFO mapreduce.Job: map 31% reduce 0%
18/07/11 16:16:54 INFO mapreduce.Job: map 32% reduce 0%
18/07/11 16:16:56 INFO mapreduce.Job: map 33% reduce 0%
18/07/11 16:16:57 INFO mapreduce.Job: map 34% reduce 0%
18/07/11 16:16:59 INFO mapreduce.Job: map 35% reduce 0%
18/07/11 16:17:00 INFO mapreduce.Job: map 36% reduce 0%
18/07/11 16:17:03 INFO mapreduce.Job: map 37% reduce 0%
18/07/11 16:17:08 INFO mapreduce.Job: map 38% reduce 0%
18/07/11 16:17:12 INFO mapreduce.Job: map 39% reduce 0%
18/07/11 16:17:21 INFO mapreduce.Job: map 41% reduce 0%
18/07/11 16:17:24 INFO mapreduce.Job: map 42% reduce 0%
18/07/11 16:17:29 INFO mapreduce.Job: map 43% reduce 0%
18/07/11 16:17:35 INFO mapreduce.Job: map 55% reduce 0%
18/07/11 16:17:38 INFO mapreduce.Job: map 56% reduce 0%
18/07/11 16:17:42 INFO mapreduce.Job: map 57% reduce 0%
18/07/11 16:18:09 INFO mapreduce.Job: map 58% reduce 0%
18/07/11 16:18:16 INFO mapreduce.Job: map 59% reduce 0%
18/07/11 16:18:23 INFO mapreduce.Job: map 60% reduce 0%
18/07/11 16:18:29 INFO mapreduce.Job: map 61% reduce 0%
18/07/11 16:18:36 INFO mapreduce.Job: map 62% reduce 0%
18/07/11 16:18:46 INFO mapreduce.Job: map 63% reduce 11%
18/07/11 16:19:10 INFO mapreduce.Job: map 64% reduce 11%
18/07/11 16:19:13 INFO mapreduce.Job: map 65% reduce 11%
18/07/11 16:19:20 INFO mapreduce.Job: map 66% reduce 11%
18/07/11 16:19:27 INFO mapreduce.Job: map 67% reduce 11%
18/07/11 16:19:35 INFO mapreduce.Job: map 68% reduce 11%
18/07/11 16:20:02 INFO mapreduce.Job: map 69% reduce 11%
18/07/11 16:20:06 INFO mapreduce.Job: map 70% reduce 11%
18/07/11 16:20:09 INFO mapreduce.Job: map 71% reduce 11%
18/07/11 16:20:16 INFO mapreduce.Job: map 72% reduce 11%
18/07/11 16:20:22 INFO mapreduce.Job: map 73% reduce 11%
18/07/11 16:20:29 INFO mapreduce.Job: map 74% reduce 11%
18/07/11 16:20:52 INFO mapreduce.Job: map 75% reduce 11%
18/07/11 16:20:56 INFO mapreduce.Job: map 76% reduce 11%
18/07/11 16:20:59 INFO mapreduce.Job: map 77% reduce 11%
18/07/11 16:21:02 INFO mapreduce.Job: map 78% reduce 11%
18/07/11 16:21:24 INFO mapreduce.Job: map 89% reduce 11%
18/07/11 16:21:26 INFO mapreduce.Job: map 100% reduce 11%
```



```

18/07/11 16:21:28 INFO mapreduce.Job: map 100% reduce 100%
18/07/11 16:21:30 INFO mapreduce.Job: Job job_1531291900377_0010 completed successfully
18/07/11 16:21:31 INFO mapreduce.Job: Counters: 50
  File System Counters
    FILE: Number of bytes read=1506
    FILE: Number of bytes written=431973
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=327164261
    HDFS: Number of bytes written=61
    HDFS: Number of read operations=12
    HDFS: Number of large read operations=0
    HDFS: Number of write operations=2
  Job Counters
    Killed map tasks=2
    Launched map tasks=5
    Launched reduce tasks=1
    Data-local map tasks=5
    Total time spent by all maps in occupied slots (ms)=1508112
    Total time spent by all reduces in occupied slots (ms)=230759
    Total time spent by all map tasks (ms)=1508112
    Total time spent by all reduce tasks (ms)=230759
    Total vcore-milliseconds taken by all map tasks=1508112
    Total vcore-milliseconds taken by all reduce tasks=230759
    Total megabyte-milliseconds taken by all map tasks=1544306688
    Total megabyte-milliseconds taken by all reduce tasks=236297216
  Map-Reduce Framework
    Map input records=8388608
    Map output records=67108864
    Map output bytes=536870912
    Map output materialized bytes=198
    Input split bytes=357
    Combine input records=67108984
    Combine output records=138
    Reduce input groups=6
    Reduce shuffle bytes=198
    Reduce input records=18
    Reduce output records=6

```

```

    Total vcore-milliseconds taken by all map tasks=1508112
    Total vcore-milliseconds taken by all reduce tasks=230759
    Total megabyte-milliseconds taken by all map tasks=1544306688
    Total megabyte-milliseconds taken by all reduce tasks=236297216
  Map-Reduce Framework
    Map input records=8388608
    Map output records=67108864
    Map output bytes=536870912
    Map output materialized bytes=198
    Input split bytes=357
    Combine input records=67108984
    Combine output records=138
    Reduce input groups=6
    Reduce shuffle bytes=198
    Reduce input records=18
    Reduce output records=6
    Spilled Records=156
    Shuffled Maps =3
    Failed Shuffles=0
    Merged Map outputs=3
    GC time elapsed (ms)=8835
    CPU time spent (ms)=221590
    Physical memory (bytes) snapshot=801980416
    Virtual memory (bytes) snapshot=8230801408
    Total committed heap usage (bytes)=541327360
  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=327163904
  File Output Format Counters
    Bytes Written=61
The median is: 3
You have new mail in /var/spool/mail/acadgild
acadgild@localhost ~]$

```


○ WordMean program execution

```
[acadgild@localhost ~]$
[acadgild@localhost ~]$ hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordmean /hadoopdata/wordcount/file327.txt /hadoopdata/F327WMn
18/07/11 16:23:52 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/07/11 16:23:55 INFO client.RMPProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/07/11 16:24:01 INFO input.FileInputFormat: Total input paths to process : 1
18/07/11 16:24:01 INFO mapreduce.JobSubmitter: number of splits:3
18/07/11 16:24:02 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1531291900377_0011
18/07/11 16:24:03 INFO impl.YarnClientImpl: Submitted application application_1531291900377_0011
18/07/11 16:24:03 INFO mapreduce.Job: The url to track the job: http://localhost:8088/proxy/application_1531291900377_0011/
18/07/11 16:24:03 INFO mapreduce.Job: Running job: job_1531291900377_0011
18/07/11 16:24:30 INFO mapreduce.Job: Job job_1531291900377_0011 running in uber mode : false
18/07/11 16:24:30 INFO mapreduce.Job: map 0% reduce 0%
18/07/11 16:25:29 INFO mapreduce.Job: map 1% reduce 0%
18/07/11 16:25:33 INFO mapreduce.Job: map 2% reduce 0%
18/07/11 16:25:36 INFO mapreduce.Job: map 4% reduce 0%
18/07/11 16:25:40 INFO mapreduce.Job: map 5% reduce 0%
18/07/11 16:25:44 INFO mapreduce.Job: map 6% reduce 0%
18/07/11 16:26:07 INFO mapreduce.Job: map 7% reduce 0%
18/07/11 16:26:11 INFO mapreduce.Job: map 9% reduce 0%
18/07/11 16:26:14 INFO mapreduce.Job: map 10% reduce 0%
18/07/11 16:26:18 INFO mapreduce.Job: map 11% reduce 0%
18/07/11 16:26:34 INFO mapreduce.Job: map 14% reduce 0%
18/07/11 16:26:37 INFO mapreduce.Job: map 15% reduce 0%
18/07/11 16:26:51 INFO mapreduce.Job: map 17% reduce 0%
18/07/11 16:26:54 INFO mapreduce.Job: map 19% reduce 0%
18/07/11 16:26:57 INFO mapreduce.Job: map 20% reduce 0%
18/07/11 16:27:10 INFO mapreduce.Job: map 23% reduce 0%
18/07/11 16:27:13 INFO mapreduce.Job: map 24% reduce 0%
18/07/11 16:27:14 INFO mapreduce.Job: map 25% reduce 0%
18/07/11 16:27:30 INFO mapreduce.Job: map 27% reduce 0%
18/07/11 16:27:31 INFO mapreduce.Job: map 28% reduce 0%
18/07/11 16:27:33 INFO mapreduce.Job: map 29% reduce 0%
18/07/11 16:27:34 INFO mapreduce.Job: map 30% reduce 0%
18/07/11 16:27:48 INFO mapreduce.Job: map 31% reduce 0%
18/07/11 16:27:49 INFO mapreduce.Job: map 33% reduce 0%
18/07/11 16:27:51 INFO mapreduce.Job: map 34% reduce 0%
18/07/11 16:28:08 INFO mapreduce.Job: map 37% reduce 0%
```

```
18/07/11 16:28:08 INFO mapreduce.Job: map 37% reduce 0%
18/07/11 16:28:11 INFO mapreduce.Job: map 38% reduce 0%
18/07/11 16:28:12 INFO mapreduce.Job: map 39% reduce 0%
18/07/11 16:28:27 INFO mapreduce.Job: map 42% reduce 0%
18/07/11 16:28:30 INFO mapreduce.Job: map 43% reduce 0%
18/07/11 16:28:34 INFO mapreduce.Job: map 54% reduce 0%
18/07/11 16:28:43 INFO mapreduce.Job: map 55% reduce 0%
18/07/11 16:28:49 INFO mapreduce.Job: map 56% reduce 0%
18/07/11 16:29:20 INFO mapreduce.Job: map 57% reduce 0%
18/07/11 16:29:23 INFO mapreduce.Job: map 58% reduce 0%
18/07/11 16:29:47 INFO mapreduce.Job: map 58% reduce 11%
18/07/11 16:29:53 INFO mapreduce.Job: map 59% reduce 11%
18/07/11 16:29:58 INFO mapreduce.Job: map 60% reduce 11%
18/07/11 16:30:05 INFO mapreduce.Job: map 61% reduce 11%
18/07/11 16:30:29 INFO mapreduce.Job: map 62% reduce 11%
18/07/11 16:30:38 INFO mapreduce.Job: map 63% reduce 11%
18/07/11 16:30:58 INFO mapreduce.Job: map 64% reduce 11%
18/07/11 16:31:05 INFO mapreduce.Job: map 65% reduce 11%
18/07/11 16:31:27 INFO mapreduce.Job: map 66% reduce 11%
18/07/11 16:31:31 INFO mapreduce.Job: map 67% reduce 11%
18/07/11 16:31:50 INFO mapreduce.Job: map 68% reduce 11%
18/07/11 16:31:55 INFO mapreduce.Job: map 69% reduce 11%
18/07/11 16:32:17 INFO mapreduce.Job: map 70% reduce 11%
18/07/11 16:32:21 INFO mapreduce.Job: map 71% reduce 11%
18/07/11 16:32:28 INFO mapreduce.Job: map 72% reduce 11%
18/07/11 16:32:44 INFO mapreduce.Job: map 73% reduce 11%
18/07/11 16:32:51 INFO mapreduce.Job: map 74% reduce 11%
18/07/11 16:33:09 INFO mapreduce.Job: map 75% reduce 11%
18/07/11 16:33:13 INFO mapreduce.Job: map 76% reduce 11%
18/07/11 16:33:28 INFO mapreduce.Job: map 77% reduce 11%
18/07/11 16:33:36 INFO mapreduce.Job: map 78% reduce 11%
18/07/11 16:33:47 INFO mapreduce.Job: map 89% reduce 11%
18/07/11 16:33:49 INFO mapreduce.Job: map 89% reduce 22%
18/07/11 16:33:51 INFO mapreduce.Job: map 100% reduce 22%
18/07/11 16:33:52 INFO mapreduce.Job: map 100% reduce 67%
18/07/11 16:33:54 INFO mapreduce.Job: map 100% reduce 100%
18/07/11 16:33:55 INFO mapreduce.Job: Job job_1531291900377_0011 completed successfully
18/07/11 16:33:56 INFO mapreduce.Job: Counters: 50
File System Counters
```

```

18/07/11 16:33:55 INFO mapreduce.Job: Job job_1531291900377_0011 completed successfully
18/07/11 16:33:56 INFO mapreduce.Job: Counters: 50
  File System Counters
    FILE: Number of bytes read=2976
    FILE: Number of bytes written=433894
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=327164261
    HDFS: Number of bytes written=32
    HDFS: Number of read operations=12
    HDFS: Number of large read operations=0
    HDFS: Number of write operations=2
  Job Counters
    Killed map tasks=2
    Launched map tasks=5
    Launched reduce tasks=1
    Data-local map tasks=5
    Total time spent by all maps in occupied slots (ms)=1959899
    Total time spent by all reduces in occupied slots (ms)=316264
    Total time spent by all map tasks (ms)=1959899
    Total time spent by all reduce tasks (ms)=316264
    Total vcore-milliseconds taken by all map tasks=1959899
    Total vcore-milliseconds taken by all reduce tasks=316264
    Total megabyte-milliseconds taken by all map tasks=2006936576
    Total megabyte-milliseconds taken by all reduce tasks=323854336
  Map-Reduce Framework
    Map input records=8388608
    Map output records=134217728
    Map output bytes=1946157056
    Map output materialized bytes=117
    Input split bytes=357
    Combine input records=134217830
    Combine output records=108
    Reduce input groups=2
    Reduce shuffle bytes=117
    Reduce input records=6
    Reduce output records=2
    Spilled Records=166

```

```

    Total vcore-milliseconds taken by all map tasks=1959899
    Total vcore-milliseconds taken by all reduce tasks=316264
    Total megabyte-milliseconds taken by all map tasks=2006936576
    Total megabyte-milliseconds taken by all reduce tasks=323854336
  Map-Reduce Framework
    Map input records=8388608
    Map output records=134217728
    Map output bytes=1946157056
    Map output materialized bytes=117
    Input split bytes=357
    Combine input records=134217830
    Combine output records=108
    Reduce input groups=2
    Reduce shuffle bytes=117
    Reduce input records=6
    Reduce output records=2
    Spilled Records=166
    Shuffled Maps =3
    Failed Shuffles=0
    Merged Map outputs=3
    GC time elapsed (ms)=8678
    CPU time spent (ms)=298810
    Physical memory (bytes) snapshot=776552448
    Virtual memory (bytes) snapshot=8227274752
    Total committed heap usage (bytes)=541327360
  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=327163904
  File Output Format Counters
    Bytes Written=32
The mean is: 3.875
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$

```


○ WordStandardDeviation program execution

```
[acadgild@localhost ~]$
[acadgild@localhost ~]$ hadoop jar /home/acadgild/install/hadoop/hadoop-2.6.5/share/hadoop/mapreduce/hadoop-mapreduce-examples-2.6.5.jar wordstandarddeviation /hadoopdata/wordcount/file327.txt /hadoopdata/F327WSD
18/07/11 16:35:45 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
18/07/11 16:35:48 INFO client.RMProxy: Connecting to ResourceManager at localhost/127.0.0.1:8032
18/07/11 16:35:53 INFO input.FileInputFormat: Total input paths to process : 1
18/07/11 16:35:54 INFO mapreduce.JobSubmitter: number of splits:3
18/07/11 16:35:54 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1531291900377_0012
18/07/11 16:35:55 INFO impl.YarnClientImpl: Submitted application application_1531291900377_0012
18/07/11 16:35:56 INFO mapreduce.Job: The url to track the job: http://localhost:8088/proxy/application_1531291900377_0012/
18/07/11 16:35:56 INFO mapreduce.Job: Running job: job_1531291900377_0012
18/07/11 16:36:24 INFO mapreduce.Job: Job job_1531291900377_0012 running in uber mode : false
18/07/11 16:36:24 INFO mapreduce.Job: map 0% reduce 0%
18/07/11 16:37:20 INFO mapreduce.Job: map 1% reduce 0%
18/07/11 16:37:27 INFO mapreduce.Job: map 3% reduce 0%
18/07/11 16:37:34 INFO mapreduce.Job: map 4% reduce 0%
18/07/11 16:38:02 INFO mapreduce.Job: map 5% reduce 0%
18/07/11 16:38:08 INFO mapreduce.Job: map 6% reduce 0%
18/07/11 16:38:14 INFO mapreduce.Job: map 7% reduce 0%
18/07/11 16:38:24 INFO mapreduce.Job: map 8% reduce 0%
18/07/11 16:38:28 INFO mapreduce.Job: map 9% reduce 0%
18/07/11 16:38:34 INFO mapreduce.Job: map 10% reduce 0%
18/07/11 16:38:44 INFO mapreduce.Job: map 11% reduce 0%
18/07/11 16:38:48 INFO mapreduce.Job: map 12% reduce 0%
18/07/11 16:38:53 INFO mapreduce.Job: map 13% reduce 0%
18/07/11 16:39:00 INFO mapreduce.Job: map 14% reduce 0%
18/07/11 16:39:07 INFO mapreduce.Job: map 15% reduce 0%
18/07/11 16:39:12 INFO mapreduce.Job: map 16% reduce 0%
18/07/11 16:39:15 INFO mapreduce.Job: map 17% reduce 0%
18/07/11 16:39:23 INFO mapreduce.Job: map 18% reduce 0%
18/07/11 16:39:28 INFO mapreduce.Job: map 19% reduce 0%
18/07/11 16:39:31 INFO mapreduce.Job: map 20% reduce 0%
18/07/11 16:39:40 INFO mapreduce.Job: map 21% reduce 0%
18/07/11 16:39:48 INFO mapreduce.Job: map 22% reduce 0%
18/07/11 16:39:52 INFO mapreduce.Job: map 23% reduce 0%
18/07/11 16:40:02 INFO mapreduce.Job: map 24% reduce 0%
18/07/11 16:40:11 INFO mapreduce.Job: map 26% reduce 0%
18/07/11 16:40:20 INFO mapreduce.Job: map 27% reduce 0%
```

```
18/07/11 16:40:20 INFO mapreduce.Job: map 27% reduce 0%
18/07/11 16:40:27 INFO mapreduce.Job: map 29% reduce 0%
18/07/11 16:40:35 INFO mapreduce.Job: map 30% reduce 0%
18/07/11 16:40:39 INFO mapreduce.Job: map 31% reduce 0%
18/07/11 16:40:43 INFO mapreduce.Job: map 32% reduce 0%
18/07/11 16:40:52 INFO mapreduce.Job: map 33% reduce 0%
18/07/11 16:40:54 INFO mapreduce.Job: map 34% reduce 0%
18/07/11 16:40:59 INFO mapreduce.Job: map 35% reduce 0%
18/07/11 16:41:08 INFO mapreduce.Job: map 36% reduce 0%
18/07/11 16:41:11 INFO mapreduce.Job: map 37% reduce 0%
18/07/11 16:41:18 INFO mapreduce.Job: map 38% reduce 0%
18/07/11 16:41:21 INFO mapreduce.Job: map 39% reduce 0%
18/07/11 16:41:29 INFO mapreduce.Job: map 40% reduce 0%
18/07/11 16:41:34 INFO mapreduce.Job: map 41% reduce 0%
18/07/11 16:41:37 INFO mapreduce.Job: map 42% reduce 0%
18/07/11 16:41:45 INFO mapreduce.Job: map 43% reduce 0%
18/07/11 16:41:50 INFO mapreduce.Job: map 54% reduce 0%
18/07/11 16:42:00 INFO mapreduce.Job: map 55% reduce 0%
18/07/11 16:42:09 INFO mapreduce.Job: map 56% reduce 0%
18/07/11 16:42:43 INFO mapreduce.Job: map 57% reduce 0%
18/07/11 16:43:00 INFO mapreduce.Job: map 57% reduce 11%
18/07/11 16:43:13 INFO mapreduce.Job: map 58% reduce 11%
18/07/11 16:43:25 INFO mapreduce.Job: map 59% reduce 11%
18/07/11 16:43:51 INFO mapreduce.Job: map 60% reduce 11%
18/07/11 16:44:14 INFO mapreduce.Job: map 61% reduce 11%
18/07/11 16:44:25 INFO mapreduce.Job: map 62% reduce 11%
18/07/11 16:44:47 INFO mapreduce.Job: map 63% reduce 11%
18/07/11 16:45:07 INFO mapreduce.Job: map 64% reduce 11%
18/07/11 16:45:24 INFO mapreduce.Job: map 65% reduce 11%
18/07/11 16:45:42 INFO mapreduce.Job: map 66% reduce 11%
18/07/11 16:46:04 INFO mapreduce.Job: map 67% reduce 11%
18/07/11 16:46:16 INFO mapreduce.Job: map 68% reduce 11%
18/07/11 16:46:35 INFO mapreduce.Job: map 69% reduce 11%
18/07/11 16:46:52 INFO mapreduce.Job: map 70% reduce 11%
18/07/11 16:47:04 INFO mapreduce.Job: map 71% reduce 11%
18/07/11 16:47:24 INFO mapreduce.Job: map 72% reduce 11%
18/07/11 16:47:45 INFO mapreduce.Job: map 73% reduce 11%
18/07/11 16:48:04 INFO mapreduce.Job: map 74% reduce 11%
18/07/11 16:48:16 INFO mapreduce.Job: map 75% reduce 11%
```



```

18/07/11 16:48:16 INFO mapreduce.Job: map 75% reduce 11%
18/07/11 16:48:30 INFO mapreduce.Job: map 76% reduce 11%
18/07/11 16:48:50 INFO mapreduce.Job: map 77% reduce 11%
18/07/11 16:49:04 INFO mapreduce.Job: map 78% reduce 11%
18/07/11 16:49:13 INFO mapreduce.Job: map 89% reduce 11%
18/07/11 16:49:15 INFO mapreduce.Job: map 89% reduce 22%
18/07/11 16:49:19 INFO mapreduce.Job: map 100% reduce 22%
18/07/11 16:49:21 INFO mapreduce.Job: map 100% reduce 100%
18/07/11 16:49:22 INFO mapreduce.Job: Job job_1531291900377_0012 completed successfully
18/07/11 16:49:23 INFO mapreduce.Job: Counters: 50
  File System Counters
    FILE: Number of bytes read=7104
    FILE: Number of bytes written=438393
    FILE: Number of read operations=0
    FILE: Number of large read operations=0
    FILE: Number of write operations=0
    HDFS: Number of bytes read=327164261
    HDFS: Number of bytes written=50
    HDFS: Number of read operations=12
    HDFS: Number of large read operations=0
    HDFS: Number of write operations=2
  Job Counters
    Killed map tasks=2
    Launched map tasks=5
    Launched reduce tasks=1
    Data-local map tasks=5
    Total time spent by all maps in occupied slots (ms)=2730508
    Total time spent by all reduces in occupied slots (ms)=448667
    Total time spent by all map tasks (ms)=2730508
    Total time spent by all reduce tasks (ms)=448667
    Total vcore-milliseconds taken by all map tasks=2730508
    Total vcore-milliseconds taken by all reduce tasks=448667
    Total megabyte-milliseconds taken by all map tasks=2796040192
    Total megabyte-milliseconds taken by all reduce tasks=459435008
  Map-Reduce Framework
    Map input records=8388608
    Map output records=201326592
    Map output bytes=2952790016
    Map output materialized bytes=168

```

```

    Total vcore-milliseconds taken by all map tasks=2730508
    Total vcore-milliseconds taken by all reduce tasks=448667
    Total megabyte-milliseconds taken by all map tasks=2796040192
    Total megabyte-milliseconds taken by all reduce tasks=459435008
  Map-Reduce Framework
    Map input records=8388608
    Map output records=201326592
    Map output bytes=2952790016
    Map output materialized bytes=168
    Input split bytes=357
    Combine input records=201326820
    Combine output records=237
    Reduce input groups=3
    Reduce shuffle bytes=168
    Reduce input records=9
    Reduce output records=3
    Spilled Records=405
    Shuffled Maps =3
    Failed Shuffles=0
    Merged Map outputs=3
    GC time elapsed (ms)=10380
    CPU time spent (ms)=436840
    Physical memory (bytes) snapshot=797732864
    Virtual memory (bytes) snapshot=8231010304
    Total committed heap usage (bytes)=541327360
  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=327163904
  File Output Format Counters
    Bytes Written=50
The standard deviation is: 2.2603926650031405
You have new mail in /var/spool/mail/acadgild
[acadgild@localhost ~]$

```