

Vaja 02

Protein Folding Optimization - Threads

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Results

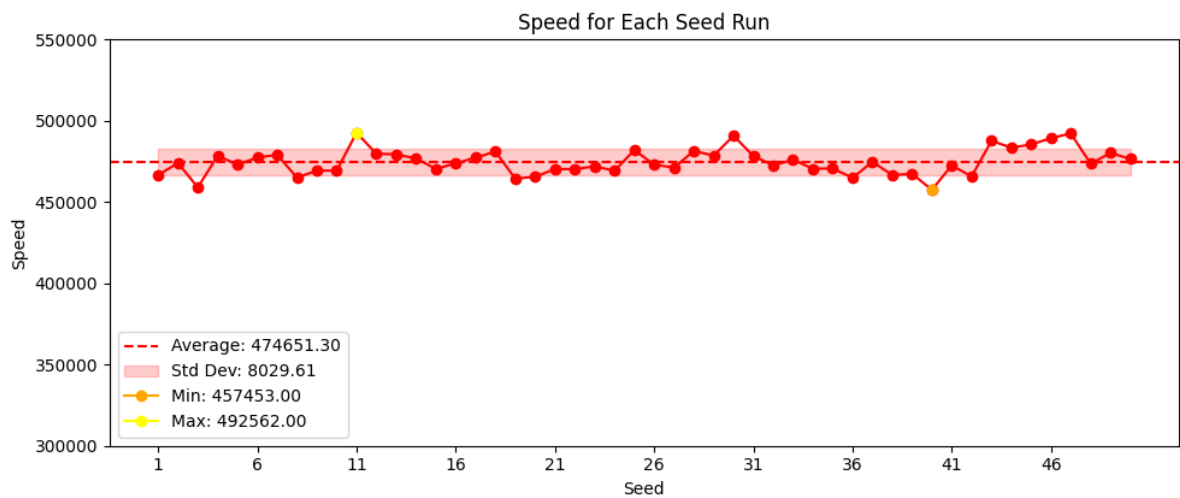
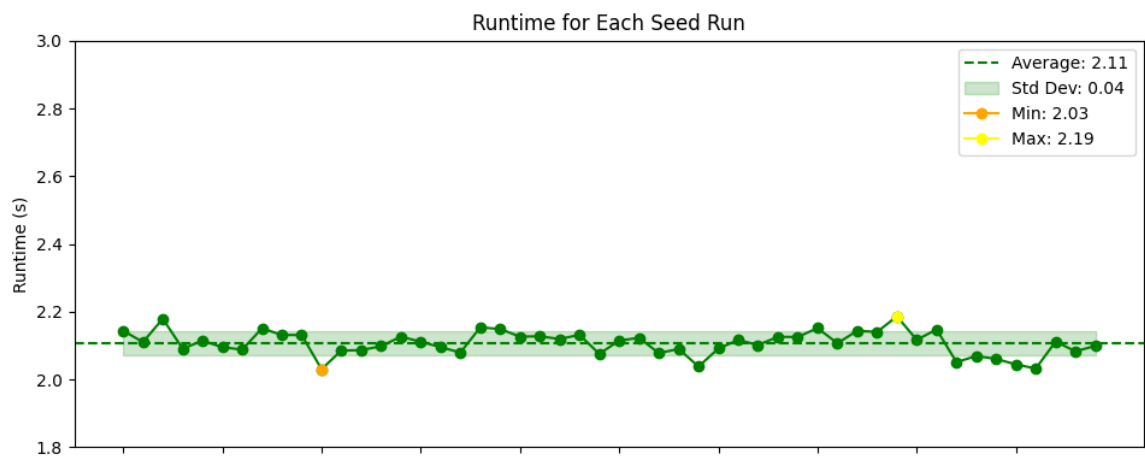
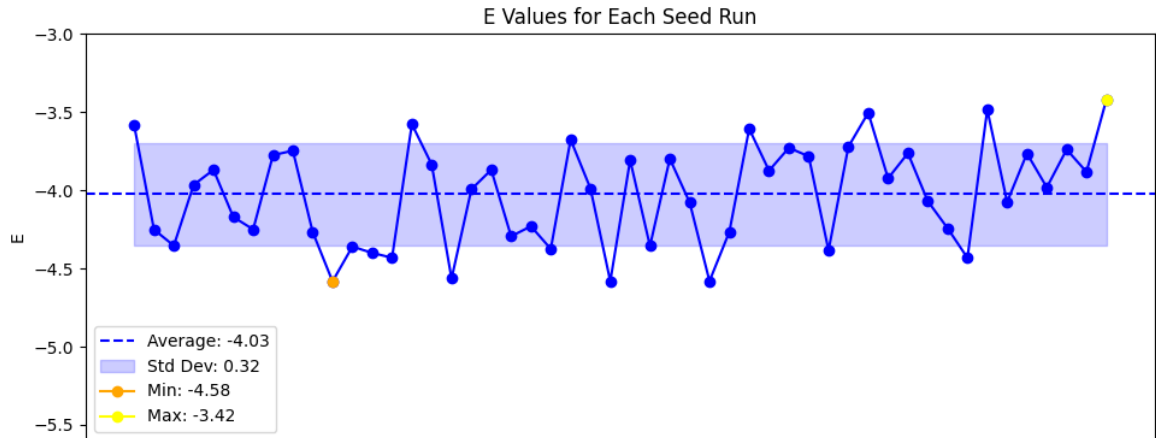
One thread:

The program was tested with following arguments:

ABBBBBBABBBAB -seed 1 -target -5.6104 -nfesLmt 1000000 -runtimeLmt 60.0 -Np 300 -expRuns 50 -expThreads 1

RUN	SEED	E	RUNTIME	NFES	SPEED
1	1	-3.58275	2.14367	1000000	466490
2	2	-4.25095	2.1101	1000000	473912
3	3	-4.35414	2.17902	1000000	458922
4	4	-3.965	2.09052	1000000	478350
5	5	-3.86917	2.11427	1000000	472976
6	6	-4.17073	2.09509	1000000	477306
7	7	-4.25013	2.08778	1000000	478978
8	8	-3.77517	2.15078	1000000	464947
9	9	-3.74665	2.13111	1000000	469239
10	10	-4.26663	2.13094	1000000	469276
11	11	-4.58259	2.0302	1000000	492562
12	12	-4.36008	2.08509	1000000	479595
13	13	-4.40044	2.08639	1000000	479296
14	14	-4.43146	2.09796	1000000	476655
15	15	-3.57715	2.12606	1000000	470353
16	16	-3.83576	2.11117	1000000	473671
17	17	-4.56462	2.0951	1000000	477305
18	18	-3.99316	2.07937	1000000	480916
19	19	-3.86894	2.15347	1000000	464366
20	20	-4.29416	2.14865	1000000	465407
21	21	-4.23005	2.12632	1000000	470295
22	22	-4.37482	2.12724	1000000	470093
23	23	-3.67579	2.11916	1000000	471885
24	24	-3.98831	2.13147	1000000	469160
25	25	-4.58159	2.07539	1000000	481837
26	26	-3.80741	2.11441	1000000	472945
27	27	-4.35589	2.1227	1000000	471098
28	28	-3.79814	2.07755	1000000	481336
29	29	-4.07789	2.09003	1000000	478461
30	30	-4.58049	2.03786	1000000	490711
31	31	-4.26585	2.09091	1000000	478260
32	32	-3.60702	2.11641	1000000	472499
33	33	-3.87411	2.10141	1000000	475871
34	34	-3.72828	2.12552	1000000	470473
35	35	-3.78266	2.12518	1000000	470549
36	36	-4.38449	2.15138	1000000	464818
37	37	-3.72136	2.10667	1000000	474683
38	38	-3.5042	2.14356	1000000	466513
39	39	-3.92345	2.13998	1000000	467293
40	40	-3.76266	2.18602	1000000	457453
41	41	-4.06914	2.11661	1000000	472454

42	42	-4.24262	2.14754	1000000	465650
43	43	-4.43245	2.05095	1000000	487578
44	44	-3.48438	2.0689	1000000	483349
45	45	-4.07506	2.06039	1000000	485345
46	46	-3.76437	2.0441	1000000	489213
47	47	-3.98156	2.03209	1000000	492104
48	48	-3.73919	2.11173	1000000	473545
49	49	-3.88226	2.0827	1000000	480146
50	50	-3.42214	2.09896	1000000	476426



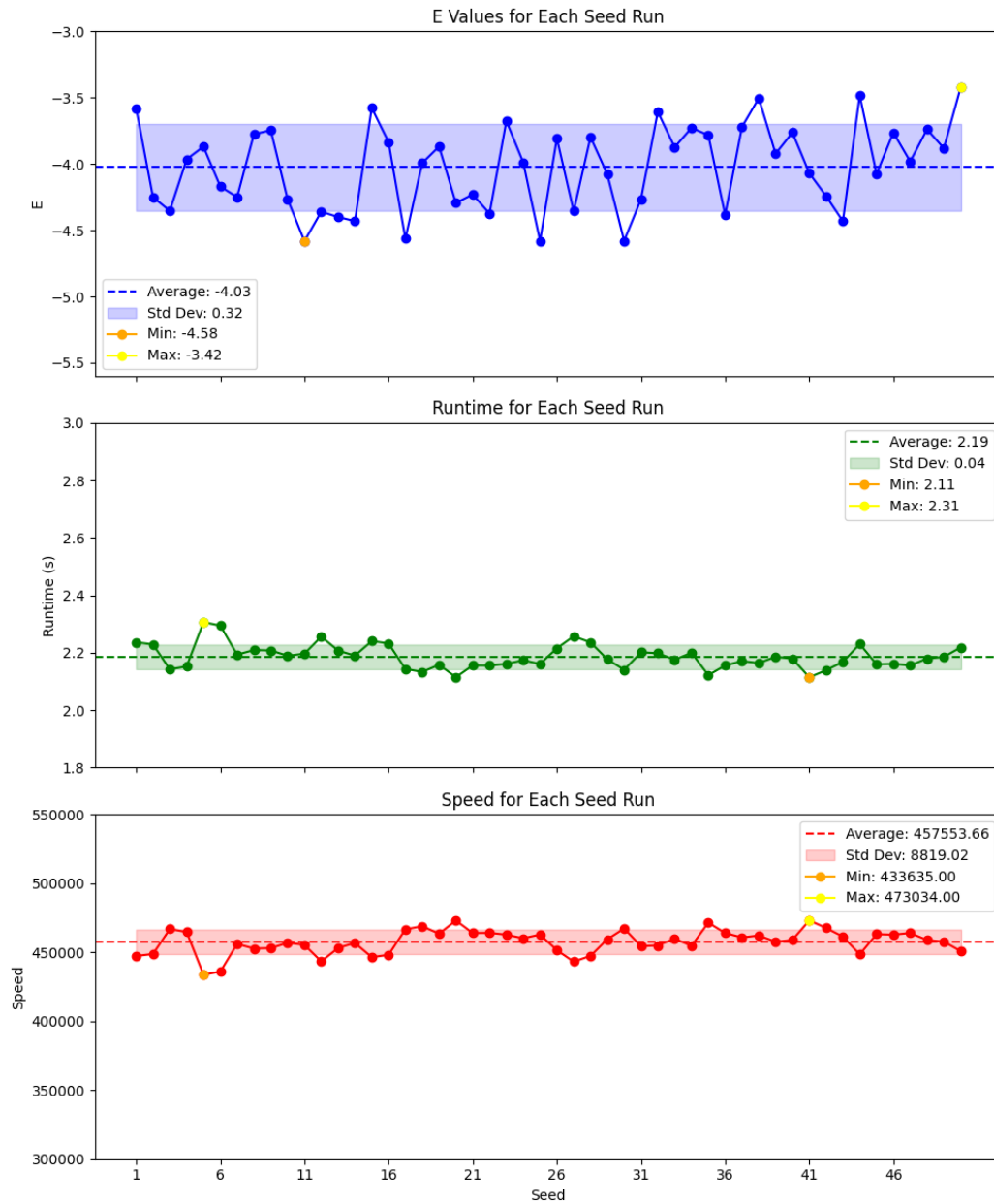
Two threads:

The program was tested with following arguments:

ABBBBBBABBBAB -seed 1 -target -5.6104 -nfesLmt 1000000 -runtimeLmt 60.0 -Np 300 -expRuns 50 -expThreads 2

RUN	SEED	E	RUNTIME	NFES	SPEED
1	1	-3.58275	2.23609	1000000	447209
2	2	-4.25095	2.22869	1000000	448694
3	3	-4.35414	2.14187	1000000	466881
4	4	-3.965	2.15197	1000000	464690
5	5	-3.86917	2.30609	1000000	433635
6	6	-4.17073	2.29423	1000000	435877
7	7	-4.25013	2.19312	1000000	455971
8	8	-3.77517	2.20915	1000000	452663
9	9	-3.74665	2.20773	1000000	452953
10	10	-4.26663	2.18917	1000000	456794
11	11	-4.58259	2.19635	1000000	455301
12	12	-4.36008	2.25571	1000000	443320
13	13	-4.40044	2.2073	1000000	453042
14	14	-4.43146	2.18952	1000000	456722
15	15	-3.57715	2.24027	1000000	446375
16	16	-3.83576	2.23195	1000000	448039
17	17	-4.56462	2.14321	1000000	466589
18	18	-3.99316	2.13278	1000000	468872
19	19	-3.86894	2.15773	1000000	463450
20	20	-4.29416	2.11438	1000000	472953
21	21	-4.23005	2.15547	1000000	463935
22	22	-4.37482	2.155	1000000	464037
23	23	-3.67579	2.161	1000000	462748
24	24	-3.98831	2.17352	1000000	460083
25	25	-4.58159	2.16068	1000000	462818
26	26	-3.80741	2.21512	1000000	451443
27	27	-4.35589	2.25674	1000000	443117
28	28	-3.79814	2.23563	1000000	447302
29	29	-4.07789	2.17699	1000000	459349
30	30	-4.58049	2.1403	1000000	467223
31	31	-4.26585	2.20115	1000000	454308
32	32	-3.60702	2.19814	1000000	454930
33	33	-3.87411	2.17511	1000000	459746
34	34	-3.72828	2.1997	1000000	454608
35	35	-3.78266	2.12142	1000000	471382
36	36	-4.38449	2.15517	1000000	464000
37	37	-3.72136	2.17076	1000000	460668
38	38	-3.5042	2.1638	1000000	462149
39	39	-3.92345	2.18549	1000000	457563
40	40	-3.76266	2.17924	1000000	458875
41	41	-4.06914	2.11401	1000000	473034
42	42	-4.24262	2.13866	1000000	467583
43	43	-4.43245	2.16776	1000000	461305
44	44	-3.48438	2.23007	1000000	448416

45	45	-4.07506	2.15938	1000000	463095
46	46	-3.76437	2.16107	1000000	462735
47	47	-3.98156	2.15539	1000000	463952
48	48	-3.73919	2.17948	1000000	458825
49	49	-3.88226	2.18508	1000000	457650
50	50	-3.42214	2.21841	1000000	450774



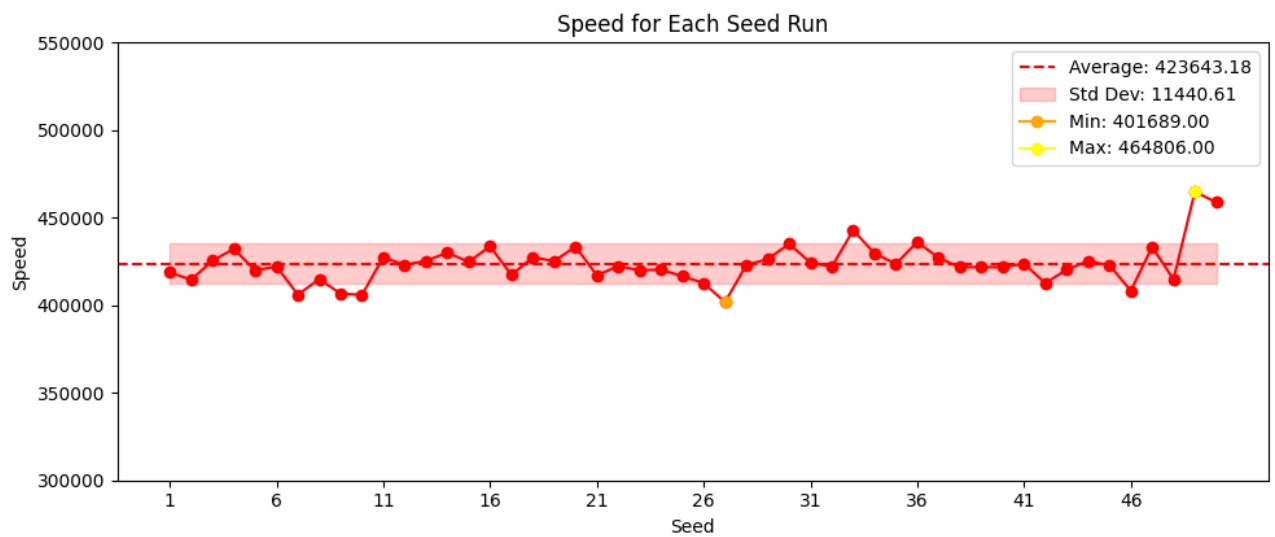
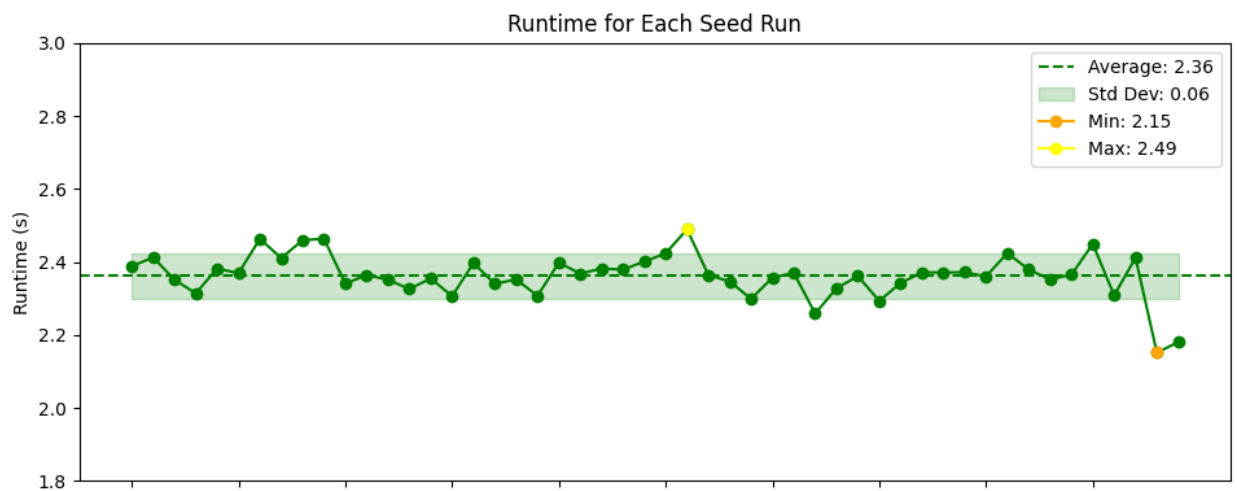
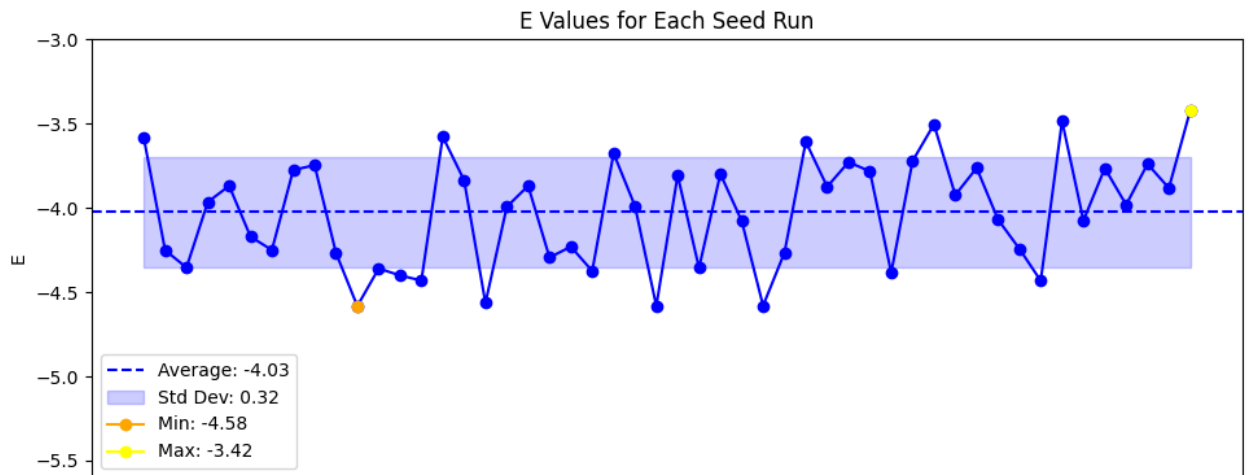
Four threads:

The program was tested with following arguments:

ABBBBBBABBAB -seed 1 -target -5.6104 -nfesLmt 1000000 -runtimeLmt 60.0 -Np 300 -expRuns 50 -expThreads 4

RUN	SEED	E	RUNTIME	NFES	SPEED
1	1	-3.58275	2.38804	1000000	418754
2	2	-4.25095	2.41256	1000000	414497
3	3	-4.35414	2.35111	1000000	425331
4	4	-3.965	2.31389	1000000	432172
5	5	-3.86917	2.38181	1000000	419848
6	6	-4.17073	2.36918	1000000	422086
7	7	-4.25013	2.46307	1000000	405997
8	8	-3.77517	2.41073	1000000	414812
9	9	-3.74665	2.45939	1000000	406604
10	10	-4.26663	2.46368	1000000	405897
11	11	-4.58259	2.34039	1000000	427279
12	12	-4.36008	2.364	1000000	423011
13	13	-4.40044	2.35121	1000000	425313
14	14	-4.43146	2.3257	1000000	429977
15	15	-3.57715	2.35469	1000000	424685
16	16	-3.83576	2.30608	1000000	433637
17	17	-4.56462	2.39685	1000000	417214
18	18	-3.99316	2.33998	1000000	427354
19	19	-3.86894	2.35211	1000000	425150
20	20	-4.29416	2.30725	1000000	433417
21	21	-4.23005	2.39792	1000000	417028
22	22	-4.37482	2.36784	1000000	422325
23	23	-3.67579	2.38179	1000000	419853
24	24	-3.98831	2.37894	1000000	420356
25	25	-4.58159	2.40102	1000000	416490
26	26	-3.80741	2.42322	1000000	412674
27	27	-4.35589	2.48949	1000000	401689
28	28	-3.79814	2.36414	1000000	422987
29	29	-4.07789	2.34625	1000000	426212
30	30	-4.58049	2.29883	1000000	435003
31	31	-4.26585	2.35683	1000000	424298
32	32	-3.60702	2.37002	1000000	421937
33	33	-3.87411	2.25847	1000000	442778
34	34	-3.72828	2.32788	1000000	429576
35	35	-3.78266	2.36104	1000000	423542
36	36	-4.38449	2.29334	1000000	436045
37	37	-3.72136	2.34197	1000000	426992
38	38	-3.5042	2.37138	1000000	421695
39	39	-3.92345	2.37085	1000000	421789
40	40	-3.76266	2.37169	1000000	421639
41	41	-4.06914	2.36012	1000000	423708
42	42	-4.24262	2.42417	1000000	412513
43	43	-4.43245	2.37894	1000000	420356
44	44	-3.48438	2.35209	1000000	425155

45	45	-4.07506	2.36497	1000000	422839
46	46	-3.76437	2.44947	1000000	408252
47	47	-3.98156	2.30834	1000000	433212
48	48	-3.73919	2.41136	1000000	414704
49	49	-3.88226	2.15143	1000000	464806
50	50	-3.42214	2.18021	1000000	458671



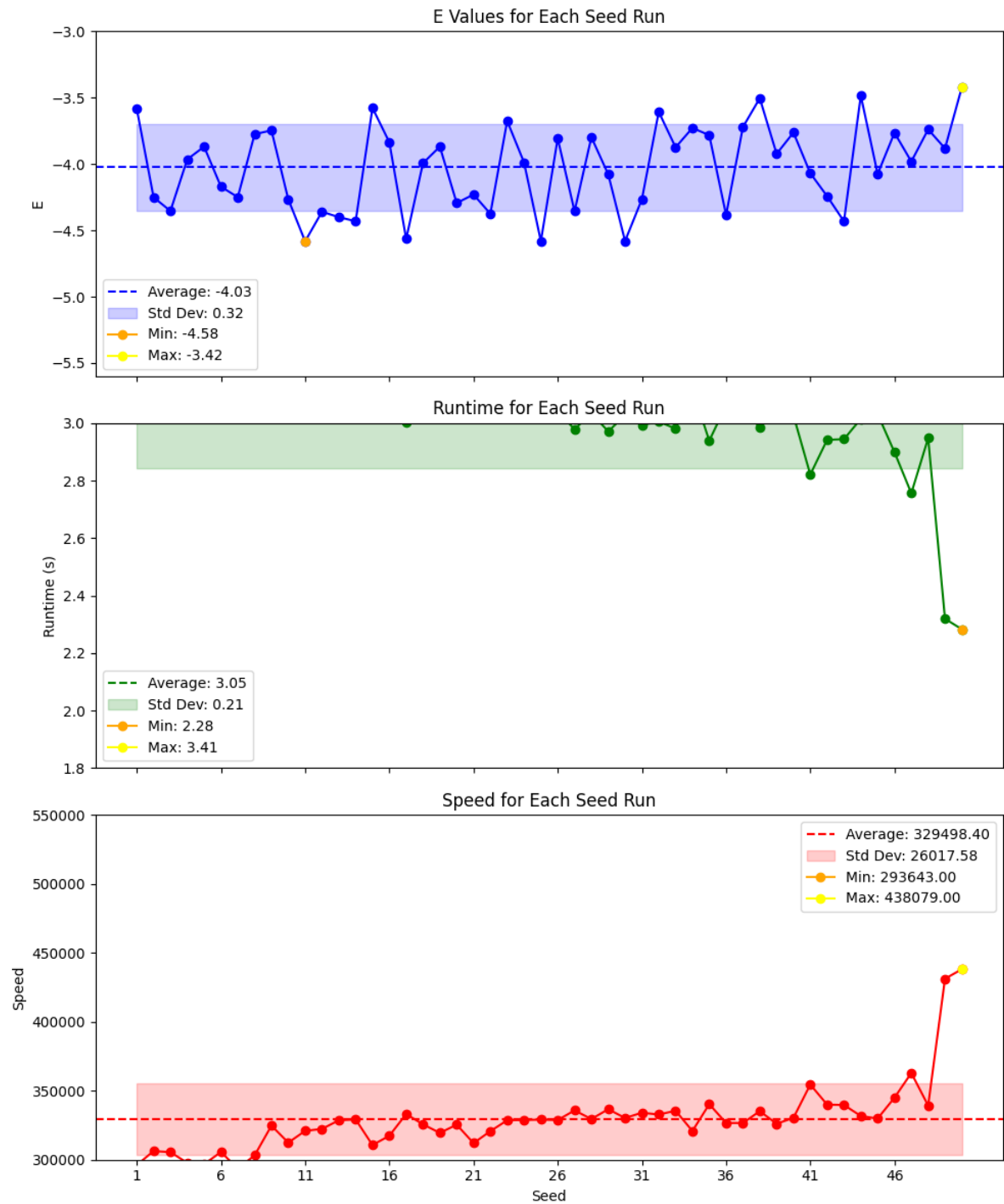
Eight threads:

The program was tested with following arguments:

ABBBBBBABBBAB -seed 1 -target -5.6104 -nfesLmt 1000000 -runtimeLmt 60.0 -Np 300 -expRuns 50 -expThreads 8

RUN	SEED	E	RUNTIME	NFES	SPEED
1	1	-3.58275	3.37711	1000000	296111
2	2	-4.25095	3.26469	1000000	306307
3	3	-4.35414	3.27368	1000000	305467
4	4	-3.965	3.35848	1000000	297753
5	5	-3.86917	3.36973	1000000	296760
6	6	-4.17073	3.27254	1000000	305573
7	7	-4.25013	3.4055	1000000	293643
8	8	-3.77517	3.29891	1000000	303130
9	9	-3.74665	3.07976	1000000	324701
10	10	-4.26663	3.20118	1000000	312385
11	11	-4.58259	3.11604	1000000	320920
12	12	-4.36008	3.1024	1000000	322331
13	13	-4.40044	3.04337	1000000	328583
14	14	-4.43146	3.03767	1000000	329200
15	15	-3.57715	3.21919	1000000	310637
16	16	-3.83576	3.15104	1000000	317356
17	17	-4.56462	3.00212	1000000	333098
18	18	-3.99316	3.07081	1000000	325647
19	19	-3.86894	3.13052	1000000	319436
20	20	-4.29416	3.07299	1000000	325416
21	21	-4.23005	3.2049	1000000	312022
22	22	-4.37482	3.11812	1000000	320706
23	23	-3.67579	3.04319	1000000	328603
24	24	-3.98831	3.04124	1000000	328813
25	25	-4.58159	3.03876	1000000	329081
26	26	-3.80741	3.04168	1000000	328766
27	27	-4.35589	2.97844	1000000	335746
28	28	-3.79814	3.03496	1000000	329494
29	29	-4.07789	2.97094	1000000	336594
30	30	-4.58049	3.02796	1000000	330255
31	31	-4.26585	2.9934	1000000	334068
32	32	-3.60702	3.00523	1000000	332753
33	33	-3.87411	2.98061	1000000	335501
34	34	-3.72828	3.11689	1000000	320833
35	35	-3.78266	2.9389	1000000	340263
36	36	-4.38449	3.06144	1000000	326643
37	37	-3.72136	3.06145	1000000	326642
38	38	-3.5042	2.98327	1000000	335202
39	39	-3.92345	3.06693	1000000	326059
40	40	-3.76266	3.02682	1000000	330380
41	41	-4.06914	2.821	1000000	354484
42	42	-4.24262	2.94166	1000000	339944
43	43	-4.43245	2.94405	1000000	339668
44	44	-3.48438	3.01473	1000000	331705

45	45	-4.07506	3.03141	1000000	329879
46	46	-3.76437	2.89869	1000000	344984
47	47	-3.98156	2.75589	1000000	362859
48	48	-3.73919	2.94768	1000000	339250
49	49	-3.88226	2.31916	1000000	431190
50	50	-3.42214	2.28269	1000000	438079



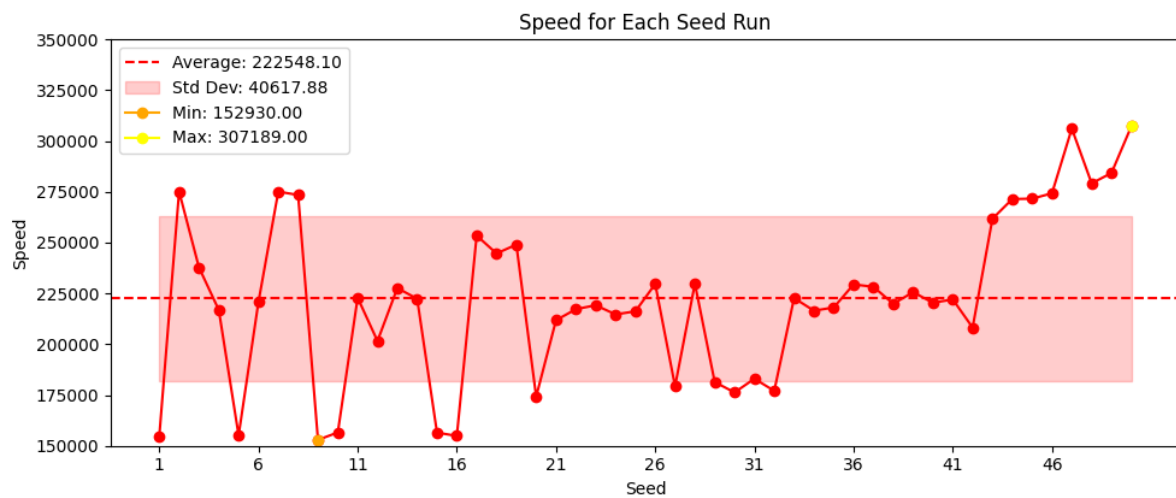
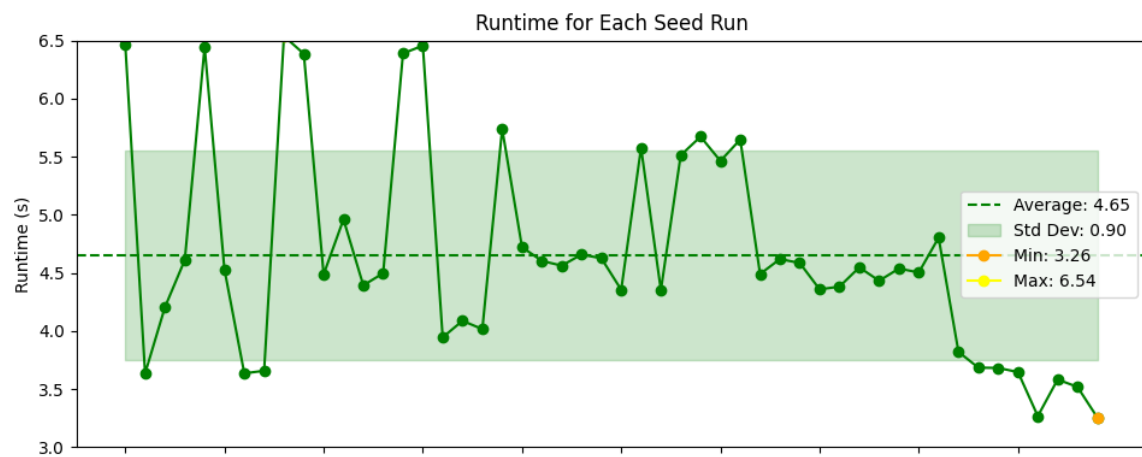
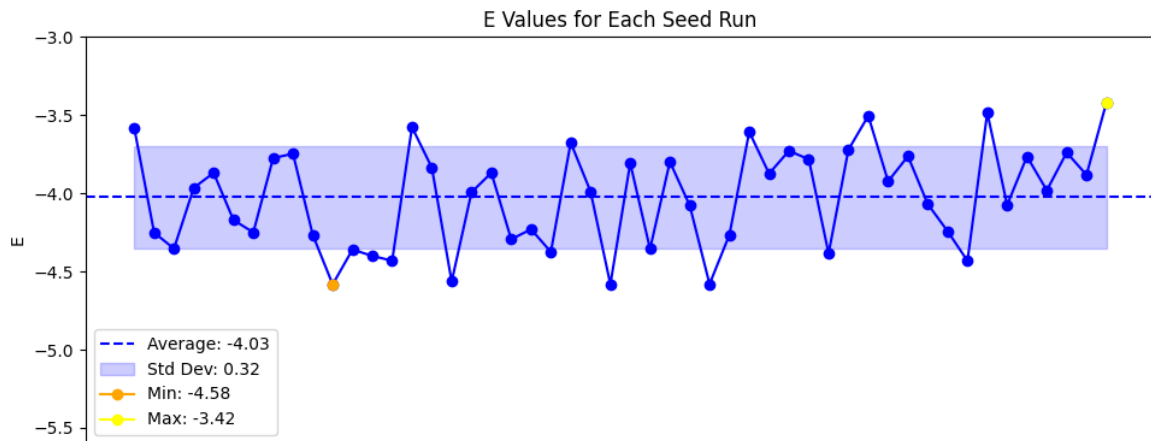
Sixteen threads:

The program was tested with following arguments:

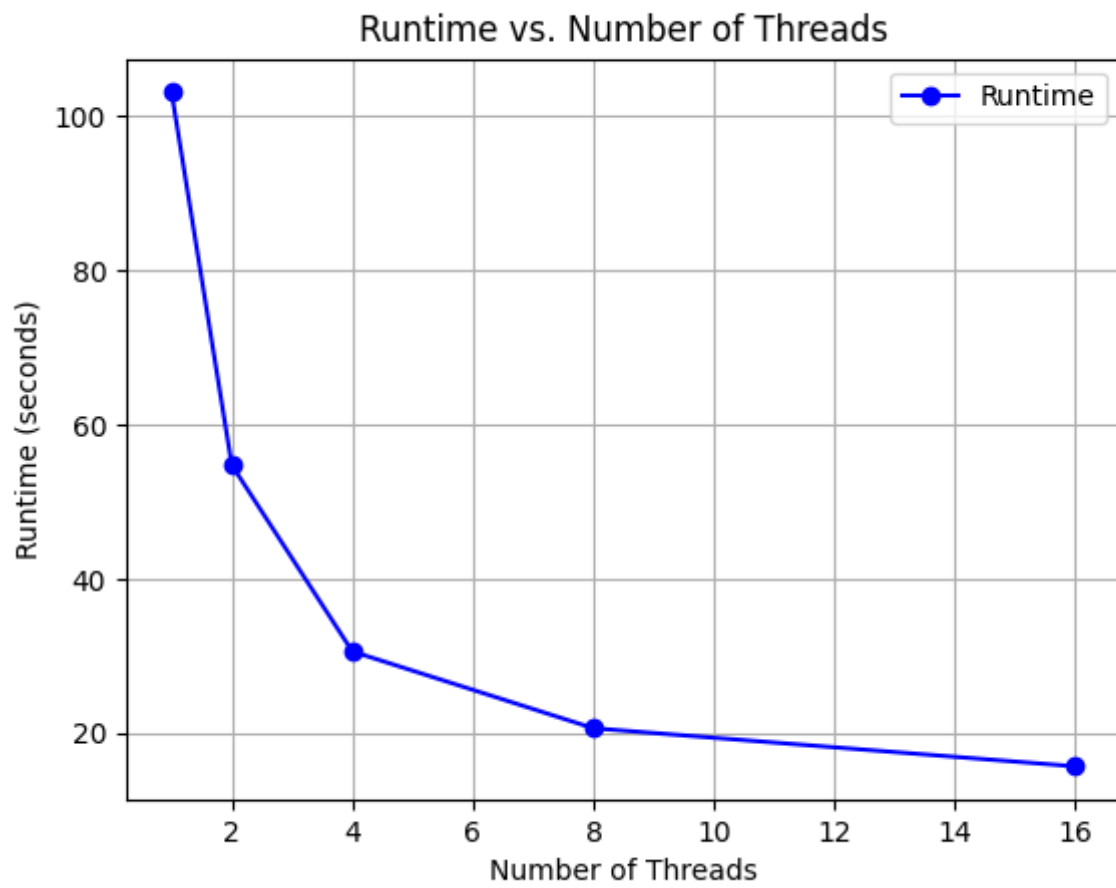
ABBBBBBABBBAB -seed 1 -target -5.6104 -nfesLmt 1000000 -runtimeLmt 60.0 -Np 300 -expRuns 50 -expThreads 16

RUN	SEED	E	RUNTIME	NFES	SPEED
1	1	-3.58275	6.46807	1000000	154606
2	2	-4.25095	3.63487	1000000	275113
3	3	-4.35414	4.20532	1000000	237794
4	4	-3.965	4.61139	1000000	216855
5	5	-3.86917	6.44559	1000000	155145
6	6	-4.17073	4.52931	1000000	220784
7	7	-4.25013	3.63535	1000000	275077
8	8	-3.77517	3.65752	1000000	273409
9	9	-3.74665	6.53893	1000000	152930
10	10	-4.26663	6.3868	1000000	156573
11	11	-4.58259	4.48722	1000000	222855
12	12	-4.36008	4.96123	1000000	201563
13	13	-4.40044	4.39317	1000000	227626
14	14	-4.43146	4.49731	1000000	222355
15	15	-3.57715	6.38981	1000000	156499
16	16	-3.83576	6.45685	1000000	154874
17	17	-4.56462	3.94538	1000000	253461
18	18	-3.99316	4.08781	1000000	244630
19	19	-3.86894	4.01611	1000000	248997
20	20	-4.29416	5.73986	1000000	174220
21	21	-4.23005	4.72172	1000000	211787
22	22	-4.37482	4.60341	1000000	217230
23	23	-3.67579	4.56272	1000000	219168
24	24	-3.98831	4.65855	1000000	214659
25	25	-4.58159	4.62596	1000000	216171
26	26	-3.80741	4.35463	1000000	229641
27	27	-4.35589	5.57711	1000000	179304
28	28	-3.79814	4.35194	1000000	229782
29	29	-4.07789	5.51367	1000000	181367
30	30	-4.58049	5.67306	1000000	176272
31	31	-4.26585	5.46423	1000000	183008
32	32	-3.60702	5.64842	1000000	177041
33	33	-3.87411	4.49038	1000000	222698
34	34	-3.72828	4.6193	1000000	216483
35	35	-3.78266	4.58546	1000000	218081
36	36	-4.38449	4.35891	1000000	229415
37	37	-3.72136	4.38158	1000000	228228
38	38	-3.5042	4.5479	1000000	219882
39	39	-3.92345	4.43252	1000000	225605
40	40	-3.76266	4.5376	1000000	220381
41	41	-4.06914	4.50401	1000000	222025
42	42	-4.24262	4.80359	1000000	208178
43	43	-4.43245	3.82067	1000000	261734
44	44	-3.48438	3.6843	1000000	271422

45	45	-4.07506	3.6819	1000000	271599
46	46	-3.76437	3.64652	1000000	274234
47	47	-3.98156	3.26712	1000000	306080
48	48	-3.73919	3.58238	1000000	279144
49	49	-3.88226	3.51827	1000000	284231
50	50	-3.42214	3.25533	1000000	307189



Runtime comparison



Computer Hardware

CPU: AMD Ryzen 5 5600G (6-core 3.9ghz)

RAM: 32 GB (2133mhz)