Project #1: OpenMP: Monte Carlo Simulation

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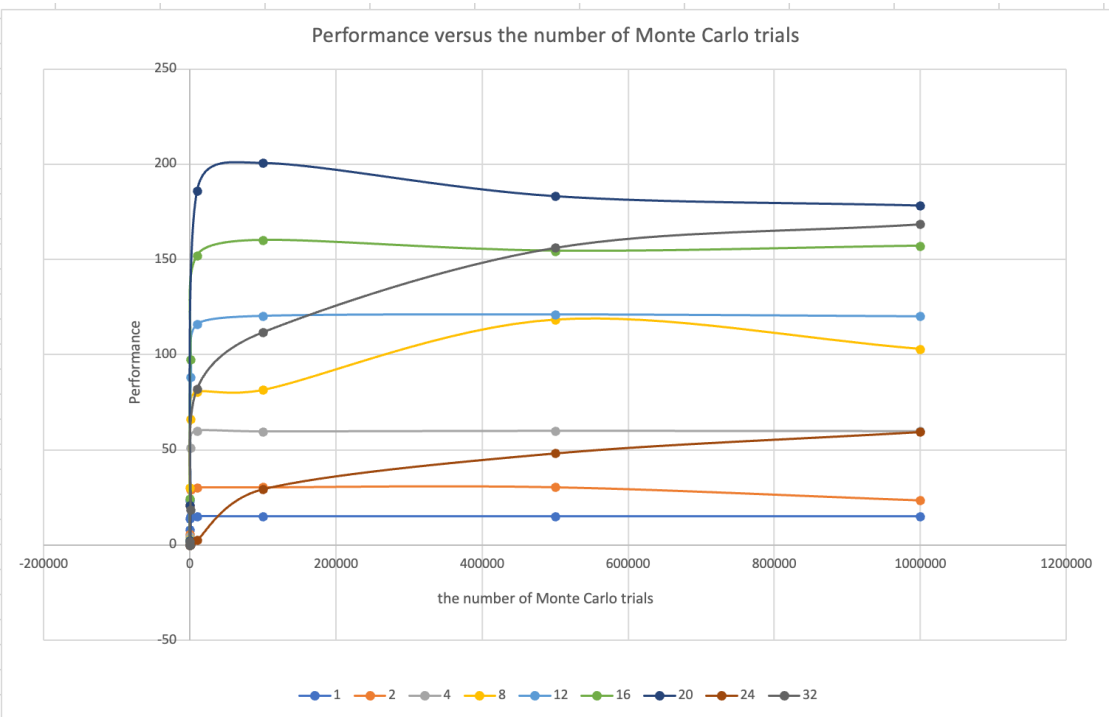
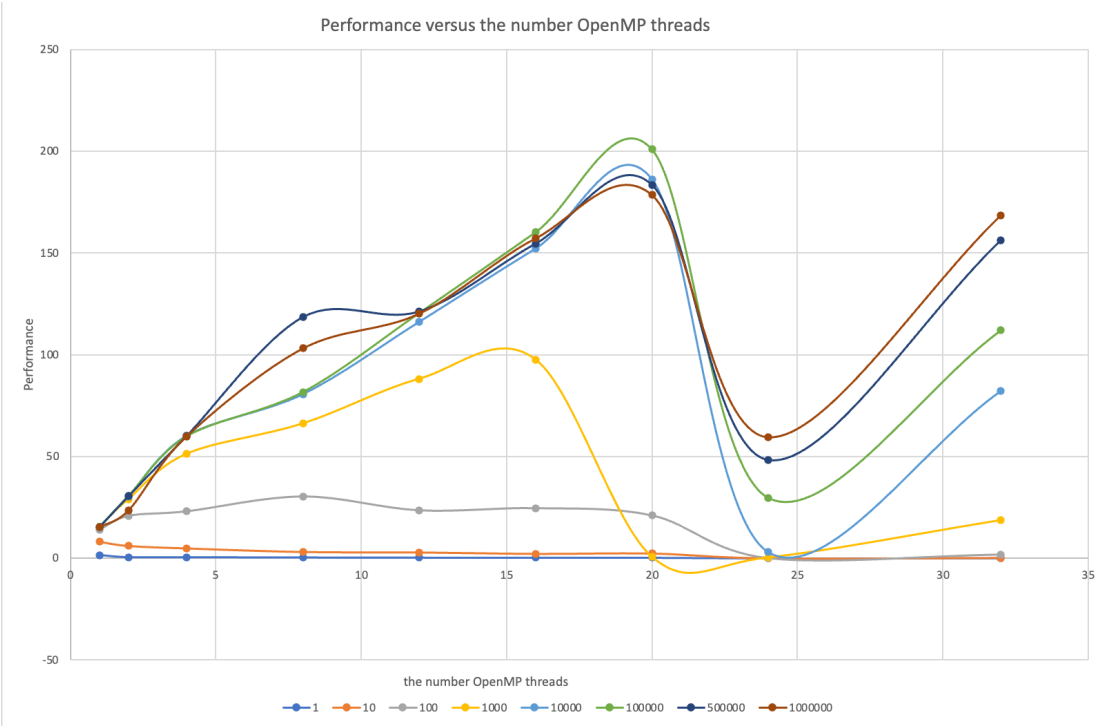
1. Performance versus the number of Monte Carlo trials, with the colored lines being the number of OpenMP threads.

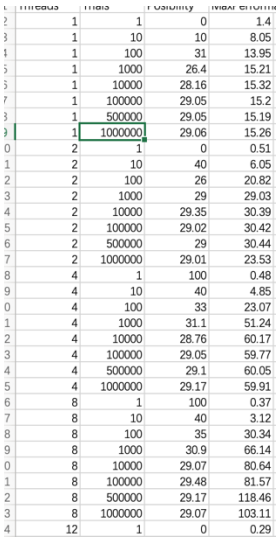


2. Performance versus the number OpenMP threads, with the colored lines being the number of Monte Carlo trials.



3. When the run is with 1000000 trials, the actual probability is nearly 29%.

4. The result of the program run is converted to excel as shown below.



1	1	0	1.4
1	10	10	8.05
1	100	31	13.95
1	1000	26.4	15.21
1	10000	28.16	15.32
1	100000	29.05	15.2
1	500000	29.05	15.19
1	1000000	29.06	15.26
2	1	0	0.51
2	10	40	6.05
2	100	26	20.82
2	1000	29	29.03
2	10000	29.35	30.39
2	100000	29.02	30.42
2	500000	29	30.44
2	1000000	29.01	23.53
4	1	100	0.48
4	10	40	4.85
4	100	33	23.07
4	1000	31.1	51.24
4	10000	28.76	60.17
4	100000	29.05	59.77
4	500000	29.1	60.05
4	1000000	29.17	59.91
8	1	100	0.37
8	10	40	3.12
8	100	35	30.34
8	1000	30.9	66.14
8	10000	29.07	80.64
8	100000	29.48	81.57
8	500000	29.17	118.46
8	1000000	29.07	103.11
12	1	0	0.29

The Pivot Table as shown below:

	1	10	100	1000	10000	100000	500000	1000000
1	1.4	8.05	13.95	15.21	15.32	15.2	15.19	15.26
2	0.51	6.05	20.82	29.03	30.39	30.42	30.44	23.53
4	0.48	4.85	23.07	51.24	60.17	59.77	60.05	59.91
8	0.37	3.12	30.34	66.14	80.64	81.57	118.46	103.11
12	0.29	2.9	23.53	88.09	116.2	120.45	121.2	120.2
16	0.24	2.19	24.59	97.51	152.2	160.18	154.52	157.15
20	0.23	2.35	21.04	0.63	186.22	200.85	183.39	178.48
24	0	0	0.05	0.32	2.95	29.52	48.28	59.49
32	0.02	0.2	1.83	18.66	82.2	111.9	156.21	168.58

The FP was shown below:

	1	10	100	1000	10000	100000	500000	1000000
1 thread to 2 thread	-3.490196	-0.66	0.6599	0.9521	0.99177	1.000657	1.001971	0.7029324
2 thread to 4 thread	-0.125	-0.49	0.1951	0.8669	0.98986	0.982098	0.986178	1.2144884
4 thread to 8 thread	-0.594595	-1.11	0.4792	0.4506	0.50769	0.53451	0.986156	0.8379401
8 thread to 12 thread	-0.827586	-0.23	-0.868	0.7475	0.91807	0.968369	0.067822	0.4265391
12 thread to 16 thread	-0.833333	-1.3	0.1724	0.3864	0.94612	0.992134	0.862542	0.9405027
16 thread to 20 thread	-0.217391	0.34	-0.844	-768.9	0.91344	1.012447	0.78712	0.5975459