

Assignment 3: Virtual Memory (Task 3)

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- Blocked (memory size 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	99.7156	1940135	5534	5484	4484	1000
LRU	99.7477	1940760	4909	4859	3875	984
MRU	13.1380	255622	1690047	1689997	1632627	57370

- Blocked (memory size 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	99.7936	1941654	4015	3915	2947	968
LRU	99.8141	1942052	3617	3517	2569	948
MRU	21.6730	421684	1523985	1523885	1471265	52620

- Matmul (memory size 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	55.1397	1279442	1040923	1040873	1039911	962
LRU	55.1396	1279440	1040925	1040875	1039914	961
MRU	15.9283	369595	1950770	1950720	1931220	19500

- Matmul (memory size 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	56.7384	1316539	1003826	1003726	1002766	960
LRU	56.6329	1314090	1006275	1006175	1005215	960
MRU	22.3449	518483	1801882	1801782	1783832	17950

- Repeatloop (memory size 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	35.5634	202	366	316	232	84
LRU	34.5070	196	372	322	236	86
MRU	49.2958	280	288	238	164	74

- Repeatloop (memory size 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

- Simpleloop (memory size 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	25.3762	860	2529	2479	0	2479
LRU	25.4352	862	2527	2477	0	2477
MRU	1.4163	48	3341	3291	410	2881

- Simpleloop (memory size 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	25.3762	860	2529	2429	0	2429
LRU	25.4352	862	2527	2427	0	2427
MRU	1.9475	66	3323	3223	401	2822

Explanation:

According to the tables above, we can clearly see that most of the time, the LRU algorithm will have a higher hit rate than the other 3 algorithms and the MRU algorithm has lower hit rate than the other 3 algorithms. We can also see that the CLOCK algorithm has a higher hit rate than the FIFO algorithm since the CLOCK algorithm is a more efficient version of the FIFO algorithm. And LRU as the near-optimal

performance algorithm it's reasonable that LRU will have the highest hit rate most of the time. The MRU algorithm has the lowest hit rate all the time except in the repeat loop. It shows that the MRU algorithm will not be a good algorithm to use in normal cases. And for the overall eviction count, we can see that the higher the hit rate, the lower the overall eviction count compared to the other algorithms in the table. As we can see in the table, most of the time the LRU algorithm has the lowest overall eviction count in the table, it shows again LRU will be the better algorithm. Also, due to the increase in the memory size, we can clearly see that the hit rate of every algorithm rises, and the overall eviction drops respectively.

- Trace1 (memory size 8)

Algorithm	Hit rate	Hit count	Miss count
FIFO	46.8750	15	17
CLOCK	43.7500	14	18
LRU	40.6250	13	19
OPTIMAL	56.2500	18	14

- Trace2 (memory size 8)

Algorithm	Hit rate	Hit count	Miss count
FIFO	75.0000	24	8
CLOCK	75.0000	24	8
LRU	75.0000	24	8
OPTIMAL	75.0000	24	8

- Trace3 (memory size 8)

Algorithm	Hit rate	Hit count	Miss count
FIFO	0.0000	0	32
CLOCK	0.0000	0	32
LRU	0.0000	0	32
MRU	50.0000	16	16