Performance of three versions of locking mechanism - plot1


According to plot1, it's obvious that it's an upward trend. In other words, the more process P executes, the more time should parent process takes. When P is large, some mild inflation pops up. I guess the reason is that All processes are not starting at exactly the same time since they are forked at different times. So it may be that the first process (or the first few processes) to be forked has an advantage and always wins before other processes get a chance.

Performance of three versions of locking mechanism - plot2
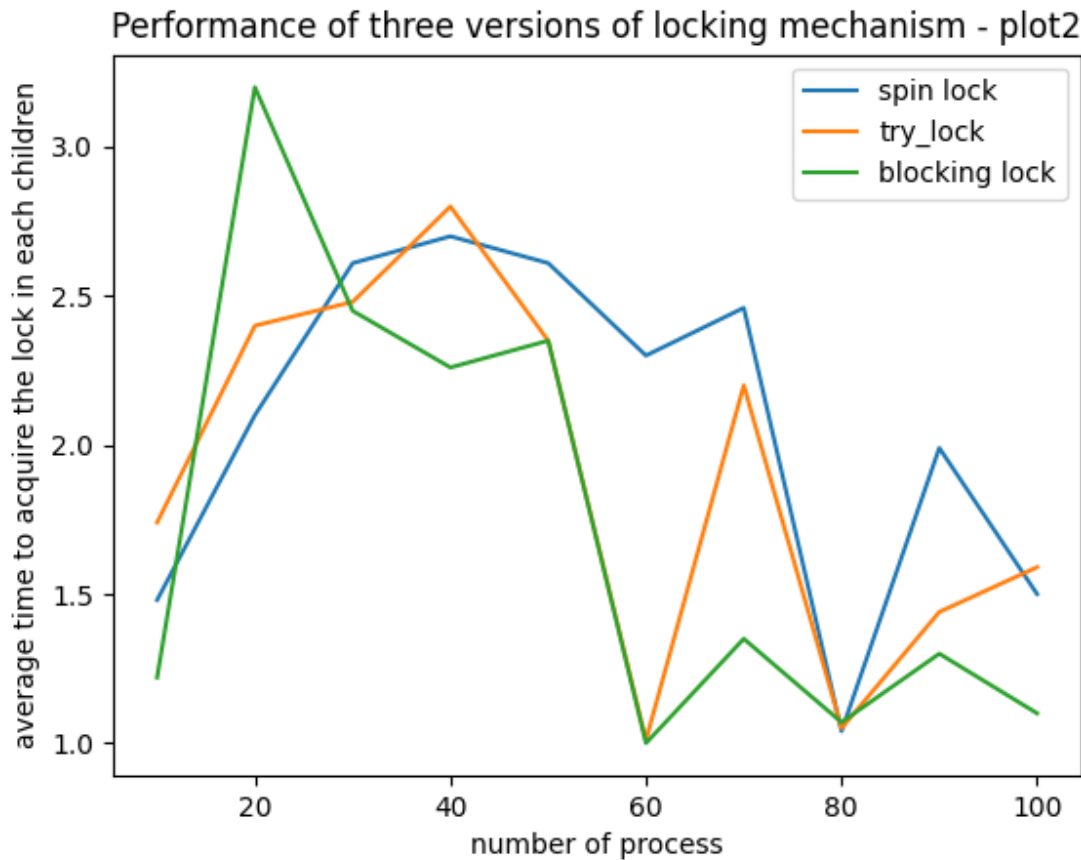
According to plot2, there is no clear relationship between the number of processes and the average time to acquire the lock in each process. We can't say which lock mechanism is best in this situation strictly. However, we can make some coarse analysis. If the number of processes is large, the average time will be stable in a narrow range. It's highly possible that blocking locks perform better than spin blocks at this time. The reason may be too many processes are computing for one CPU which causes more waste of time. Otherwise, when the number of processes is small, the spinlock may be better because the competition of lock is not fierce and the critical session is not very long.