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EECS 117 Hw #2

Part 1:

4	0.0000507694
8	0.0000510676
16	0.0000510019
32	0.0000509574
64	0.0000511130
128	0.0000512686
256	0.0000513165
512	0.0000642710
1024	0.0000752060
2048	0.0000939965
4096	0.0001204045
8192	0.0001626515
16384	0.0002292446
32768	0.0003702440
65536	0.0007713650
131072	0.0013238910
262144	0.0024388225
524288	0.0046662245
1048576	0.0091242535
2097152	0.0180520545
4194304	0.0358956395
8388608	0.0715507826

Figure 1: results (message, time) from pingpong

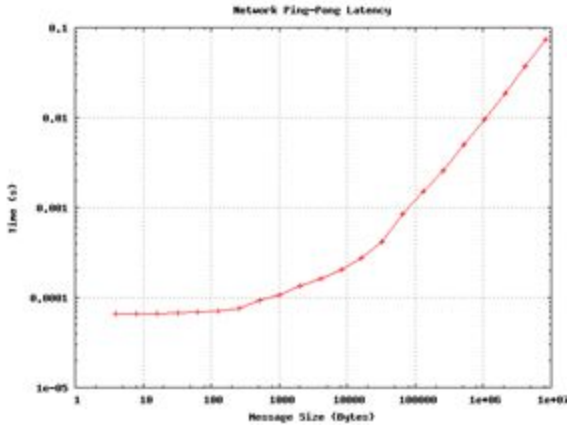


Figure 2: graph (message vs. time) from pingpong

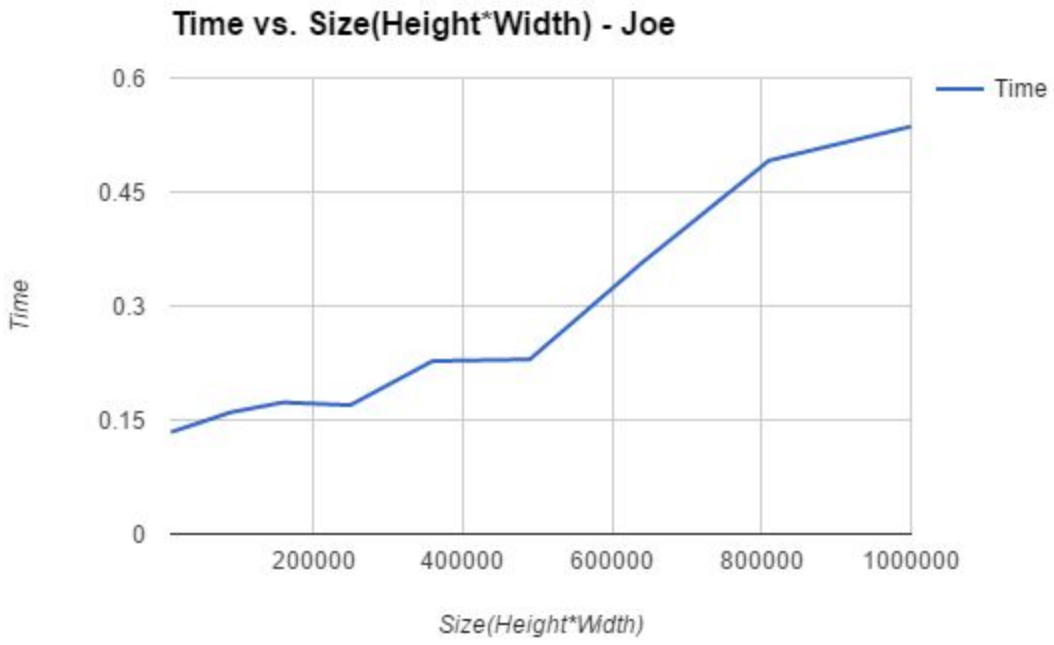
From Figure 1, the minimum time for sending a message of any size, within the given range, is 0.0716 seconds. The estimated slope of the line, from messages 16384 onwards, is:
$T(m) = m * 8.5188 * 10^{-9}$. The slope represent the rate at which messages will be sent as more messages are sent.

For m bytes,
T(m) = {
$m * 2.6577 * 10^{-8}$ for m < 512,
$m * 1.0394 * 10^{-8}$ for 512 <= m <= 16384,
$m * 8.5188 * 10^{-9}$ for m > 16384

Part 2.

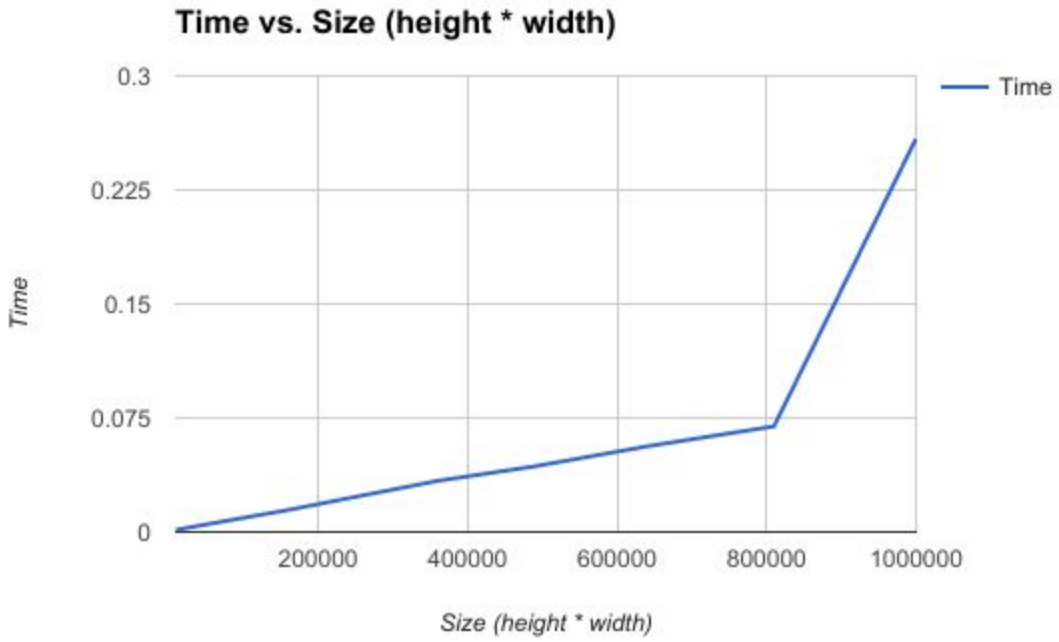
Joe. Number of processors = 10.

Size(Height*Width)	Time(Seconds)
10000	0.134
40000	0.1437
90000	0.1601
160000	0.1731
250000	0.169511
360000	0.227531
490000	0.229693
640000	0.356758
810000	0.491318
1000000	0.53612



Susie. Number of processors = 10

Size (height * width)	Time
10000	0.001369
40000	0.004017
90000	0.008404
160000	0.014451
250000	0.02309
360000	0.033614
490000	0.043203
640000	0.056322
810000	0.069505
1000000	0.258588



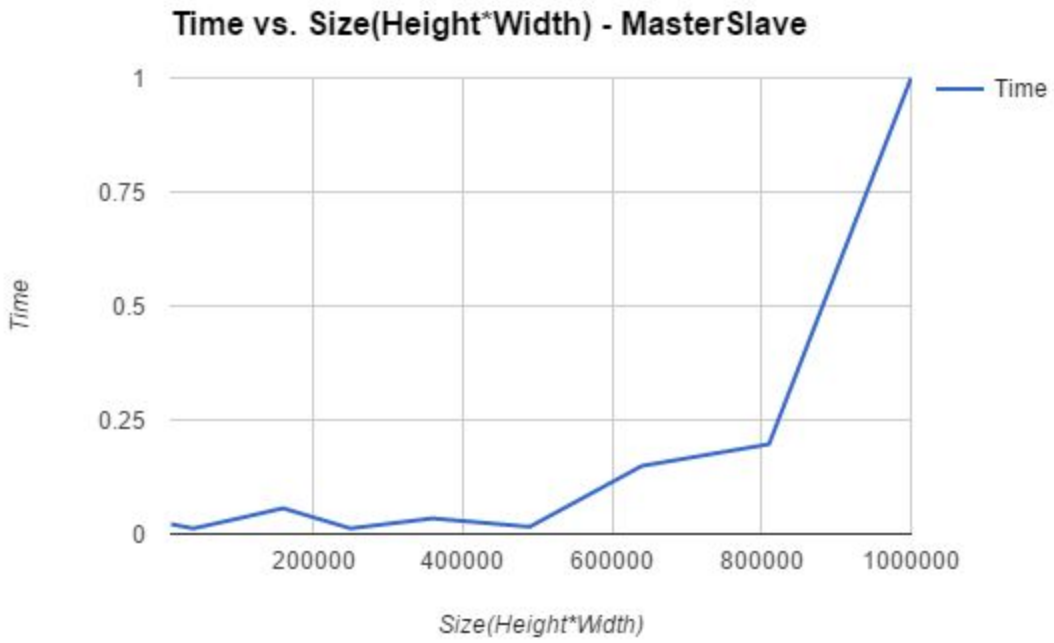
Which do you think is better? Why? Which intern do you offer a full-time job?

Susie is better as the run times is significantly faster than Joe's. I would offer Susie the job for a more complex approach to parallelism with higher speed up.

Master Slave. Number of processors = 10.

Size(Height*Width)	Time(Seconds)
10000	0.021625
40000	0.012212
90000	0.030314

160000	0.056382
250000	0.0122928
360000	0.034182
490000	0.015783
640000	0.149263
810000	0.196822
1000000	0.999343



Compare the master/slave strategy with Susie/Joe's implementation. Which do you think will scale to very large image sizes? Why?

Master/slave implementation is good for dynamically allocating jobs to the processors and not working on a set job.