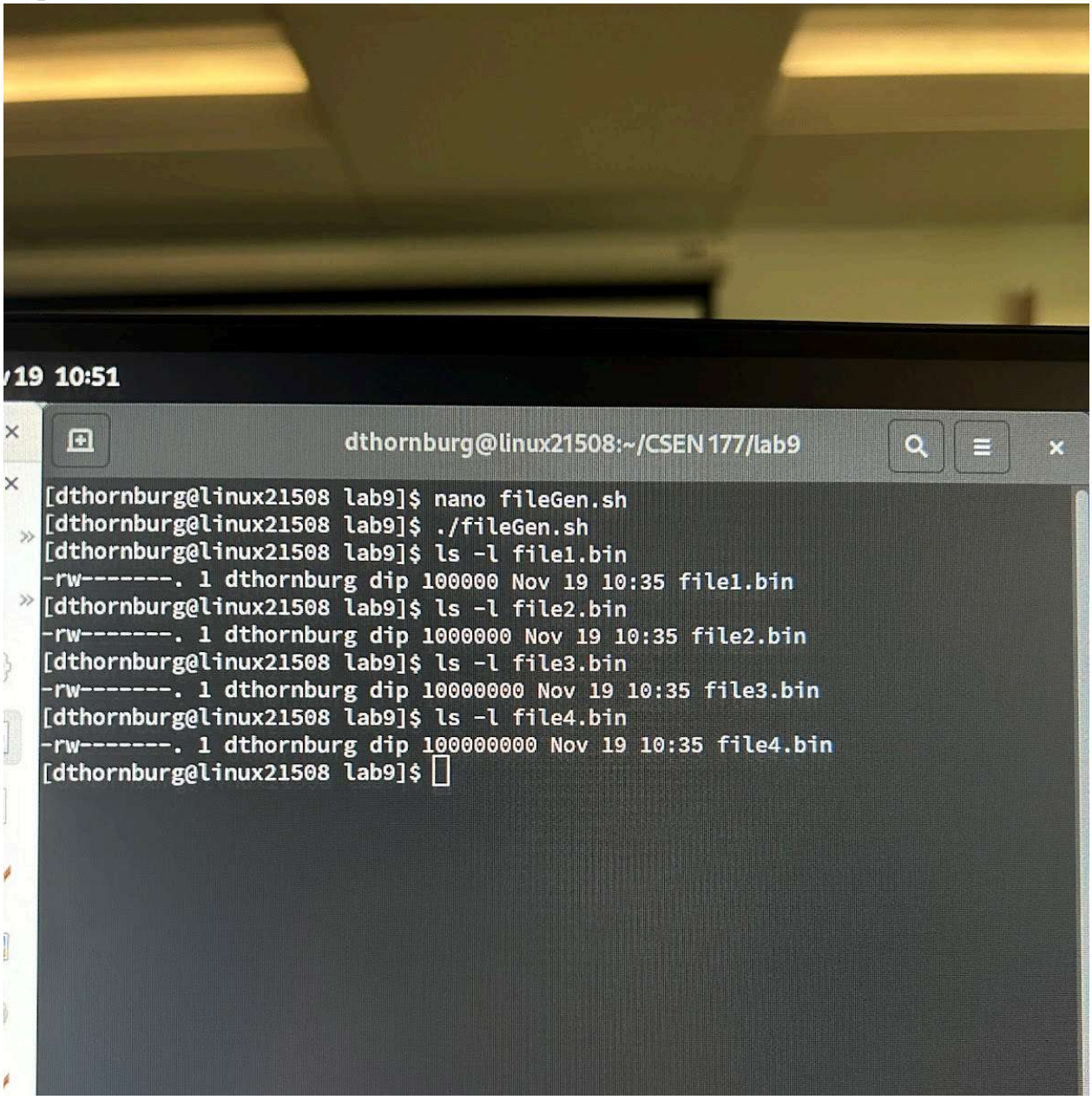
Name: Dylan Thornburg
Date: 11/19/2024

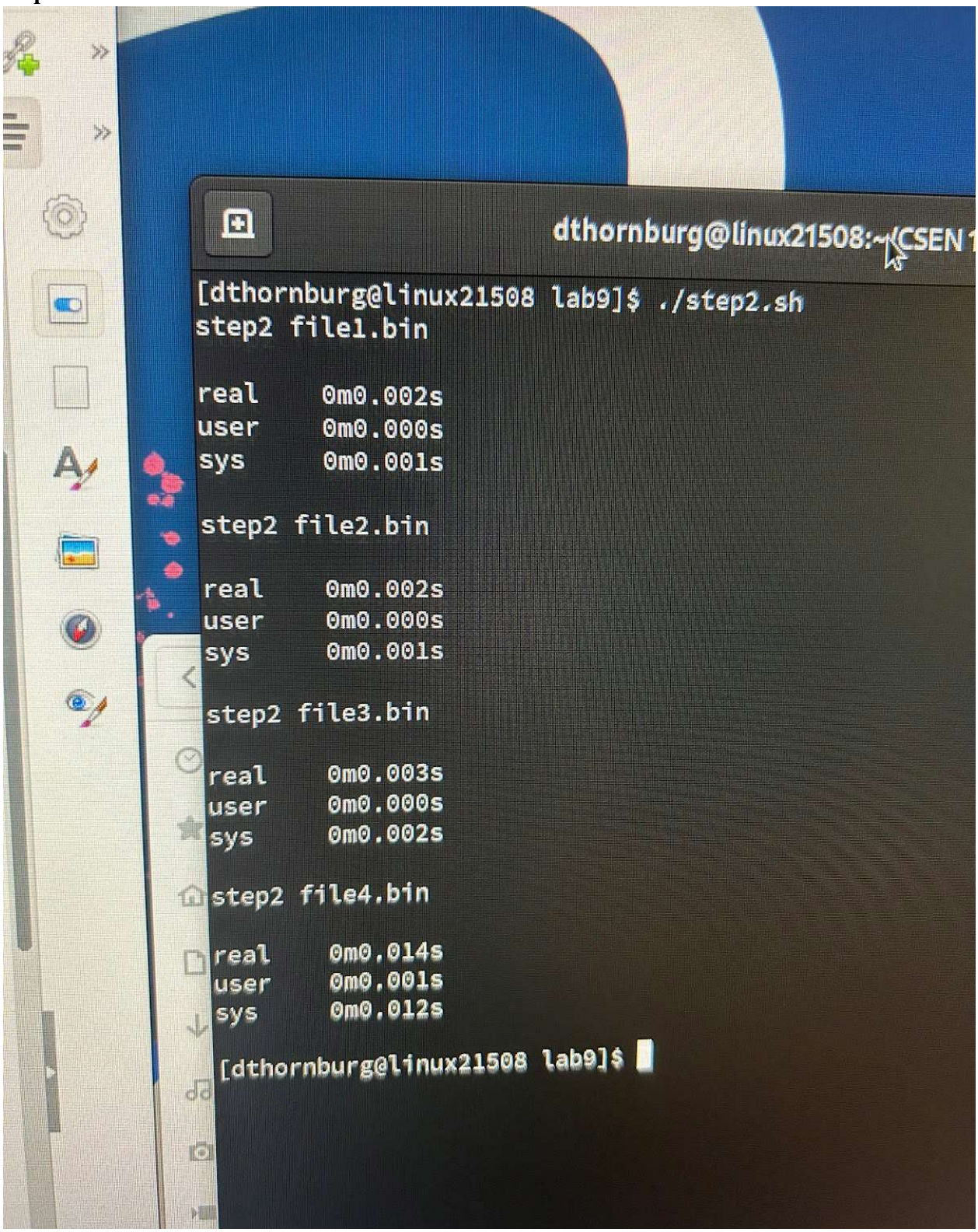
Lab 9 - File Performance Measurement

Description: We will see how long it takes for files of various sizes to be read, copied, and written.

Step 1:

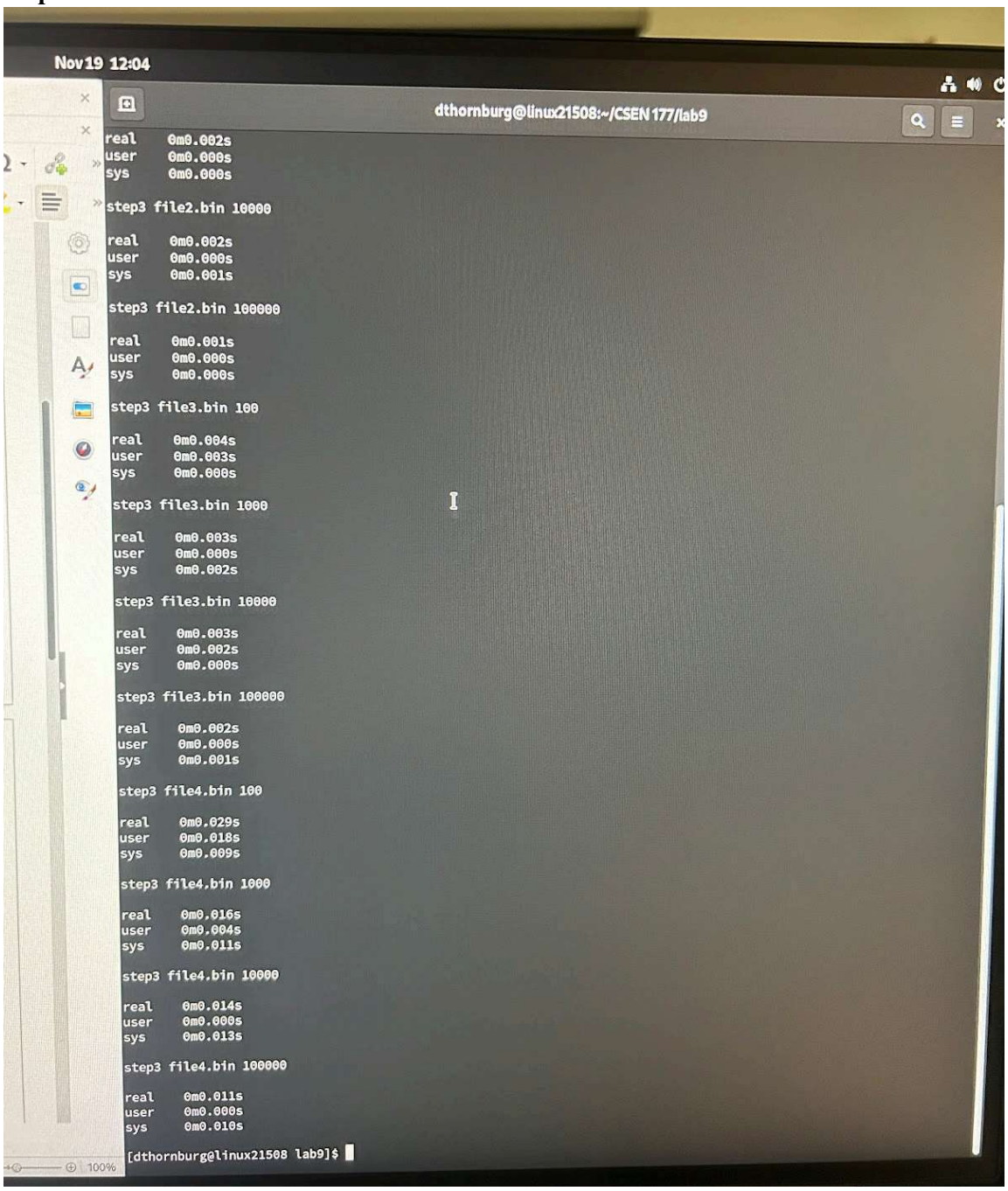


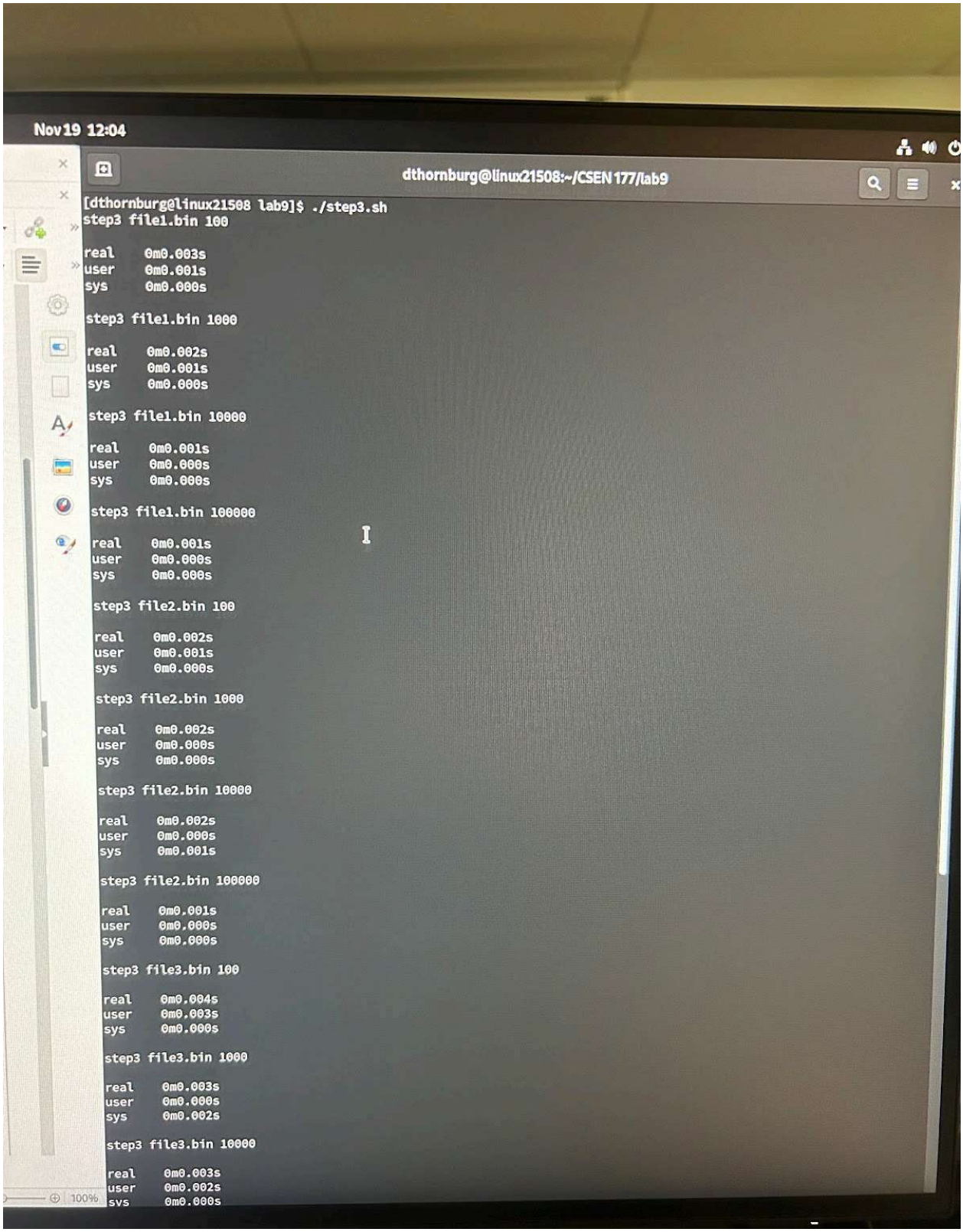
Step 2:



The time it takes to finish the file is slightly longer for the third file but still negligible. The last file with size 100000000 is where we finally see the delay in reading the whole thing.

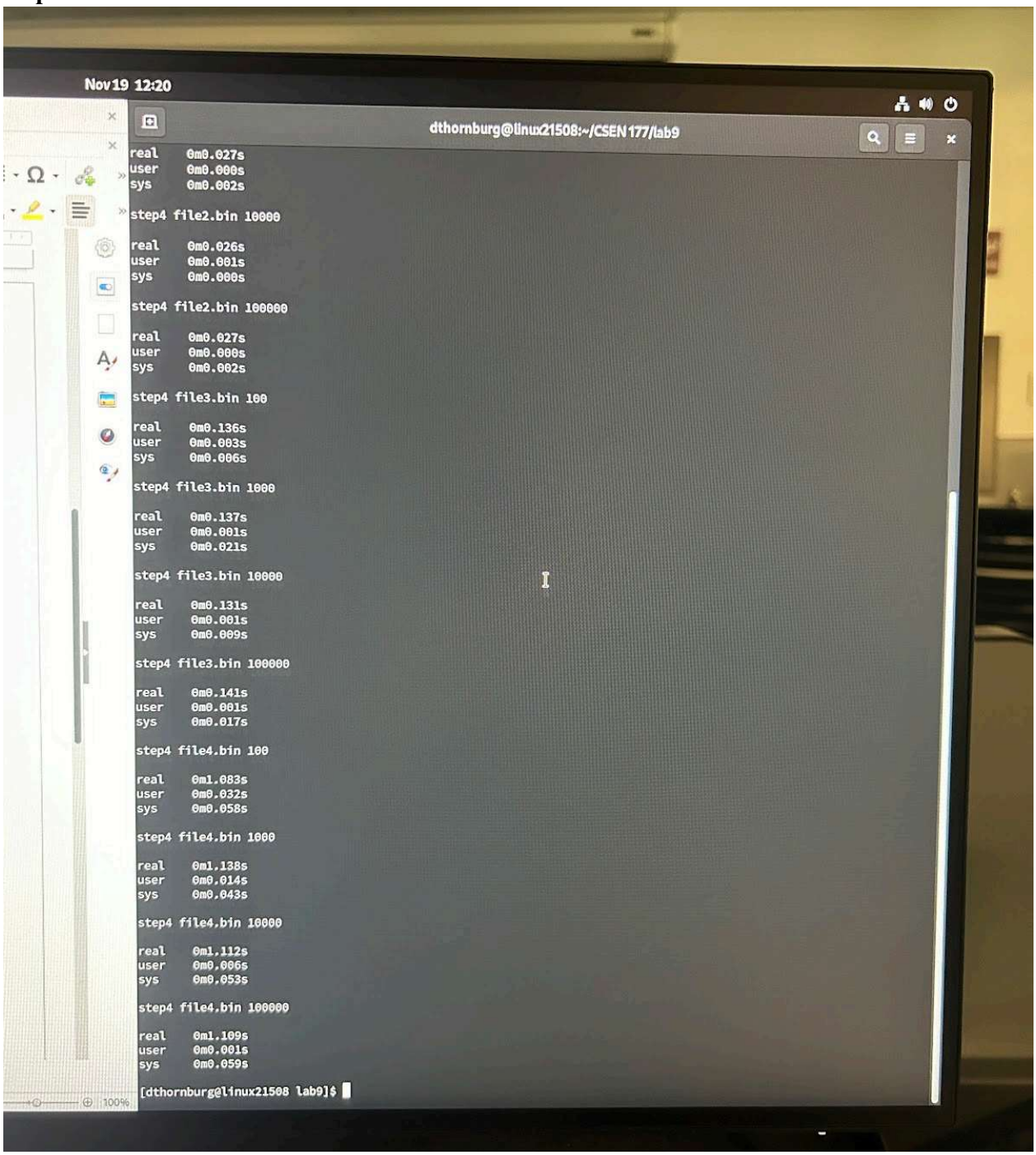
Step 3:

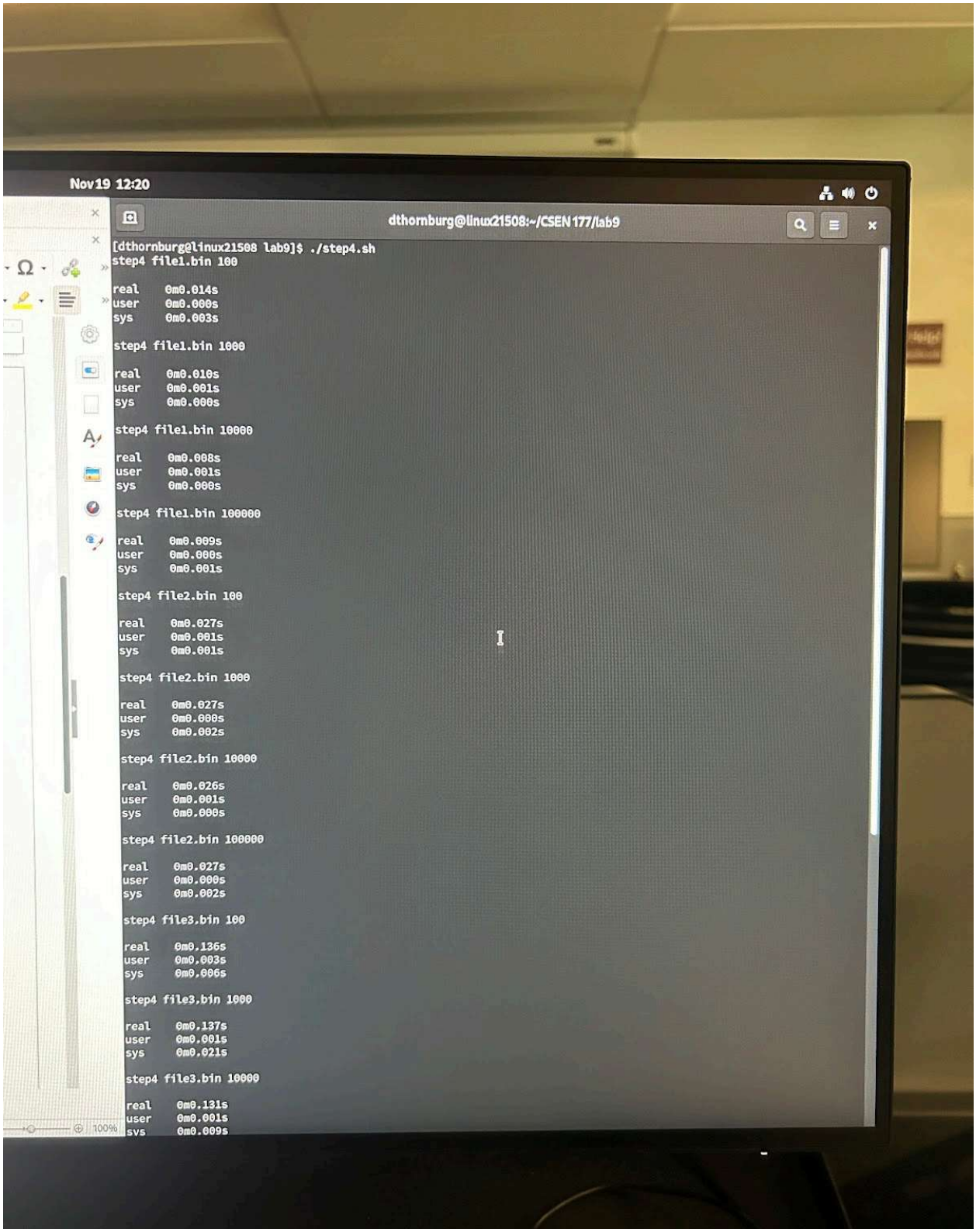

Nov19 12:04
dthornburg@linux21508:~/CSEN 177/lab9
real 0m0.002s
user 0m0.000s
sys 0m0.000s
step3 file2.bin 10000
real 0m0.002s
user 0m0.000s
sys 0m0.001s
step3 file2.bin 100000
real 0m0.001s
user 0m0.000s
sys 0m0.000s
step3 file3.bin 100
real 0m0.004s
user 0m0.003s
sys 0m0.000s
step3 file3.bin 1000
real 0m0.003s
user 0m0.000s
sys 0m0.002s
step3 file3.bin 10000
real 0m0.003s
user 0m0.002s
sys 0m0.000s
step3 file3.bin 100000
real 0m0.002s
user 0m0.000s
sys 0m0.001s
step3 file4.bin 100
real 0m0.029s
user 0m0.018s
sys 0m0.009s
step3 file4.bin 1000
real 0m0.016s
user 0m0.004s
sys 0m0.011s
step3 file4.bin 10000
real 0m0.014s
user 0m0.000s
sys 0m0.013s
step3 file4.bin 100000
real 0m0.011s
user 0m0.000s
sys 0m0.010s
[dthornburg@linux21508 lab9]$
100%



As the buffer size gets larger or the file length gets smaller, the time it takes to go through the file decreases.

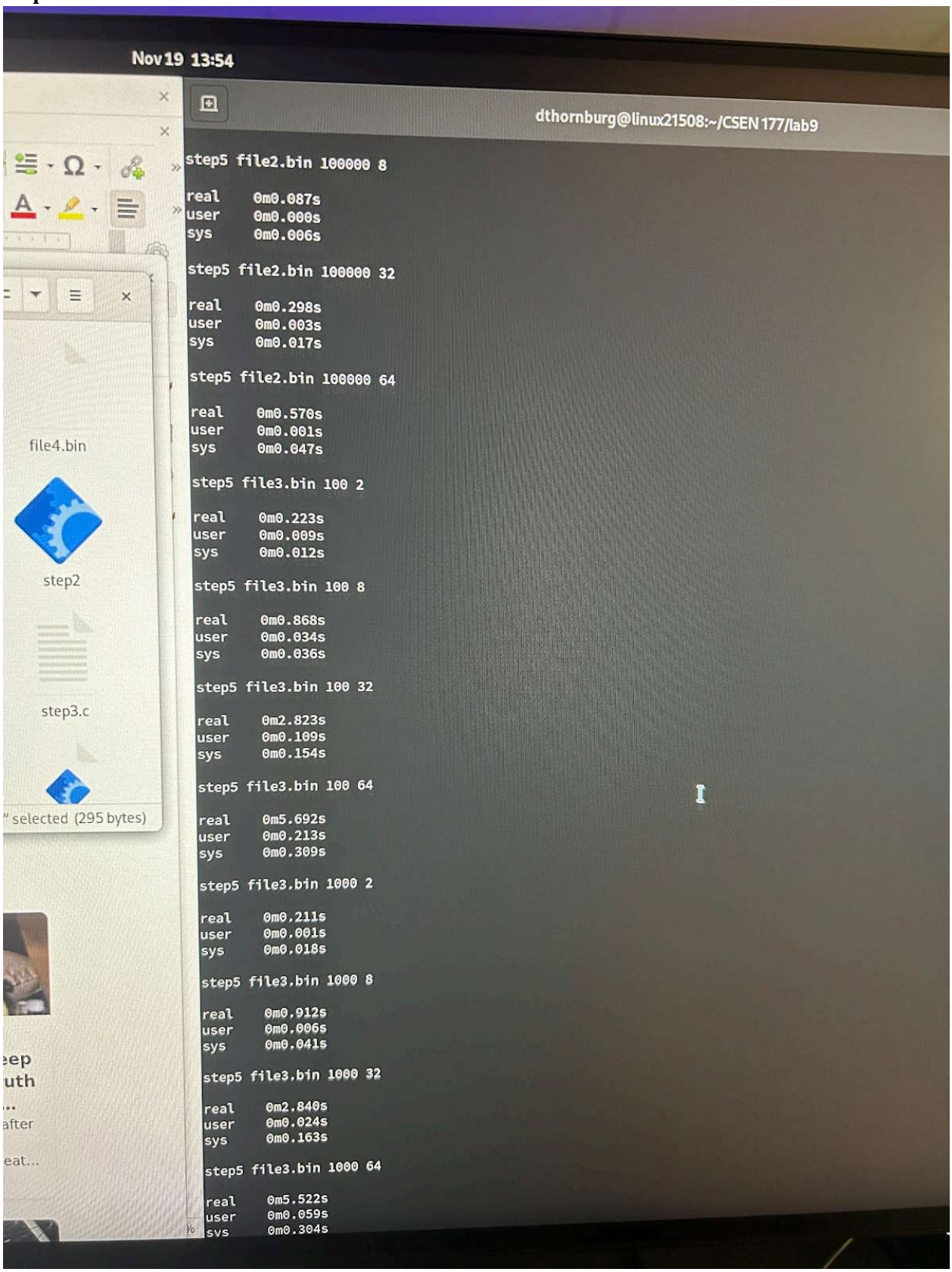
Step 4:

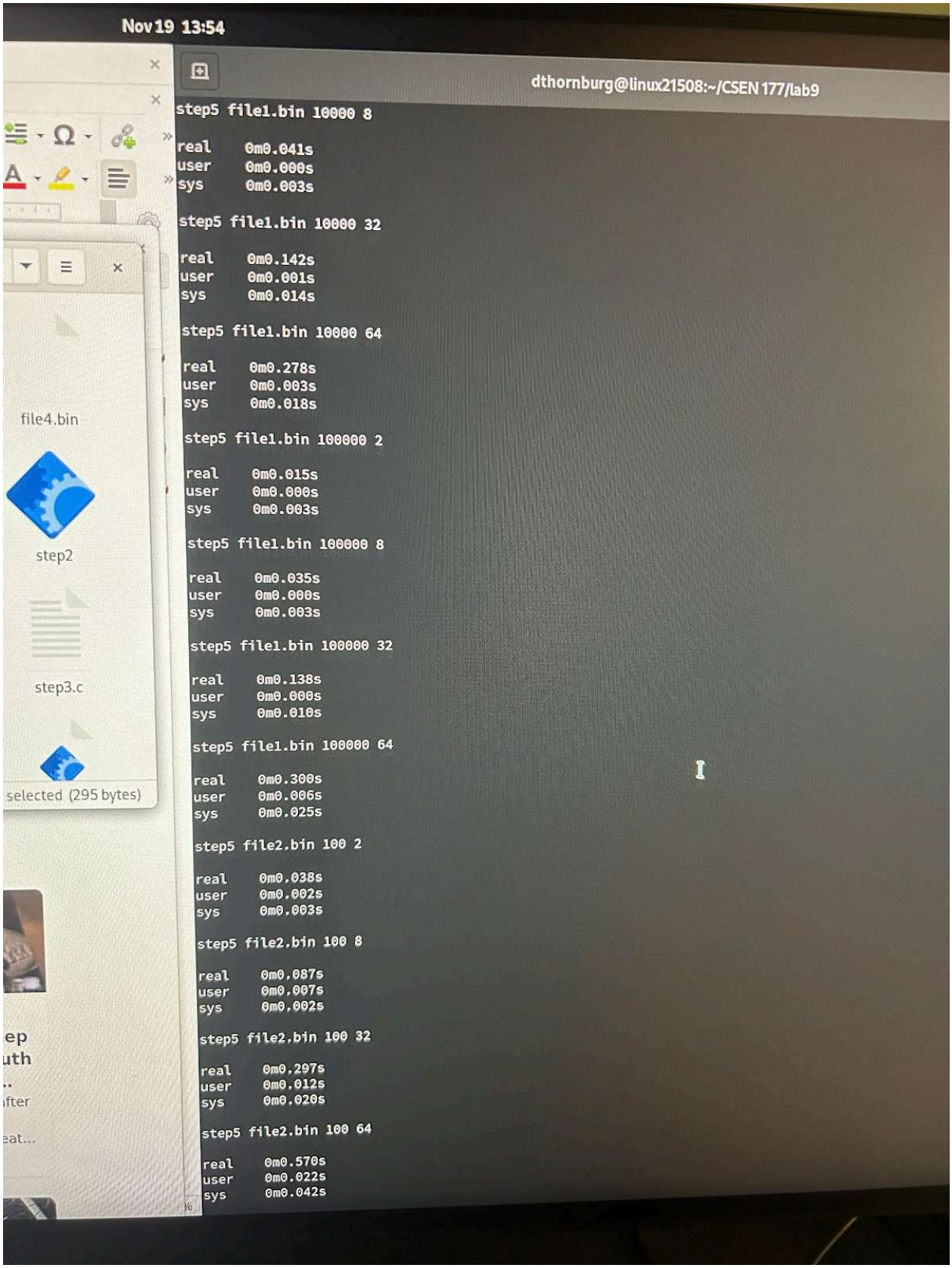

Nov 19 12:20
dthornburg@linux21508:~/CSEN 177/lab9
real 0m0.027s
user 0m0.000s
sys 0m0.002s
step4 file2.bin 10000
real 0m0.026s
user 0m0.001s
sys 0m0.000s
step4 file2.bin 100000
real 0m0.027s
user 0m0.000s
sys 0m0.002s
step4 file3.bin 100
real 0m0.136s
user 0m0.003s
sys 0m0.006s
step4 file3.bin 1000
real 0m0.137s
user 0m0.001s
sys 0m0.021s
step4 file3.bin 10000
real 0m0.131s
user 0m0.001s
sys 0m0.009s
step4 file3.bin 100000
real 0m0.141s
user 0m0.001s
sys 0m0.017s
step4 file4.bin 100
real 0m1.083s
user 0m0.032s
sys 0m0.058s
step4 file4.bin 1000
real 0m1.138s
user 0m0.014s
sys 0m0.043s
step4 file4.bin 10000
real 0m1.112s
user 0m0.006s
sys 0m0.053s
step4 file4.bin 100000
real 0m1.109s
user 0m0.001s
sys 0m0.059s
[dthornburg@linux21508 lab9]$
100%

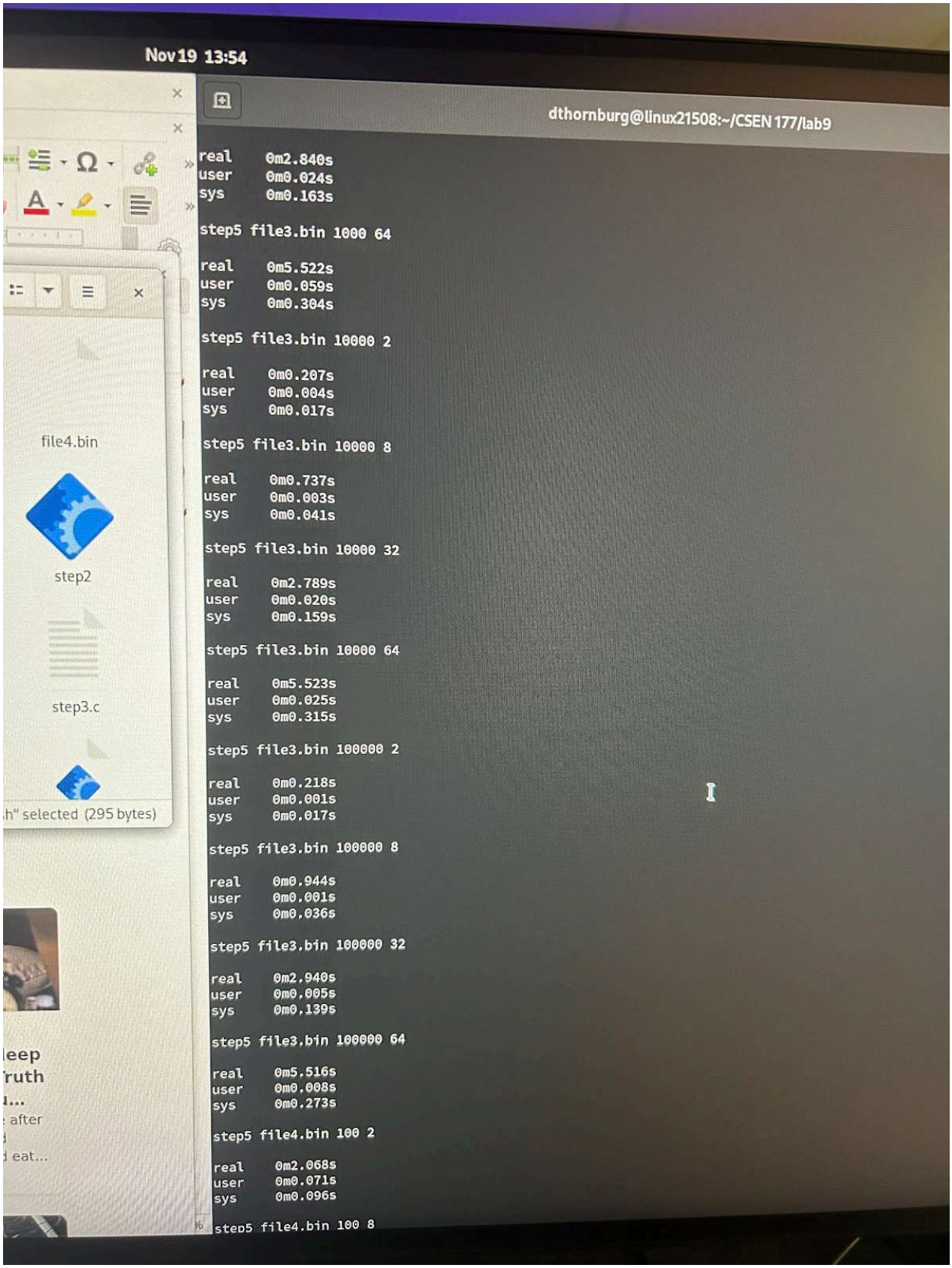


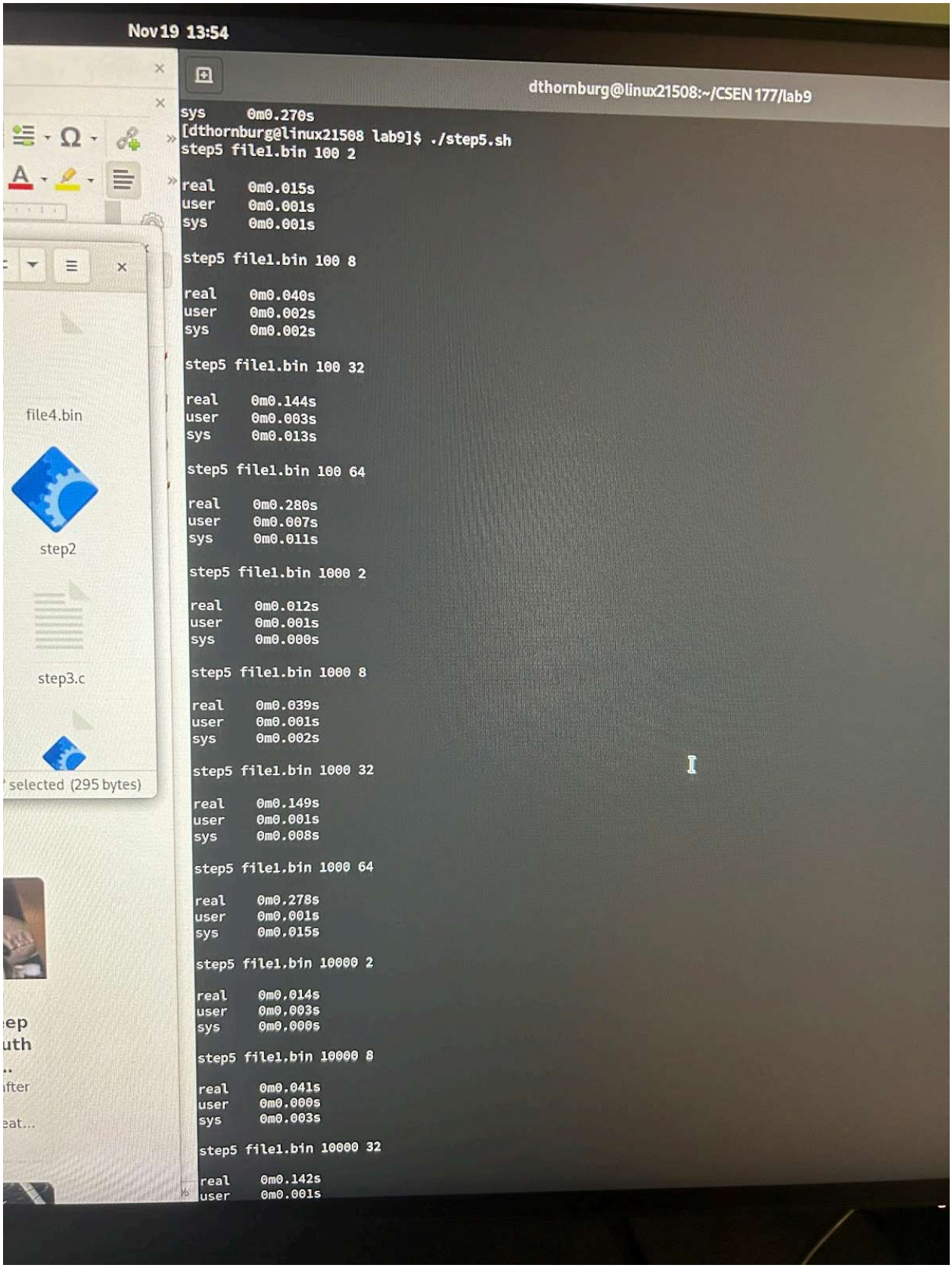
The speed benefits we once saw from bigger buffer sizes now aren't really present due to the writes. Having a smaller overall file still increases speed though.

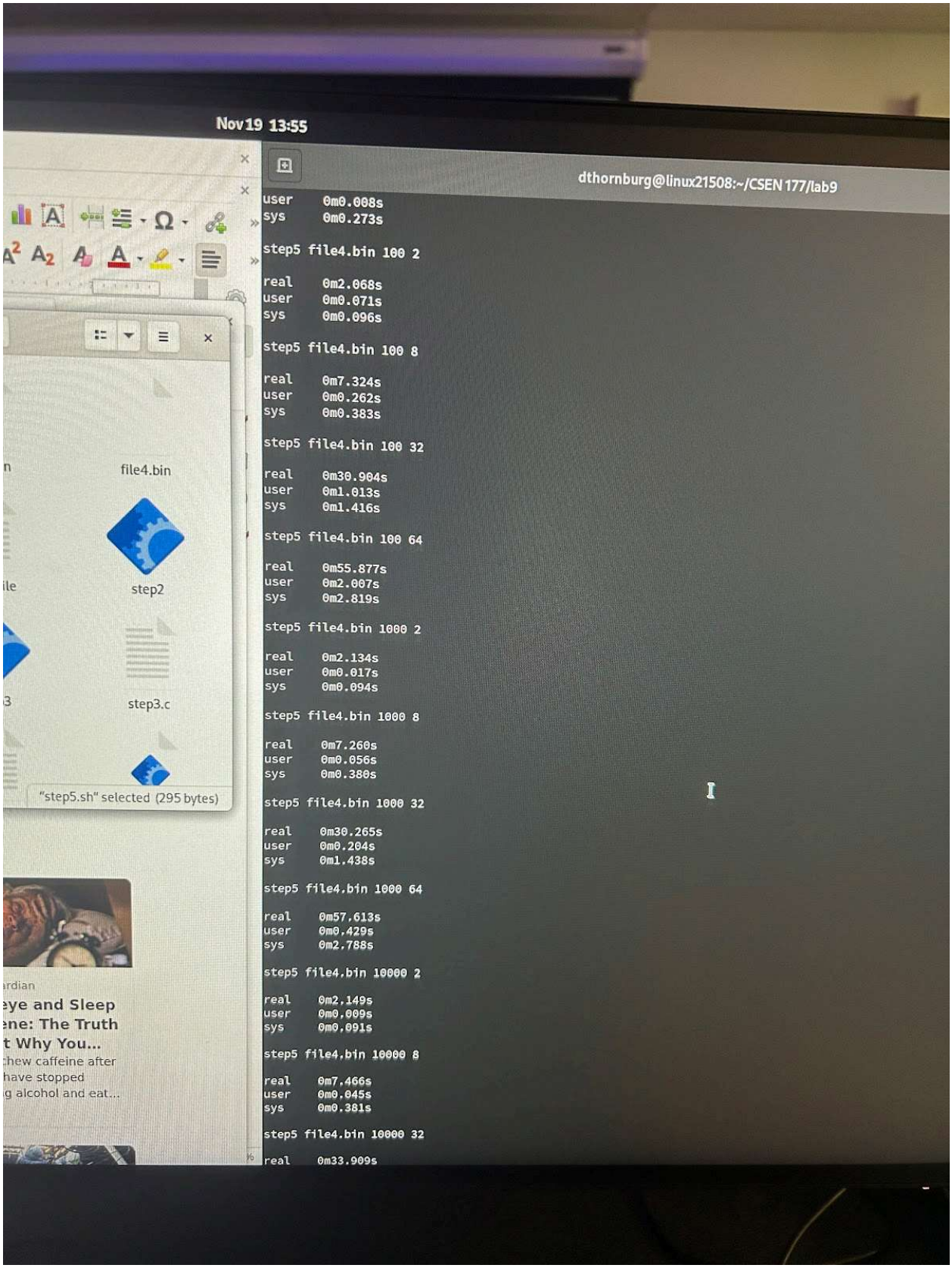
Step 5:

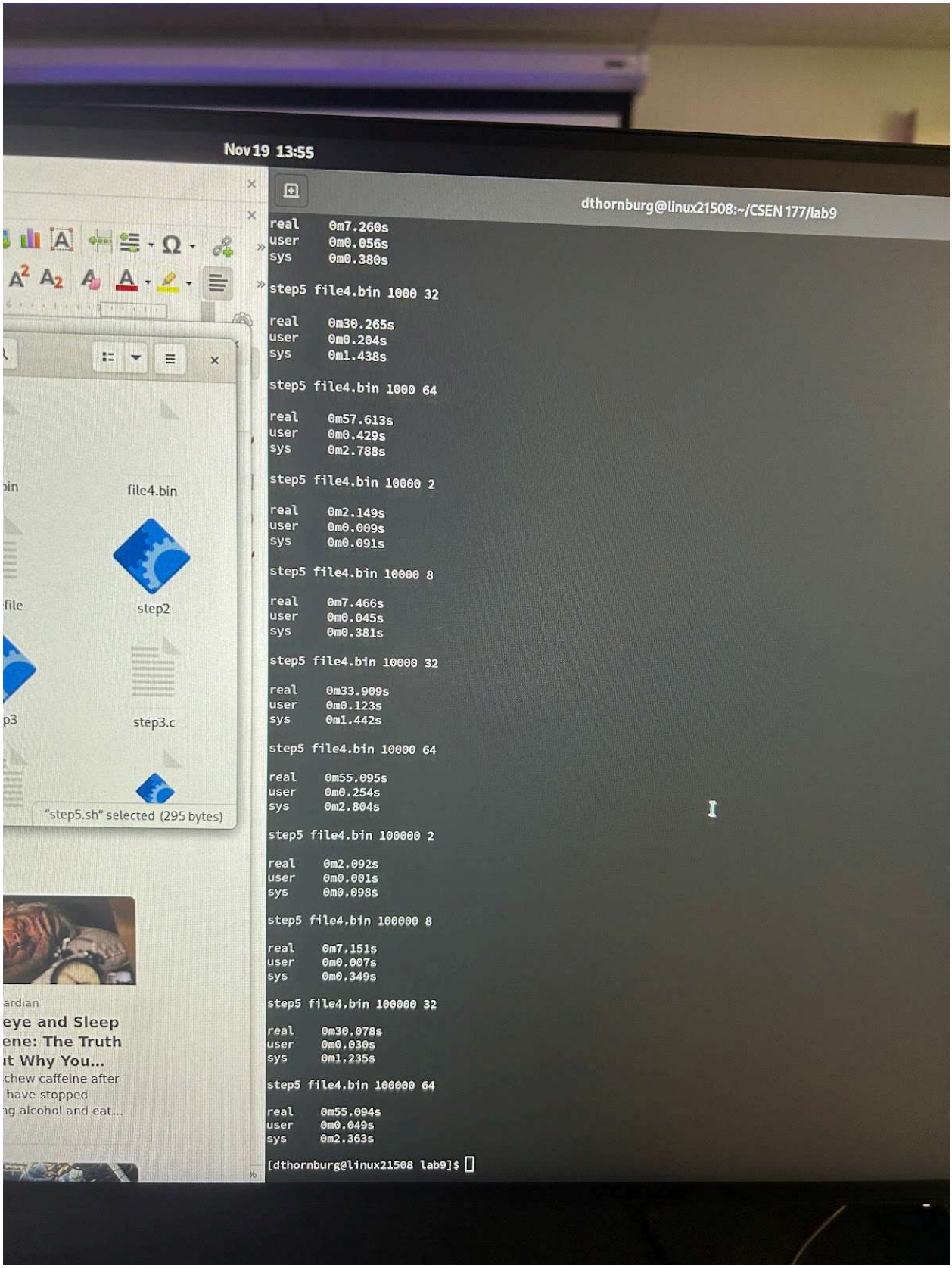

Nov 19 13:54
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
" selected (295 bytes)
step5 file2.bin 100000 8
real 0m0.087s
user 0m0.000s
sys 0m0.006s
step5 file2.bin 100000 32
real 0m0.298s
user 0m0.003s
sys 0m0.017s
step5 file2.bin 100000 64
real 0m0.570s
user 0m0.001s
sys 0m0.047s
step5 file3.bin 100 2
real 0m0.223s
user 0m0.009s
sys 0m0.012s
step5 file3.bin 100 8
real 0m0.868s
user 0m0.034s
sys 0m0.036s
step5 file3.bin 100 32
real 0m2.823s
user 0m0.109s
sys 0m0.154s
step5 file3.bin 100 64
real 0m5.692s
user 0m0.213s
sys 0m0.309s
step5 file3.bin 1000 2
real 0m0.211s
user 0m0.001s
sys 0m0.018s
step5 file3.bin 1000 8
real 0m0.912s
user 0m0.006s
sys 0m0.041s
step5 file3.bin 1000 32
real 0m2.840s
user 0m0.024s
sys 0m0.163s
step5 file3.bin 1000 64
real 0m5.522s
user 0m0.059s
sys 0m0.304s

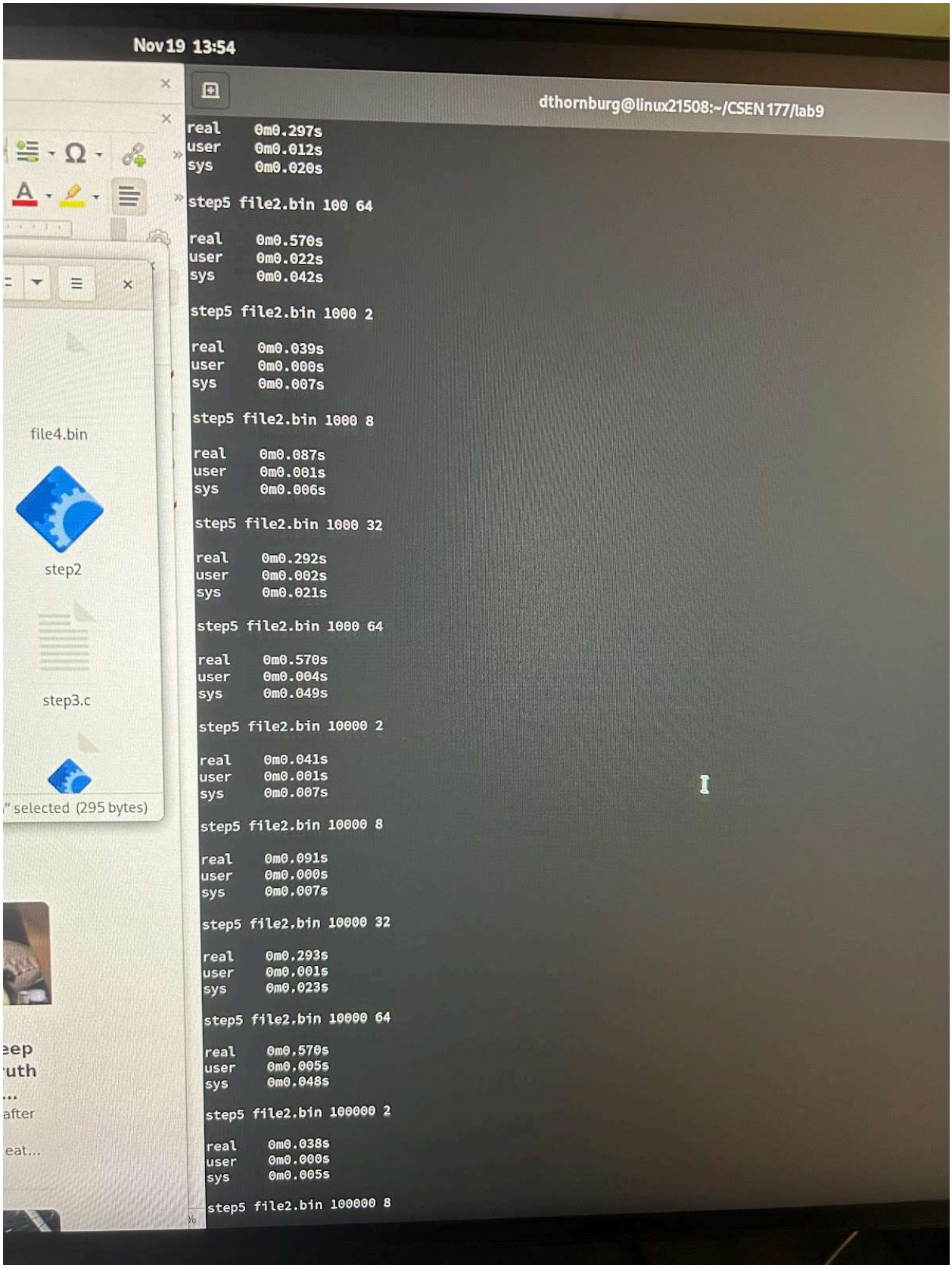

Nov 19 13:54
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
selected (295 bytes)
step5 file1.bin 10000 8
real 0m0.041s
user 0m0.000s
sys 0m0.003s
step5 file1.bin 10000 32
real 0m0.142s
user 0m0.001s
sys 0m0.014s
step5 file1.bin 10000 64
real 0m0.278s
user 0m0.003s
sys 0m0.018s
step5 file1.bin 100000 2
real 0m0.015s
user 0m0.000s
sys 0m0.003s
step5 file1.bin 100000 8
real 0m0.035s
user 0m0.000s
sys 0m0.003s
step5 file1.bin 100000 32
real 0m0.138s
user 0m0.000s
sys 0m0.010s
step5 file1.bin 100000 64
real 0m0.300s
user 0m0.006s
sys 0m0.025s
step5 file2.bin 100 2
real 0m0.038s
user 0m0.002s
sys 0m0.003s
step5 file2.bin 100 8
real 0m0.087s
user 0m0.007s
sys 0m0.002s
step5 file2.bin 100 32
real 0m0.297s
user 0m0.012s
sys 0m0.020s
step5 file2.bin 100 64
real 0m0.570s
user 0m0.022s
sys 0m0.042s


Nov 19 13:54
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
h" selected (295 bytes)
real 0m2.840s
user 0m0.024s
sys 0m0.163s
step5 file3.bin 1000 64
real 0m5.522s
user 0m0.059s
sys 0m0.304s
step5 file3.bin 10000 2
real 0m0.207s
user 0m0.004s
sys 0m0.017s
step5 file3.bin 10000 8
real 0m0.737s
user 0m0.003s
sys 0m0.041s
step5 file3.bin 10000 32
real 0m2.789s
user 0m0.020s
sys 0m0.159s
step5 file3.bin 10000 64
real 0m5.523s
user 0m0.025s
sys 0m0.315s
step5 file3.bin 100000 2
real 0m0.218s
user 0m0.001s
sys 0m0.017s
step5 file3.bin 100000 8
real 0m0.944s
user 0m0.001s
sys 0m0.036s
step5 file3.bin 100000 32
real 0m2.940s
user 0m0.005s
sys 0m0.139s
step5 file3.bin 100000 64
real 0m5.516s
user 0m0.008s
sys 0m0.273s
step5 file4.bin 100 2
real 0m2.068s
user 0m0.071s
sys 0m0.096s
step5 file4.bin 100 8


Nov 19 13:54
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
selected (295 bytes)
sys 0m0.270s
[dthornburg@linux21508 lab9]$ ./step5.sh
step5 file1.bin 100 2
real 0m0.015s
user 0m0.001s
sys 0m0.001s
step5 file1.bin 100 8
real 0m0.040s
user 0m0.002s
sys 0m0.002s
step5 file1.bin 100 32
real 0m0.144s
user 0m0.003s
sys 0m0.013s
step5 file1.bin 100 64
real 0m0.280s
user 0m0.007s
sys 0m0.011s
step5 file1.bin 1000 2
real 0m0.012s
user 0m0.001s
sys 0m0.000s
step5 file1.bin 1000 8
real 0m0.039s
user 0m0.001s
sys 0m0.002s
step5 file1.bin 1000 32
real 0m0.149s
user 0m0.001s
sys 0m0.008s
step5 file1.bin 1000 64
real 0m0,278s
user 0m0,001s
sys 0m0,015s
step5 file1.bin 10000 2
real 0m0,014s
user 0m0,003s
sys 0m0,000s
step5 file1.bin 10000 8
real 0m0.041s
user 0m0.000s
sys 0m0.003s
step5 file1.bin 10000 32
real 0m0.142s
user 0m0.001s


Nov 19 13:55
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
"step5.sh" selected (295 bytes)
user 0m0.008s
sys 0m0.273s
step5 file4.bin 100 2
real 0m2.068s
user 0m0.071s
sys 0m0.096s
step5 file4.bin 100 8
real 0m7.324s
user 0m0.262s
sys 0m0.383s
step5 file4.bin 100 32
real 0m30.904s
user 0m1.013s
sys 0m1.416s
step5 file4.bin 100 64
real 0m55.877s
user 0m2.007s
sys 0m2.819s
step5 file4.bin 1000 2
real 0m2.134s
user 0m0.017s
sys 0m0.094s
step5 file4.bin 1000 8
real 0m7.260s
user 0m0.056s
sys 0m0.380s
step5 file4.bin 1000 32
real 0m30.265s
user 0m0.204s
sys 0m1.438s
step5 file4.bin 1000 64
real 0m57.613s
user 0m0.429s
sys 0m2.788s
step5 file4.bin 10000 2
real 0m2.149s
user 0m0.009s
sys 0m0.091s
step5 file4.bin 10000 8
real 0m7.466s
user 0m0.045s
sys 0m0.381s
step5 file4.bin 10000 32
real 0m33.909s


Nov 19 13:55
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
"step5.sh" selected (295 bytes)
real 0m7.260s
user 0m0.056s
sys 0m0.380s
step5 file4.bin 1000 32
real 0m30.265s
user 0m0.204s
sys 0m1.438s
step5 file4.bin 1000 64
real 0m57.613s
user 0m0.429s
sys 0m2.788s
step5 file4.bin 10000 2
real 0m2.149s
user 0m0.009s
sys 0m0.091s
step5 file4.bin 10000 8
real 0m7.466s
user 0m0.045s
sys 0m0.381s
step5 file4.bin 10000 32
real 0m33.909s
user 0m0.123s
sys 0m1.442s
step5 file4.bin 10000 64
real 0m55.095s
user 0m0.254s
sys 0m2.804s
step5 file4.bin 100000 2
real 0m2.092s
user 0m0.001s
sys 0m0.098s
step5 file4.bin 100000 8
real 0m7.151s
user 0m0.007s
sys 0m0.349s
step5 file4.bin 100000 32
real 0m30.078s
user 0m0.030s
sys 0m1.235s
step5 file4.bin 100000 64
real 0m55.094s
user 0m0.049s
sys 0m2.363s
[dthornburg@linux21508 lab9]$


Nov 19 13:54
dthornburg@linux21508:~/CSEN 177/lab9
file4.bin
step2
step3.c
" selected (295 bytes)
real 0m0.297s
user 0m0.012s
sys 0m0.020s
step5 file2.bin 100 64
real 0m0.570s
user 0m0.022s
sys 0m0.042s
step5 file2.bin 1000 2
real 0m0.039s
user 0m0.000s
sys 0m0.007s
step5 file2.bin 1000 8
real 0m0.087s
user 0m0.001s
sys 0m0.006s
step5 file2.bin 1000 32
real 0m0.292s
user 0m0.002s
sys 0m0.021s
step5 file2.bin 1000 64
real 0m0.570s
user 0m0.004s
sys 0m0.049s
step5 file2.bin 10000 2
real 0m0.041s
user 0m0.001s
sys 0m0.007s
step5 file2.bin 10000 8
real 0m0.091s
user 0m0.000s
sys 0m0.007s
step5 file2.bin 10000 32
real 0m0.293s
user 0m0.001s
sys 0m0.023s
step5 file2.bin 10000 64
real 0m0.570s
user 0m0.005s
sys 0m0.048s
step5 file2.bin 100000 2
real 0m0.038s
user 0m0.000s
sys 0m0.005s
step5 file2.bin 100000 8

The threads made it take longer across the board, but faster than it would have been if I had repeated step 4 each thread-amount of times (64 threads is faster than copying into 64 copy.bins sequentially). The buffer size continues to not make a difference.