CSC369 Assignment 3

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Comparing Algorithms:

page-blocked.ref with memsize of 50

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	99.6911	1939658	6011	5961	4946	1015
CLOCK	99.6997	1939827	5842	5792	4777	1015
LRU	99.7477	1940760	4909	4859	3875	984
MRU	13.1380	255622	1690047	1689997	1632627	57370

page-blocked.ref with memsize of 100

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	99.7881	1941547	4122	4022	3025	997
CLOCK	99.7882	1941549	4120	4020	3024	996
LRU	99.8141	1942052	3617	3517	2569	948
MRU	21.6730	421684	1523985	1523885	1471265	52620

page-matmul.ref with memsize of 50

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	52.4492	1217013	1103352	1103302	1102309	993
CLOCK	52.4104	1216113	1104252	1104202	1103210	992
LRU	55.1396	1279440	1040925	1040875	1039914	961
MRU	15.9283	369595	1950770	1950720	1931220	19500

page-matmul.ref with memsize of 100

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	53.7949	1248239	1072126	1072026	1071052	974
CLOCK	53.7921	1248172	1072193	1072093	1071119	974
LRU	56.6329	1314090	1006275	1006175	1005215	960
MRU	22.3449	518483	1801882	1801782	1783832	17950

page-repeatloop.ref with memsize of 50

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	33.4507	190	378	328	241	87
CLOCK	48.4155	275	293	243	156	87
LRU	34.5070	196	372	322	236	86
MRU	49.2958	280	288	238	164	74

page-repeatloop.ref with memsize of 100

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	82.7465	470	98	0	0	0
CLOCK	82.7465	470	98	0	0	0
LRU	82.7465	470	98	0	0	0
MRU	82.7465	470	98	0	0	0

page-simpleloop.ref with memsize of 50

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	22.7206	770	2619	2569	45	2524
CLOCK	22.6616	768	2621	2571	46	2525
LRU	25.4352	862	2527	2477	0	2477
MRU	1.4163	48	3341	3291	410	2881

page-simpleloop.ref with memsize of 100

Algorithm	Hit rate	Hit count	Miss count	Overall eviction count	Clean eviction count	Dirty eviction count
FIFO	24.0189	814	2575	2475	23	2452
CLOCK	23.9894	813	2576	2476	24	2452
LRU	25.4352	862	2527	2427	0	2427
MRU	1.9475	66	3323	3223	401	2822

Discussion:

Within the four algorithms we have, LRU has the relatively best hit rate while MRU has the relatively worst hit rate. Further, LRU has the relatively lowest overall eviction count, and MRU has the highest overall eviction count. LRU having the best performance makes sense since it is an improved version of FIFO and CLOCK is designed to approximate it. The performances of CLOCK and FIFO are very similar, since CLOCK is an updated version of FIFO. The hit rates of MRU are significantly lower than those of the other algorithms except for in page-repeatloop.ref, showing that replacing the most recently used page is normally not a good algorithm to apply. As the memory size increases, the hit rates of all four algorithms increases, and the overall eviction counts all decreases.

Custom Traces:

Trace 1

Algorithm	Hit rate	Hit count	Miss count
FIFO	60.6061	20	13
CLOCK	57.5758	19	14
LRU	63.6364	21	12

Trace 2

Algorithm	Hit rate	Hit count	Miss count
FIFO	95.0000	38	2
CLOCK	95.0000	38	2
LRU	95.0000	38	2

Trace 3

Algorithm	Hit rate	Hit count	Miss count
FIFO	0.0000	0	39
CLOCK	0.0000	0	39
LRU	0.0000	0	39