

# Draigana

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The code is tested using `hspec` and I chose a board representation using `Data.Sequence` which has faster lookup and tail operation times.

In my solution I have implemented basic `forkIO` lightweight thread parallelism. For each possible moves in a given board, a lightweight thread is spawned. The thread spawning the sub-threads wait until all the sub-threads have returned (using a `QSemN`). If that happens and more time is left, the minimax depth is doubled, and the threads are started again. The attached image shows that all (4) threads are utilised, but that there are a lot of pausing. This is probably due to the semaphore implementation, where the threads are forced to wait for each other. A different approach could be to use an `STM` monad to calculate the heuristics recursively. If done recursively, each calculation can be evaluated against each other without forcing other threads to wait.

Due to time limitations I have not attempted to implement this.

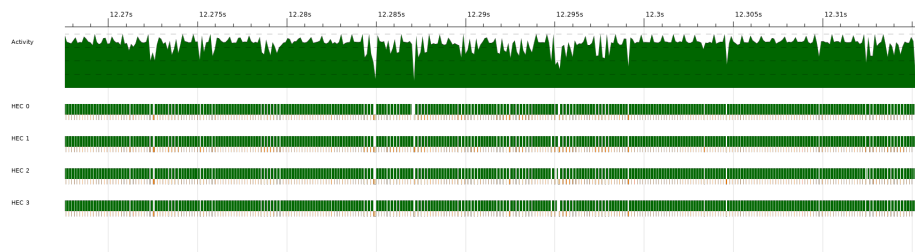


Figure 1. Screenshot of a brief `play-par` run.

Note: while I respect the idea of having a competition, I think it's a shame we don't have more time to develop the solution. I have only been able to use the normalised 20 hours on this assignment.