

Collatz Stopping Time Generator
Project 2
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Collatz calculations were performed on a large number value while, varying processing thread counts to observe processing speeds. To gain an accurate observation sample, the trial was run three times under different CPU processing conditions with an average time calculated. Each trial performed Collatz on the number 10000, and 1 to 30 threads were observed. See table below.

N	Threads	Time1	Time 2	Time 3	Avg Time
10000	1	0.283165991	0.297347993	0.30706501	0.382866333
10000	2	0.575922012	0.540422976	0.568085015	0.561476668
10000	3	1.001160979	0.877003014	1.053038955	0.977067649
10000	4	1.301844954	1.472511053	1.390498996	1.388285001
10000	5	1.784283042	1.861683011	1.812687993	1.819551349
10000	6	2.177190065	2.214071035	2.172733068	2.187998056
10000	7	2.581660986	2.327588081	2.503725052	2.470991373
10000	8	3.125087023	3.137568951	2.893287897	3.05198129
10000	9	3.044322968	3.096662998	3.062252045	3.067746004
10000	10	3.351358891	3.358815908	3.549854994	3.420009931
10000	11	2.405921936	4.185813904	3.521612883	3.371116241
10000	12	4.17360878	4.443798065	4.2140131	4.277139982
10000	13	4.516238213	4.682232857	4.629384041	4.609285037
10000	14	4.948123932	4.694374084	4.659912109	4.767470042
10000	15	5.115326881	5.422324181	5.182119846	5.239923636
10000	16	5.835248947	5.484156132	5.780698776	5.700034618
10000	17	6.225111008	6.147500992	6.853895187	6.408835729
10000	18	6.397601128	6.437415123	6.38223505	6.405750434
10000	19	6.809729099	6.76473093	7.148818016	6.907759348
10000	20	7.512853146	7.792819023	7.683040142	7.662904104
10000	21	7.672441959	7.224482059	7.447679996	7.448201338
10000	22	8.952177048	8.046881676	7.733280182	8.244112969
10000	23	8.959053993	8.92010498	8.637703896	8.83895429
10000	24	8.279970169	10.8935566	9.479227066	9.550917943
10000	25	9.258029938	9.435040474	9.428520203	9.373863538
10000	26	9.317542076	9.452623367	9.09881115	9.289658864
10000	27	9.638161659	8.436170578	10.54862976	9.540987333
10000	28	10.0062542	10.19483471	10.46419811	10.22176234
10000	29	11.86430359	10.44776344	11.15495586	11.1556743
10000	30	10.88103771	11.02606392	7.554102898	9.82040151

Figure 1 Thread Time Trials

Trial one was performed with minimal processes running in the background. Nothing was done while the Collatz processes were running. Trial two had multiple programs running, including an audio streaming application. The Collatz function was also ran simultaneously while recording the previous time in excel. The trial was under conditions midway between trials one

and two. The processing time varied greatly between minimal and heavy CPU loads, when considering the incredible speeds the Dual Core 3.20 I7 processor functions in. A steady increase in times can be observed with the increase in computational threads ran, which is to be expected. The surprising element was 30 threads performed better than 29 threads, by a very significant margin. This can be observed in graph 1.

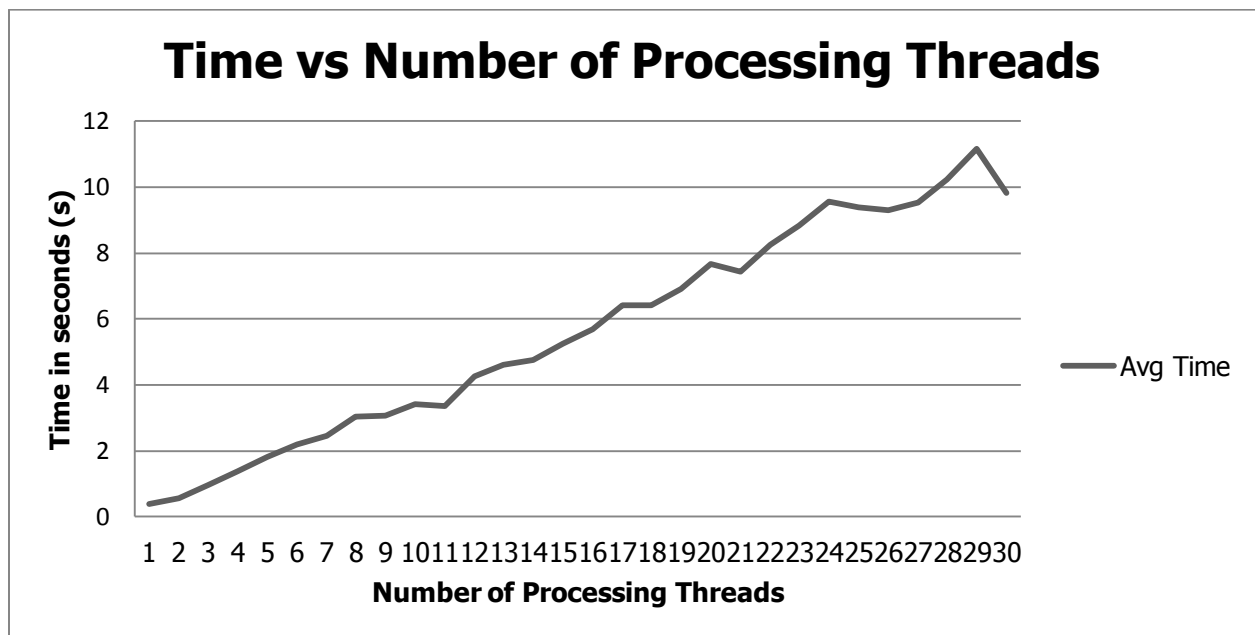


Figure 2 Thread observations