

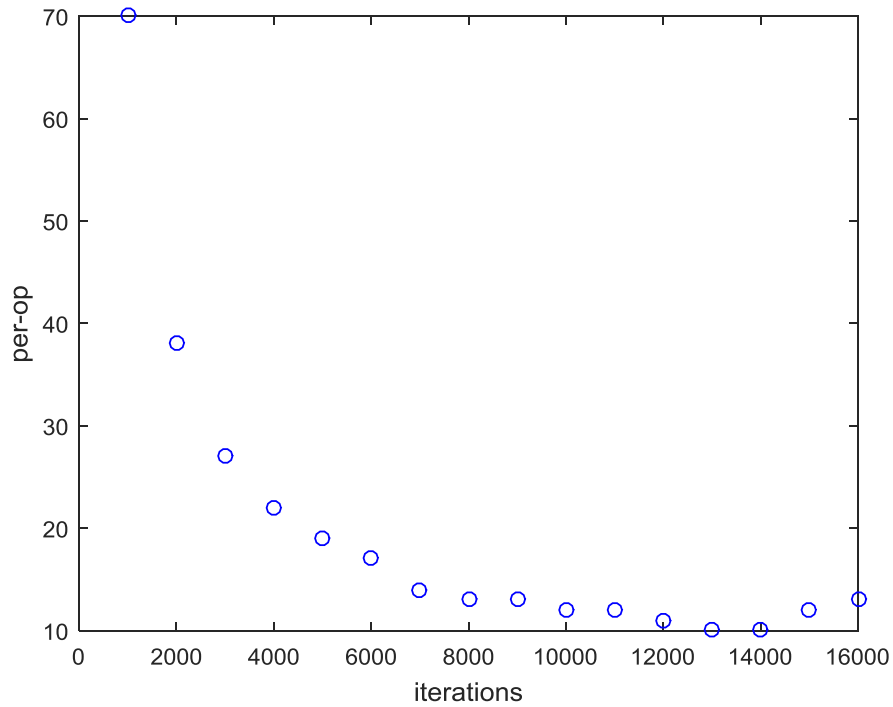
Graphs

Part1:

Graph 1, average cost per operation (non-yield) vs iterations with single thread:

per_op = [70 38 27 22 19 17 14 13 13 12 12 11 10 10 12 13]

iterations = [1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000]

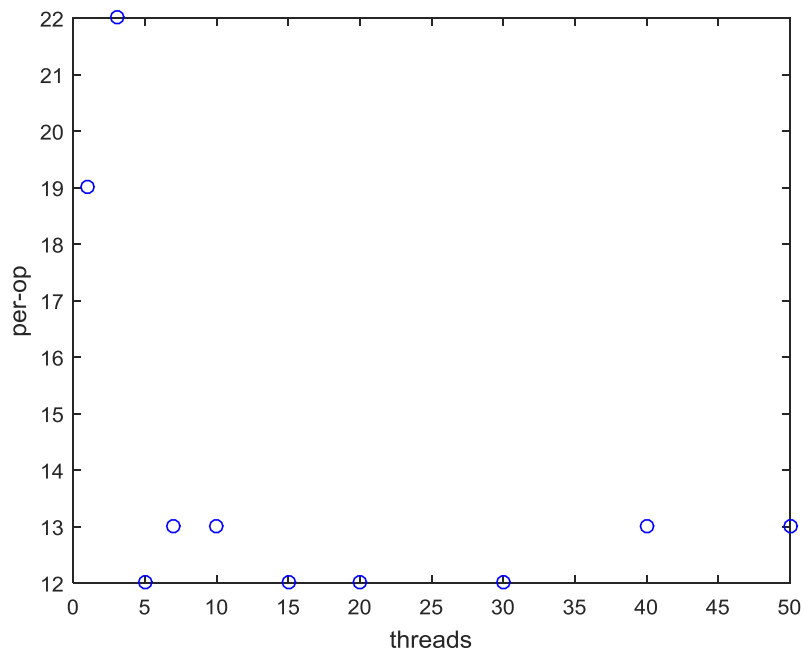


Graph 2, time per op for range of thread values using large iteration value=10000:

Unprotected:

per_op = [19 22 12 13 13 12 12 12 13 13]

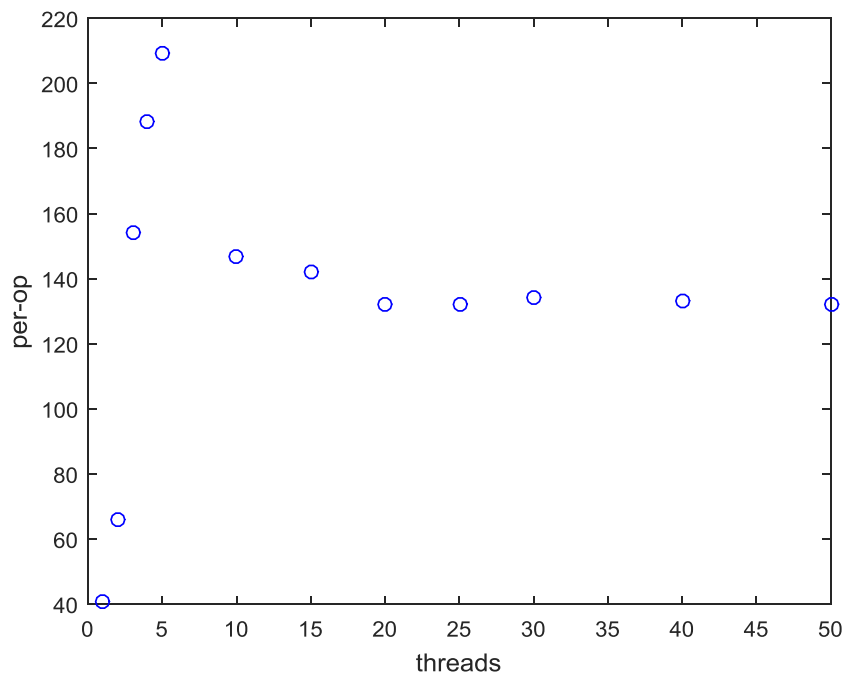
threads = [1 3 5 7 10 15 20 30 40 50]



Mutex:

per_op = [41 66 154 188 209 147 142 132 132 134 133 132]

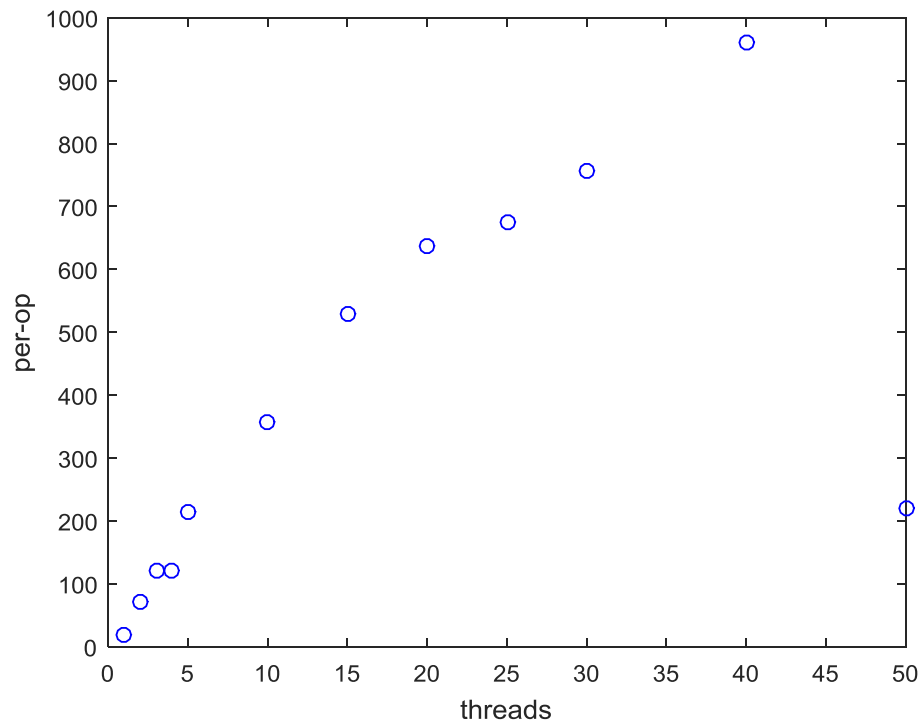
threads = [1 2 3 4 5 10 15 20 25 30 40 50]



Spinlock:

per_op = [20 72 120 121 214 356 529 638 676 756 960 220]

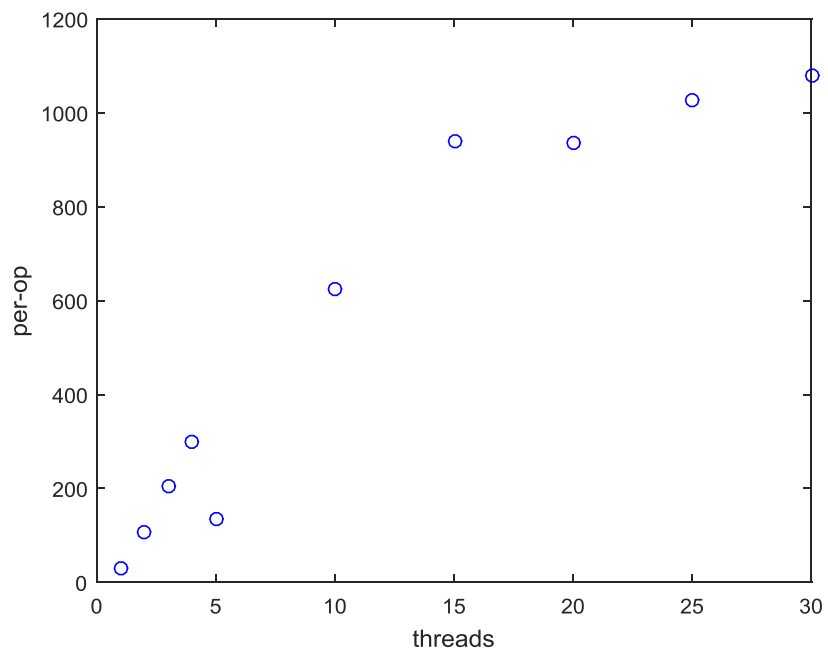
threads = [1 2 3 4 5 10 15 20 25 30 40 50]



Compare_swap:

per_op = [30 108 205 300 136 624 940 936 1028 1081]

threads = [1 2 3 4 5 10 15 20 25 30]

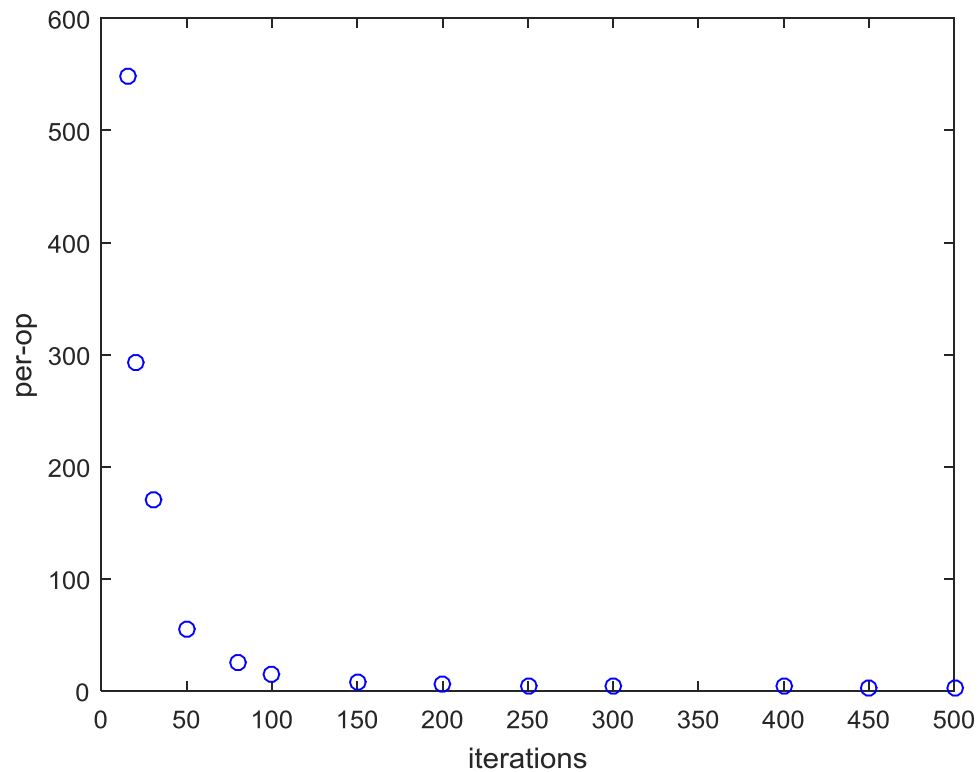


Part2:

Graph 3, time per op for single thread, increasing number of iterations:

per_op = [549 293 171 55 25 15 8 6 4 4 4 3 3]

iterations = [15 20 30 50 80 100 150 200 250 300 400 450 500]

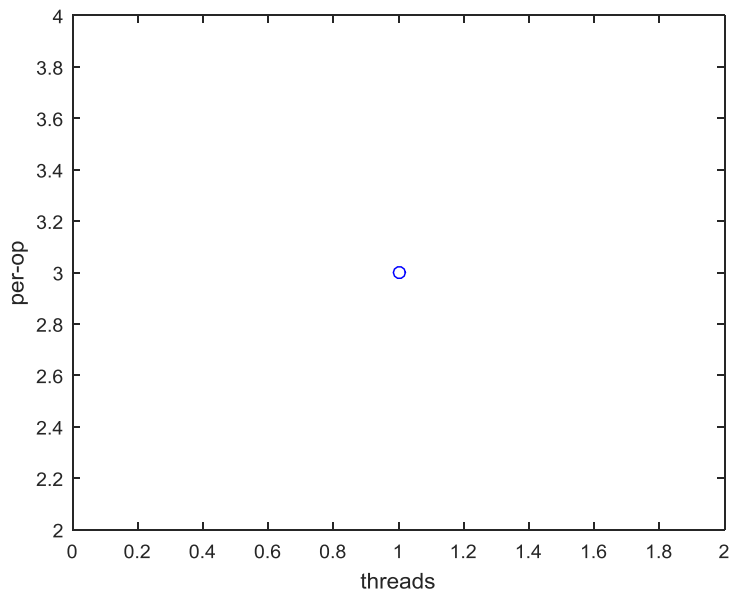


Graph 4, per operation times (for each of the three synchronization options unprotected, mutex, spin) vs the number of threads given iterations=2000:

Unprotected:

per_op = [3]

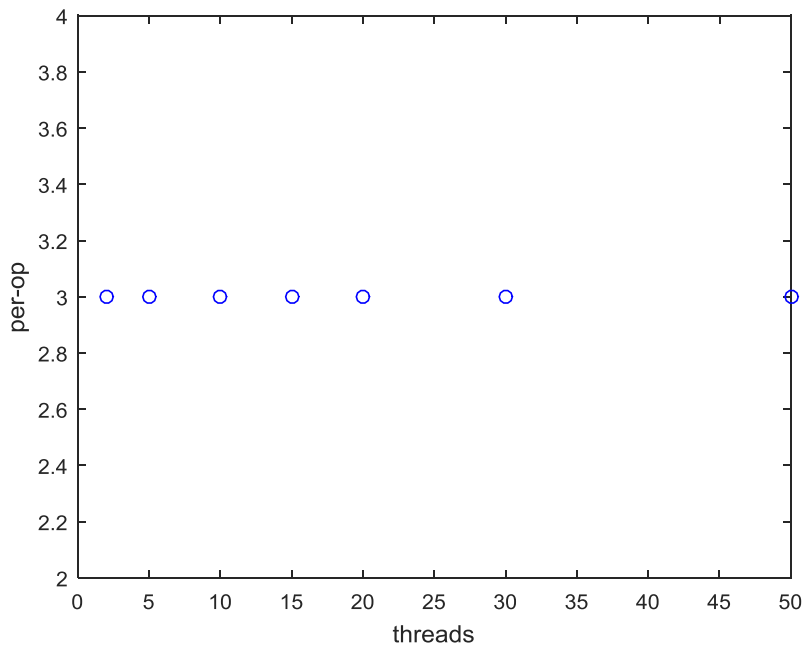
threads = [1]



Mutex:

per_op = [3 3 3 3 3 3 3]

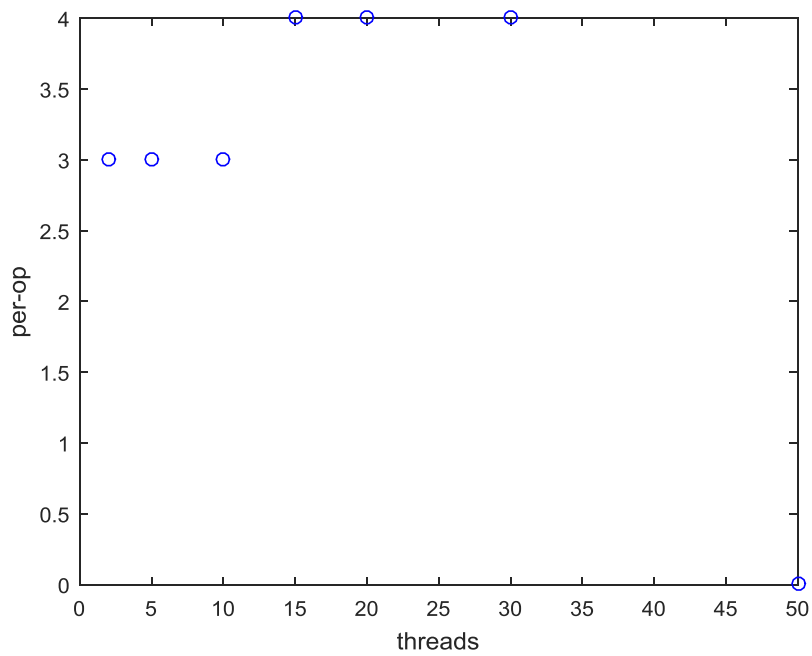
threads = [2 5 10 15 20 30 50]



Spinlock:

per_op = [3 3 3 4 4 4 0]

threads = [2 5 10 15 20 30 50]

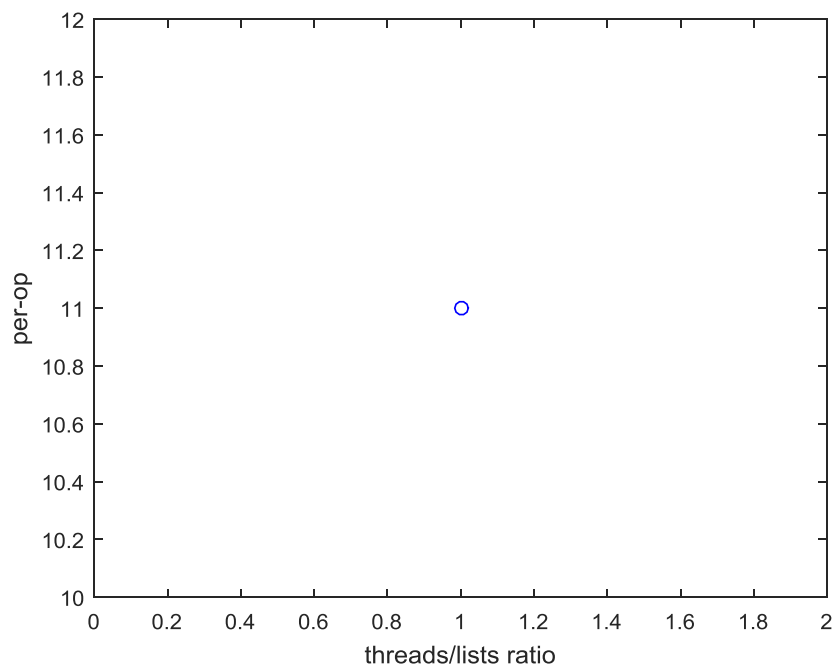


Graph 5, all three versions without yields for a range of --list=values, (unprotected only for single thread), showing operation time vs threads/list ratio

Unprotected:

per_op = [11]

threads_lists_ratio = [1]

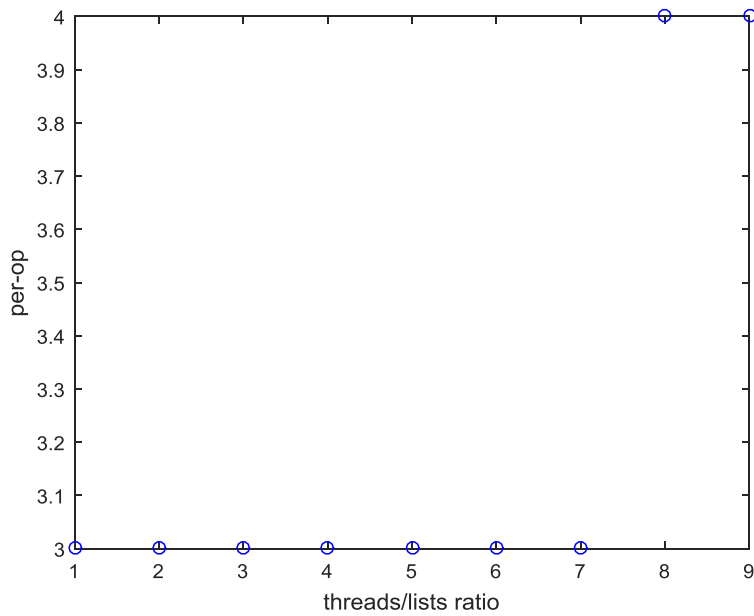


Mutex:

(NOTE: Results were obtained by increasing list count each time from `-lists=2, 3, 4, 5`, etc. with `-threads=2, 6, 12, 20`, etc. to have a `threads_lists_ratio=1, 2, 3, 4`, etc.)

`per_op = [3 3 3 3 3 3 3 4 4]`

`threads_lists_ratio = [1 2 3 4 5 6 7 8 9]`



Spinlock:

`per_op = [3 4 6 8 11 15 20 23 4]`

`threads_lists_ratio = [1 2 3 4 5 6 7 8 9]`

