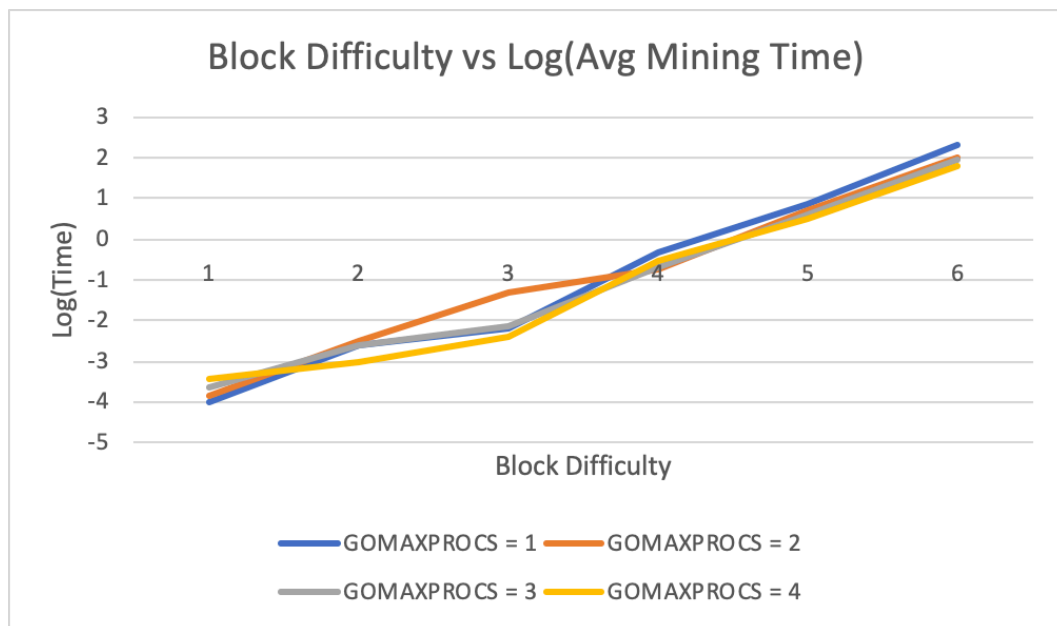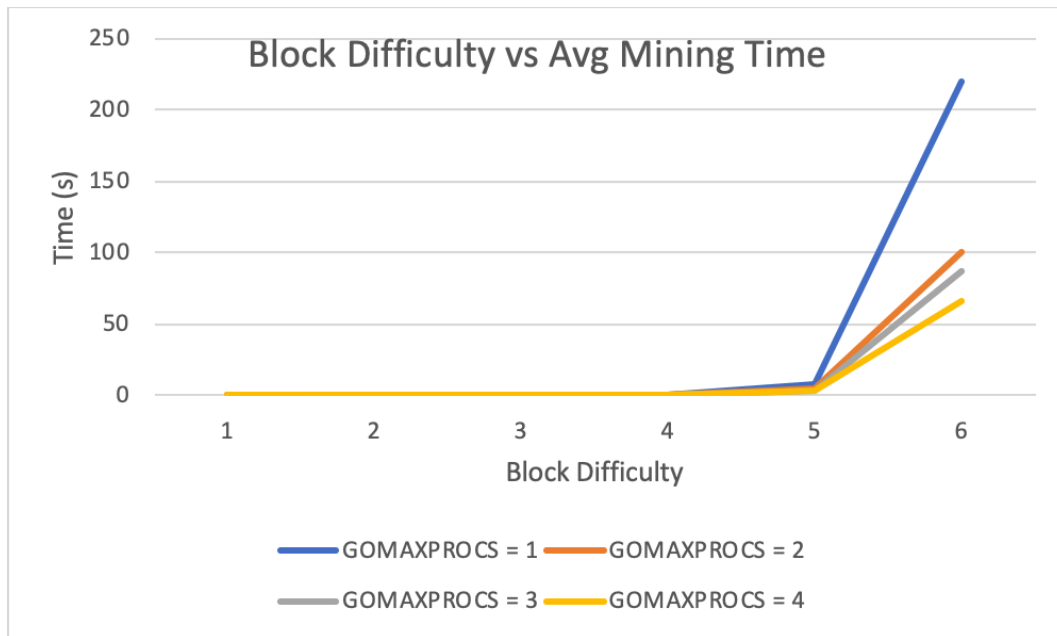# Performance Report

The following data was collected using different values for GOMAXPROCS. As I am using a 4-core MacBook Pro, and any value greater than 4 would yield negligible results, I tested values from 1 to 4. For each value of GOMAXPROCS, I ran the mining simulation on a chain of 10 blocks, with 10 miners, reporting the average time to mine one block. I increased the difficulty until the average time to mine one block surpassed 5 minutes. The following four tables and graph show the data collected. Also included is a graph showing the Log of the average mining time, as the difference between the time for block 1 and block 6 is very large.

GOMAXPROCS = 1		GOMAXPROCS = 2	
Block Difficulty	Time (s)	Block Difficulty	Time (s)
1	0.000103	1	0.000143
2	0.002372	2	0.003042
3	0.006459	3	0.049647
4	0.495751	4	0.181616
5	7.499855	5	4.962042
6	219.220657	6	101.106022

GOMAXPROCS = 3		GOMAXPROCS = 4	
Block Difficulty	Time (s)	Block Difficulty	Time (s)
1	0.00024	1	0.000362
2	0.002571	2	0.000916
3	0.00737	3	0.004149
4	0.207216	4	0.298589
5	3.895668	5	3.18393
6	86.313383	6	66.392166

Block Difficulty vs Avg Mining Time

Time (s)

250
200
150
100
50
0

Block Difficulty

1 2 3 4 5 6

GOMAXPROCS = 1 — GOMAXPROCS = 2
GOMAXPROCS = 3 — GOMAXPROCS = 4

Block Difficulty vs Log(Avg Mining Time)

Log(Time)

3
2
1
0
-1
-2
-3
-4
-5

Block Difficulty

1 2 3 4 5 6

GOMAXPROCS = 1 — GOMAXPROCS = 2
GOMAXPROCS = 3 — GOMAXPROCS = 4

As the data shows, the benefit that increasing GOMAXPROCS has on the mining simulation is seen more clearly as the difficulty of the mining puzzle increases. GOMAXPROCS of 1 performs best of all values at lower block difficulty, but as the difficulty increases, higher values of GOMAXPROCS outperforms. Additionally, there was no value of GOMAXPROCS that ever made the mining puzzle solvable in under 5 minutes for any difficulty greater than 6.