Physical Hardware	
CPU	Intel(R) Core(TM) i7-10750H CPU @ 2.60GHz BOOST @ 4.80GHz Base speed: 2.59 GHz Sockets: 1 Cores: 6 Logical processors: 12 Virtualization: Enabled L1 cache: 384 KB L2 cache: 1.5 MB L3 cache: 12.0 MB
RAM	16 GB Dual-Channel DDR4 @2933MHz
SSD	WD BLUE SN550 1TB : PCIE Gen3x4
GPU	RTX 2060 Moblile
OS	Windows 10 2H22
Hyper-V Environments	
CPU	6C/12T
RAM	8 GB
SSD	30 GB
OS	UbuntuLTS Desktop 22.04

Workload	1	x1000 steps for find a convergent point

Threads	Type	Time with out I/O										Time with I/O			AVG time with out I/O (1 ~ 10)	AVG time with I/O (1~10)
		1st Round	2nd Round	3rd Round	4th Round	5th Round	6th Round	7th Round	8th Round	9th Round	10th Round	11th Round (1/0)	12th Round (1/0)	13th Round (1/0)		
1	Real	3.867	3.914	3.918	3.98	3.584	3.899	3.893	3.949	3.971	3.93	4.348	4.251	4.284	3.92	4.014870931
	User	3.871	3.907	3.897	3.961	3.975	3.89	3.884	3.935	3.95	3.989	4.134	4.235	4.276	3.9176	4.1736923077
	System	0.004	0.016	0.02	0.012	0.008	0.008	0.008	0.008	0.01	0.01	0.012	0.016	0.008	0.0124	0.0123076923
2	Real	2.587	2.655	2.58	2.575	2.653	2.538	2.582	2.654	2.51	2.624	2.951	2.939	2.991	2.5878	2.8272692308
	User	5.168	5.277	5.147	5.143	5.272	5.06	4.969	5.269	5.015	5.244	5.978	5.864	5.958	5.1083	5.5188846154
	System	0.004	0.016	0.012	0.004	0.02	0.008	0.008	0.008	0.004	0.012	0.02	0.004	0.008	0.0096	0.0092461538
4	Real	2.263	2.258	2.226	2.443	2.253	2.163	2.159	2.221	2.483	2.273	2.585	2.619	2.535	2.3146	2.369
	User	9.012	9.488	9.277	9.674	8.874	9.183	9.14	8.864	9.512	9.871	9.943	10.411	10.012	9.2257	9.4124615385
	System	0.004	0.016	0.02	0.008	0.016	0.004	0.012	0.016	0.024	0.012	0.012	0.012	0.012	0.014	0.0135384615
6	Real	1.947	1.941	1.961	1.961	1.941	1.933	1.977	1.958	1.945	1.921	2.146	2.166	2.2	1.9447	2.0880423488
	User	11.45	11.622	11.717	11.75	11.687	11.547	11.62	11.699	11.648	11.556	12.472	12.812	12.974	11.6616	11.9287692
	System	0.004	0.008	0.016	0.012	0.004	0.008	0.016	0.016	0	0.008	0.004	0.02	0.016	0.0124	0.0073307692
8	Real	1.727	1.782	1.674	1.687732	1.711	1.748	1.909	1.722	1.749	1.731	2.004	2.249	2.265	1.7178732	1.9425626877
	User	13.733	13.556	13.318	13.485	13.316	13.583	14.022	13.716	13.864	13.764	14.144	17.486	17.517	13.7489	14.518846154
	System	0.012	0.012	0.016	0.012	0.004	0.004	0.004	0.012	0.008	0.008	0.04	0.008	0.008	0.0108	0.0092307692
12	Real	2.297	2.748	2.495	4.272	2.953	2.695	2.851	2.245	2.275	2.476	6.893	6.132	6.45	2.64	4.2263384462
	User	34.198	48.718	38.876	45.853	42.527	39.757	41.487	35.235	34.887	37.788	64.5	65.815	67.254	39.4496	45.491923846
	System	0.156	0.23	0.145	0.278	0.222	0.215	0.233	0.116	0.086	0.122	0.586	0.746	0.633	0.1922	0.3812307692
16	Real	14.41	14.367	14.475	14.451	14.414	14.427	14.58	14.516	14.525	14.541	14.16	15.195	15.892	14.477	14.666
	User	9.689	9.671	9.352	9.576	9.344	9.729	9.867	9.142	9.514	9.454	9.494	9.493	9.349	9.5215	9.5176153385
	System	17.561	17.484	17.751	17.459	17.46	17.417	17.475	17.46	17.401	17.781	18.233	18.491	18.42	17.6123	17.7896923

Thread = 1
Context SW

Thread = 8
Context SW

Thread = 2
Context SW

Thread = 12
Context SW

Thread = 4
Context SW

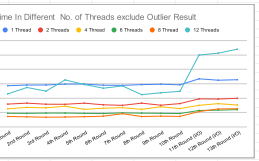
Thread = 16
Context SW

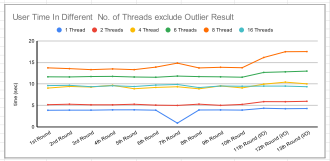
Thread = 6
Context SW

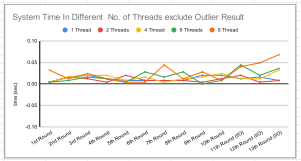
Real	1 Thread	2 Threads	4 Thread	6 Threads	8 Thread	12 Threads	16 Threads
1st Round	3.867	2.587	2.261	1.947	1.727	2.297	14.41
2nd Round	3.914	2.655	2.258	1.941	1.782	2.748	14.367
3rd Round	3.918	2.58	2.226	1.961	1.674	2.495	14.475
4th Round	3.98	2.575	2.443	1.961	1.687732	4.272	14.451
5th Round	3.584	2.653	2.253	1.941	1.711	2.953	14.414
6th Round	3.899	2.538	2.382	1.933	1.748	2.695	14.427
7th Round	3.893	2.582	2.159	1.977	1.909	2.851	14.58
8th Round	3.949	2.654	2.221	1.958	1.722	2.245	14.516
9th Round	3.971	2.51	2.483	1.945	1.749	2.275	14.525
10th Round	3.93	2.624	2.275	1.921	1.731	2.476	14.541
11th Round (1/0)	4.348	2.951	2.585	2.146	2.004	6.893	14.16
12th Round (1/0)	4.251	2.939	2.619	2.166	2.249	6.132	15.195
13th Round (1/0)	4.284	2.991	2.535	2.2	2.265	6.45	15.892

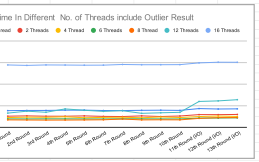
User	1 Thread	2 Threads	4 Thread	6 Threads	8 Thread	12 Threads	16 Threads
1st Round	3.871	5.168	9.012	11.65	13.733	34.198	9.689
2nd Round	3.897	5.277	9.488	11.622	13.556	48.718	9.671
3rd Round	3.897	5.147	9.277	11.717	13.318	38.876	9.352
4th Round	3.947	5.143	9.674	11.75	13.485	45.853	9.576
5th Round	3.975	5.272	8.874	11.687	13.316	42.527	9.344
6th Round	3.89	5.06	9.183	11.547	13.583	39.757	9.729
7th Round	3.884	4.995	9.14	11.82	14.022	41.487	9.867
8th Round	3.935	5.291	8.864	11.699	13.716	35.235	9.142
9th Round	3.95	5.015	9.512	11.648	13.864	34.887	9.514
10th Round	3.989	5.244	9.871	11.556	13.764	37.788	9.454
11th Round (1/0)	4.134	5.978	9.943	12.472	14.144	64.5	9.494
12th Round (1/0)	4.235	5.864	10.411	12.812	17.486	65.815	9.493
13th Round (1/0)	4.276	5.958	10.012	12.974	17.517	67.254	9.349

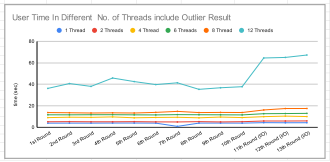
System	1 Thread	2 Threads	4 Thread	6 Threads	8 Thread	12 Threads	16 Threads
1st Round	0.004	0.004	0.004	0.004	0.012	0.154	17.561
2nd Round	0.016	0.016	0.016	0.008	0.012	0.23	17.484
3rd Round	0.02	0.012	0.02	0.016	0.016	0.824	17.751
4th Round	0.012	0.004	0.02	0.012	0.012	0.278	17.459
5th Round	0.008	0.02	0.008	0.004	0.004	0.222	17.46
6th Round	0.008	0.008	0.016	0.008	0.004	0.215	17.417
7th Round	0.008	0.008	0.004	0.016	0.004	0.229	17.475
8th Round	0.008	0.008	0.012	0.028	0.012	0.116	17.46
9th Round	0.02	0.004	0.016	0	0.028	0.086	17.401
10th Round	0.02	0.012	0.024	0.008	0.008	0.122	17.781
11th Round (1/0)	0.012	0.02	0.012	0.004	0.04	0.586	18.233
12th Round (1/0)	0.016	0.004	0.012	0.02	0.049	0.746	18.491
13th Round (1/0)	0.008	0.008	0.012	0.016	0.068	0.633	18.42

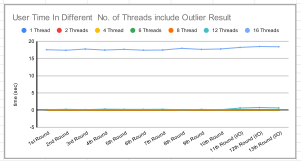












Workload	2	60000 steps for find a convergent point : Possible Maximum

Threads	Type	Time with out I/O										Time with I/O				
		1st Round	2nd Round	3rd Round	4th Round	5th Round	6th Round	7th Round	8th Round	9th Round	10th Round	11th Round (I/O)	12th Round (I/O)	13th Round (I/O)	AVG time with out I/O (1 ~ 10)	AVG time with I/O (1~13)
1	Real	54.172	54.406	54.327	54.193	54.471	54.852	54.883	54.246	54.37	54.239	56.176	56.99	57.951	54.27	54.945366
	User	54.189	54.452	54.288	54.136	54.427	54.853	54.852	54.219	54.353	54.389	56.126	56.969	57.884	54.2954	54.918846
	System	0.86	0.844	0.856	0.852	0.84	0.856	0.848	0.854	0.856	0.856	0.858	0.856	0.864	0.8498	0.84169238
2	Real	21.365	21.565	21.549	21.349	21.162	20.828	34.686	31.427	21.272	21.268	26.579	26.941	34.579	21.8275	22.887153
	User	62.638	62.638	62.951	62.396	62.288	61.588	63.262	62.75	62.436	62.64	72.669	73.483	68.846	62.5317	64.455
	System	0.844	0.844	0.852	0.836	0.828	0.836	0.864	0.844	0.84	0.852	0.152	0.896	0.892	0.844	0.86
4	Real	23.864	23.584	23.581	23.146	23.623	23.667	23.393	23.165	23.317	23.153	29.863	28.614	27.887	23.46	24.547438
	User	95.145	93.963	93.624	92.191	93.986	94.216	93.859	92.879	93.682	92.18	109.967	111.695	108.956	93.2985	97.272536
	System	0.136	0.84	0.868	0.872	0.14	0.132	0.184	0.184	0.152	0.876	0.272	0.26	0.272	0.1824	0.1985713
6	Real	19.145	19.303	19.834	18.715	18.654	18.884	18.862	19.878	18.139	17.82	22.331	21.713	21.579	18.9292	19.429126
	User	114.853	114.783	113.288	111.397	111.434	111.928	107.685	111.471	108.41	106.56	138.513	127.284	127.886	111.8649	115.958126
	System	0.868	0.176	0.176	0.136	0.864	0.128	0.124	0.245	0.892	0.876	0.392	0.272	0.356	0.1865	0.1863038769
8	Real	15.82	15.941	16.405	16.657	15.933	16.026	16.178	15.938	15.898	28.116	28.116	28.529	21.48	16.1467	17.288876
	User	125.362	138.961	125.974	126.982	132.889	126.458	129.729	127.73	126.32	126.32	155.843	158.542	164.63	127.8645	135.284654
	System	0.132	0.128	0.216	0.128	0.14	0.128	0.228	0.132	0.136	0.136	0.536	0.632	0.852	0.1545	0.2728461538
12	Real	19.877	18.589	18.935	18.858	19.226	19.486	19.167	18.8232	18.105	19.391	24.989	28.195	28.78	18.99812	20.918784
	User	215.569	218.885	214.376	213.623	218.999	219.266	216.167	213.123	217.768	219.651	279.983	387.398	318.857	215.8123	235.862866
	System	0.781	0.652	0.769	0.754	0.787	0.794	0.787	0.789	0.569	0.71	1.652	2.82	2.153	0.6839	0.9741538462
16	Real	34.218	34.277	34.588	34.32	34.383	35.145	34.452	35.28	34.588	34.854	36.645	36.718	36.594	34.6686	35.119932
	User	71.939	71.522	73.345	73.278	72.125	74.162	72.174	74.378	72.382	73.353	77.582	76.522	76.119	72.8674	73.761385
	System	35.136	35.278	35.582	35.486	34.946	36.147	35.213	36.288	35.42	35.534	37.376	37.743	37.536	35.4965	35.973838

Thread = 1
Context SW

Thread = 8
Context SW

Thread = 2
Context SW

Thread = 12
Context SW

Thread = 4
Context SW

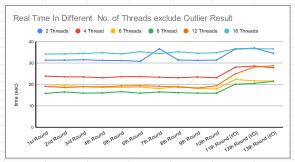
Thread = 16
Context SW

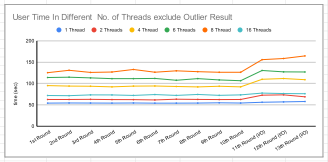
Thread = 6
Context SW

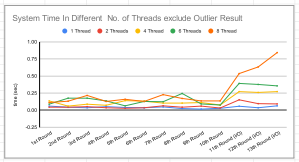
Real	1 Thread	2 Threads	4 Thread	6 Threads	8 Thread	12 Threads	16 Threads
1st Round	54.172	21.361	23.898	19.145	15.82	19.877	34.218
2nd Round	54.406	21.361	23.584	19.303	16.511	18.589	34.277
3rd Round	54.327	21.541	22.581	19.838	15.941	18.939	34.588
4th Round	54.193	21.349	23.146	18.715	16.405	18.858	34.32
5th Round	54.471	21.162	23.622	18.654	16.657	19.226	34.383
6th Round	54.852	20.828	23.667	18.884	15.933	19.486	35.145
7th Round	54.883	34.686	23.393	18.862	16.026	19.167	34.452
8th Round	54.246	31.427	23.141	19.878	16.178	18.8232	35.28
9th Round	54.37	21.272	23.317	18.139	15.938	18.105	34.588
10th Round	54.239	21.268	23.153	17.887	15.938	19.391	34.854
11th Round (I/O)	56.176	26.571	28.883	22.331	28.116	24.989	36.645
12th Round (I/O)	56.99	26.941	28.618	21.713	28.529	28.195	36.718
13th Round (I/O)	57.951	34.578	27.887	21.579	21.49	28.74	36.594

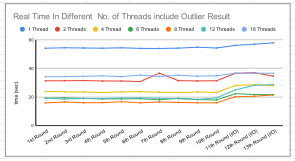
User	1 Thread	2 Threads	4 Thread	6 Threads	8 Thread	12 Threads	16 Threads
1st Round	54.189	62.638	95.145	114.853	125.362	215.934	71.939
2nd Round	54.452	62.638	93.963	114.783	138.961	218.885	71.522
3rd Round	54.288	62.951	93.624	113.288	125.974	214.379	73.345
4th Round	54.136	62.396	92.191	111.397	126.982	213.621	73.278
5th Round	54.427	62.288	93.986	111.434	132.889	218.999	72.125
6th Round	54.853	61.568	94.216	111.928	126.458	219.266	74.162
7th Round	54.852	63.262	93.859	107.685	129.729	216.167	72.174
8th Round	54.219	62.75	92.879	111.471	127.73	213.123	74.378
9th Round	54.353	62.436	93.682	108.41	126.32	217.768	72.382
10th Round	54.389	62.64	92.18	106.56	126.32	219.651	73.353
11th Round (I/O)	56.126	72.669	109.967	138.513	155.843	279.983	77.582
12th Round (I/O)	56.969	73.483	111.695	127.284	158.542	387.398	76.522
13th Round (I/O)	57.884	68.846	108.956	127.886	164.63	318.857	76.119

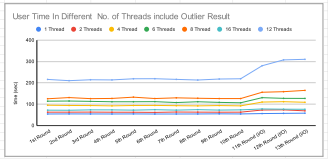
System	1 Thread	2 Threads	4 Thread	6 Threads	8 Thread	12 Threads	16 Threads
1st Round	0.86	0.844	0.136	0.888	0.112	0.781	35.136
2nd Round	0.844	0.844	0.84	0.176	0.132	0.652	35.278
3rd Round	0.856	0.852	0.888	0.176	0.216	0.769	35.582
4th Round	0.852	0.856	0.872	0.136	0.128	0.554	35.486
5th Round	0.84	0.828	0.14	0.864	0.16	0.784	34.946
6th Round	0.836	0.836	0.132	0.128	0.128	0.754	36.147
7th Round	0.848	0.864	0.184	0.124	0.228	0.787	35.213
8th Round	0.824	0.844	0.184	0.245	0.172	0.789	36.288
9th Round	0.856	0.86	0.152	0.892	0.136	0.569	35.42
10th Round	0.828	0.852	0.876	0.876	0.136	0.71	35.534
11th Round (I/O)	0.858	0.152	0.272	0.392	0.536	1.652	37.376
12th Round (I/O)	0.856	0.896	0.26	0.272	0.632	2.82	37.743
13th Round (I/O)	0.864	0.892	0.272	0.356	0.848	2.153	37.536

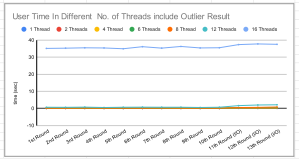






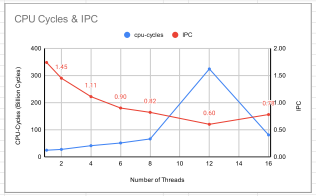


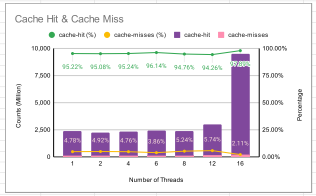


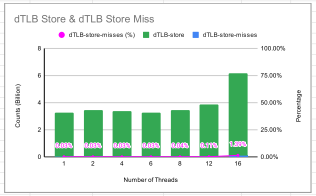


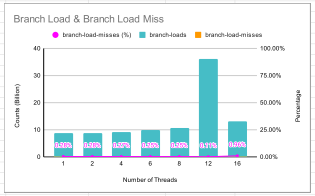
WorkLoad: 2 66000 steps for find a convergent point : 320*320 Square

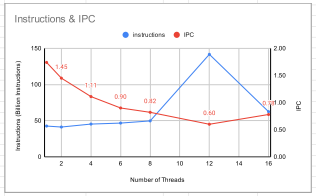
Threads	cpu-cycles	instructions	IPC	cache-references	cache-hit	cache-misses	cache-hit (%)	cache-misses (%)	dTLB-loads	dTLB-loads-misses	dTLB-loads-misses (%)	dTLB-store	dTLB-store-misses	dTLB-store-misses (%)	iTLB-loads	iTLB-loads-misses	iTLB-loads-misses (%)	branch-loads	branch-load-misses	branch-load-misses (%)	time-elapsed (sec)
1	24,494,232,796	42,520,423,239	1.74	2,387,063,104	2,272,852,841	114,210,263	95.22%	4.78%	11,746,750,453	3,869,819	0.03%	3,256,411,154	1,043,460	0.03%	744,168	2,246,224	301.85%	8,776,926,862	24,786,947	0.28%	3.86795
2	27,415,700,290	41,164,251,832	1.45	2,226,550,012	2,117,026,031	109,523,981	95.08%	4.92%	11,911,077,159	4,563,811	0.04%	3,447,644,807	1,808,454	0.03%	548,562	2,091,881	381.32%	8,641,974,655	24,546,958	0.28%	2.5402
4	41,164,141,622	45,262,930,440	1.11	2,329,621,864	2,218,813,132	110,808,732	95.24%	4.76%	12,490,471,210	3,804,021	0.03%	3,368,279,594	1,856,238	0.03%	572,837	1,919,541	335.09%	9,157,849,687	24,789,680	0.27%	2.1659
6	51,136,396,045	46,616,149,542	0.90	2,486,822,274	2,393,884,755	93,017,519	96.14%	3.86%	12,449,363,072	3,341,367	0.03%	3,263,166,344	1,100,215	0.03%	692,906	2,155,847	311.13%	9,852,880,545	24,613,116	0.25%	1.96285
8	66,066,683,696	49,645,132,207	0.82	2,355,966,744	2,232,447,318	123,519,426	94.76%	5.24%	12,963,332,432	3,675,571	0.03%	3,432,742,717	1,421,858	0.04%	907,329	2,320,495	255.75%	10,616,743,465	26,430,831	0.25%	1.9108
12	324,126,627,127	141,647,760,310	0.40	2,904,718,203	2,813,522,603	171,195,600	94.26%	5.74%	26,500,757,137	10,446,820	0.04%	3,849,860,325	4,251,597	0.11%	2,225,189	4,611,541	207.24%	35,994,987,003	37,968,555	0.11%	6.7
16	80,882,641,088	62,372,420,377	0.78	9,511,985,188	9,311,584,407	200,400,781	97.89%	2.11%	16,465,602,137	183,799,528	1.12%	6,065,798,414	84,180,103	1.39%	10,009,004	222,913,669	2227.13%	13,016,325,957	124,334,049	0.96%	15.2162

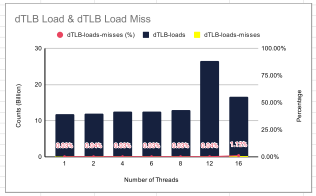


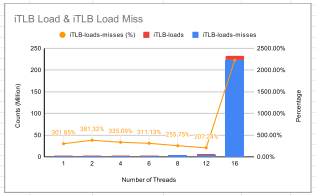


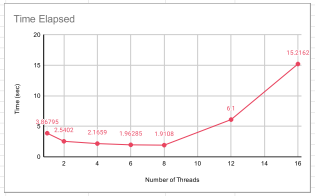













```
Performance counter stats for 'system wide' (10 runs):

24,494,232,796      cpu-cycles                                              ( +-  0.58% )  (33.28%)
42,520,423,239      instructions              #    1.74  insn per cycle     ( +-  0.18% )  (41.70%)
2,387,063,104       cache-references                                        ( +-  1.07% )  (41.75%)
114,210,263         cache-misses              #    4.953 % of all cache refs  ( +-  1.26% )  (41.76%)
11,746,750,453      dTLB-loads                                              ( +-  0.15% )  (41.75%)
3,869,819           dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  1.33% )  (41.76%)
3,256,411,154       dTLB-store                                              ( +-  0.27% )  (33.29%)
1,043,460           dTLB-store-misses                                       ( +-  1.54% )  (33.28%)
744,168             iTLB-loads                                              ( +-  2.73% )  (33.28%)
2,246,224           iTLB-load-misses          #  350.68% of all iTLB cache accesses  ( +-  1.93% )  (33.28%)
8,776,926,862       branch-loads                                            ( +-  0.28% )  (33.28%)
24,786,947          branch-load-misses                                      ( +-  1.41% )  (33.29%)

3.86795 +- 0.00724 seconds time elapsed  ( +-  0.19% )
```

```
Performance counter stats for 'system wide' (10 runs):

27,415,700,290      cpu-cycles                                              ( +-  0.81% )  (33.21%)
41,164,251,832      instructions              #    1.45  insn per cycle     ( +-  0.63% )  (41.63%)
2,226,550,012       cache-references                                        ( +-  0.64% )  (41.79%)
109,523,981         cache-misses              #    4.706 % of all cache refs  ( +-  1.57% )  (41.94%)
11,911,077,159      dTLB-loads                                              ( +-  0.41% )  (42.08%)
4,563,811           dTLB-load-misses          #    0.04% of all dTLB cache accesses  ( +-  2.58% )  (41.97%)
3,447,644,807       dTLB-store                                              ( +-  0.67% )  (33.39%)
1,808,454           dTLB-store-misses                                       ( +-  1.38% )  (33.24%)
548,562             iTLB-loads                                              ( +-  4.29% )  (33.11%)
2,091,881           iTLB-load-misses          #  350.59% of all iTLB cache accesses  ( +-  1.82% )  (33.10%)
8,641,974,655       branch-loads                                            ( +-  0.28% )  (33.10%)
24,546,958          branch-load-misses                                      ( +-  1.59% )  (33.09%)

2.5402 +- 0.0193 seconds time elapsed  ( +-  0.76% )
```

```
Performance counter stats for 'system wide' (10 runs):

41,164,141,622      cpu-cycles                                              ( +-  0.79% )  (33.06%)
45,262,930,440      instructions              #    1.11  insn per cycle     ( +-  0.40% )  (41.58%)
2,329,621,864       cache-references                                        ( +-  0.48% )  (41.67%)
110,808,732         cache-misses              #    4.775 % of all cache refs  ( +-  1.51% )  (41.87%)
12,490,471,210      dTLB-loads                                              ( +-  0.53% )  (42.05%)
3,804,021           dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  1.68% )  (42.16%)
3,368,279,594       dTLB-store                                              ( +-  0.45% )  (33.58%)
1,856,238           dTLB-store-misses                                       ( +-  1.68% )  (33.39%)
572,837             iTLB-loads                                              ( +-  1.59% )  (33.21%)
1,919,541           iTLB-load-misses          #  329.58% of all iTLB cache accesses  ( +-  1.78% )  (33.03%)
9,157,849,687       branch-loads                                            ( +-  0.55% )  (32.99%)
24,789,680          branch-load-misses                                      ( +-  1.09% )  (32.99%)

2.1659 +- 0.0146 seconds time elapsed  ( +-  0.67% )
```

```
Performance counter stats for 'system wide' (10 runs):

51,136,396,045      cpu-cycles                                              ( +-  0.51% )  (33.28%)
46,616,149,542      instructions              #    0.90  insn per cycle     ( +-  0.35% )  (41.78%)
2,486,822,274       cache-references                                        ( +-  0.75% )  (41.98%)
93,017,519          cache-misses              #    3.927 % of all cache refs  ( +-  2.26% )  (41.91%)
12,449,363,072      dTLB-loads                                              ( +-  0.18% )  (41.91%)
3,341,367           dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  1.38% )  (41.83%)
3,263,166,344       dTLB-store                                              ( +-  0.43% )  (33.28%)
1,100,215           dTLB-store-misses                                       ( +-  1.64% )  (33.28%)
692,906             iTLB-loads                                              ( +-  2.05% )  (33.19%)
2,155,847           iTLB-load-misses          #  335.25% of all iTLB cache accesses  ( +-  1.64% )  (33.19%)
9,852,880,545       branch-loads                                            ( +-  0.32% )  (33.28%)
24,613,116          branch-load-misses                                      ( +-  1.08% )  (33.19%)

1.96285 +- 0.00943 seconds time elapsed  ( +-  0.48% )
```

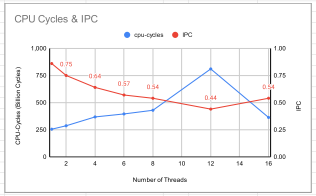
```
Performance counter stats for 'system wide' (10 runs):

66,066,683,696      cpu-cycles                                              ( +-  1.89% )  (32.88%)
49,645,132,207      instructions              #    0.82  insn per cycle     ( +-  0.96% )  (41.28%)
2,355,966,744       cache-references                                        ( +-  1.43% )  (41.38%)
123,519,426         cache-misses              #    5.116 % of all cache refs  ( +-  2.81% )  (41.58%)
12,963,332,432      dTLB-loads                                              ( +-  0.63% )  (41.79%)
3,675,571           dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  4.72% )  (41.97%)
3,432,742,717       dTLB-store                                              ( +-  0.92% )  (33.68%)
1,421,858           dTLB-store-misses                                       ( +-  4.64% )  (33.57%)
907,329             iTLB-loads                                              ( +-  3.86% )  (33.54%)
2,320,495           iTLB-load-misses          #  306.14% of all iTLB cache accesses  ( +-  2.68% )  (33.43%)
10,616,743,465      branch-loads                                            ( +-  1.05% )  (33.22%)
26,430,831          branch-load-misses                                      ( +-  1.58% )  (33.03%)

1.9108 +- 0.0353 seconds time elapsed  ( +-  2.90% )
```

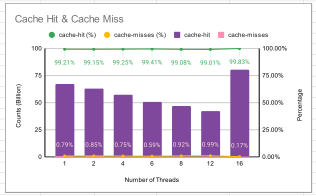
```
Performance counter stats for 'system wide' (10 runs):

324,126,627,127     cpu-cycles                                              ( +- 12.33% )  (33.31%)
141,647,760,310     instructions              #    0.60  insn per cycle     ( +- 10.58% )  (41.68%)
2,904,718,203       cache-references                                        ( +-  2.68% )  (41.78%)
171,195,600         cache-misses              #    5.682 % of all cache refs  ( +-  8.09% )  (41.71%)
26,500,757,137      dTLB-loads                                              ( +-  8.44% )  (41.71%)
10,446,820          dTLB-load-misses          #    0.05% of all dTLB cache accesses  ( +- 11.95% )  (41.72%)
3,849,860,325       dTLB-store                                              ( +-  2.74% )  (33.31%)
4,251,597           dTLB-store-misses                                       ( +- 12.08% )  (33.31%)
2,225,189           iTLB-loads                                              ( +- 11.71% )  (33.31%)
4,611,541           iTLB-load-misses          #  206.94% of all iTLB cache accesses  ( +- 11.58% )  (33.38%)
35,994,987,003      branch-loads                                            ( +- 11.25% )  (33.32%)
37,968,555          branch-load-misses                                      ( +-  8.49% )  (33.38%)

6.10 +- 1.12 seconds time elapsed  ( +- 18.36% )
```

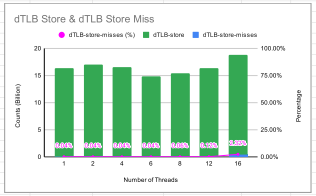
```
Performance counter stats for 'system wide' (10 runs):

80,882,641,088 cpu-cycles                                ( +-  1.68% )  (33.31%)
62,372,420,377 instructions                              #    0.54  insn per cycle         ( +-  2.67% )  (41.65%)
9,511,985,188  cache-references                          ( +-  0.34% )  (41.66%)
200,400,781    cache-misses                              #    0.178 % of all cache refs    ( +- 59.68% )  (41.67%)
16,465,602,137 dTLB-loads                                ( +-  1.93% )  (41.68%)
183,799,528    dTLB-load-misses                          #    1.12% of all dTLB cache accesses  ( +-  0.25% )  (41.69%)
6,065,798,414  dTLB-store                                ( +-  3.88% )  (33.36%)
84,180,103     dTLB-store-misses                         ( +-  0.11% )  (33.35%)
10,009,004     iTLB-loads                                ( +-  3.19% )  (33.34%)
222,913,669    iTLB-load-misses                          # 2121.96% of all iTLB cache accesses  ( +-  0.24% )  (33.33%)
13,016,325,957 branch-loads                              ( +-  1.13% )  (33.32%)
124,334,049    branch-load-misses                        ( +-  5.75% )  (33.31%)

15.2162 +- 0.0[illegible]seconds time el[illegible]  ( +-  0.86% )
```

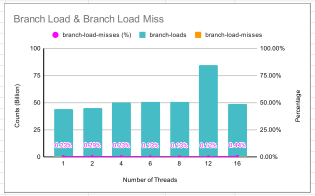
WorkLoad 2 66000 steps for find a convergent point : 320*320 Square

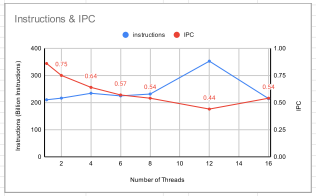
Threads	cpu-cycles	instructions	IPC	cache-references	cache-hit	cache-misses	cache-hit (%)	cache-misses (%)	dTLB-loads	dTLB-loads-misses	dTLB-loads-misses (%)	dTLB-store	dTLB-store-misses	dTLB-store-misses (%)	iTLB-loads	iTLB-loads-misses	iTLB-loads-misses (%)	branch-loads	branch-load-misses	branch-load-misses (%)	time-elapsed (sec)
1	254,818,849,142	210,276,006,084	0.86	67,293,058,153	66,761,127,747	531,930,406	99.21%	0.79%	60,410,637,322	24,687,634	0.04%	16,366,735,044	6,559,379	0.04%	6,302,976	16,683,917	263.43%	43,881,769,929	102,787,773	0.23%	52.46
2	286,487,243,905	216,310,993,296	0.75	62,861,848,919	62,327,471,608	534,377,311	99.15%	0.85%	61,222,027,274	23,885,090	0.04%	16,988,561,001	6,195,229	0.04%	4,371,844	13,486,483	308.49%	44,747,913,133	127,673,005	0.29%	30.654
4	367,927,314,291	234,202,779,531	0.64	57,155,784,982	56,726,529,702	429,255,280	99.25%	0.75%	63,307,938,090	21,630,082	0.03%	16,567,619,180	6,768,556	0.04%	3,489,087	12,563,255	360.07%	50,267,090,457	116,898,978	0.23%	21.2795
6	395,505,826,131	224,596,588,880	0.57	50,617,875,624	50,120,691,842	297,183,782	99.41%	0.59%	60,816,633,499	18,066,282	0.03%	14,867,979,231	6,638,347	0.04%	2,101,148	8,317,398	395.85%	50,428,638,293	64,586,375	0.13%	16.59
8	429,312,022,868	231,392,481,787	0.54	46,979,440,838	46,547,948,401	431,492,437	99.08%	0.92%	61,894,851,817	21,204,547	0.03%	15,398,851,813	9,032,869	0.06%	2,274,766	8,868,379	354.69%	50,792,000,185	63,740,784	0.13%	14.06
12	818,369,539,438	352,662,844,254	0.44	41,997,211,389	41,580,584,351	416,627,038	99.01%	0.99%	79,432,408,720	46,033,887	0.06%	16,344,915,288	19,263,938	0.12%	5,185,519	11,960,147	230.65%	84,356,719,834	99,999,829	0.12%	20.394
16	363,037,053,545	214,535,141,668	0.54	80,404,702,590	80,350,193,841	134,508,749	99.83%	0.17%	61,507,423,798	769,814,300	1.25%	18,392,762,824	426,704,887	2.32%	17,637,178	442,874,889	2511.03%	48,420,672,517	212,957,521	0.44%	39.021

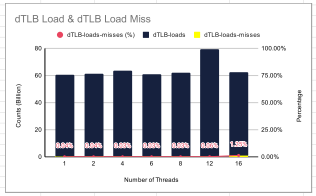


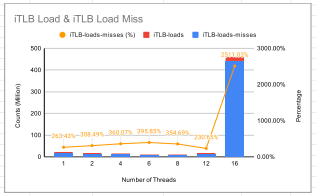


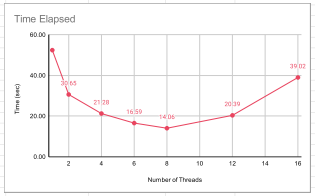













```
 Performance counter stats for 'system wide' (10 runs): 8 Threads

   429,312,022,868      cpu-cycles                                    ( +-  0.34% )  (33.32%)
   231,392,481,787      instructions              #    0.54  insn per cycle           ( +-  0.18% )  (41.66%)
    46,979,440,838      cache-references                                              ( +-  0.54% )  (41.69%)
       431,492,437      cache-misses              #    0.918 % of all cache refs      ( +-  0.62% )  (41.69%)
    61,894,851,817      dTLB-loads                                                    ( +-  0.08% )  (41.69%)
    21,204,547          dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  0.91% )  (41.78%)
    15,398,851,813      dTLB-store                                                    ( +-  0.19% )  (33.32%)
     9,032,869      dTLB-store-misses                                             ( +-  0.73% )  (33.32%)
     2,274,766      iTLB-loads                                                    ( +-  0.77% )  (33.32%)
     8,868,379      iTLB-load-misses          #  363.45% of all iTLB cache accesses  ( +-  0.67% )  (33.32%)
    50,792,000,185      branch-loads                                             ( +-  0.18% )  (33.32%)
    63,740,784      branch-load-misses                                            ( +-  0.15% )  (33.32%)

          14.0585 +- 0.0986 seconds time elapsed  ( +-  0.70% )

 Performance counter stats for 'system wide' (10 runs): 6 Threads

   395,505,826,131      cpu-cycles                                    ( +-  0.21% )  (33.33%)
   224,596,588,880      instructions              #    0.57  insn per cycle           ( +-  0.18% )  (41.66%)
    50,617,875,624      cache-references                                              ( +-  0.40% )  (41.66%)
       297,183,782      cache-misses              #    0.588 % of all cache refs      ( +-  1.68% )  (41.66%)
    60,816,633,499      dTLB-loads                                                    ( +-  0.15% )  (41.66%)
    18,066,282      dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  0.81% )  (41.66%)
    14,867,979,231      dTLB-store                                                    ( +-  0.11% )  (33.34%)
     6,638,347      dTLB-store-misses                                             ( +-  0.97% )  (33.34%)
     2,101,148      iTLB-loads                                                    ( +-  1.54% )  (33.34%)
     8,317,398      iTLB-load-misses          #  404.01% of all iTLB cache accesses  ( +-  1.11% )  (33.34%)
    50,428,638,293      branch-loads                                             ( +-  0.11% )  (33.34%)
    64,586,375      branch-load-misses                                            ( +-  0.37% )  (33.34%)

          16.5872 +- 0.0665 seconds time elapsed  ( +-  0.40% )

 Performance counter stats for 'system wide' (10 runs): 1 Thread

   254,818,849,142      cpu-cycles                                    ( +-  0.91% )  (33.33%)
   210,276,006,084      instructions              #    0.86  insn per cycle           ( +-  1.03% )  (41.66%)
    67,293,058,153      cache-references                                              ( +-  0.27% )  (41.66%)
       531,930,406      cache-misses              #    0.796 % of all cache refs      ( +-  5.87% )  (41.66%)
    60,410,637,322      dTLB-loads                                                    ( +-  0.93% )  (41.67%)
    24,687,634      dTLB-load-misses          #    0.04% of all dTLB cache accesses  ( +-  5.99% )  (41.66%)
    16,366,735,044      dTLB-store                                                    ( +-  1.42% )  (33.34%)
     6,559,379      dTLB-store-misses                                             ( +-  4.29% )  (33.34%)
     6,302,976      iTLB-loads                                                    ( +- 10.00% )  (33.34%)
    16,683,917      iTLB-load-misses          #  414.78% of all iTLB cache accesses  ( +-  9.51% )  (33.34%)
    43,881,769,929      branch-loads                                             ( +-  0.66% )  (33.33%)
       102,787,773      branch-load-misses                                        ( +-  5.77% )  (33.33%)

          52.4629 +- 0.8938 seconds time elapsed  ( +-  0.18% )

 Performance counter stats for 'system wide' (10 runs): 2 Threads

   286,487,243,905      cpu-cycles                                    ( +-  0.37% )  (33.30%)
   216,310,993,296      instructions              #    0.75  insn per cycle           ( +-  0.68% )  (41.64%)
    62,861,848,919      cache-references                                              ( +-  0.47% )  (41.65%)
       534,377,311      cache-misses              #    0.842 % of all cache refs      ( +-  0.72% )  (41.67%)
    61,222,027,274      dTLB-loads                                                    ( +-  0.60% )  (41.68%)
    23,885,090      dTLB-load-misses          #    0.04% of all dTLB cache accesses  ( +-  0.94% )  (41.69%)
    16,988,561,001      dTLB-store                                                    ( +-  1.20% )  (33.36%)
     6,195,229      dTLB-store-misses                                             ( +-  1.36% )  (33.36%)
     4,371,844      iTLB-loads                                                    ( +-  3.68% )  (33.34%)
    13,486,483      iTLB-load-misses          #  291.36% of all iTLB cache accesses  ( +-  1.34% )  (33.33%)
    44,747,913,133      branch-loads                                             ( +-  0.49% )  (33.31%)
       127,673,005      branch-load-misses                                        ( +-  0.78% )  (33.30%)

          30.654 +- 0.104 seconds time elapsed  ( +-  0.34% )

 Performance counter stats for 'system wide' (10 runs): 4 Threads

   367,927,314,291      cpu-cycles                                    ( +-  0.47% )  (33.31%)
   234,202,779,531      instructions              #    0.64  insn per cycle           ( +-  0.25% )  (41.66%)
    57,155,784,982      cache-references                                              ( +-  0.38% )  (41.67%)
       429,255,280      cache-misses              #    0.754 % of all cache refs      ( +-  1.71% )  (41.69%)
    63,307,938,090      dTLB-loads                                                    ( +-  0.22% )  (41.71%)
    21,630,082      dTLB-load-misses          #    0.03% of all dTLB cache accesses  ( +-  1.65% )  (41.71%)
    16,567,619,180      dTLB-store                                                    ( +-  0.46% )  (33.35%)
     6,768,556      dTLB-store-misses                                             ( +-  0.93% )  (33.33%)
     3,489,087      iTLB-loads                                                    ( +-  4.86% )  (33.31%)
    12,563,255      iTLB-load-misses          #  330.42% of all iTLB cache accesses  ( +-  1.62% )  (33.31%)
    50,267,090,457      branch-loads                                             ( +-  0.20% )  (33.31%)
       116,898,978      branch-load-misses                                        ( +-  0.82% )  (33.31%)

          21.2795 +- 0.0892 seconds time elapsed  ( +-  0.42% )

 Performance counter stats for 'system wide' (10 runs): 12 Threads

   818,369,539,438      cpu-cycles                                    ( +-  0.61% )  (33.31%)
   352,662,844,254      instructions              #    0.44  insn per cycle           ( +-  0.48% )  (41.64%)
    41,997,211,389      cache-references                                              ( +-  0.69% )  (41.66%)
       416,627,038      cache-misses              #    0.990 % of all cache refs      ( +-  1.88% )  (41.68%)
    79,432,408,720      dTLB-loads                                                    ( +-  0.46% )  (41.70%)
    46,033,887      dTLB-load-misses          #    0.06% of all dTLB cache accesses  ( +-  1.11% )  (41.71%)
    16,344,915,288      dTLB-store                                                    ( +-  0.63% )  (33.36%)
    19,263,938      dTLB-store-misses                                             ( +-  1.15% )  (33.34%)
     5,185,519      iTLB-loads                                                    ( +-  3.27% )  (33.33%)
    11,960,147      iTLB-load-misses          #  233.08% of all iTLB cache accesses  ( +-  2.23% )  (33.30%)
    84,356,719,834      branch-loads                                             ( +-  0.56% )  (33.30%)
    99,999,829      branch-load-misses                                            ( +-  1.22% )  (33.30%)

          20.394 +- 0.214 seconds time elapsed  ( +-  1.05% )

 Performance counter stats for 'system wide' (10 runs):

   363,037,053,545 cpu-cycles                    ( +-  1.68% )  (33.31%)
   214,535,141,668 instructions              #    0.54  insn per cycle           ( +-  2.67% )  (41.65%)
    80,404,702,590 cache-references                                              ( +-  0.34% )  (41.66%)
       134,508,749 cache-misses              #    0.170 % of all cache refs      ( +- 59.68% )  (41.67%)
    61,507,423,798 dTLB-loads                                                    ( +-  1.93% )  (41.68%)
       769,814,300 dTLB-load-misses          #    1.12% of all dTLB cache accesses  ( +-  0.25% )  (41.69%)
    18,392,762,824 dTLB-store                                                    ( +-  3.88% )  (33.36%)
       426,704,887 dTLB-store-misses                                             ( +-  0.11% )  (33.35%)
        17,637,178 iTLB-loads                                                    ( +-  3.19% )  (33.34%)
       442,874,889 iTLB-load-misses          # 2121.96% of all iTLB cache accesses  ( +-  0.24% )  (33.33%)
    48,420,672,517 branch-loads                                                  ( +-  1.13% )  (33.32%)
       212,957,521 branch-load-misses                                            ( +-  5.75% )  (33.31%)

          39.021 +- 0.337 seconds time el(              +-            0.86% )
```