Test cases for simpsh: (Used LC_ALL=en_US.UTF-8)

Tests	User Time	System Time
./simpsh --profile --rdonly pg98.txt --creat --rdwr output1.txt --creat --rdwr output2.txt \ --creat --wronly error.txt --command 0 1 3 sort -r --command 0 2 3 tr [:lower:] \ [:upper:] >test1out.txt 2>test1err.txt; cat test1out.txt; rm test1out.txt test1err.txt output1.txt output2.txt error.txt;	0.000839s	0.0009086s
./simpsh \ --profile --rdonly pg98.txt \ --pipe --pipe \ --creat --trunc --wronly output.txt \ --creat --append --wronly error.txt \ --command 0 2 6 sort -r --close 2 \ --command 1 4 6 cat pg98.txt - --close 4 \ --command 3 5 6 tr [:upper:] [:lower:] >test2out.txt 2>test2err.txt; cat test2out.txt; rm output.txt error.txt test2out.txt test2err.txt;	0.0005913s	0.001029s
./simpsh \ --profile --creat --rdwr test3.txt \ --rdonly pg98.txt \ --creat --wronly output.txt \ --creat --wronly error.txt --pipe --pipe --pipe \ --command 0 0 0 time -p sleep 2 \ --command 1 5 3 cat --close 5 \ --command 4 7 3 tr [:lower:] [:upper:] --close 7 \ --command 6 2 3 sort -r >test3out.txt 2>test3err.txt; cat test3out.txt; rm test3.txt test3out.txt test3err.txt output.txt error.txt;	0.0009986s	0.0008565s

Test Cases for Dash: (Used LC_ALL=en_US.UTF-8)

Tests	User Time	System Time
sort -r <pg98.txt >output1.txt 2>error.txt; tr [:lower:] [:upper:] <pg98.txt >output2.txt 2>error.txt;	0.143s	0.033s
(sort -r < pg98.txt | cat pg98.txt - | tr A-Z a-z >output.txt) 2>>error.txt	0.193s	0.043s
(time -p sleep 2 > test3.txt | cat pg98.txt - | tr A-Z a-z | sort -r > output.txt) 2>>error.txt	0.240s	0.053s

Test Cases for Bash: (Used LC_ALL=en_US.UTF-8)

Tests	User Time	System Time
sort -r <pg98.txt >output1.txt 2>error.txt; tr [:lower:] [:upper:] <pg98.txt >output2.txt 2>error.txt;	0.153s	0.0373s
(sort -r < pg98.txt | cat pg98.txt - | tr A-Z a-z >output.txt) 2>>error.txt	0.1997s	0.0497s
(time -p sleep 2 > test3.txt | cat pg98.txt - | tr A-Z a-z | sort -r > output.txt) 2>>error.txt	0.232s	0.0553s

From the data, is evident that our simpsh shell is significantly faster since it has a much shorter user and kernel time (almost 1000 times smaller). On the other hand, the bash and dash implementions of the same test cases results in very similar user and system time usages. However, bash seems to take marginally longer than dash in both user time and in system time to execute the tests cases. Therefore, based on the data evidenced, it is easy to conclude that the efficiency follows: