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Atividade 1 (Salvem prints da tela para envio)

1) ```$ hadoop jar /usr/lib/hadoop-mapreduce/hadoop-mapreduce-examples.jar pi 1 100```

2) ```$ hadoop jar /usr/lib/hadoop-mapreduce/hadoop-mapreduce-examples.jar pi 1 500000```

3) ```$ hadoop jar /usr/lib/hadoop-mapreduce/hadoop-mapreduce-examples.jar pi 5 100000```

- Comentem sobre a diferença de execução dos exercícios 2 e 3
(Quais diferenças? Tempo? Por que?)

Resposta:

Em relação ao pi 1 100 e os outros houve melhoria de precisão nos outros devido ao número de interações.

Comparando o tempo o pi 1 100 e o pi 1 500000 tiveram tempo aproximados, já o pi 1 500000 e o pi 5 100000 embora tenha a mesma quantidade de interações o segundo demorou um segundo mais devido ao fato de tempo para executar cinco processos paralelos de 100000 interações ao invés de um com 500000.

Parametros: pi 1 100

```
root@sandbox:~                                              —   □   ✕

  Using username "root".
  root@localhost's password:
Last login: Sat Nov 19 06:07:25 2022
[root@sandbox ~]# hadoop jar /usr/lib/hadoop-mapreduce/hadoop-mapreduce-examples
.jar pi 1 100
Number of Maps  = 1
Samples per Map = 100
Wrote input for Map #0
Starting Job
22/11/19 06:09:35 INFO client.RMProxy: Connecting to ResourceManager at sandbox.
hortonworks.com/10.0.2.15:8050
22/11/19 06:09:36 INFO input.FileInputFormat: Total input paths to process : 1
22/11/19 06:09:36 INFO mapreduce.JobSubmitter: number of splits:1
22/11/19 06:09:36 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_16
68866818960_0001
22/11/19 06:09:36 INFO impl.YarnClientImpl: Submitted application application_16
68866818960_0001
22/11/19 06:09:37 INFO mapreduce.Job: The url to track the job: http://sandbox.h
ortonworks.com:8088/proxy/application_1668866818960_0001/
22/11/19 06:09:37 INFO mapreduce.Job: Running job: job_1668866818960_0001
22/11/19 06:09:46 INFO mapreduce.Job: Job job_1668866818960_0001 running in uber
 mode : false
22/11/19 06:09:46 INFO mapreduce.Job:  map 0% reduce 0%
22/11/19 06:09:52 INFO mapreduce.Job:  map 100% reduce 0%
22/11/19 06:09:59 INFO mapreduce.Job:  map 100% reduce 100%
22/11/19 06:10:00 INFO mapreduce.Job: Job job_1668866818960_0001 completed succe
ssfully
22/11/19 06:10:00 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=28
                FILE: Number of bytes written=199083
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=277
                HDFS: Number of bytes written=215
                HDFS: Number of read operations=7
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=3
        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)=4009
                Total time spent by all reduces in occupied slots (ms)=3895
                Total time spent by all map tasks (ms)=4009
                Total time spent by all reduce tasks (ms)=3895
                Total vcore-seconds taken by all map tasks=4009
```

```
                HDFS: Number of write operations=3
        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)=4009
                Total time spent by all reduces in occupied slots (ms)=3895
                Total time spent by all map tasks (ms)=4009
                Total time spent by all reduce tasks (ms)=3895
                Total vcore-seconds taken by all map tasks=4009
                Total vcore-seconds taken by all reduce tasks=3895
                Total megabyte-seconds taken by all map tasks=1002250
                Total megabyte-seconds taken by all reduce tasks=973750
        Map-Reduce Framework
                Map input records=1
                Map output records=2
                Map output bytes=18
                Map output materialized bytes=28
                Input split bytes=159
                Combine input records=0
                Combine output records=0
                Reduce input groups=2
                Reduce shuffle bytes=28
                Reduce input records=2
                Reduce output records=0
                Spilled Records=4
                Shuffled Maps =1
                Failed Shuffles=0
                Merged Map outputs=1
                GC time elapsed (ms)=144
                CPU time spent (ms)=1570
                Physical memory (bytes) snapshot=310878208
                Virtual memory (bytes) snapshot=1830608896
                Total committed heap usage (bytes)=155713536
        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=118
        File Output Format Counters
                Bytes Written=97
Job Finished in 25.281 seconds
Estimated value of Pi is 3.20000000000000000000
[root@sandbox ~]#
```

Tempo: 25.281 segunndos

Valor de PI: 3.20

Parametros: pi 1 500000


```
root@sandbox:~                                              —    □    ✕

Using username "root".
root@localhost's password:
Last login: Sat Nov 19 06:07:25 2022
[root@sandbox ~]# hadoop jar /usr/lib/hadoop-mapreduce/hadoop-mapreduce-examples
.jar pi 1 100
Number of Maps  = 1
Samples per Map = 100
Wrote input for Map #0
Starting Job
22/11/19 06:09:35 INFO client.RMProxy: Connecting to ResourceManager at sandbox.
hortonworks.com/10.0.2.15:8050
22/11/19 06:09:36 INFO input.FileInputFormat: Total input paths to process : 1
22/11/19 06:09:36 INFO mapreduce.JobSubmitter: number of splits:1
22/11/19 06:09:36 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_16
68866818960_0001
22/11/19 06:09:36 INFO impl.YarnClientImpl: Submitted application application_16
68866818960_0001
22/11/19 06:09:37 INFO mapreduce.Job: The url to track the job: http://sandbox.h
ortonworks.com:8088/proxy/application_1668866818960_0001/
22/11/19 06:09:37 INFO mapreduce.Job: Running job: job_1668866818960_0001
22/11/19 06:09:46 INFO mapreduce.Job: Job job_1668866818960_0001 running in uber
 mode : false
22/11/19 06:09:46 INFO mapreduce.Job:  map 0% reduce 0%
22/11/19 06:09:52 INFO mapreduce.Job:  map 100% reduce 0%
22/11/19 06:09:59 INFO mapreduce.Job:  map 100% reduce 100%
22/11/19 06:10:00 INFO mapreduce.Job: Job job_1668866818960_0001 completed succe
ssfully
22/11/19 06:10:00 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=28
                FILE: Number of bytes written=199083
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=277
                HDFS: Number of bytes written=215
                HDFS: Number of read operations=7
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=3
        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)=4009
                Total time spent by all reduces in occupied slots (ms)=3895
                Total time spent by all map tasks (ms)=4009
```

```
                        Data-local map tasks=1
                        Total time spent by all maps in occupied slots (ms)=4421
                        Total time spent by all reduces in occupied slots (ms)=4686
                        Total time spent by all map tasks (ms)=4421
                        Total time spent by all reduce tasks (ms)=4686
                        Total vcore-seconds taken by all map tasks=4421
                        Total vcore-seconds taken by all reduce tasks=4686
                        Total megabyte-seconds taken by all map tasks=1105250
                        Total megabyte-seconds taken by all reduce tasks=1171500
                Map-Reduce Framework
                        Map input records=1
                        Map output records=2
                        Map output bytes=18
                        Map output materialized bytes=28
                        Input split bytes=159
                        Combine input records=0
                        Combine output records=0
                        Reduce input groups=2
                        Reduce shuffle bytes=28
                        Reduce input records=2
                        Reduce output records=0
                        Spilled Records=4
                        Shuffled Maps =1
                        Failed Shuffles=0
                        Merged Map outputs=1
                        GC time elapsed (ms)=65
                        CPU time spent (ms)=1770
                        Physical memory (bytes) snapshot=340553728
                        Virtual memory (bytes) snapshot=1782583296
                        Total committed heap usage (bytes)=210239488
                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=118
                File Output Format Counters
                        Bytes Written=97
Job Finished in 24.504 seconds
Estimated value of Pi is 3.14159200000000000000
[root@sandbox ~]#
[root@sandbox ~]#
[root@sandbox ~]#
```

Tempo: 24.504segunndos

Valor de PI: 3.141592

Parametros: pi 5 100000


```
root@sandbox:~                                    —    □    ✕

[root@sandbox ~]# hadoop jar /usr/lib/hadoop-mapreduce/hadoop-mapreduce-examples
.jar pi 5 100000
Number of Maps  = 5
Samples per Map = 100000

Wrote input for Map #0
Wrote input for Map #1
Wrote input for Map #2
Wrote input for Map #3
Wrote input for Map #4
Starting Job
22/11/19 06:16:38 INFO client.RMProxy: Connecting to ResourceManager at sandbox.
hortonworks.com/10.0.2.15:8050
22/11/19 06:16:39 INFO input.FileInputFormat: Total input paths to process : 5
22/11/19 06:16:39 INFO mapreduce.JobSubmitter: number of splits:5
22/11/19 06:16:39 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_16
68866818960_0003
22/11/19 06:16:39 INFO impl.YarnClientImpl: Submitted application application_16
68866818960_0003
22/11/19 06:16:39 INFO mapreduce.Job: The url to track the job: http://sandbox.h
ortonworks.com:8088/proxy/application_1668866818960_0003/
22/11/19 06:16:39 INFO mapreduce.Job: Running job: job_1668866818960_0003
22/11/19 06:16:48 INFO mapreduce.Job: Job job_1668866818960_0003 running in uber
 mode : false
22/11/19 06:16:48 INFO mapreduce.Job:  map 0% reduce 0%
22/11/19 06:16:57 INFO mapreduce.Job:  map 20% reduce 0%
22/11/19 06:16:58 INFO mapreduce.Job:  map 100% reduce 0%
22/11/19 06:17:04 INFO mapreduce.Job:  map 100% reduce 100%
22/11/19 06:17:04 INFO mapreduce.Job: Job job_1668866818960_0003 completed succe
ssfully
22/11/19 06:17:04 INFO mapreduce.Job: Counters: 49
        File System Counters
                FILE: Number of bytes read=116
                FILE: Number of bytes written=597447
                FILE: Number of read operations=0
                FILE: Number of large read operations=0
                FILE: Number of write operations=0
                HDFS: Number of bytes read=1385
                HDFS: Number of bytes written=215
                HDFS: Number of read operations=23
                HDFS: Number of large read operations=0
                HDFS: Number of write operations=3
        Job Counters
                Launched map tasks=5
                Launched reduce tasks=1
                Data-local map tasks=5
```

```
root@sandbox:~                                          —   □   ✕
             Launched reduce tasks=1
             Data-local map tasks=5
             Total time spent by all maps in occupied slots (ms)=38259
             Total time spent by all reduces in occupied slots (ms)=3869
             Total time spent by all map tasks (ms)=38259
             Total time spent by all reduce tasks (ms)=3869
             Total vcore-seconds taken by all map tasks=38259
             Total vcore-seconds taken by all reduce tasks=3869
             Total megabyte-seconds taken by all map tasks=9564750
             Total megabyte-seconds taken by all reduce tasks=967250
     Map-Reduce Framework
             Map input records=5
             Map output records=10
             Map output bytes=90
             Map output materialized bytes=140
             Input split bytes=795
             Combine input records=0
             Combine output records=0
             Reduce input groups=2
             Reduce shuffle bytes=140
             Reduce input records=10
             Reduce output records=0
             Spilled Records=20
             Shuffled Maps =5
             Failed Shuffles=0
             Merged Map outputs=5
             GC time elapsed (ms)=392
             CPU time spent (ms)=4010
             Physical memory (bytes) snapshot=1123315712
             Virtual memory (bytes) snapshot=5298356224
             Total committed heap usage (bytes)=628097024
     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=590
     File Output Format Counters
             Bytes Written=97
Job Finished in 26.289 seconds
Estimated value of Pi is 3.14159200000000000000
[root@sandbox ~]#
[root@sandbox ~]#
```

Tempo: 26.289 segunndos

Valor de PI: 3.141592