Yamato Sasaki
804608241

Lab 1C Report

I created 3 benchmarks, each with Following commands:

Benchmark	Shell Type	Command
1	bash	cat < /usr/share/dict/words 2> err1.txt | sort -r 2> err1.txt | grep and > bout1.txt 2> err1.txt
	dash	cat < /usr/share/dict/words 2> err1.txt | sort -r 2> err1.txt | grep and > dout1.txt 2> err1.txt
	simpsh	./simpsh --rdonly /usr/share/dict/words --wronly err1.txt --pipe --pipe --wronly out1.txt --command 0 3 1 cat --command 2 5 1 sort -r --command 4 6 1 grep and --wait --profile
2	bash	cat < /usr/share/dict/words 2> err2.txt | tr "a" "b" 2> err2.txt | sort 2> err2.txt | grep b > bout2.txt 2> err2.txt
	dash	cat < /usr/share/dict/words 2> err2.txt | tr "a" "b" 2> err2.txt | sort 2> err2.txt | grep b > dout2.txt 2> err2.txt
	simpsh	./simpsh --rdonly /usr/share/dict/words --wronly out2.txt --wronly err2.txt --pipe --pipe --pipe --command 0 4 2 cat --command 3 6 2 tr "a" "b" --command 5 8 2 sort --command 7 1 2 grep b --wait --profile
3	bash	man -k file < /dev/null 2> err3.txt | tr -s ' ' '¥n' 2> err3.txt | sort 2> err3.txt | sort -r 2> err3.txt | grep il 2> err3.txt | tr '¥n' ' ' 2> err3.txt | wc -c > bout3.txt 2> err3.txt
	dash	man -k file < /dev/null 2> err3.txt | tr -s ' ' '¥n' 2> err3.txt | sort 2> err3.txt | sort -r 2> err3.txt | grep il 2> err3.txt | tr '¥n' ' ' 2> err3.txt | wc -c > dout3.txt 2> err3.txt
	simpsh	./simpsh --rdonly /dev/null --wronly out3.txt --wronly err3.txt --pipe --pipe --pipe --pipe --pipe --command 0 4 2 man -k file --command 3 6 2 tr -s ' ' '¥n' --command 5 8 2 sort --command 7 10 2 sort -r --command 9 12 2 grep il --command 11 14 2 tr '¥n' ' ' --command 13 1 2 wc -c --wait --profile

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Below is the chart of user/system times for 3 benchmarks:

Benchmark 1

Trial		bash			dash			simpsh	
1		User	System		User	System		User	System
	Parent	0.002	0	Parent	0	0	Parent	0	0.001361
	Child	1.118	0.019	Child	1.15	0.01	Child	1.157977	0.019058
	Total	1.12	0.019	Total	1.15	0.01	Total	1.157977	0.020419
2		User	System		User	System		User	System
	Parent	0.001	0.002	Parent	0	0	Parent	0	0.00138
	Child	1.14	0.019	Child	1.13	0.02	Child	1.133302	0.023737
	Total	1.141	0.021	Total	1.13	0.02	Total	1.133302	0.025117
3		User	System		User	System		User	System
	Parent	0	0.002	Parent	0	0	Parent	0.001501	0
	Child	1.126	0.021	Child	1.12	0.02	Child	1.139985	0.014913
	Total	1.126	0.023	Total	1.12	0.02	Total	1.141486	0.014913
		User	System		User	System		User	System
Average		**1.129**	**0.021**		**1.13333**	**0.01667**		**1.14426**	**0.02015**

Benchmark 2

Trial		bash			dash			simpsh	
1		User	System		User	System		User	System
	Parent	0.001	0.002	Parent	0	0	Parent	0	0.001398
	Child	1.158	0.026	Child	1.15	0.02	Child	1.152663	0.028553
	Total	1.159	0.028	Total	1.15	0.02	Total	1.152663	0.029951
2		User	System		User	System		User	System
	Parent	0.001	0.002	Parent	0	0	Parent	0	0.001555
	Child	1.162	0.036	Child	1.17	0.02	Child	1.161075	0.025047
	Total	1.163	0.038	Total	1.17	0.02	Total	1.161075	0.026602
3		User	System		User	System		User	System
	Parent	0.001	0.001	Parent	0	0	Parent	0	0.001438
	Child	1.154	0.023	Child	1.16	0.02	Child	1.164126	0.026854
	Total	1.155	0.024	Total	1.16	0.02	Total	1.164126	0.028292
		User	System		User	System		User	System
Average		**1.159**	**0.03**		**1.16**	**0.02**		**1.15929**	**0.02828**

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Benchmark 3									
Trial	bash			dash			simpsh		
1		User	System		User	System		User	System
	Parent	0.001	0.001	Parent	0	0	Parent	0.003118	0.012474
	Child	0.165	0.013	Child	0.16	0.01	Child	0.165785	0.018391
	Total	0.166	0.014	Total	0.16	0.01	Total	0.168903	0.030865
2		User	System		User	System		User	System
	Parent	0	0.002	Parent	0	0	Parent	0.001555	0.003111
	Child	0.166	0.011	Child	0.15	0.01	Child	0.170475	0.024623
	Total	0.166	0.013	Total	0.15	0.01	Total	0.17203	0.027734
3		User	System		User	System		User	System
	Parent	0.001	0.002	Parent	0	0	Parent	0.000616	0.001805
	Child	0.159	0.018	Child	0.15	0.01	Child	0.168751	0.016411
	Total	0.16	0.02	Total	0.15	0.01	Total	0.169367	0.018216
		User	System		User	System		User	System
Average		**0.164**	**0.01567**		**0.15333**	**0.01**		**0.1701**	**0.02561**

Conclusion

Comparing the user times, there seems to be no noticeable difference, although bash seems to be faster in terms of user times overall.
Comparingthe system times, this dash seems to lead the other two, although no noticeable difference exists either.

In focusing the simpsh user time, it's either between bash/dash, or is slower than both. This is probably due to the creation of initial variables, and extra checking of command grammars, etc (a lot of validity checks are done within simpsh).
In terms of system time, it's also between bash/dash, or is slower than both. This is probably due to extra allocation of pid array, file descriptor array, and all the extra output done by wait option.