m = 50, tr-simpleloop					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	71.2577	71.4874	73.3442	73.3346	74.4736
Hit Count	7445	7469	7663	7662	7781
Miss Count	3003	2979	2785	2786	2667
Overall Eviction Count	2953	2929	2732	2736	2617
Clean Eviction Count	146	128	67	65	19
Dirty Eviction Count	2807	2801	2668	2671	2598

m = 100, tr-simpleloop					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	73.4686	73.6217	74.3109	74.2917	74.7224
Hit Count	7676	7692	7764	7762	7807
Miss Count	2772	2756	2684	2686	2641
Overall Eviction Count	2672	2656	2584	2586	2541
Clean Eviction Count	38	32	2	3	0
Dirty Eviction Count	2634	2624	2582	2583	2541

m = 150, tr-simpleloop					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	74.0620	74.0046	74.3300	74.3204	74.7224
Hit Count	7738	7732	7766	7765	7807
Miss Count	2710	2716	2682	2683	2641
Overall Eviction Count	2560	2566	2532	2533	2491
Clean Eviction Count	11	8	0	0	0
Dirty Eviction Count	2549	2558	2532	2533	2491

m = 200, tr-simpleloop					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	74.0046	74.0812	74.3300	74.3204	74.7224
Hit Count	7732	7740	7766	7765	7807
Miss Count	2716	2708	2682	2683	2641
Overall Eviction Count	2516	2508	2482	2483	2541
Clean Eviction Count	10	6	0	0	0
Dirty Eviction Count	2506	2502	2482	2483	2541

m = 50, tr-matmul					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	65.5497	60.9690	63.9483	63.9482	80.2071
Hit Count	1893176	1760876	1846924	1846922	2365234
Miss Count	994976	1127276	1041228	1041230	586454
Overall Eviction Count	994926	1127226	1041178	1041180	587956
Clean Eviction Count	478046	541685	520104	520102	290346
Dirty Eviction Count	516880	585541	521074	521078	297610

m = 100, tr-matmul					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	88.7727	62.4830	65.1523	65.3137	96.8544
Hit Count	2563891	1804604	1881697	1886358	2769641
Miss Count	324261	1083548	1006455	1001794	92765
Overall Eviction Count	324161	1083448	1006355	1001694	92486
Clean Eviction Count	158519	530671	502791	500466	45612
Dirty Eviction Count	165642	552777	503564	501228	46874

m = 150, tr-matmul					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	96.6595	98.8086	98.8613	98.7994	99.1023
Hit Count	2791673	2853743	2855265	2853477	2941462
Miss Count	96479	34409	32887	34675	26456
Overall Eviction Count	96329	34259	32737	34525	26166
Clean Eviction Count	47185	16665	16018	16918	12901
Dirty Eviction Count	49144	17594	16719	17607	13265

m = 200, tr-matmul					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	98.0398	98.8267	98.8617	98.8613	99.3325
Hit Count	2831539	2854264	2855277	2855264	2948055
Miss Count	56613	33888	32875	32888	20132
Overall Eviction Count	56413	33688	32675	32688	19702
Clean Eviction Count	27559	16250	15985	15994	9600
Dirty Eviction Count	28854	17438	16690	16694	10102

m = 50, tr-blocked					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.6572	99.7318	99.7174	99.7622	99.8242
Hit Count	2410102	2411905	564217	2412641	2521032
Miss Count	8290	6487	1599	5751	3713
Overall Eviction Count	8240	6437	1549	5701	3656
Clean Eviction Count	3021	2117	387	1674	1080
Dirty Eviction Count	5219	4320	1162	4027	2576

m = 100, tr-blocked					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.7842	99.8207	99.7720	99.8198	99.9001
Hit Count	2413173	2414055	564526	2414034	2524286
Miss Count	5219	4337	1290	4358	3001
Overall Eviction Count	5119	4237	1190	4258	2890
Clean Eviction Count	1831	1398	296	1333	1075
Dirty Eviction Count	3288	2839	894	2925	1815

m = 150, tr-blocked					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.8169	99.8253	99.7731	99.8437	99.9008
Hit Count	2413965	2414166	564532	2414611	2518794
Miss Count	4427	4226	1284	3781	2456
Overall Eviction Count	4277	4076	1134	3631	2321
Clean Eviction Count	1552	1367	248	1325	1073
Dirty Eviction Count	2725	2709	886	2306	1248

m = 200, tr-blocked					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.8399	99.8687	99.7748	99.8673	99.8902
Hit Count	2414520	2415216	564542	2415183	2522457
Miss Count	3872	3176	1274	3209	2271
Overall Eviction Count	3672	2976	1074	3009	2031
Clean Eviction Count	1324	1003	230	1058	1001
Dirty Eviction Count	2348	1973	844	1951	1030

m = 50, tr-printptree					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	93.8541	93.0058	95.4465	95.6859	98.2098
Hit Count	36070	35744	36682	36774	37744
Miss Count	2362	2688	1750	1658	688
Overall Eviction Count	2312	2638	1700	1608	638
Clean Eviction Count	941	1084	729	685	230
Dirty Eviction Count	1371	1554	971	923	408

m = 100, tr-printptree					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.2216	99.4172	99.5108	99.5056	99.5525
Hit Count	38129	38208	38244	38242	38260
Miss Count	303	224	188	190	172
Overall Eviction Count	203	124	88	90	72
Clean Eviction Count	47	9	3	2	0
Dirty Eviction Count	156	115	85	88	72

m = 150, tr-printptree					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.4822	99.5056	99.5525	99.5420	99.5525
Hit Count	38233	38242	38260	38256	38260
Miss Count	199	190	172	176	172
Overall Eviction Count	49	40	22	26	22
Clean Eviction Count	3	0	0	0	0
Dirty Eviction Count	46	40	22	26	22

m = 200, tr-printptree					
Algorithm	RAND	FIFO	LRU	CLOCK	OPT
Hit Rate	99.5525	99.5525	99.5525	99.5525	99.5525
Hit Count	38260	38260	38260	38260	38260
Miss Count	172	172	172	172	172
Overall Eviction Count	0	0	0	0	0
Clean Eviction Count	0	0	0	0	0
Dirty Eviction Count	0	0	0	0	0

The fourth program we used was the print-ptree from CSC209 that prints the directories and all the sub directories from the the test folder. The interesting thing about the memory reference is that each of the replacement algorithms have high hit rates that hover around 95 - 99 percent .What is also interesting about printptree is that after a certain memory size, the results for all algorithms become the same for all of the Hit Rate, Hit Count, Miss Count etc.

Comparing the various algorithms using the results, we can see that OPT will always result in the best hit rate. This makes sense since we know that the OPT replacement algorithm is meant to be optimal. We can also see that for the matmul trace, that RAND has a higher hit rate than the other algorithms except for opt. This is seen by looking at matmul, we can see that, the data is randomly created. With less locality for matmul, RAND has a chance to perform better than FIFO, LRU, and CLOCK. For the other trace files, FIFO, LRU, CLOCK, and OPT do better than RAND since there is more locality. More generally we can see that for hit rate, LRU does better than FIFO, and OPT does better than CLOCK.

From the results, we can see that the more memory size, the higher the hit rate. The reason why this happens is because that since our memory size has increased, LRU specifically can store more recently referenced pages and cause a more accurate reading. This happens similarly for FIFO as allowing a greater memory size will help locality and increase hit rate. This happens for all trace files.

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