ScaleGraph/Python Test Result

ScaleGraph/Pythonの実行試験結果をここに示します。

Environment

ライブラリおよびミドルウェアは下記のバージョンを利用しています。

- GCC 5.2.0
- MPI 3.1.4
- Hadoop 2.7.1
- Python 3.5.0

Graph Algorithm API

Test specification

テスト仕様はPython標準のユニットテストフレームワークを利用して記述しました。
src/python/scalegraph/testalgorithm.pyに記述があります。

Test result

下記の通り208パターンのテストに合格しています。

```
test_ErrorInvalidExtraOptions (__main__.TestGenerateGraph) ...
ok
test_ErrorInvalidInput (__main__.TestGenerateGraph) ... ok
test_ErrorInvalidInputFs (__main__.TestGenerateGraph) ... ok
test_ErrorInvalidOutputFs (__main__.TestGenerateGraph) ... ok
test_ErrorInvalidRmatScale (__main__.TestGenerateGraph) ... ok
test_ErrorNoInput (__main__.TestGenerateGraph) ... ok
test_ErrorNoInputFilePath (__main__.TestGenerateGraph) ... ok
test_ErrorNoOutput (__main__.TestGenerateGraph) ... ok
test_ErrorNoValueInputHeaderSource (__main__.TestGenerateGraph)
... ok
test_ErrorNoValueInputHeaderTarget (__main__.TestGenerateGraph)
... ok
test_ErrorNoValueInputHeaderWeight (__main__.TestGenerateGraph)
... ok
test_ErrorNoValueOutputHeaderSource (__main__.TestGenerateGraph)
... ok
test_ErrorNoValueOutputHeaderTarget (__main__.TestGenerateGraph)
... ok
test_ErrorNoValueOutputHeaderWeight (__main__.TestGenerateGraph)
... ok
test_ErrorNotStrInputFilePath (__main__.TestGenerateGraph) ... ok
test_ErrorNotStrOutputFilePath (__main__.TestGenerateGraph) ...
ok
test_ErrorTypeExtraOptions (__main__.TestGenerateGraph) ... ok
test_HeaderOutputOS (__main__.TestGenerateGraph) ... ok
test_OutputHDFS (__main__.TestGenerateGraph) ... ok
test_OutputOS (__main__.TestGenerateGraph) ... ok
test_RmatScale (__main__.TestGenerateGraph) ... ok
test_ChangeEdgeHeader (__main__.TestPageRank) ... ok
test_ErrorInvalidExtraOptions (__main__.TestPageRank) ... ok
test_ErrorInvalidInput (__main__.TestPageRank) ... ok
test_ErrorInvalidInputFs (__main__.TestPageRank) ... ok
test_ErrorInvalidOutputFs (__main__.TestPageRank) ... ok
test_ErrorInvalidRmatScale (__main__.TestPageRank) ... ok
test_ErrorNoInput (__main__.TestPageRank) ... ok
test_ErrorNoInputFilePath (__main__.TestPageRank) ... ok
test_ErrorNoOutput (__main__.TestPageRank) ... ok
test_ErrorNoValueInputHeaderSource (__main__.TestPageRank) ... ok
test_ErrorNoValueInputHeaderTarget (__main__.TestPageRank) ... ok
test_ErrorNoValueInputHeaderWeight (__main__.TestPageRank) ... ok
test_ErrorNoValueOutputHeaderSource (__main__.TestPageRank) ...
```

```
ok
test_ErrorNoValueOutputHeaderTarget (__main__.TestPageRank) ...
ok
test_ErrorNoValueOutputHeaderWeight (__main__.TestPageRank) ...
ok
test_ErrorNotStrInputFilePath (__main__.TestPageRank) ... ok
test_ErrorNotStrOutputFilePath (__main__.TestPageRank) ... ok
test_ErrorTypeExtraOptions (__main__.TestPageRank) ... ok
test_ExtraOptions (__main__.TestPageRank) ... ok
test_InputHDFSOutputHDFS (__main__.TestPageRank) ... ok
test_InputOSOutputOS (__main__.TestPageRank) ... ok
test_InputRmatOutputHDFS (__main__.TestPageRank) ... ok
test_InputRmatOutputOS (__main__.TestPageRank) ... ok
test_NotReadWeight (__main__.TestPageRank) ... ok
test_RmatScale (__main__.TestPageRank) ... ok
test_ErrorInvalidExtraOptions (__main__.TestDegreeDistribution)
... ok
test_ErrorInvalidInput (__main__.TestDegreeDistribution) ... ok
test_ErrorInvalidInputFs (__main__.TestDegreeDistribution) ...
ok
test_ErrorInvalidOutputFs (__main__.TestDegreeDistribution) ...
ok
test_ErrorInvalidRmatScale (__main__.TestDegreeDistribution) ...
ok
test_ErrorNoInput (__main__.TestDegreeDistribution) ... ok
test_ErrorNoInputFilePath (__main__.TestDegreeDistribution) ...
ok
test_ErrorNoOutput (__main__.TestDegreeDistribution) ... ok
test_ErrorNoValueInputHeaderSource
(__main__.TestDegreeDistribution) ... ok
test_ErrorNoValueInputHeaderTarget
(__main__.TestDegreeDistribution) ... ok
test_ErrorNoValueInputHeaderWeight
(__main__.TestDegreeDistribution) ... ok
test_ErrorNoValueOutputHeaderSource
(__main__.TestDegreeDistribution) ... ok
test_ErrorNoValueOutputHeaderTarget
(__main__.TestDegreeDistribution) ... ok
test_ErrorNoValueOutputHeaderWeight
(__main__.TestDegreeDistribution) ... ok
test_ErrorNotStrInputFilePath (__main__.TestDegreeDistribution)
... ok
test_ErrorNotStrOutputFilePath (__main__.TestDegreeDistribution)
... ok
test_ErrorTypeExtraOptions (__main__.TestDegreeDistribution) ...
```

```
ok
test_InputHDFSOutputHDFS (__main__.TestDegreeDistribution) ... ok
test_InputOSOutputOS (__main__.TestDegreeDistribution) ... ok
test_InputRmatOutputHDFS (__main__.TestDegreeDistribution) ...
ok
test_InputRmatOutputOS (__main__.TestDegreeDistribution) ... ok
test_NotReadWeight (__main__.TestDegreeDistribution) ... ok
test_RmatScale (__main__.TestDegreeDistribution) ... ok
test_ChangeEdgeHeader (__main__.TestBetweennessCentrality) ... ok
test_ChangeWeightHeader (__main__.TestBetweennessCentrality) ...
ok
test_ConstWeight (__main__.TestBetweennessCentrality) ... ok
test_ErrorInvalidExtraOptions
(__main__.TestBetweennessCentrality) ... ok
test_ErrorInvalidInput (__main__.TestBetweennessCentrality) ...
ok
test_ErrorInvalidInputFs (__main__.TestBetweennessCentrality) ...
ok
test_ErrorInvalidOutputFs (__main__.TestBetweennessCentrality)
... ok
test_ErrorInvalidRmatScale (__main__.TestBetweennessCentrality)
... ok
test_ErrorNoConstWeight (__main__.TestBetweennessCentrality) ...
ok
test_ErrorNoInput (__main__.TestBetweennessCentrality) ... ok
test_ErrorNoInputFilePath (__main__.TestBetweennessCentrality)
... ok
test_ErrorNoOutput (__main__.TestBetweennessCentrality) ... ok
test_ErrorNoValueInputHeaderSource
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNoValueInputHeaderTarget
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNoValueInputHeaderWeight
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNoValueOutputHeaderSource
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNoValueOutputHeaderTarget
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNoValueOutputHeaderWeight
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNotStrInputFilePath
(__main__.TestBetweennessCentrality) ... ok
test_ErrorNotStrOutputFilePath
(__main__.TestBetweennessCentrality) ... ok
test_ErrorReadWeight (__main__.TestBetweennessCentrality) ... ok
```

```
test_ErrorTypeExtraOptions (__main__.TestBetweennessCentrality)
... ok
test_ExtraOptions (__main__.TestBetweennessCentrality) ... ok
test_InputHDFSOutputHDFS (__main__.TestBetweennessCentrality) ...
ok
test_InputOSOutputOS (__main__.TestBetweennessCentrality) ... ok
test_InputRmatOutputHDFS (__main__.TestBetweennessCentrality) ...
ok
test_InputRmatOutputOS (__main__.TestBetweennessCentrality) ...
ok
test_NotReadWeight (__main__.TestBetweennessCentrality) ... ok
test_RandomWeight (__main__.TestBetweennessCentrality) ... ok
test_ReadWeight (__main__.TestBetweennessCentrality) ... ok
test_RmatScale (__main__.TestBetweennessCentrality) ... ok
test_ErrorInvalidExtraOptions (__main__.TestHyperANF) ... ok
test_ErrorInvalidInput (__main__.TestHyperANF) ... ok
test_ErrorInvalidInputFs (__main__.TestHyperANF) ... ok
test_ErrorInvalidOutputFs (__main__.TestHyperANF) ... ok
test_ErrorInvalidRmatScale (__main__.TestHyperANF) ... ok
test_ErrorNoInput (__main__.TestHyperANF) ... ok
test_ErrorNoInputFilePath (__main__.TestHyperANF) ... ok
test_ErrorNoOutput (__main__.TestHyperANF) ... ok
test_ErrorNoValueInputHeaderSource (__main__.TestHyperANF) ... ok
test_ErrorNoValueInputHeaderTarget (__main__.TestHyperANF) ... ok
test_ErrorNoValueInputHeaderWeight (__main__.TestHyperANF) ... ok
test_ErrorNoValueOutputHeaderSource (__main__.TestHyperANF) ...
ok
test_ErrorNoValueOutputHeaderTarget (__main__.TestHyperANF) ...
ok
test_ErrorNoValueOutputHeaderWeight (__main__.TestHyperANF) ...
ok
test_ErrorNotStrInputFilePath (__main__.TestHyperANF) ... ok
test_ErrorNotStrOutputFilePath (__main__.TestHyperANF) ... ok
test_ErrorTypeExtraOptions (__main__.TestHyperANF) ... ok
test_ExtraOptions (__main__.TestHyperANF) ... ok
test_InputHDFSOutputHDFS (__main__.TestHyperANF) ... ok
test_InputOSOutputOS (__main__.TestHyperANF) ... ok
test_InputRmatOutputHDFS (__main__.TestHyperANF) ... ok
test_InputRmatOutputOS (__main__.TestHyperANF) ... ok
test_NotReadWeight (__main__.TestHyperANF) ... ok
test_RmatScale (__main__.TestHyperANF) ... ok
test_ErrorApiDriver (__main__.TestStronglyConnectedComponent)
... ok
test_ErrorInvalidInput (__main__.TestStronglyConnectedComponent)
... ok
```

```
test_ErrorInvalidInputFs
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorInvalidOutput1Fs
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorInvalidOutput2Fs
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorInvalidRmatScale
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorNoInput (__main__.TestStronglyConnectedComponent) ...
ok
test_ErrorNoInputFilePath
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorNoOutput (__main__.TestStronglyConnectedComponent) ...
ok
test_ErrorNoOutput1 (__main__.TestStronglyConnectedComponent)
... ok
test_ErrorNoOutput2 (__main__.TestStronglyConnectedComponent)
... ok
test_ErrorNotStrInputFilePath
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorNotStrOutput1FilePath
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorNotStrOutput2FilePath
(__main__.TestStronglyConnectedComponent) ... ok
test_ErrorTypeExtraOptions
(__main__.TestStronglyConnectedComponent) ... ok
test_ExtraOptions (__main__.TestStronglyConnectedComponent) ...
ok
test_InputHDFSOutputHDFS
(__main__.TestStronglyConnectedComponent) ... ok
test_InputOSOutputOS (__main__.TestStronglyConnectedComponent)
... ok
test_InputRmatOutputHDFS
(__main__.TestStronglyConnectedComponent) ... ok
test_InputRmatOutputOS (__main__.TestStronglyConnectedComponent)
... ok
test_NotReadWeight (__main__.TestStronglyConnectedComponent) ...
ok
test_RmatScale (__main__.TestStronglyConnectedComponent) ... ok
test_ErrorInvalidExtraOptions (__main__.TestMinimumSpanningTree)
... ok
test_ErrorInvalidInput (__main__.TestMinimumSpanningTree) ... ok
test_ErrorInvalidInputFs (__main__.TestMinimumSpanningTree) ...
ok
test_ErrorInvalidOutputFs (__main__.TestMinimumSpanningTree) ...
```

```
ok
test_ErrorInvalidRmatScale (__main__.TestMinimumSpanningTree)
... ok
test_ErrorNoInput (__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoInputFilePath (__main__.TestMinimumSpanningTree) ...
ok
test_ErrorNoOutput (__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoValueInputHeaderSource
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoValueInputHeaderTarget
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoValueInputHeaderWeight
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoValueOutputHeaderSource
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoValueOutputHeaderTarget
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorNoValueOutputHeaderWeight
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorNotStrInputFilePath (__main__.TestMinimumSpanningTree)
... ok
test_ErrorNotStrOutputFilePath
(__main__.TestMinimumSpanningTree) ... ok
test_ErrorTypeExtraOptions (__main__.TestMinimumSpanningTree)
... ok
test_ChangeEdgeHeader (__main__.TestMaxFlow) ... ok
test_ChangeWeightHeader (__main__.TestMaxFlow) ... ok
test_ConstWeight (__main__.TestMaxFlow) ... ok
test_ErrorInvalidExtraOptions (__main__.TestMaxFlow) ... ok
test_ErrorInvalidInput (__main__.TestMaxFlow) ... ok
test_ErrorInvalidInputFs (__main__.TestMaxFlow) ... ok
test_ErrorInvalidRmatScale (__main__.TestMaxFlow) ... ok
test_ErrorInvalidSinkId (__main__.TestMaxFlow) ... ok
test_ErrorInvalidSourceId (__main__.TestMaxFlow) ... ok
test_ErrorNoConstWeight (__main__.TestMaxFlow) ... ok
test_ErrorNoInput (__main__.TestMaxFlow) ... ok
test_ErrorNoInputFilePath (__main__.TestMaxFlow) ... ok
test_ErrorNoSinkId (__main__.TestMaxFlow) ... ok
test_ErrorNoSourceId (__main__.TestMaxFlow) ... ok
test_ErrorNoSourceIdNoSinkId (__main__.TestMaxFlow) ... ok
test_ErrorNoValueInputHeaderSource (__main__.TestMaxFlow) ... ok
test_ErrorNoValueInputHeaderTarget (__main__.TestMaxFlow) ... ok
test_ErrorNoValueInputHeaderWeight (__main__.TestMaxFlow) ... ok
test_ErrorNotStrInputFilePath (__main__.TestMaxFlow) ... ok
test_ErrorReadWeight (__main__.TestMaxFlow) ... ok
```

```
test_ErrorSourceIdEqualSinkId (__main__.TestMaxFlow) ... ok
test_ErrorTypeExtraOptions (__main__.TestMaxFlow) ... ok
test_InputHDFS (__main__.TestMaxFlow) ... ok
test_InputOS (__main__.TestMaxFlow) ... ok
test_InputRmat (__main__.TestMaxFlow) ... ok
test_RandomWeight (__main__.TestMaxFlow) ... ok
test_ReadWeight (__main__.TestMaxFlow) ... ok
test_RmatScale (__main__.TestMaxFlow) ... ok
test_ErrorInvalidExtraOptions (__main__.TestSpectralClustering)
... ok
test_ErrorInvalidInput (__main__.TestSpectralClustering) ... ok
test_ErrorInvalidInputFs (__main__.TestSpectralClustering) ... ok
test_ErrorInvalidOutputFs (__main__.TestSpectralClustering) ...
ok
test_ErrorInvalidRmatScale (__main__.TestSpectralClustering) ...
ok
test_ErrorNoInput (__main__.TestSpectralClustering) ... ok
test_ErrorNoInputFilePath (__main__.TestSpectralClustering) ...
ok
test_ErrorNoOutput (__main__.TestSpectralClustering) ... ok
test_ErrorNoValueInputHeaderSource
(__main__.TestSpectralClustering) ... ok
test_ErrorNoValueInputHeaderTarget
(__main__.TestSpectralClustering) ... ok
test_ErrorNoValueInputHeaderWeight
(__main__.TestSpectralClustering) ... ok
test_ErrorNoValueOutputHeaderSource
(__main__.TestSpectralClustering) ... ok
test_ErrorNoValueOutputHeaderTarget
(__main__.TestSpectralClustering) ... ok
test_ErrorNoValueOutputHeaderWeight
(__main__.TestSpectralClustering) ... ok
test_ErrorNotStrInputFilePath (__main__.TestSpectralClustering)
... ok
test_ErrorNotStrOutputFilePath (__main__.TestSpectralClustering)
... ok
test_ErrorTypeExtraOptions (__main__.TestSpectralClustering) ...
ok

----------------------------------------------------------------------
---
Ran 208 tests in 299.501s

OK
```

> Note: 各アルゴリズムの実行は、既存のScaleGraphが提供するコードによるものです。本テストにおいては既存のコードの実行結果の正確性までは確認できておりません。また、Minimum Spanning TreeおよびSpectral Clusteringについては、既存のコードそのものが実行時にエラーとなってしまうため、この2種に限ってはユニットテストをラッパー部分のみに限定しています。他の6種については、既存のアルゴリズムから結果が出力されるところまでをテストしています。

Pregel Model Computation API

Test specifiation

PageRankを計算するサンプルアプリケーションを記述し、実行ログによって、計算が正しく進行していることを確認しました。
サンプルアプリケーションのパスはsrc/python/scalegraph/pagerank.pyで、実行方法については、ScaleGraph/Python Installドキュメントに記載されている通りです。

Test result

開発中においては、superstep == 30までテストしておりますが、ここではsuperstep == 4の結果を示します。Pregel計算は、想定どおりに進行していることを確認しました。

```
$ X10_NTHREADS=2 mpirun -np 2 ./testpyxpregel
Hello, world
shared_memory = 0x111e7f000, copy_from = 0x114067000, len = 3786
shared_memory = 0x107851000, copy_from = 0x10988e000, len = 3786
shared_memory = 0x107c4d000, copy_from = 0x109a82000, len = 4104
shared_memory = 0x111e7f000, copy_from = 0x114228000, len = 4104
shared_memory = 0x109f27000, copy_from = 0x109a60000, len = 66360
shared_memory = 0x107c4d000, copy_from = 0x109af2000, len = 4104
shared_memory = 0x11472b000, copy_from = 0x114206000, len = 64712
shared_memory = 0x109f27000, copy_from = 0x109ede000, len = 64592
shared_memory = 0x111e7f000, copy_from = 0x114682000, len = 4104
shared_memory = 0x11472b000, copy_from = 0x11469e000, len = 66480
[0] 02:52:06 start graph construction: 5.343 ms: 5.343 ms elapsed:
Memory:G 1.560576 MB 0.0 MB
```

```
[0] 02:52:06 count edge finished: 0.085 ms: 5.428 ms elapsed:
Memory:G 1.560576 MB 0.0 MB
[0] 02:52:06 complete creating send data: 0.223 ms: 5.651 ms
elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 finished converting edge format: 0.558 ms: 6.209 ms
elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 start first step sorting: 0.037 ms: 6.246 ms elapsed:
Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 sort [thread local add ver] numChunks=128,
numShift=2: 0.026 ms: 6.272 ms elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 sort: initialize: 0.01 ms: 6.282 ms elapsed:
Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 sort: count: 0.043 ms: 6.325 ms elapsed: Memory:G
2.1504 MB 0.0 MB
[0] 02:52:06 sort: calc offset: 0.012 ms: 6.337 ms elapsed:
Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 sort: copy: 0.141 ms: 6.478 ms elapsed: Memory:G
2.1504 MB 0.0 MB
[0] 02:52:06 sort: check offset: 0.011 ms: 6.489 ms elapsed:
Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 sort end: 0.208 ms: 6.697 ms elapsed: Memory:G
2.1504 MB 0.0 MB
[0] 02:52:06 finished first step sorting: 0.011 ms: 6.708 ms
elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 finished making offsets: 0.042 ms: 6.75 ms elapsed:
Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 finished second step sorting: 0.091 ms: 6.841 ms
elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 start to update in edge: 35.987000000000002 ms:
42.828000000000003 ms elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 vertex processing start: 0.042 ms: 42.869999999999997
ms elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 vertex processing finished: 0.47 ms:
43.340000000000003 ms elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 start to process unicast messages: 0.02 ms:
43.359999999999999 ms elapsed: Memory:G 2.1504 MB 0.0 MB
[0] 02:52:06 copying dest id: 0.042 ms: 43.402000000000001 ms
elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 copying message value: 0.089 ms: 43.491 ms elapsed:
Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 finished message processing: 0.063 ms:
43.554000000000002 ms elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 start to unicast message communication: 0.013 ms:
43.567 ms elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 alltoallv...: 0.071 ms: 43.637999999999998 ms
```

```
elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 before sort...: 0.256 ms: 43.893999999999998 ms
elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 sort...: 0.017 ms: 43.911000000000001 ms elapsed:
Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 sort [thread local add ver] numChunks=128,
numShift=2: 0.009 ms: 43.920000000000002 ms elapsed: Memory:G
2.932736 MB 0.0 MB
[0] 02:52:06 sort count: 0.053 ms: 43.972999999999999 ms elapsed:
Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 sort copy: 0.097 ms: 44.07 ms elapsed: Memory:G
2.932736 MB 0.0 MB
[0] 02:52:06 sort end: 0.221 ms: 44.290999999999997 ms elapsed:
Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 finished unicast message communication: 0.052 ms:
44.343000000000004 ms elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 finished broadcast message communication: 0.088 ms:
44.430999999999997 ms elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 finished to update in edge: 0.073 ms:
44.503999999999998 ms elapsed: Memory:G 2.932736 MB 0.0 MB
[0] 02:52:06 Check mOutEdge
[0] 02:52:06 NO EDGES
[0] 02:52:06 Check Done
shared_memory = 0x111e7f000, copy_from = 0x11423b000, len = 4096
shared_memory = 0x111e7f000, copy_from = 0x114234f00, len = 64
shared_memory = 0x111e7f000, copy_from = 0x114234eb0, len = 64
shared_memory = 0x111e7f000, copy_from = 0x114234460, len = 64
shared_memory = 0x111e7f000, copy_from = 0x11468a000, len = 4096
shared_memory = 0xffffffffffffffff, copy_from = 0x114689540, len
= 0
shared_memory = 0x111e7f000, copy_from = 0x11466c000, len = 4104
shm_open /pyxpregel.place.0 514
#0  numGlobalVertices = 1024
#0  numLocalVertices = 512
#0  outEdge_offsets_size = 513
#0  outEdge_vertices_size = 8089
#0  inEdge_offsets_size = 513
#0  inEdge_vertices_size = 8310
#0  vertexValue_type = 7
#0  vertexActive_mc_size = 8
#0  vertexShouldBeActive_mc_size = 8
#0  message_values_size = 0
#0  message_offsets_size = 513
#0  message_value_type = 7
mask signal = 30 3159159 forked 59161
```

```
mask signal = 30 3159159 forked 59162
[0] 02:52:06 Send command:superstep 0
 length=12 bufsize=12
[0] 02:52:06 Wait Aggregated Value from Thread:1
[0] 02:52:06 Wait Aggregated Value from Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:1 = 0.25
[0] 02:52:06 Reveived Aggregated Value from Thread:0 = 0.25
[0] 02:52:06 Wait numProcessed from Thread:1
[0] 02:52:06 Wait numProcessed from Thread:0
[0] 02:52:06 Reveived numProcessed from Thread:1 = 256
[0] 02:52:06 Reveived numProcessed from Thread:0 = 256
[0] 02:52:06 Reveived NumMessage from Thread:1 = 4164
[0] 02:52:06 Reveived NumMessage from Thread:0 = 3925
[0] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[0] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[0] 02:52:06 Wait OK Thread:1
[0] 02:52:06 Wait OK Thread:0
[0] 02:52:06 numSentMessage: 3925
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x11472b000, copy_to = 0x114675000, len = 31400
shared_memory = 0x11472b000, copy_to = 0x1146af000, len = 31400
[0] 02:52:06 numSentMessage: 4164
[1] 02:52:06 Check mOutEdge
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x11472b000, copy_to = 0x1146e7000, len = 33312
shared_memory = 0x11472b000, copy_to = 0x1146f0000, len = 33312
[0] 02:52:06 BCCHasMessage has NO message !!!!
[0] 02:52:06 Dispatch BCC Messages
[0] 02:52:06 call allreduce
[1] 02:52:06 NO EDGES
[1] 02:52:06 Check Done
shared_memory = 0x107851000, copy_from = 0x109a8e000, len = 4096
shared_memory = 0x107851000, copy_from = 0x1099bbf00, len = 64
shared_memory = 0x107851000, copy_from = 0x1099bbeb0, len = 64
shared_memory = 0x107851000, copy_from = 0x1099bbe10, len = 64
shared_memory = 0x107851000, copy_from = 0x109ef3000, len = 4096
shared_memory = 0xffffffffffffffff, copy_from = 0x109ef2540, len
= 0
shared_memory = 0x107c4d000, copy_from = 0x109f0a000, len = 4104
shm_open /pyxpregel.place.1 514
#1  numGlobalVertices = 1024
#1  numLocalVertices = 512
#1  outEdge_offsets_size = 513
#1  outEdge_vertices_size = 8295
#1  inEdge_offsets_size = 513
```

```
#1  inEdge_vertices_size = 8074
#1  vertexValue_type = 7
#1  vertexActive_mc_size = 8
#1  vertexShouldBeActive_mc_size = 8
#1  message_values_size = 0
#1  message_offsets_size = 513
#1  message_value_type = 7
mask signal = 30 3159160 forked 59163
mask signal = 30 3159160 forked 59164
[1] 02:52:06 Send command:superstep 0
 length=12 bufsize=12
[1] 02:52:06 Wait Aggregated Value from Thread:1
[1] 02:52:06 Wait Aggregated Value from Thread:0
[1] 02:52:06 Reveived Aggregated Value from Thread:0 = 0.25
[1] 02:52:06 Reveived Aggregated Value from Thread:1 = 0.25
[1] 02:52:06 Wait numProcessed from Thread:0
[1] 02:52:06 Wait numProcessed from Thread:1
[1] 02:52:06 Reveived numProcessed from Thread:0 = 256
[1] 02:52:06 Reveived numProcessed from Thread:1 = 256
[1] 02:52:06 Reveived NumMessage from Thread:0 = 4249
[1] 02:52:06 Reveived NumMessage from Thread:1 = 4046
[1] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[1] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[1] 02:52:06 Wait OK Thread:0
[1] 02:52:06 Wait OK Thread:1
[1] 02:52:06 numSentMessage: 4249
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a066000, copy_to = 0x109fe7000, len = 33992
shared_memory = 0x10a066000, copy_to = 0x109ff0000, len = 33992
[1] 02:52:06 numSentMessage: 4046
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a066000, copy_to = 0x109fec000, len = 32368
shared_memory = 0x10a066000, copy_to = 0x10a049000, len = 32368
[1] 02:52:06 BCCHasMessage has NO message !!!!
[1] 02:52:06 Dispatch BCC Messages
[1] 02:52:06 call allreduce
[0] 02:52:06 numAllBCSCount: 0
[0] 02:52:06 Call aggregator
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.5
[0] 02:52:06 Call gather
[1] 02:52:06 numAllBCSCount: 0
[1] 02:52:06 Call aggregator
[1] 02:52:06 start callAggregator
```

```
[1] 02:52:06 runString
[1] 02:52:06 result: 0.5
[1] 02:52:06 Call gather
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 1.0
[0] 02:52:06 Call terminator
[0] 02:52:06 ==> 0
[0] 02:52:06 Call gatherInformation
[1] 02:52:06 Call terminator
[1] 02:52:06 ==> 0
[1] 02:52:06 Call gatherInformation
[0] 02:52:06 start to process unicast messages:
105.813000000000002 ms: 150.317000000000007 ms elapsed: Memory:G
3.91168 MB 0.0 MB
[0] 02:52:06 copying dest id: 0.03 ms: 150.347000000000008 ms
elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 copying message value: 0.071 ms: 150.418000000000006
ms elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 finished message processing: 0.062 ms:
150.47999999999999 ms elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 returns false
shared_memory = 0x111e80000, copy_from = 0x114234460, len = 64
[0] 02:52:06 STT_END_COUNT: 0
[0] 02:52:06 STT_ACTIVE_VERTEX: 1024
[0] 02:52:06 STT_RAW_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_MESSAGE: 0
[0] 02:52:06 STT_COMBINED_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_TRANSFERED_MESSAGE: 0
[0] 02:52:06 Exchange Messages
[1] 02:52:06 returns false
shared_memory = 0x1079f0000, copy_from = 0x1099bbe10, len = 64
[1] 02:52:06 Exchange Messages
shared_memory = 0x10a154000, copy_from = 0x10a0d5000, len = 64592
shared_memory = 0x107c4d000, copy_from = 0x10a0cf000, len = 4104
#1  numGlobalVertices = 1024
#1  numLocalVertices = 512
#1  outEdge_offsets_size = 513
#1  outEdge_vertices_size = 8295
#1  inEdge_offsets_size = 513
#1  inEdge_vertices_size = 8074
#1  vertexValue_type = 7
#1  vertexActive_mc_size = 8
#1  vertexShouldBeActive_mc_size = 8
#1  message_values_size = 8074
```

```
#1  message_offsets_size = 513
#1  message_value_type = 7
shared_memory = 0x11481a000, copy_from = 0x1147c4000, len = 66480
shared_memory = 0x112272000, copy_from = 0x1147e5000, len = 4104
#0  numGlobalVertices = 1024
#0  numLocalVertices = 512
#0  outEdge_offsets_size = 513
#0  outEdge_vertices_size = 8089
#0  inEdge_offsets_size = 513
#0  inEdge_vertices_size = 8310
#0  vertexValue_type = 7
#0  vertexActive_mc_size = 8
#0  vertexShouldBeActive_mc_size = 8
#0  message_values_size = 8310
#0  message_offsets_size = 513
#0  message_value_type = 7
[0] 02:52:06 start to unicast message communication: 0.315 ms:
150.794999999999987 ms elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 alltoallv...: 0.427 ms: 151.222000000000008 ms
elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 before sort...: 0.313 ms: 151.534999999999997 ms
elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 sort...: 0.018 ms: 151.552999999999997 ms elapsed:
Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 sort [thread local add ver] numChunks=128,
numShift=2: 0.008 ms: 151.561000000000007 ms elapsed: Memory:G
3.91168 MB 0.0 MB
[0] 02:52:06 sort count: 0.051 ms: 151.611999999999995 ms elapsed:
Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 sort copy: 0.159 ms: 151.770999999999987 ms elapsed:
Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 sort end: 0.224 ms: 151.995000000000005 ms elapsed:
Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 finished unicast message communication: 0.064 ms:
152.058999999999997 ms elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 finished broadcast message communication: 0.008 ms:
152.067000000000007 ms elapsed: Memory:G 3.91168 MB 0.0 MB
[0] 02:52:06 Send command:superstep 1
 length=12 bufsize=12
[0] 02:52:06 Wait Aggregated Value from Thread:1
[0] 02:52:06 Wait Aggregated Value from Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.089601625414778
[0] 02:52:06 Wait numProcessed from Thread:0
[0] 02:52:06 Reveived numProcessed from Thread:0 = 256
```

```
[0] 02:52:06 Reveived NumMessage from Thread:0 = 3925
[0] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[0] 02:52:06 Wait OK Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.087003680523169
[1] 02:52:06 Send command:superstep 1
 length=12 bufsize=12
[0] 02:52:06 Wait numProcessed from Thread:1
[0] 02:52:06 Reveived numProcessed from Thread:1 = 256
[0] 02:52:06 Reveived NumMessage from Thread:1 = 4164
[0] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[0] 02:52:06 Wait OK Thread:1
[0] 02:52:06 numSentMessage: 3925
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x11481a000, copy_to = 0x1147f0000, len = 31400
shared_memory = 0x11481a000, copy_to = 0x1147f8000, len = 31400
[0] 02:52:06 numSentMessage: 4164
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x11499d000, copy_to = 0x1147f0000, len = 33312
shared_memory = 0x11499d000, copy_to = 0x11482e000, len = 33312
[0] 02:52:06 BCCHasMessage has NO message !!!!
[0] 02:52:06 Dispatch BCC Messages
[0] 02:52:06 call allreduce
[1] 02:52:06 Wait Aggregated Value from Thread:1
[1] 02:52:06 Wait Aggregated Value from Thread:0
[1] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.093505642187369
[1] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.08368338056778
[1] 02:52:06 Wait numProcessed from Thread:0
[1] 02:52:06 Wait numProcessed from Thread:1
[1] 02:52:06 Reveived numProcessed from Thread:0 = 256
[1] 02:52:06 Reveived numProcessed from Thread:1 = 256
[1] 02:52:06 Reveived NumMessage from Thread:0 = 4249
[1] 02:52:06 Reveived NumMessage from Thread:1 = 4046
[1] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[1] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[1] 02:52:06 Wait OK Thread:0
[1] 02:52:06 Wait OK Thread:1
[1] 02:52:06 numSentMessage: 4249
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a154000, copy_to = 0x10a117000, len = 33992
shared_memory = 0x10a154000, copy_to = 0x10a120000, len = 33992
[1] 02:52:06 numSentMessage: 4046
[1] 02:52:06 numSentMessageN: 0
```

```
shared_memory = 0x10a292000, copy_to = 0x10a11c000, len = 32368
shared_memory = 0x10a292000, copy_to = 0x10a17b000, len = 32368
[1] 02:52:06 BCCHasMessage has NO message !!!!
[1] 02:52:06 Dispatch BCC Messages
[1] 02:52:06 call allreduce
[0] 02:52:06 numAllBCSCount: 0
[0] 02:52:06 Call aggregator
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.176605305937948
[0] 02:52:06 Call gather
[1] 02:52:06 numAllBCSCount: 0
[1] 02:52:06 Call aggregator
[1] 02:52:06 start callAggregator
[1] 02:52:06 runString
[1] 02:52:06 result: 0.177189022755149
[1] 02:52:06 Call gather
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.353794328693097
[0] 02:52:06 Call terminator
[0] 02:52:06 ==> 0
[0] 02:52:06 Call gatherInformation
[1] 02:52:06 Call terminator
[1] 02:52:06 ==> 0
[1] 02:52:06 Call gatherInformation
[0] 02:52:06 start to process unicast messages: 17.337 ms:
169.403999999999996 ms elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 copying dest id: 0.018 ms: 169.421999999999997 ms
elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 copying message value: 0.053 ms: 169.474999999999994
ms elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 finished message processing: 0.041 ms:
169.515999999999991 ms elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 returns false
shared_memory = 0x111e80000, copy_from = 0x114234460, len = 64
[0] 02:52:06 STT_END_COUNT: 0
[0] 02:52:06 STT_ACTIVE_VERTEX: 1024
[0] 02:52:06 STT_RAW_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_MESSAGE: 0
[0] 02:52:06 STT_COMBINED_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_TRANSFERED_MESSAGE: 0
[0] 02:52:06 Exchange Messages
[1] 02:52:06 returns false
shared_memory = 0x1079f0000, copy_from = 0x1099bbe10, len = 64
```

```
[1] 02:52:06 Exchange Messages
shared_memory = 0x10a2d2000, copy_from = 0x10a1f6000, len = 64592
shared_memory = 0x107c4d000, copy_from = 0x10a1ee000, len = 4104
#1  numGlobalVertices = 1024
#1  numLocalVertices = 512
#1  outEdge_offsets_size = 513
#1  outEdge_vertices_size = 8295
#1  inEdge_offsets_size = 513
#1  inEdge_vertices_size = 8074
#1  vertexValue_type = 7
#1  vertexActive_mc_size = 8
#1  vertexShouldBeActive_mc_size = 8
#1  message_values_size = 8074
#1  message_offsets_size = 513
#1  message_value_type = 7
shared_memory = 0x11499d000, copy_from = 0x1148f2000, len = 66480
shared_memory = 0x112272000, copy_from = 0x114913000, len = 4104
#0  numGlobalVertices = 1024
#0  numLocalVertices = 512
#0  outEdge_offsets_size = 513
#0  outEdge_vertices_size = 8089
#0  inEdge_offsets_size = 513
#0  inEdge_vertices_size = 8310
#0  vertexValue_type = 7
#0  vertexActive_mc_size = 8
#0  vertexShouldBeActive_mc_size = 8
#0  message_values_size = 8310
#0  message_offsets_size = 513
#0  message_value_type = 7
[0] 02:52:06 start to unicast message communication: 0.249 ms:
169.764999999999986 ms elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 alltoallv...: 0.412 ms: 170.176999999999992 ms
elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 before sort...: 0.179 ms: 170.355999999999995 ms
elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 sort...: 0.018 ms: 170.373999999999995 ms elapsed:
Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 sort [thread local add ver] numChunks=128,
numShift=2: 0.009 ms: 170.383000000000001 ms elapsed: Memory:G
5.234688 MB 0.0 MB
[0] 02:52:06 sort count: 0.04 ms: 170.423000000000002 ms elapsed:
Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 sort copy: 0.07 ms: 170.492999999999995 ms elapsed:
Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 sort end: 0.156 ms: 170.649000000000001 ms elapsed:
```

```
Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 finished unicast message communication: 0.028 ms:
170.676999999999992 ms elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 finished broadcast message communication: 0.006 ms:
170.682999999999993 ms elapsed: Memory:G 5.234688 MB 0.0 MB
[0] 02:52:06 Send command:superstep 2
 length=12 bufsize=12
[0] 02:52:06 Wait Aggregated Value from Thread:1
[0] 02:52:06 Wait Aggregated Value from Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.030991358521462
[0] 02:52:06 Wait numProcessed from Thread:0
[0] 02:52:06 Reveived numProcessed from Thread:0 = 256
[0] 02:52:06 Reveived NumMessage from Thread:0 = 3925
[0] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[0] 02:52:06 Wait OK Thread:0
[1] 02:52:06 Send command:superstep 2
 length=12 bufsize=12
[0] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.029624733669009
[0] 02:52:06 Wait numProcessed from Thread:1
[0] 02:52:06 Reveived numProcessed from Thread:1 = 256
[0] 02:52:06 Reveived NumMessage from Thread:1 = 4164
[0] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[0] 02:52:06 Wait OK Thread:1
[0] 02:52:06 numSentMessage: 3925
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x11499d000, copy_to = 0x11491e000, len = 31400
shared_memory = 0x11499d000, copy_to = 0x114926000, len = 31400
[0] 02:52:06 numSentMessage: 4164
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x11499d000, copy_to = 0x11491f000, len = 33312
shared_memory = 0x114b50000, copy_to = 0x11499d000, len = 33312
[0] 02:52:06 BCCHasMessage has NO message !!!!
[0] 02:52:06 Dispatch BCC Messages
[0] 02:52:06 call allreduce
[1] 02:52:06 Wait Aggregated Value from Thread:1
[1] 02:52:06 Wait Aggregated Value from Thread:0
[1] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.031515721555802
[1] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.030586366252794
[1] 02:52:06 Wait numProcessed from Thread:0
[1] 02:52:06 Wait numProcessed from Thread:1
[1] 02:52:06 Reveived numProcessed from Thread:0 = 256
```

```
[1] 02:52:06 Reveived numProcessed from Thread:1 = 256
[1] 02:52:06 Reveived NumMessage from Thread:0 = 4249
[1] 02:52:06 Reveived NumMessage from Thread:1 = 4046
[1] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[1] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[1] 02:52:06 Wait OK Thread:0
[1] 02:52:06 Wait OK Thread:1
[1] 02:52:06 numSentMessage: 4249
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a2d2000, copy_to = 0x10a23b000, len = 33992
shared_memory = 0x10a2d2000, copy_to = 0x10a244000, len = 33992
[1] 02:52:06 numSentMessage: 4046
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a47e000, copy_to = 0x10a23c000, len = 32368
shared_memory = 0x10a47e000, copy_to = 0x10a244000, len = 32368
[1] 02:52:06 BCCHasMessage has NO message !!!!
[1] 02:52:06 Dispatch BCC Messages
[1] 02:52:06 call allreduce
[0] 02:52:06 numAllBCSCount: 0
[0] 02:52:06 Call aggregator
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.060616092190471
[0] 02:52:06 Call gather
[1] 02:52:06 numAllBCSCount: 0
[1] 02:52:06 Call aggregator
[1] 02:52:06 start callAggregator
[1] 02:52:06 runString
[1] 02:52:06 result: 0.062102087808595
[1] 02:52:06 Call gather
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.122718179999066
[0] 02:52:06 Call terminator
[0] 02:52:06 ==> 0
[0] 02:52:06 Call gatherInformation
[1] 02:52:06 Call terminator
[1] 02:52:06 ==> 0
[1] 02:52:06 Call gatherInformation
[0] 02:52:06 start to process unicast messages: 15.779 ms:
186.461999999999989 ms elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 copying dest id: 0.017 ms: 186.479000000000013 ms
elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 copying message value: 0.089 ms: 186.568000000000012
ms elapsed: Memory:G 7.016448 MB 0.0 MB
```

```
[0] 02:52:06 finished message processing: 0.056 ms:
186.623999999999995 ms elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 returns false
shared_memory = 0x111e80000, copy_from = 0x114234460, len = 64
[0] 02:52:06 STT_END_COUNT: 0
[0] 02:52:06 STT_ACTIVE_VERTEX: 1024
[0] 02:52:06 STT_RAW_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_MESSAGE: 0
[0] 02:52:06 STT_COMBINED_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_TRANSFERED_MESSAGE: 0
[0] 02:52:06 Exchange Messages
[1] 02:52:06 returns false
shared_memory = 0x1079f0000, copy_from = 0x1099bbe10, len = 64
[1] 02:52:06 Exchange Messages
shared_memory = 0x10a47e000, copy_from = 0x10a353000, len = 64592
shared_memory = 0x107c4d000, copy_from = 0x10a364000, len = 4104
#1  numGlobalVertices = 1024
#1  numLocalVertices = 512
#1  outEdge_offsets_size = 513
#1  outEdge_vertices_size = 8295
#1  inEdge_offsets_size = 513
#1  inEdge_vertices_size = 8074
#1  vertexValue_type = 7
#1  vertexActive_mc_size = 8
#1  vertexShouldBeActive_mc_size = 8
#1  message_values_size = 8074
#1  message_offsets_size = 513
#1  message_value_type = 7
[1] 02:52:06 Send command:superstep 3
 length=12 bufsize=12
shared_memory = 0x114b50000, copy_from = 0x114a63000, len = 66480
shared_memory = 0x112272000, copy_from = 0x114a84000, len = 4104
#0  numGlobalVertices = 1024
#0  numLocalVertices = 512
#0  outEdge_offsets_size = 513
#0  outEdge_vertices_size = 8089
#0  inEdge_offsets_size = 513
#0  inEdge_vertices_size = 8310
#0  vertexValue_type = 7
#0  vertexActive_mc_size = 8
#0  vertexShouldBeActive_mc_size = 8
#0  message_values_size = 8310
#0  message_offsets_size = 513
#0  message_value_type = 7
[0] 02:52:06 start to unicast message communication: 0.191 ms:
```

```
186.814999999999998 ms elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 alltoallv...: 0.368 ms: 187.182999999999993 ms
elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 before sort...: 0.212 ms: 187.39500000000001 ms
elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 sort...: 0.018 ms: 187.413000000000011 ms elapsed:
Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 sort [thread local add ver] numChunks=128,
numShift=2: 0.008 ms: 187.420999999999992 ms elapsed: Memory:G
7.016448 MB 0.0 MB
[0] 02:52:06 sort count: 0.034 ms: 187.455000000000013 ms elapsed:
Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 sort copy: 0.094 ms: 187.549000000000007 ms elapsed:
Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 sort end: 0.179 ms: 187.728000000000009 ms elapsed:
Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 finished unicast message communication: 0.071 ms:
187.799000000000007 ms elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 finished broadcast message communication: 0.105 ms:
187.903999999999996 ms elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 Send command:superstep 3
 length=12 bufsize=12
[0] 02:52:06 Wait Aggregated Value from Thread:1
[0] 02:52:06 Wait Aggregated Value from Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.011149997780148
[0] 02:52:06 Wait numProcessed from Thread:0
[0] 02:52:06 Reveived numProcessed from Thread:0 = 256
[0] 02:52:06 Reveived NumMessage from Thread:0 = 3925
[0] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[0] 02:52:06 Wait OK Thread:0
[1] 02:52:06 Wait Aggregated Value from Thread:1
[1] 02:52:06 Wait Aggregated Value from Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.010939299682335
[0] 02:52:06 Wait numProcessed from Thread:1
[0] 02:52:06 Reveived numProcessed from Thread:1 = 256
[0] 02:52:06 Reveived NumMessage from Thread:1 = 4164
[0] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[0] 02:52:06 Wait OK Thread:1
[0] 02:52:06 numSentMessage: 3925
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x114b50000, copy_to = 0x114a94000, len = 31400
shared_memory = 0x114b50000, copy_to = 0x114a9c000, len = 31400
[0] 02:52:06 numSentMessage: 4164
```

```
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x114b50000, copy_to = 0x114a95000, len = 33312
shared_memory = 0x114b50000, copy_to = 0x114ad1000, len = 33312
[0] 02:52:06 BCCHasMessage has NO message !!!!
[0] 02:52:06 Dispatch BCC Messages
[0] 02:52:06 call allreduce
[1] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.010966481215291
[1] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.011465465599769
[1] 02:52:06 Wait numProcessed from Thread:1
[1] 02:52:06 Wait numProcessed from Thread:0
[1] 02:52:06 Reveived numProcessed from Thread:1 = 256
[1] 02:52:06 Reveived numProcessed from Thread:0 = 256
[1] 02:52:06 Reveived NumMessage from Thread:1 = 4046
[1] 02:52:06 Reveived NumMessage from Thread:0 = 4249
[1] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[1] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[1] 02:52:06 Wait OK Thread:1
[1] 02:52:06 Wait OK Thread:0
[1] 02:52:06 numSentMessage: 4249
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a47e000, copy_to = 0x10a39a000, len = 33992
shared_memory = 0x10a47e000, copy_to = 0x10a3a3000, len = 33992
[1] 02:52:06 numSentMessage: 4046
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a47e000, copy_to = 0x10a3a0000, len = 32368
shared_memory = 0x10a47e000, copy_to = 0x10a3fd000, len = 32368
[1] 02:52:06 BCCHasMessage has NO message !!!!
[1] 02:52:06 Dispatch BCC Messages
[1] 02:52:06 call allreduce
[0] 02:52:06 numAllBCSCount: 0
[0] 02:52:06 Call aggregator
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.022089297462483
[0] 02:52:06 Call gather
[1] 02:52:06 numAllBCSCount: 0
[1] 02:52:06 Call aggregator
[1] 02:52:06 start callAggregator
[1] 02:52:06 runString
[1] 02:52:06 result: 0.02243194681506
[1] 02:52:06 Call gather
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
```

```
[0] 02:52:06 result: 0.044521244277542
[0] 02:52:06 Call terminator
[0] 02:52:06 ==> 0
[0] 02:52:06 Call gatherInformation
[1] 02:52:06 Call terminator
[1] 02:52:06 ==> 0
[1] 02:52:06 Call gatherInformation
[0] 02:52:06 start to process unicast messages: 14.303000000000001
ms: 202.206999999999994 ms elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 copying dest id: 0.024 ms: 202.230999999999995 ms
elapsed: Memory:G 7.016448 MB 0.0 MB
[0] 02:52:06 copying message value: 0.097 ms: 202.328000000000003
ms elapsed: Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 finished message processing: 0.065 ms:
202.393000000000001 ms elapsed: Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 returns false
shared_memory = 0x111e80000, copy_from = 0x114234460, len = 64
[0] 02:52:06 STT_END_COUNT: 0
[0] 02:52:06 STT_ACTIVE_VERTEX: 1024
[0] 02:52:06 STT_RAW_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_MESSAGE: 0
[0] 02:52:06 STT_COMBINED_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_TRANSFERED_MESSAGE: 0
[0] 02:52:06 Exchange Messages
[1] 02:52:06 returns false
shared_memory = 0x1079f0000, copy_from = 0x1099bbe10, len = 64
[1] 02:52:06 Exchange Messages
shared_memory = 0x10a6bf000, copy_from = 0x10a470000, len = 64592
shared_memory = 0x107c4d000, copy_from = 0x10a481000, len = 4104
shared_memory = 0x114d9b000, copy_from = 0x114b8d000, len = 66480
#1  numGlobalVertices = 1024
#1  numLocalVertices = 512
#1  outEdge_offsets_size = 513
#1  outEdge_vertices_size = 8295
#1  inEdge_offsets_size = 513
#1  inEdge_vertices_size = 8074
#1  vertexValue_type = 7
#1  vertexActive_mc_size = 8
#1  vertexShouldBeActive_mc_size = 8
#1  message_values_size = 8074
#1  message_offsets_size = 513
#1  message_value_type = 7
shared_memory = 0x112272000, copy_from = 0x114b79000, len = 4104
#0  numGlobalVertices = 1024
#0  numLocalVertices = 512
```

```
#0  outEdge_offsets_size = 513
#0  outEdge_vertices_size = 8089
#0  inEdge_offsets_size = 513
#0  inEdge_vertices_size = 8310
#0  vertexValue_type = 7
#0  vertexActive_mc_size = 8
#0  vertexShouldBeActive_mc_size = 8
#0  message_values_size = 8310
#0  message_offsets_size = 513
#0  message_value_type = 7
[0] 02:52:06 start to unicast message communication: 0.235 ms:
202.627999999999986 ms elapsed: Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 alltoallv...: 0.382 ms: 203.009999999999991 ms
elapsed: Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 before sort...: 0.234 ms: 203.244 ms elapsed:
Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 sort...: 0.017 ms: 203.260999999999996 ms elapsed:
Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 sort [thread local add ver] numChunks=128,
numShift=2: 0.01 ms: 203.270999999999987 ms elapsed: Memory:G
9.4208 MB 0.0 MB
[0] 02:52:06 sort count: 0.038 ms: 203.308999999999997 ms elapsed:
Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 sort copy: 0.121 ms: 203.430000000000007 ms elapsed:
Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 sort end: 0.256 ms: 203.686000000000007 ms elapsed:
Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 finished unicast message communication: 0.044 ms:
203.729999999999999 ms elapsed: Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 finished broadcast message communication: 0.008 ms:
203.738 ms elapsed: Memory:G 9.4208 MB 0.0 MB
[0] 02:52:06 Send command:superstep 4
 length=12 bufsize=12
[0] 02:52:06 Wait Aggregated Value from Thread:1
[0] 02:52:06 Wait Aggregated Value from Thread:0
[0] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.004518786636961
[0] 02:52:06 Wait numProcessed from Thread:1
[0] 02:52:06 Reveived numProcessed from Thread:1 = 256
[0] 02:52:06 Reveived NumMessage from Thread:1 = 4164
[0] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.004343437220736
[0] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[0] 02:52:06 Wait numProcessed from Thread:0
[0] 02:52:06 Wait OK Thread:1
```

```
[0] 02:52:06 Reveived numProcessed from Thread:0 = 256
[0] 02:52:06 Reveived NumMessage from Thread:0 = 3925
[0] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[1] 02:52:06 Send command:superstep 4
 length=12 bufsize=12
[0] 02:52:06 Wait OK Thread:0
[0] 02:52:06 numSentMessage: 3925
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x114d9b000, copy_to = 0x114bba000, len = 31400
shared_memory = 0x114d9b000, copy_to = 0x114bc2000, len = 31400
[0] 02:52:06 numSentMessage: 4164
[0] 02:52:06 numSentMessageN: 0
shared_memory = 0x114d9b000, copy_to = 0x114bba000, len = 33312
shared_memory = 0x114d9b000, copy_to = 0x114bf7000, len = 33312
[0] 02:52:06 BCCHasMessage has NO message !!!!
[0] 02:52:06 Dispatch BCC Messages
[0] 02:52:06 call allreduce
[1] 02:52:06 Wait Aggregated Value from Thread:1
[1] 02:52:06 Wait Aggregated Value from Thread:0
[1] 02:52:06 Reveived Aggregated Value from Thread:0 =
0.00438302864145
[1] 02:52:06 Reveived Aggregated Value from Thread:1 =
0.003939305442363
[1] 02:52:06 Wait numProcessed from Thread:0
[1] 02:52:06 Wait numProcessed from Thread:1
[1] 02:52:06 Reveived numProcessed from Thread:0 = 256
[1] 02:52:06 Reveived numProcessed from Thread:1 = 256
[1] 02:52:06 Reveived NumMessage from Thread:0 = 4249
[1] 02:52:06 Reveived NumMessage from Thread:1 = 4046
[1] 02:52:06 Reveived NumMessageN from Thread:0 = 0
[1] 02:52:06 Reveived NumMessageN from Thread:1 = 0
[1] 02:52:06 Wait OK Thread:0
[1] 02:52:06 Wait OK Thread:1
[1] 02:52:06 numSentMessage: 4249
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a6bf000, copy_to = 0x10a4bc000, len = 33992
shared_memory = 0x10a6bf000, copy_to = 0x10a4c5000, len = 33992
[1] 02:52:06 numSentMessage: 4046
[1] 02:52:06 numSentMessageN: 0
shared_memory = 0x10a6bf000, copy_to = 0x10a4c1000, len = 32368
shared_memory = 0x10a6bf000, copy_to = 0x10a51f000, len = 32368
[1] 02:52:06 BCCHasMessage has NO message !!!!
[1] 02:52:06 Dispatch BCC Messages
[1] 02:52:06 call allreduce
[0] 02:52:06 numAllBCSCount: 0
```

```
[0] 02:52:06 Call aggregator
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.008862223857698
[0] 02:52:06 Call gather
[1] 02:52:06 numAllBCSCount: 0
[1] 02:52:06 Call aggregator
[1] 02:52:06 start callAggregator
[1] 02:52:06 runString
[1] 02:52:06 result: 0.008322334083814
[1] 02:52:06 Call gather
[0] 02:52:06 start callAggregator
[0] 02:52:06 runString
[0] 02:52:06 result: 0.017184557941512
[0] 02:52:06 Call terminator
[0] 02:52:06 ==> 1
[0] 02:52:06 Call gatherInformation
[1] 02:52:06 Call terminator
[1] 02:52:06 ==> 1
[1] 02:52:06 Call gatherInformation
[0] 02:52:06 returns true
shared_memory = 0x111e80000, copy_from = 0x114234460, len = 64
[0] 02:52:06 STT_END_COUNT: 2
[0] 02:52:06 STT_ACTIVE_VERTEX: 1024
[0] 02:52:06 STT_RAW_MESSAGE: 16384
[0] 02:52:06 STT_VERTEX_MESSAGE: 0
[0] 02:52:06 TERMINATE
[0] 02:52:06 KILL CHILD
[0] 02:52:06 Exit
[0] 02:52:06 Last Aggregated Value: 0.017184557941512
[1] 02:52:06 returns true
shared_memory = 0x1079f0000, copy_from = 0x1099bbe10, len = 64
[1] 02:52:06 TERMINATE
[1] 02:52:06 KILL CHILD
[1] 02:52:06 Exit
[1] 02:52:06 Last Aggregated Value: 0.017184557941512
```

Pregel計算は各MPIプロセスが実行するX10スレッド毎にforkしたPython workerプロセスで実行されますが、このworkerプロセス個別のログは、src/python/scalegraph/config.pyにあるwork_dir変数が示すパスに吐かれます。そのうちのひとつを例として以下に示します。

```
$ cat log_59163.txt
[1:0:59163] rangePlaceLocalVertices range(0, 512)
```

```
[1:0:59163] rangeThreadLocalVertices range(0, 256)
[1:0:59163] START
[1:0:59163] command:  superstep 0

[1:0:59163] superstep: 0
[1:0:59163] numVertives: 1024
[1:0:59163] num received messages: [0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
[1:0:59163] len aggregated value: 256
[1:0:59163] aggregated value = 0.25
[1:0:59163] return: d 0.25
[1:0:59163] return: q 256
[1:0:59163] return: q 4249
[1:0:59163] return: q 0
[1:0:59163] command:  superstep 1

[1:0:59163] superstep: 1
[1:0:59163] numVertives: 1024
[1:0:59163] num received messages: [12, 27, 41, 14, 14, 14, 2,
11, 17, 29, 24, 23, 6, 14, 22, 30, 16, 20, 10, 5, 8, 11, 17, 8,
43, 10, 21, 5, 12, 32, 5, 10, 53, 6, 8, 3, 14, 18, 17, 11, 21,
22, 14, 11, 9, 38, 6, 25, 11, 50, 6, 24, 4, 13, 26, 13, 41, 16,
25, 8, 43, 4, 4, 8, 13, 9, 21, 27, 13, 50, 9, 34, 14, 22, 4, 10,
7, 34, 14, 5, 16, 30, 8, 12, 8, 24, 26, 7, 7, 14, 9, 36, 4, 9,
17, 11, 13, 11, 18, 14, 8, 8, 25, 5, 17, 9, 11, 8, 10, 11, 9,
32, 23, 31, 11, 8, 21, 16, 12, 5, 8, 8, 9, 28, 9, 16, 20, 6, 18,
13, 16, 13, 4, 24, 48, 15, 20, 6, 17, 9, 15, 26, 5, 13, 19, 15,
13, 6, 12, 10, 10, 39, 16, 8, 18, 29, 42, 13, 21, 7, 14, 5, 7,
12, 10, 6, 36, 7, 19, 11, 14, 5, 12, 26, 5, 35, 5, 10, 25, 7,
19, 2, 14, 9, 20, 32, 6, 11, 16, 10, 19, 11, 16, 5, 14, 9, 5,
12, 9, 17, 40, 8, 16, 6, 11, 13, 14, 12, 12, 23, 9, 18, 18, 4,
16, 11, 6, 4, 19, 16, 45, 7, 10, 8, 12, 27, 14, 4, 18, 13, 16,
22, 22, 6, 19, 24, 25, 15, 11, 16, 12, 28, 45, 15, 12, 14, 40,
9, 8, 4, 48, 20, 20, 15, 12, 8]
```

```
[1:0:59163] len aggregated value: 256
[1:0:59163] aggregated value = 0.09350564218736937
[1:0:59163] return: d 0.09350564218736937
[1:0:59163] return: q 256
[1:0:59163] return: q 4249
[1:0:59163] return: q 0
[1:0:59163] command:  superstep 2

[1:0:59163] superstep: 2
[1:0:59163] numVertives: 1024
[1:0:59163] num received messages: [12, 27, 41, 14, 14, 14, 2,
11, 17, 29, 24, 23, 6, 14, 22, 30, 16, 20, 10, 5, 8, 11, 17, 8,
43, 10, 21, 5, 12, 32, 5, 10, 53, 6, 8, 3, 14, 18, 17, 11, 21,
22, 14, 11, 9, 38, 6, 25, 11, 50, 6, 24, 4, 13, 26, 13, 41, 16,
25, 8, 43, 4, 4, 8, 13, 9, 21, 27, 13, 50, 9, 34, 14, 22, 4, 10,
7, 34, 14, 5, 16, 30, 8, 12, 8, 24, 26, 7, 7, 14, 9, 36, 4, 9,
17, 11, 13, 11, 18, 14, 8, 8, 25, 5, 17, 9, 11, 8, 10, 11, 9,
32, 23, 31, 11, 8, 21, 16, 12, 5, 8, 8, 9, 28, 9, 16, 20, 6, 18,
13, 16, 13, 4, 24, 48, 15, 20, 6, 17, 9, 15, 26, 5, 13, 19, 15,
13, 6, 12, 10, 10, 39, 16, 8, 18, 29, 42, 13, 21, 7, 14, 5, 7,
12, 10, 6, 36, 7, 19, 11, 14, 5, 12, 26, 5, 35, 5, 10, 25, 7,
19, 2, 14, 9, 20, 32, 6, 11, 16, 10, 19, 11, 16, 5, 14, 9, 5,
12, 9, 17, 40, 8, 16, 6, 11, 13, 14, 12, 12, 23, 9, 18, 18, 4,
16, 11, 6, 4, 19, 16, 45, 7, 10, 8, 12, 27, 14, 4, 18, 13, 16,
22, 22, 6, 19, 24, 25, 15, 11, 16, 12, 28, 45, 15, 12, 14, 40,
9, 8, 4, 48, 20, 20, 15, 12, 8]
[1:0:59163] len aggregated value: 256
[1:0:59163] aggregated value = 0.03151572155580171
[1:0:59163] return: d 0.03151572155580171
[1:0:59163] return: q 256
[1:0:59163] return: q 4249
[1:0:59163] return: q 0
[1:0:59163] command:  superstep 3

[1:0:59163] superstep: 3
[1:0:59163] numVertives: 1024
[1:0:59163] num received messages: [12, 27, 41, 14, 14, 14, 2,
11, 17, 29, 24, 23, 6, 14, 22, 30, 16, 20, 10, 5, 8, 11, 17, 8,
43, 10, 21, 5, 12, 32, 5, 10, 53, 6, 8, 3, 14, 18, 17, 11, 21,
22, 14, 11, 9, 38, 6, 25, 11, 50, 6, 24, 4, 13, 26, 13, 41, 16,
25, 8, 43, 4, 4, 8, 13, 9, 21, 27, 13, 50, 9, 34, 14, 22, 4, 10,
7, 34, 14, 5, 16, 30, 8, 12, 8, 24, 26, 7, 7, 14, 9, 36, 4, 9,
17, 11, 13, 11, 18, 14, 8, 8, 25, 5, 17, 9, 11, 8, 10, 11, 9,
32, 23, 31, 11, 8, 21, 16, 12, 5, 8, 8, 9, 28, 9, 16, 20, 6, 18,
13, 16, 13, 4, 24, 48, 15, 20, 6, 17, 9, 15, 26, 5, 13, 19, 15,
```

```
13, 6, 12, 10, 10, 39, 16, 8, 18, 29, 42, 13, 21, 7, 14, 5, 7,
12, 10, 6, 36, 7, 19, 11, 14, 5, 12, 26, 5, 35, 5, 10, 25, 7,
19, 2, 14, 9, 20, 32, 6, 11, 16, 10, 19, 11, 16, 5, 14, 9, 5,
12, 9, 17, 40, 8, 16, 6, 11, 13, 14, 12, 12, 23, 9, 18, 18, 4,
16, 11, 6, 4, 19, 16, 45, 7, 10, 8, 12, 27, 14, 4, 18, 13, 16,
22, 22, 6, 19, 24, 25, 15, 11, 16, 12, 28, 45, 15, 12, 14, 40,
9, 8, 4, 48, 20, 20, 15, 12, 8]
[1:0:59163] len aggregated value: 256
[1:0:59163] aggregated value = 0.011465465599768822
[1:0:59163] return: d 0.011465465599768822
[1:0:59163] return: q 256
[1:0:59163] return: q 4249
[1:0:59163] return: q 0
[1:0:59163] command:  superstep 4

[1:0:59163] superstep: 4
[1:0:59163] numVertives: 1024
[1:0:59163] num received messages: [12, 27, 41, 14, 14, 14, 2,
11, 17, 29, 24, 23, 6, 14, 22, 30, 16, 20, 10, 5, 8, 11, 17, 8,
43, 10, 21, 5, 12, 32, 5, 10, 53, 6, 8, 3, 14, 18, 17, 11, 21,
22, 14, 11, 9, 38, 6, 25, 11, 50, 6, 24, 4, 13, 26, 13, 41, 16,
25, 8, 43, 4, 4, 8, 13, 9, 21, 27, 13, 50, 9, 34, 14, 22, 4, 10,
7, 34, 14, 5, 16, 30, 8, 12, 8, 24, 26, 7, 7, 14, 9, 36, 4, 9,
17, 11, 13, 11, 18, 14, 8, 8, 25, 5, 17, 9, 11, 8, 10, 11, 9,
32, 23, 31, 11, 8, 21, 16, 12, 5, 8, 8, 9, 28, 9, 16, 20, 6, 18,
13, 16, 13, 4, 24, 48, 15, 20, 6, 17, 9, 15, 26, 5, 13, 19, 15,
13, 6, 12, 10, 10, 39, 16, 8, 18, 29, 42, 13, 21, 7, 14, 5, 7,
12, 10, 6, 36, 7, 19, 11, 14, 5, 12, 26, 5, 35, 5, 10, 25, 7,
19, 2, 14, 9, 20, 32, 6, 11, 16, 10, 19, 11, 16, 5, 14, 9, 5,
12, 9, 17, 40, 8, 16, 6, 11, 13, 14, 12, 12, 23, 9, 18, 18, 4,
16, 11, 6, 4, 19, 16, 45, 7, 10, 8, 12, 27, 14, 4, 18, 13, 16,
22, 22, 6, 19, 24, 25, 15, 11, 16, 12, 28, 45, 15, 12, 14, 40,
9, 8, 4, 48, 20, 20, 15, 12, 8]
[1:0:59163] len aggregated value: 256
[1:0:59163] aggregated value = 0.00438302864145049
[1:0:59163] return: d 0.00438302864145049
[1:0:59163] return: q 256
[1:0:59163] return: q 4249
[1:0:59163] return: q 0
[1:0:59163] END
```