Lab 1, Winter 2016
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“Small” File

Trials	Simpsh	Bash	Execline
1	User: 0.00095s Kernel: 0.001s	User: 0s Kernel: 0.01s	User: 0.071s Kernel: 0.009s
2	User: 0s Kernel: 0.0018s	User: 0.001s Kernel: 0.01s	User: 0.007s Kernel: 0.002s
3	User: 0s Kernel: 0.002s	User: .002s Kernel: 0.009s	User: 0.007s Kernel: 0.003s
4	User: 0.0008s Kernel: 0.0009s	User: .001s Kernel: 0.009s	User: 0.009s Kernel: 0.003s
5	User: 0s Kernel: 0.0019s	User: 0s Kernel: 0.009s	User: 0.007s Kernel: 0.004s
6	User: 0.035s Kernel: 0.004s	User: .033s Kernel: 0.008s	User: 0.020s Kernel: 0.001s
7	User: 0.0005s Kernel: 0.0015s	User: 0s Kernel: 0.01s	User: 0.007s Kernel: 0.003s
8	User: 0s Kernel: 0.0018s	User: 0s Kernel: 0.009s	User: 0.007s Kernel: 0.002s
Average	User: 0.0046 Kernel: 0.00186	User: .0046 Kernel: 0.00925	User: 0.017 Kernel: 0.00338

“Medium” File

Trials	Simpsh	Bash	Execline
1	User: 0.03s Kernel: 0.012s	User: 0.035s Kernel: 0.007s	User: 0.076s Kernel: 0.007s
2	User: 0.033s Kernel: 0.011s	User: 0.0331s Kernel: 0.006s	User: 0.079s Kernel: 0.013s
3	User: 0.034s Kernel: 0.008s	User: 0.03s Kernel: 0.01s	User: 0.059s Kernel: 0.006s

4	User: 0.03s Kernel: 0.0079s	User: 0.027s Kernel: 0.012s	User: 0.073s Kernel: 0.007s
5	User: 0.031s Kernel: 0.008s	User: 0.032s Kernel: 0.009s	User: 0.056s Kernel: 0.004s
6	User: 0.0346s Kernel: 0.004s	User: 0.033s Kenel: 0.008s	User: 0.055s Kernel: 0.006s
7	User: 0.03s Kernel: 0.0062s	User: 0.031s Kernel: 0.008s	User: 0.053s Kernel: 0.006s
8	User: 0.035s Kernel: 0.004s	User: 0.031s Kernel: 0.009s	User: 0.059s Kernel: 0.008s
Average	User: 0.032 Kernel: 0.0076	User: 0.032 Kernel: 0.0086	User: 0.064 Kernel: 0.0071

“Big” File

Trials	Simpsh	Bash	Execline
1	User: 3.09s Kernel: 0.168s	User: 3.46s Kernel: 0.167s	User: 1.695s Kernel: 0.088s
2	User: 3.27s Kernel: 0.173	User: 3.28s Kernel: 0.162s	User: 1.475s Kernel: 0.077s
3	User: 3.095s Kernel: 0.158s	User: 3.14s Kernel: 0.160s	User: 2.267s Kernel: 0.097s
4	User: 3.49s Kernel: 0.152s	User: 3.11s Kernel: 0.16s	User: 2.011s Kernel: 0.096s
5	User: 3.23s Kernel: 0.15s	User: 3.11s Kernel: 0.159s	User: 1.979s Kernel: 0.091s
6	User: 3.32s Kernel: 0.167s	User: 3.28s Kernel: 0.183s	User: 1.618s Kernel: 0.086s
7	User: 3.5s Kernel: 0.164s	User: 3.46s Kernel: 0.18s	User: 1.669s Kernel: 0.076s
8	User: 3.3s Kernel: 0.148s	User: 3.15s Kernel: 0.162s	User: 1.656s Kernel: 0.096s
Average	User: 3.286s Kernel: 0.16s	User: 3.248s Kernel: 0.166s	User: 1.796s Kernel: 0.088s

Conclusion

Time profile evaluations for this lab are done by first running make check, as the shell script also creates the files necessary for use in Execline time evaluation. To collect time data for Simpsh, we add the total time spent in user mode and kernel mode for each command issued to Simpsh. While the “medium” file size testing routine has an extra pipe, our main point of comparison for program efficacy was that of file size. We created three files: small, with corresponding byte size 500, medium, with corresponding byte size 1000000, and big, with corresponding byte size 50000000. We then ran make check and our Execline shell evaluations eight times and gathered data for time spent in user and kernel modes.

Following our data collection, we can see that while Bash and Simpsh have relatively similar performance, Simpsh spends marginally less time in the kernel. This is most likely due to additional error checking in Bash that is not implemented in Simpsh. Execline, on the other hand, performs much poorer on smaller file sizes, but scales better with increasing size than bash and simpsh do. Thus, it is probably better to use Execline for larger data groups and bash and simpsh for smaller or medium data groups, since they have better performance with those respective groups.