TESTING AND ANALYSIS

Part I – Testing library on benchmark code

Test parameters

Ilab machine used: h206-2.cs.rutgers.edu

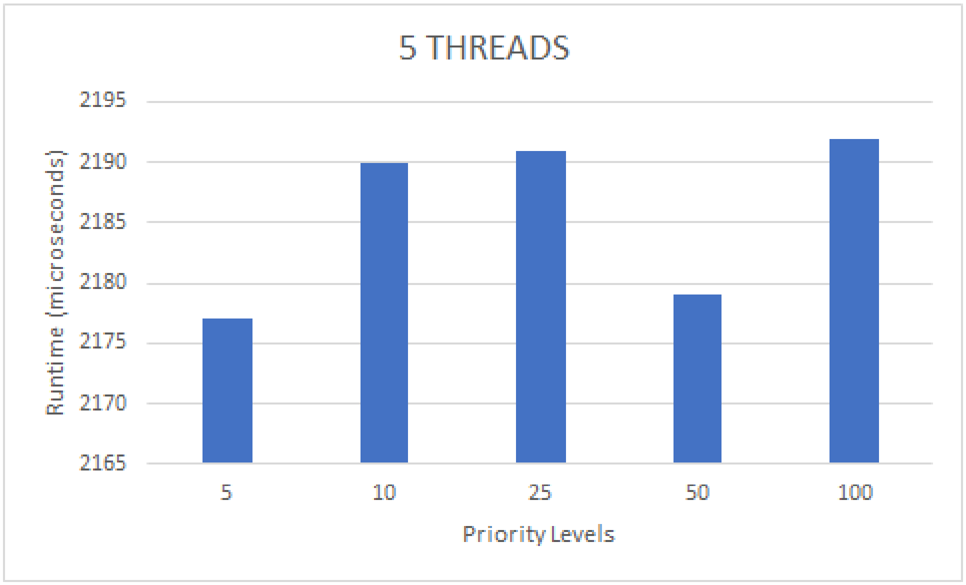
Our implementation of pthread library is tested by varying the following design parameters:

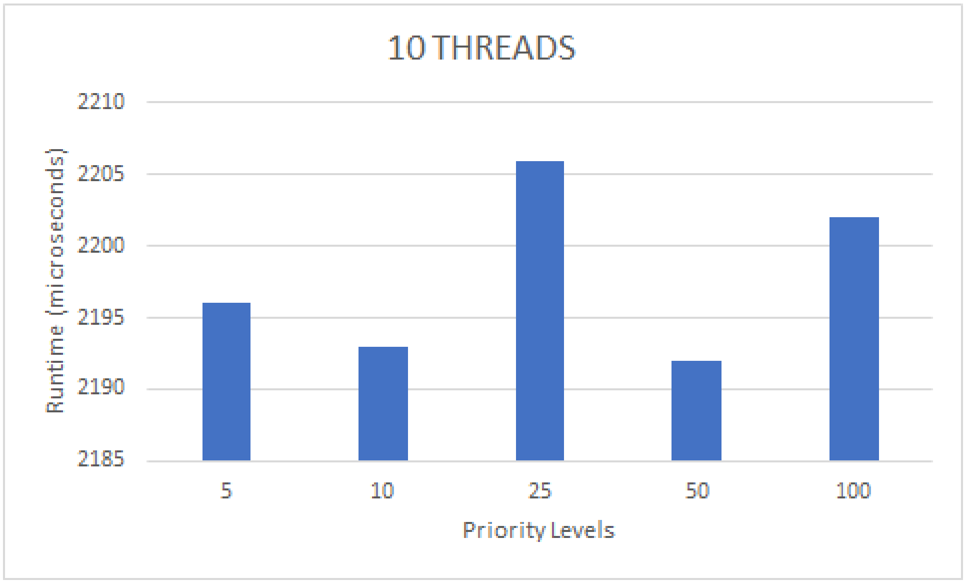
1. Number of priority levels
2. Number of user threads

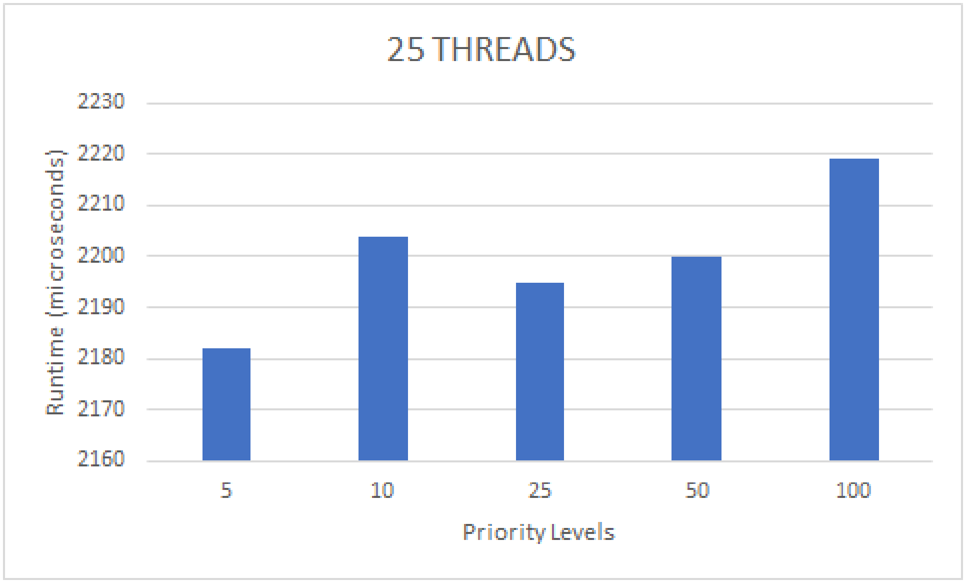
For given number of threads we check runtime of the program at different priority levels and plot this against the pair of priority levels and user threads.

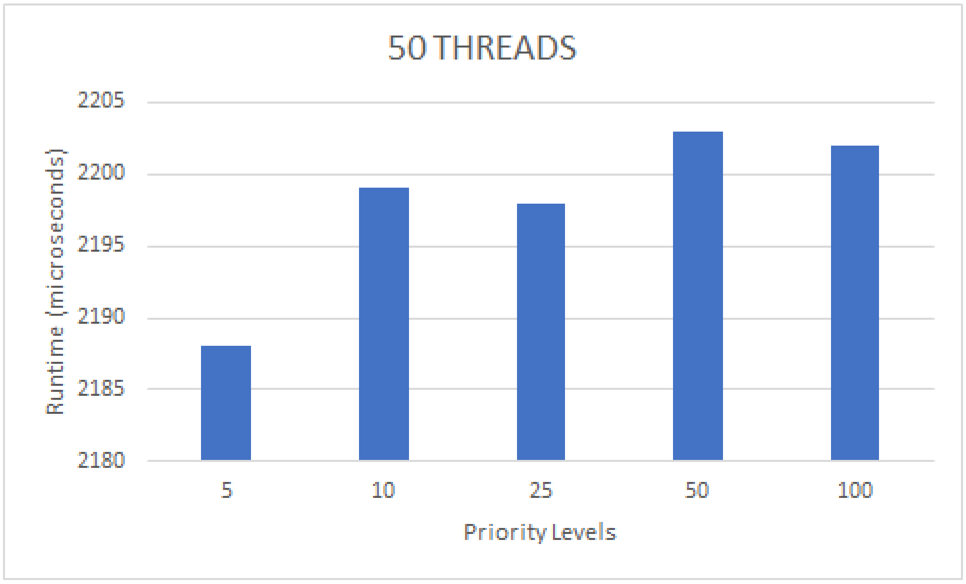
Following table shows how we varied these parameters

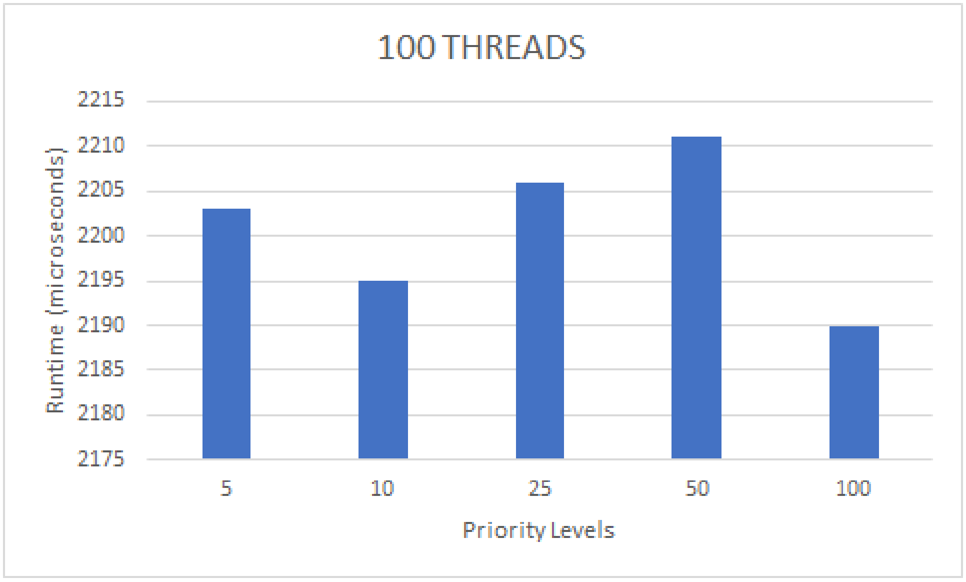
User Threads	Priority Levels
5	5, 10, 25, 50, 100
10	5, 10, 25, 50, 100
25	5, 10, 25, 50, 100
50	5, 10, 25, 50, 100
100	5, 10, 25, 50, 100

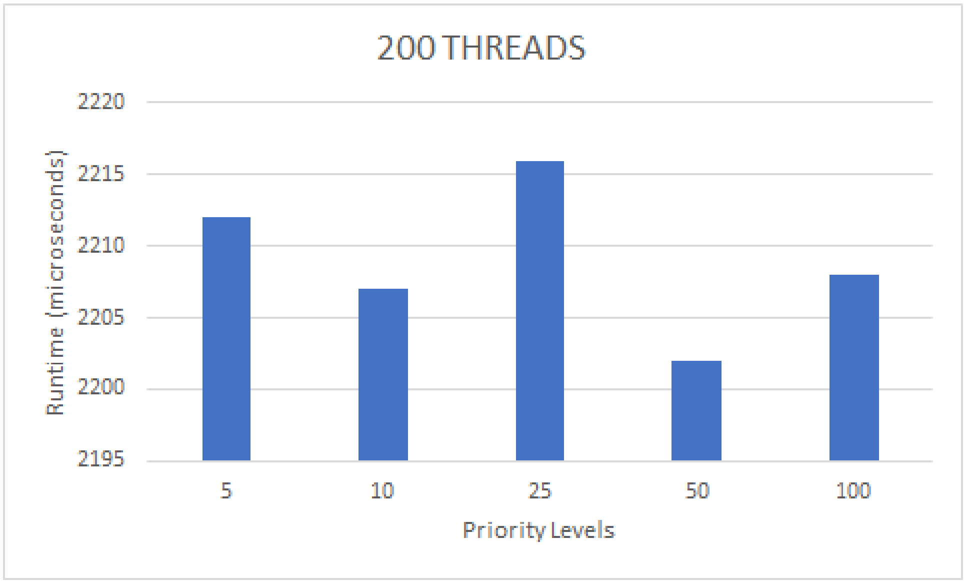


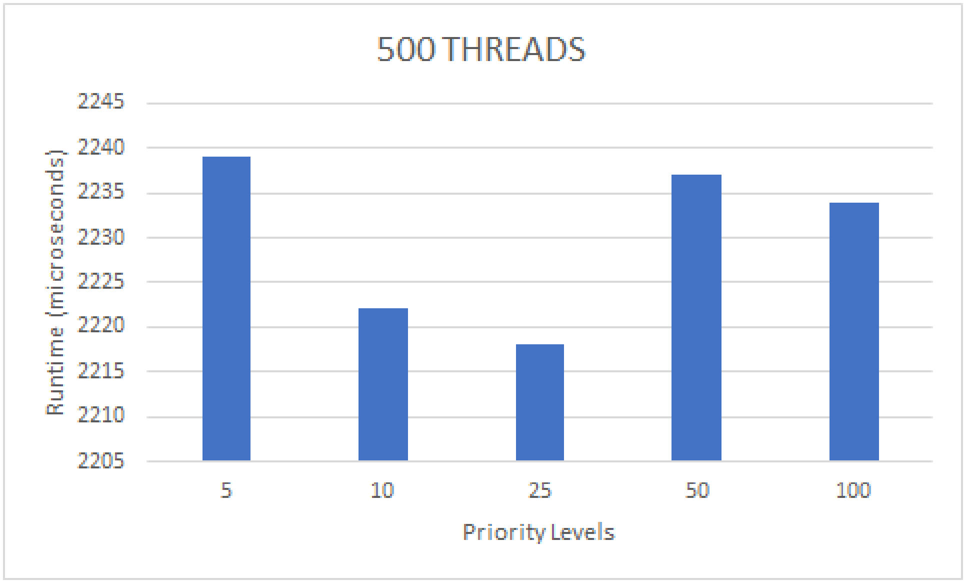

10 THREADS
Runtime (microseconds)
2210
2205
2200
2195
2190
2185
5
10
25
50
100
Priority Levels


25 THREADS
Runtime (microseconds)
2230
2220
2210
2200
2190
2180
2170
2160
5
10
25
50
100
Priority Levels

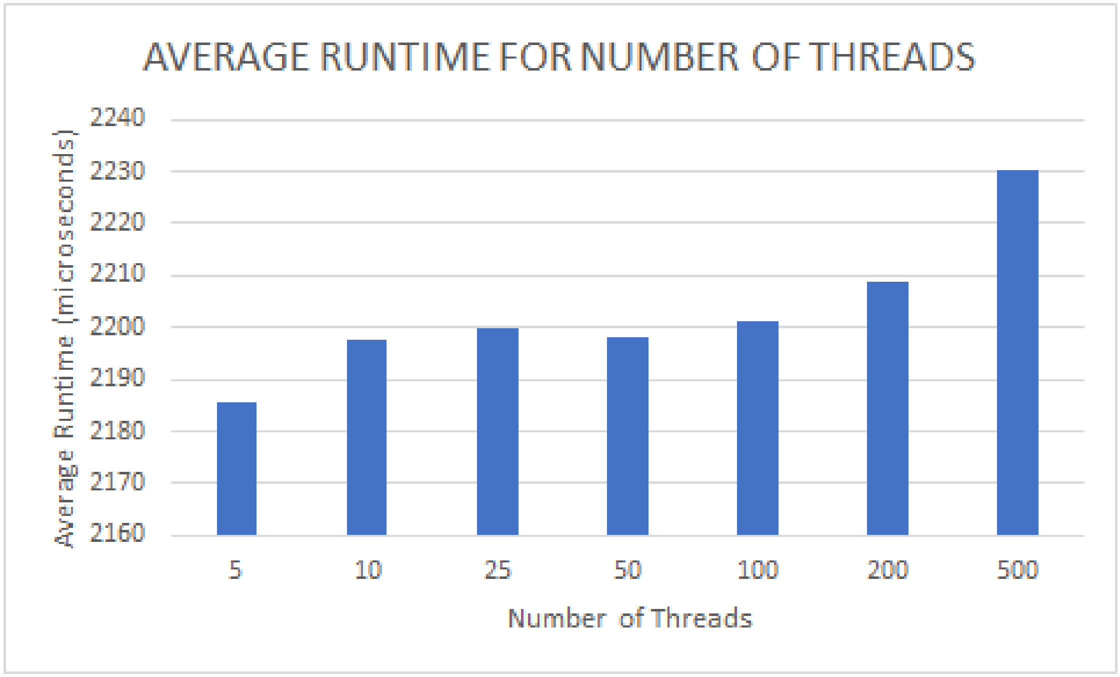

50 THREADS
2205
2200
2195
2190
2185
2180
Runtime (microseconds)
5
10
25
50
100
Priority Levels


100 THREADS
2215
2210
2205
2200
2195
2190
2185
2180
2175
Runtime (microseconds)
5
10
25
50
100
Priority Levels


200 THREADS
Runtime (microseconds)
2220
2215
2210
2205
2200
2195
5
10
25
50
100
Priority Levels


500 THREADS
Runtime (microseconds)
2245
2240
2235
2230
2225
2220
2215
2210
2205
5
10
25
50
100
Priority Levels

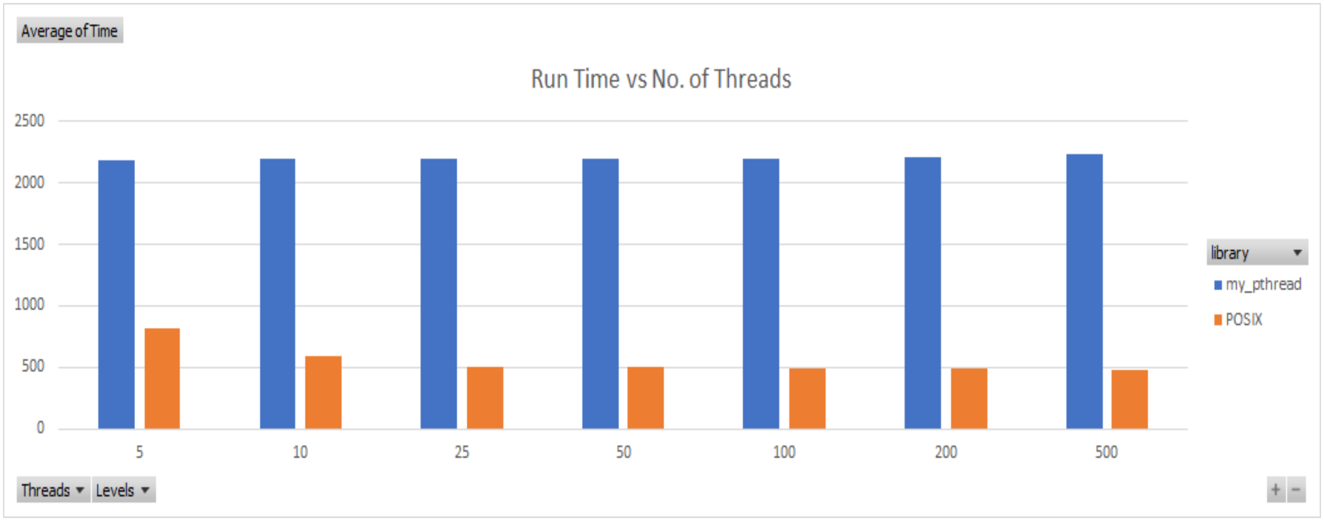
Analysis



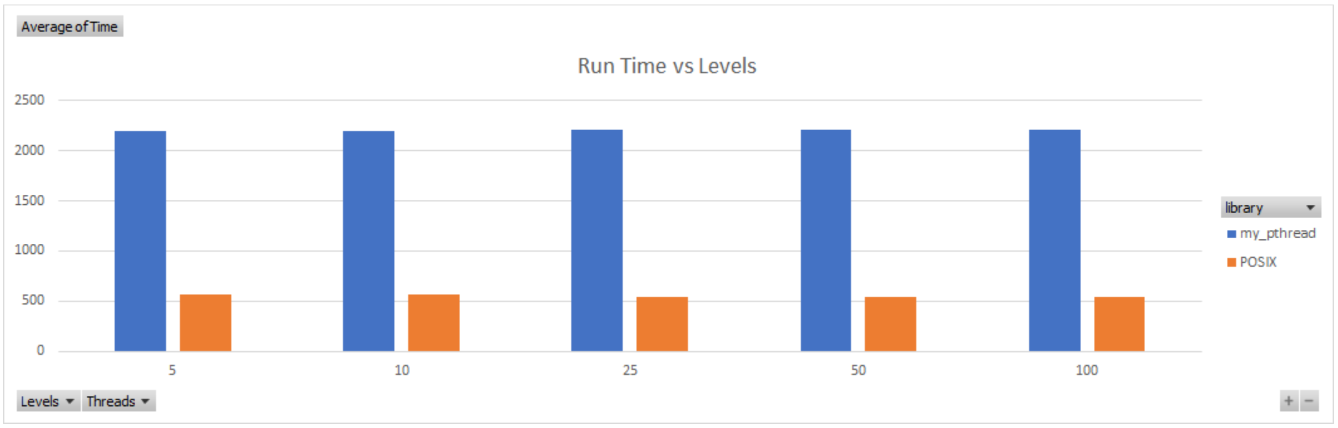
We calculated the average runtimes of our threads which have been executed over multiple priority levels. We observe that the runtime generally increases with increasing no of queues which is expected hence we can clearly say our scheduler scales effectively with increasing workloads.

From the previous runtime/no of threads graph, we notice that the runtime does increase with increasing priority levels until it reaches a peak (Level 100) and then reduces again forming almost like a sine curve.

Part II – Comparing our thread library performance with POSIX library



We observed that the native POSIX library performed about 400% better faster than our custom my_pthread_library. Considering the differences in performance of our library and POSIX, the difference is least for threads 50.



Regarding the number of levels to be used for best performance we saw that maintaining LEVELS = 100 gave the best performance.