

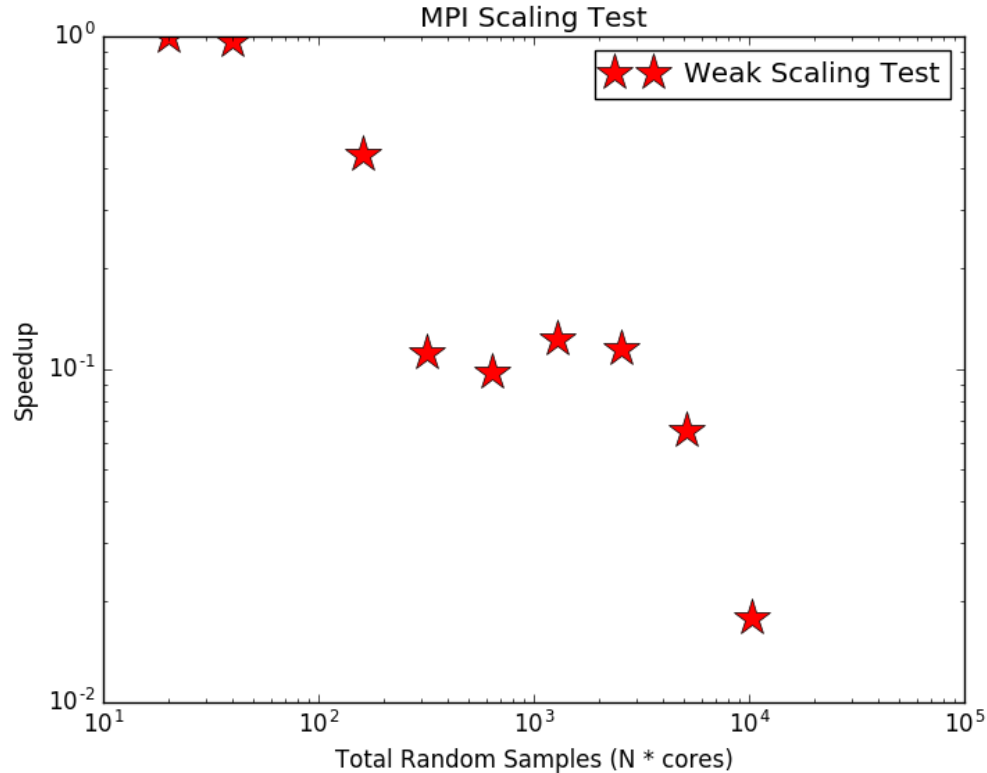
Solution to Homework #5—EAS 520 & DSC 520 & MTH 499

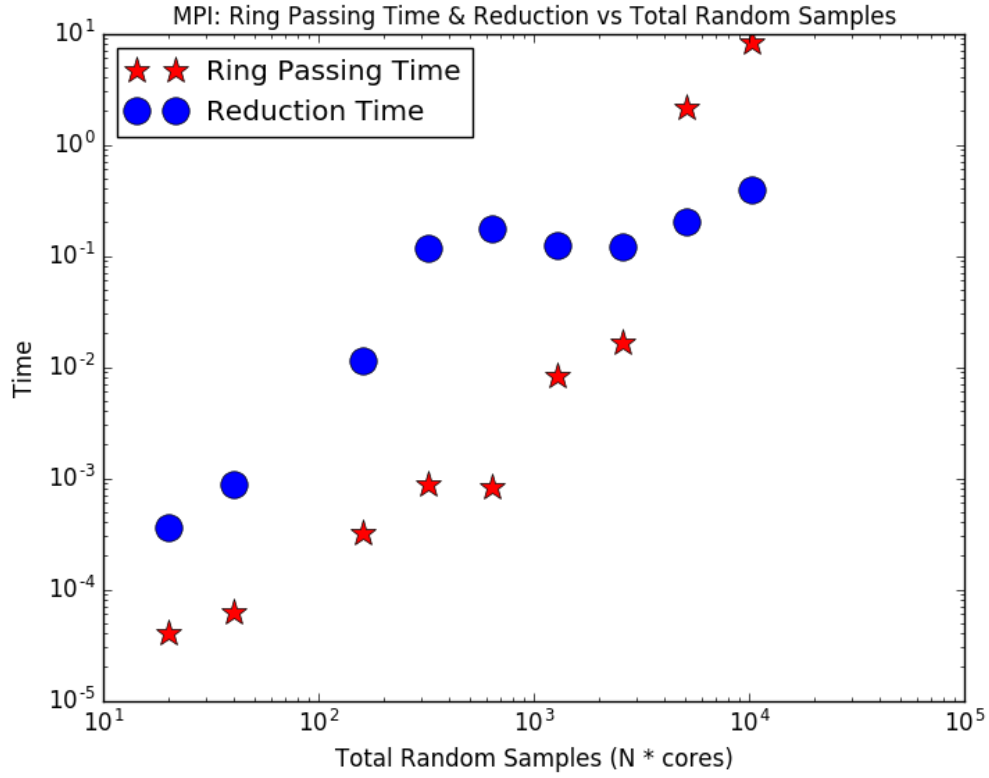
Solution for Problem 1 a,b :

```
f( 512, 404.2319 ) = -1059.640663
Proccess 2, sample 1, with f = 1.101457e+02
Proccess 1, sample 1, with f = -3.312653e+02
Proccess 3, sample 1, with f = -1.635407e+02
Proccess 0, sample 1, with f = 3.860226e+02
Proccess 2, sample 2, with f = -2.389024e+02
Proccess 1, sample 2, with f = 2.873286e+02
Proccess 3, sample 2, with f = -2.066937e+02
Proccess 0, sample 2, with f = -1.773359e+02
Process 2 of 4 local min = -2.389024e+02
Process 3 of 4 local min = -2.066937e+02
Process 0 of 4 local min = -1.773359e+02
Process 1 of 4 local min = -3.312653e+02
A Ring Topology Min = -3.312653e+02      MPI Min Reduction Global Min = -3.312653e+02
```

Solution for Problem 1 c : On Stampede, I increased N sample number and the process size (cores)=4. Result running time (Secret and Rand func) for each proccess making single sample is converging 0.0048 sec.

N size	Min (Ring)	Min(Reduction)	Entire T	Ring T	MPI T	Scrt+Rnd	Scrt&Rnd/N*size
10, 4,	-4.879420e+02,	-4.879420e+02,	0.424975,	0.000063,	0.000876,	0.424036,	0.010601
50, 4,	-7.606640e+02,	-7.606640e+02,	1.129642,	0.000066,	0.000869,	1.128707,	0.005644
100, 4,	-8.362344e+02,	-8.362344e+02,	2.089839,	0.000061,	0.000861,	2.088917,	0.005222
500, 4,	-9.327838e+02,	-9.327838e+02,	9.764632,	0.000067,	0.000943,	9.763622,	0.004882
1000, 4,	-9.312489e+02,	-9.312489e+02,	19.372315,	0.000066,	0.000897,	19.371352,	0.004843
10000, 4,	-9.517893e+02,	-9.517893e+02,	192.147944,	0.000065,	0.000920,	192.146959,	0.004804





N	cores	Min-Reduction	Entire Time	MPI Time	Secret & rand Time	Stampede output file
4000	1024	-1.041659e+03	472.120754	78.117580	394.003174	hw5_p2d_7876445.stdou
10000	1024	-1.056865e+03	1033.799760	181.037155	852.762605	hw5_p2d_7876648.stdou
100000	256	-1.059512e+03	1931.949510	4.449555	1927.499955	hw5_p2d_7876775.stdou
200000	256	-1.055818e+03	4095.107267	259.863719	3835.243548	hw5_p2d_7877455.stdou
200000	256	-1.058304e+03	4095.851167	259.731049	3836.120118	hw5_p2d_7877521.stdou
300000	256	-1.059302e+03	6142.260361	390.724083	5751.536278	hw5_p2d_7877590.stdou