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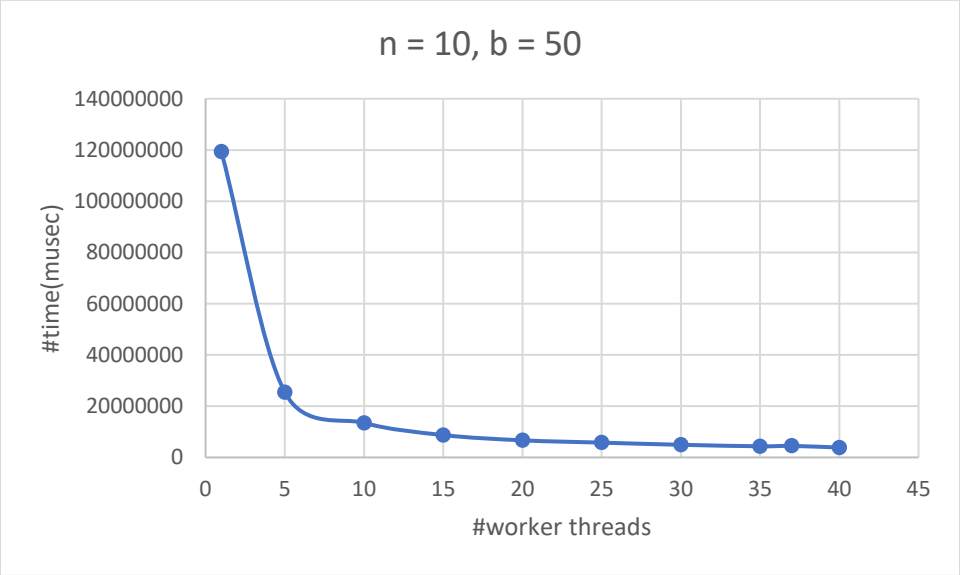
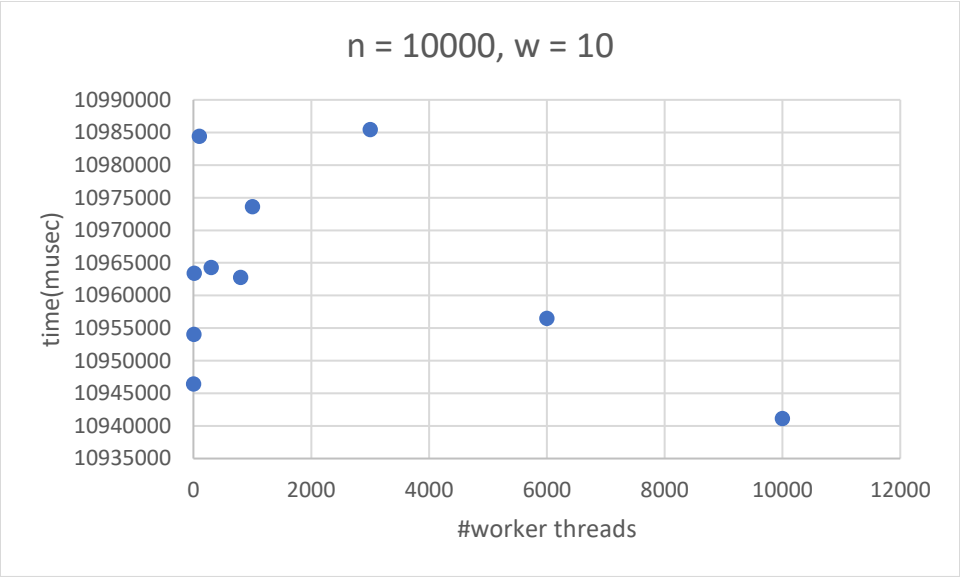
CSCE 313: PA6 – Report

Message Queue

1	119313683	119	313683
5	25471192	25	471192
10	13488014	13	488014
15	8730072	8	730072
20	6676570	6	676570
25	5779719	5	779719
30	4937186	4	937186
35	4350090	4	350090
37	4507655	4	507655
40	3848798	3	848798

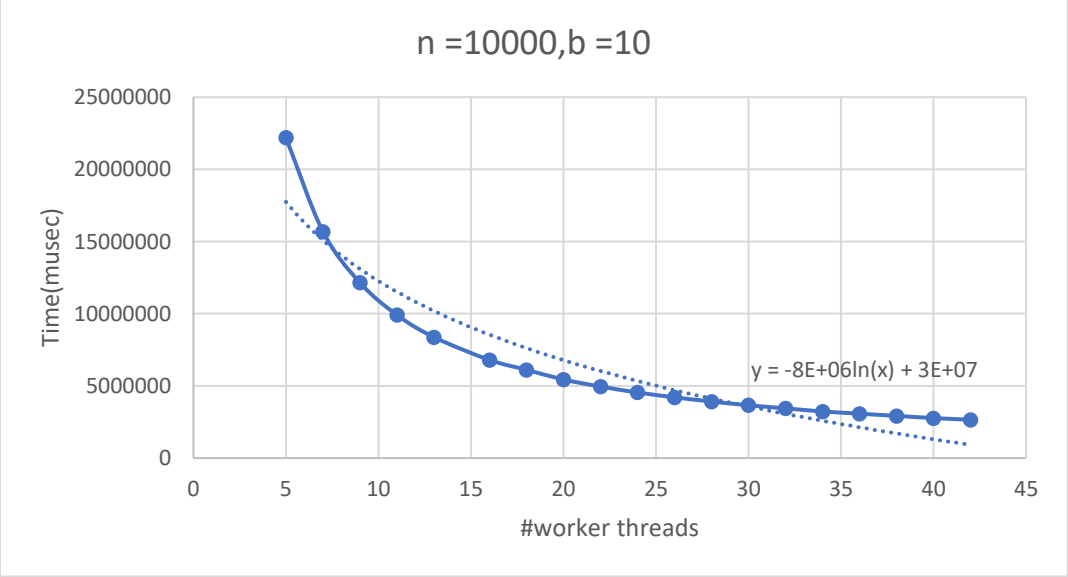


1	10946413
10	10954049
15	10963402
100	10984424
300	10964283
800	10962768
1000	10973601
3000	10985432
6000	10956477
10000	10941118



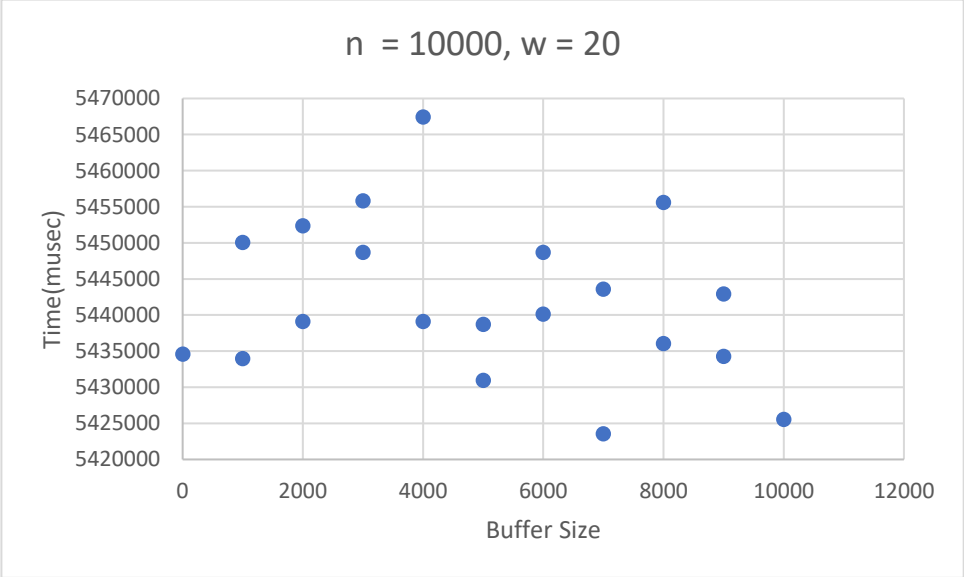
FIFO

w	total time (musec)	sec	musec
3	36275847	36	275847
5	22189574	22	189574
7	15692840	15	692840
9	12148368	12	148368
11	9913587	9	913587
13	8375873	8	375873
16	6798731	6	798731
18	6116277	6	116277
20	5443025	5	443025
22	4952522	4	952522
24	4546541	4	546541
26	4207748	4	207748
28	3919193	3	919193
30	3659220	3	659220
32	3444629	3	444629
34	3229668	3	229668
36	3076480	3	76480
38	2922220	2	922220
40	2769570	2	769570
42	2657707	2	657707



The performance improves as the number of worker threads increases. The program also in whole runs much faster than when we were using a Safe Buffer.

buf size	time(musec)
1	5434574
1000	5450048
1000	5433950
2000	5439107
2000	5452331
3000	5448677
3000	5455798
4000	5467395
4000	5439094
5000	5438672
5000	5430917
6000	5448683
6000	5440095
7000	5443566
7000	5423544
8000	5455577
8000	5436041
9000	5442905
9000	5434255
10000	5425534



Shared Memory Queue did not work therefore I was not able to obtain the data needed to make the graphs.

Performance Comparison

For my Message Queue Request Channels, I was able to reach about 40 worker threads before it broke. With the original FIFO version, the program would go up to at least 46-47. This affects the time it takes for the processes' performance. The request channels can comfortably reach around 10000

Limitations

Some limits encountered by the Message Queue class is that there is a limit places on the total number of queues and the size of the messages sent through the queues. Message Queues also doesn't maintain the count of the number of processes refering to the queue. There needs to be identifiers instead of file descriptors so certain interesting functions are also not applicable.

FIFO has limits pertaining to the its named pipes feature. Because they are a single named pipe multiple processes cannot use them unless you find a complicated way to distinguish them. Synchronizing these pipes can also be tricky because they may block the results.

Shared memory queue – memory allocation, you need to have enough memory allocation for the channels to be able to communicate through a shared memory segment. You also have to be careful of race conditions when updating the memory segment

IPC Clean Up Activity

Message Queue – using msgctl, remove to delete files and msgctl to delete msg queue.

FIFO – closing pipes, sending quits and deleting fifo files.

Shared Memory – calling shmdt and deleting the kernel semaphores.

The only extra thing that may be needed is to compile the KernelSemaphore using g++ -std=c++11 KernelSemaphore.h . This won't be absolutely necessary though. Use make to compile files and ./client to run program.