

Trace file: Simple Loop Mem: 50

The program was run as shown below with the tracefile name being altered for every tracefile.

`./sim -f tr-simpleloop.ref -m 50 -s 1000000 -a program`

Constant swapfile size of 1000000 has been picked for all files.

Fifo	Hit count: 7404 Miss count: 3156 Clean evictions: 367 Dirty evictions: 2739 Total references : 10560 Hit rate: 70.1136 Miss rate: 29.8864
LRU	Hit count: 7782 Miss count: 2778 Clean evictions: 91 Dirty evictions: 2637 Total references : 10560 Hit rate: 73.6932 Miss rate: 26.3068
Clock	Hit count: 7773 Miss count: 2787 Clean evictions: 97 Dirty evictions: 2640 Total references : 10560 Hit rate: 73.6080 Miss rate: 26.3920
Opt	
Rand	Hit count: 7583 Miss count: 2977 Clean evictions: 227 Dirty evictions: 2700 Total references : 10560 Hit rate: 71.8087 Miss rate: 28.1913

Trace file: Simple Loop Mem: 100

Fifo	Hit count: 7776 Miss count: 2784 Clean evictions: 71 Dirty evictions: 2613 Total references : 10560 Hit rate: 73.6364 Miss rate: 26.3636
LRU	Hit count: 7881 Miss count: 2679 Clean evictions: 0 Dirty evictions: 2579 Total references : 10560 Hit rate: 74.6307 Miss rate: 25.3693
Clock	Hit count: 7882 Miss count: 2678 Clean evictions: 0 Dirty evictions: 2578 Total references : 10560 Hit rate: 74.6402 Miss rate: 25.3598
Opt	Hit count: 7923 Miss count: 2637 Clean evictions: 1 Dirty evictions: 2536 Total references : 10560 Hit rate: 75.0284 Miss rate: 24.9716
Rand	Hit count: 7810 Miss count: 2750 Clean evictions: 52 Dirty evictions: 2598 Total references : 10560 Hit rate: 73.9583 Miss rate: 26.0417

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Fifo	Hit count: 7850 Miss count: 2710 Clean evictions: 20 Dirty evictions: 2540 Total references : 10560 Hit rate: 74.3371 Miss rate: 25.6629
LRU	Hit count: 7883 Miss count: 2677 Clean evictions: 0 Dirty evictions: 2527 Total references : 10560 Hit rate: 74.6496 Miss rate: 25.3504
Clock	Hit count: 7883 Miss count: 2677 Clean evictions: 0 Dirty evictions: 2527 Total references : 10560 Hit rate: 74.6496 Miss rate: 25.3504
Opt	Hit count: 7926 Miss count: 2634 Clean evictions: 0 Dirty evictions: 2484 Total references : 10560 Hit rate: 75.0568 Miss rate: 24.9432
Rand	Hit count: 7844 Miss count: 2716 Clean evictions: 21 Dirty evictions: 2545 Total references : 10560 Hit rate: 74.2803 Miss rate: 25.7197

Trace file: Simple Loop Mem: 200

Fifo	Hit count: 7872 Miss count: 2688 Clean evictions: 13 Dirty evictions: 2475 Total references : 10560 Hit rate: 74.5455 Miss rate: 25.4545
LRU	Hit count: 7883 Miss count: 2677 Clean evictions: 0 Dirty evictions: 2477 Total references : 10560 Hit rate: 74.6496 Miss rate: 25.3504
Clock	Hit count: 7883 Miss count: 2677 Clean evictions: 0 Dirty evictions: 2477 Total references : 10560 Hit rate: 74.6496 Miss rate: 25.3504
Opt	Hit count: 7925 Miss count: 2635 Clean evictions: 0 Dirty evictions: 2435 Total references : 10560 Hit rate: 75.0473 Miss rate: 24.9527
Rand	Hit count: 7863 Miss count: 2697 Clean evictions: 14 Dirty evictions: 2483 Total references : 10560 Hit rate: 74.4602 Miss rate: 25.5398

Trace file: tr-blocked.ref Mem: 50

Fifo	Hit count: 2511192 Miss count: 13832 Clean evictions: 10490 Dirty evictions: 3292 Total references : 2525024 Hit rate: 99.4522 Miss rate: 0.5478
LRU	Hit count: 2519837 Miss count: 5187 Clean evictions: 2791 Dirty evictions: 2346 Total references : 2525024 Hit rate: 99.7946 Miss rate: 0.2054
Clock	Hit count: 2519288 Miss count: 5736 Clean evictions: 3275 Dirty evictions: 2411 Total references : 2525024 Hit rate: 99.7728 Miss rate: 0.2272
Opt	
Rand	Hit count: 2516621 Miss count: 8403 Clean evictions: 5856 Dirty evictions: 2497 Total references : 2525024 Hit rate: 99.6672 Miss rate: 0.3328

Trace file: tr-blocked.ref Mem: 100

Fifo	Hit count: 2518660 Miss count: 6364 Clean evictions: 3918 Dirty evictions: 2346 Total references : 2525024 Hit rate: 99.7480 Miss rate: 0.2520
LRU	Hit count: 2521212 Miss count: 3812 Clean evictions: 2632 Dirty evictions: 1080 Total references : 2525024 Hit rate: 99.8490 Miss rate: 0.1510
Clock	Hit count: 2520687 Miss count: 4337 Clean evictions: 2639 Dirty evictions: 1598 Total references : 2525024 Hit rate: 99.8282 Miss rate: 0.1718
Opt	
Rand	Hit count: 2519742 Miss count: 5282 Clean evictions: 3411 Dirty evictions: 1771 Total references : 2525024 Hit rate: 99.7908 Miss rate: 0.2092

Trace file: tr-blocked.ref Mem: 150

Fifo	Hit count: 2519136 Miss count: 5888 Clean evictions: 3980 Dirty evictions: 1758 Total references : 2525024 Hit rate: 99.7668 Miss rate: 0.2332
LRU	Hit count: 2521220 Miss count: 3804 Clean evictions: 2596 Dirty evictions: 1058 Total references : 2525024 Hit rate: 99.8493 Miss rate: 0.1507
Clock	Hit count: 2521214 Miss count: 3810 Clean evictions: 2600 Dirty evictions: 1060 Total references : 2525024 Hit rate: 99.8491 Miss rate: 0.1509
Opt	
Rand	Hit count: 2520584 Miss count: 4440 Clean evictions: 2780 Dirty evictions: 1510 Total references : 2525024 Hit rate: 99.8242 Miss rate: 0.1758

Trace file: tr-blocked.ref Mem: 200

Fifo	Hit count: 2519332 Miss count: 5692 Clean evictions: 3719 Dirty evictions: 1773 Total references : 2525024 Hit rate: 99.7746 Miss rate: 0.2254
LRU	Hit count: 2521328 Miss count: 3696 Clean evictions: 2438 Dirty evictions: 1058 Total references : 2525024 Hit rate: 99.8536 Miss rate: 0.1464
Clock	Hit count: 2521840 Miss count: 3184 Clean evictions: 1915 Dirty evictions: 1069 Total references : 2525024 Hit rate: 99.8739 Miss rate: 0.1261
Opt	
Rand	Hit count: 2521169 Miss count: 3855 Clean evictions: 2334 Dirty evictions: 1321 Total references : 2525024 Hit rate: 99.8473 Miss rate: 0.1527

Trace file: tr-matmul.ref Mem: 50

Fifo	Hit count: 1811923 Miss count: 1156229 Clean evictions: 1097647 Dirty evictions: 58532 Total references : 2968152 Hit rate: 61.0455 Miss rate: 38.9545
LRU	Hit count: 1926927 Miss count: 1041225 Clean evictions: 1040073 Dirty evictions: 1102 Total references : 2968152 Hit rate: 64.9201 Miss rate: 35.0799
Clock	Hit count: 1926917 Miss count: 1041235 Clean evictions: 1040079 Dirty evictions: 1106 Total references : 2968152 Hit rate: 64.9198 Miss rate: 35.0802
Opt	
Rand	Hit count: 1973357 Miss count: 994795 Clean evictions: 955639 Dirty evictions: 39106 Total references : 2968152 Hit rate: 66.4844 Miss rate: 33.5156

Trace file: tr-matmul.ref Mem: 100

Fifo	Hit count: 1865314 Miss count: 1102838 Clean evictions: 1070821 Dirty evictions: 31917 Total references : 2968152 Hit rate: 62.8443 Miss rate: 37.1557
LRU	Hit count: 1961704 Miss count: 1006448 Clean evictions: 1005271 Dirty evictions: 1077 Total references : 2968152 Hit rate: 66.0918 Miss rate: 33.9082
Clock	Hit count: 1966369 Miss count: 1001783 Clean evictions: 1000607 Dirty evictions: 1076 Total references : 2968152 Hit rate: 66.2489 Miss rate: 33.7511
Opt	
Rand	Hit count: 2644977 Miss count: 323175 Clean evictions: 315688 Dirty evictions: 7387 Total references : 2968152 Hit rate: 89.1119 Miss rate: 10.8881

Trace file tr-matmul.ref Mem: 150

Fifo	Hit count: 2000220 Miss count: 967932 Clean evictions: 948647 Dirty evictions: 19135 Total references : 2968152 Hit rate: 67.3894 Miss rate: 32.6106
LRU	Hit count: 2935272 Miss count: 32880 Clean evictions: 31655 Dirty evictions: 1075 Total references : 2968152 Hit rate: 98.8922 Miss rate: 1.1078
Clock	Hit count: 2933828 Miss count: 34324 Clean evictions: 33098 Dirty evictions: 1076 Total references : 2968152 Hit rate: 98.8436 Miss rate: 1.1564
Opt	
Rand	Hit count: 2871730 Miss count: 96422 Clean evictions: 93946 Dirty evictions: 2326 Total references : 2968152 Hit rate: 96.7514 Miss rate: 3.2486

Trace file tr-matmul.ref Mem: 200

Fifo	Hit count: 2895551 Miss count: 72601 Clean evictions: 70390 Dirty evictions: 2011 Total references : 2968152 Hit rate: 97.5540 Miss rate: 2.4460
LRU	Hit count: 2935283 Miss count: 32869 Clean evictions: 31594 Dirty evictions: 1075 Total references : 2968152 Hit rate: 98.8926 Miss rate: 1.1074
Clock	Hit count: 2934686 Miss count: 33466 Clean evictions: 32186 Dirty evictions: 1080 Total references : 2968152 Hit rate: 98.8725 Miss rate: 1.1275
Opt	
Rand	Hit count: 2911835 Miss count: 56317 Clean evictions: 54467 Dirty evictions: 1650 Total references : 2968152 Hit rate: 98.1026 Miss rate: 1.8974

Trace file: tr-test.ref Mem: 50

This is the 4th tracefile and is the Fibonacci algorithm.

Fifo	Hit count: 9652 Miss count: 10660 Clean evictions: 590 Dirty evictions: 10020 Total references : 20312 Hit rate: 47.5187 Miss rate: 52.4813
LRU	Hit count: 10231 Miss count: 10081 Clean evictions: 60 Dirty evictions: 9971 Total references : 20312 Hit rate: 50.3692 Miss rate: 49.6308
Clock	Hit count: 10226 Miss count: 10086 Clean evictions: 57 Dirty evictions: 9979 Total references : 20312 Hit rate: 50.3446 Miss rate: 49.6554
Opt	
Rand	Hit count: 9791 Miss count: 10521 Clean evictions: 478 Dirty evictions: 9993 Total references : 20312 Hit rate: 48.2030 Miss rate: 51.7970

Trace file: tr-test.ref Mem: 100

Fifo	Hit count: 10096 Miss count: 10216 Clean evictions: 262 Dirty evictions: 9854 Total references : 20312 Hit rate: 49.7046 Miss rate: 50.2954
LRU	Hit count: 10417 Miss count: 9895 Clean evictions: 0 Dirty evictions: 9795 Total references : 20312 Hit rate: 51.2850 Miss rate: 48.7150
Clock	Hit count: 10425 Miss count: 9887 Clean evictions: 0 Dirty evictions: 9787 Total references : 20312 Hit rate: 51.3243 Miss rate: 48.6757
Opt	
Rand	Hit count: 10194 Miss count: 10118 Clean evictions: 209 Dirty evictions: 9809 Total references : 20312 Hit rate: 50.1871 Miss rate: 49.8129

Trace file tr-test.ref Mem: 150

Fifo	Hit count: 10333 Miss count: 9979 Clean evictions: 152 Dirty evictions: 9677 Total references : 20312 Hit rate: 50.8714 Miss rate: 49.1286
LRU	Hit count: 10554 Miss count: 9758 Clean evictions: 0 Dirty evictions: 9608 Total references : 20312 Hit rate: 51.9594 Miss rate: 48.0406
Clock	Hit count: 10557 Miss count: 9755 Clean evictions: 0 Dirty evictions: 9605 Total references : 20312 Hit rate: 51.9742 Miss rate: 48.0258
Opt	
Rand	Hit count: 10413 Miss count: 9899 Clean evictions: 136 Dirty evictions: 9613 Total references : 20312 Hit rate: 51.2653 Miss rate: 48.7347

Trace file tr-matmul.ref Mem: 200

Fifo	Hit count: 10526 Miss count: 9786 Clean evictions: 106 Dirty evictions: 9480 Total references : 20312 Hit rate: 51.8216 Miss rate: 48.1784
LRU	Hit count: 10669 Miss count: 9643 Clean evictions: 0 Dirty evictions: 9443 Total references : 20312 Hit rate: 52.5256 Miss rate: 47.4744
Clock	Hit count: 10672 Miss count: 9640 Clean evictions: 0 Dirty evictions: 9440 Total references : 20312 Hit rate: 52.5404 Miss rate: 47.4596
Opt	
Rand	Hit count: 10561 Miss count: 9751 Clean evictions: 91 Dirty evictions: 9460 Total references : 20312 Hit rate: 51.9939 Miss rate: 48.0061

Comparison:

Through the results, it is visible that FIFO is always terrible. It performs better in simpleloop however terrible in the other files. As size increases, it gets better and the Hit rate increases. As visible, clock is an lru approximation. It is very similar however, it does not carry the overhead. It tends towards the LRU as size increases. Apart from that, Fifo is constantly the worst. LRU is almost as good as optimum but it has a significant overhead.

LRU:

It is visible from the results that as memory size increases, LRU starts to demonstrate increasingly stable behavior. Initially the hit rate is not very high. However, as soon as the memory size increases, either between 50 and 100 or 100 and 150 there is a sudden jump after which the remaining increase is very minimal. Eventually as memory is set to 150, hit rate is usually very high and there is only a minor difference between memory size=150 and 200. The reason

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behind this is LRU learns from previous patterns and evicts the frame that was least recently used. This eventually helps as when frames get used more often it is not evicted and more hits are obtained.