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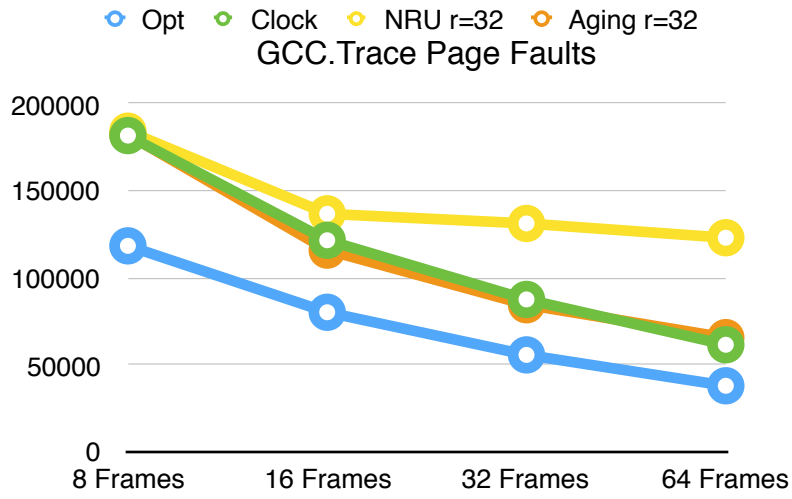
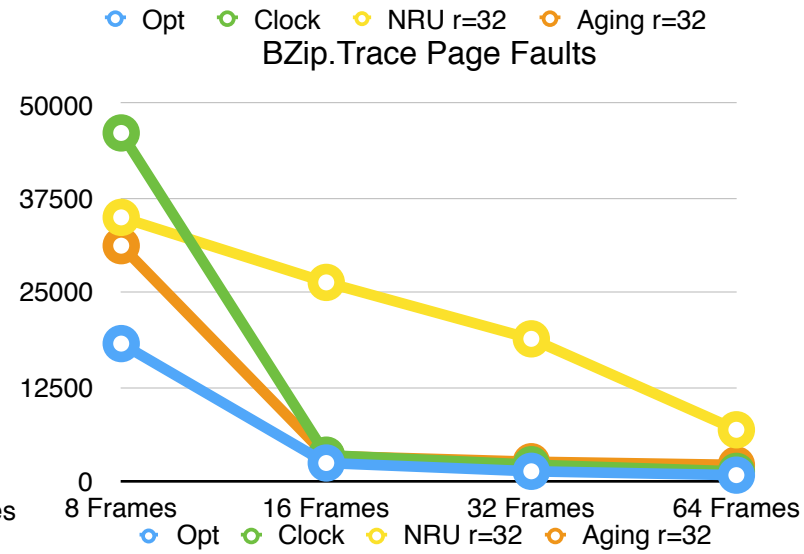
CS 1550 Project 3 Writeup

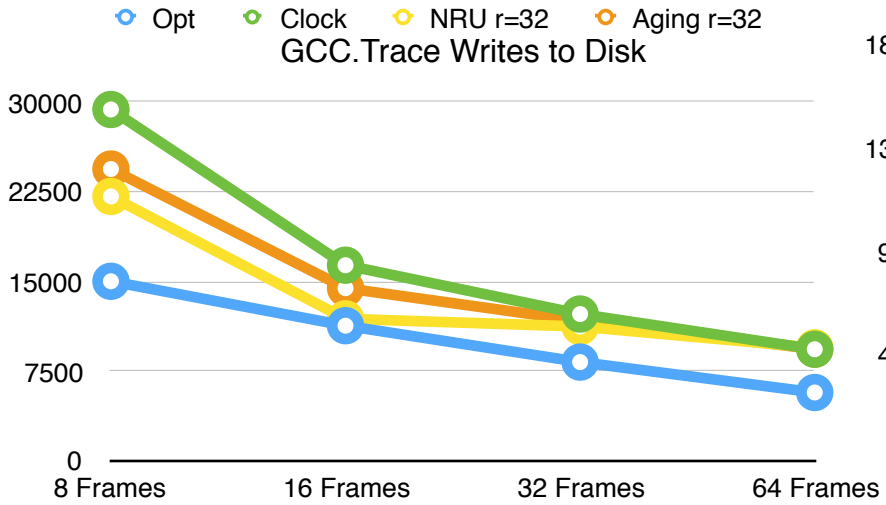
For the algorithm that I think would be most appropriate,either aging or clock seem to be the closest to opt in terms of number of page faults. As for which is more appropriate among these two, I believe that it depends on the system, as one with more resources should use aging as you can dedicate more resources to the extra history bits, while for smaller systems, aging is simple and does the job well enough. NRU isn't as practical in many cases it is less effective than aging as it lacks the extra history. As for number of frames, the increased number seems to yield diminishing returns, thus somewhere around 32 seems about right.

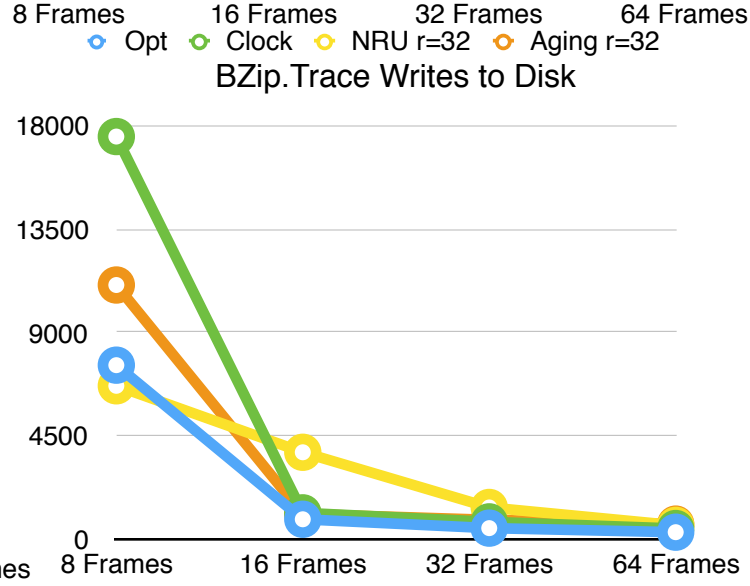
For refresh I found somewhere between 32 and 64 to be the right rate, with 16 and 128 to be too high and low a rate respectively. To find this information, I tested with various refresh rates on all combinations of frames, using the NRU algorithm, on GCC.trace

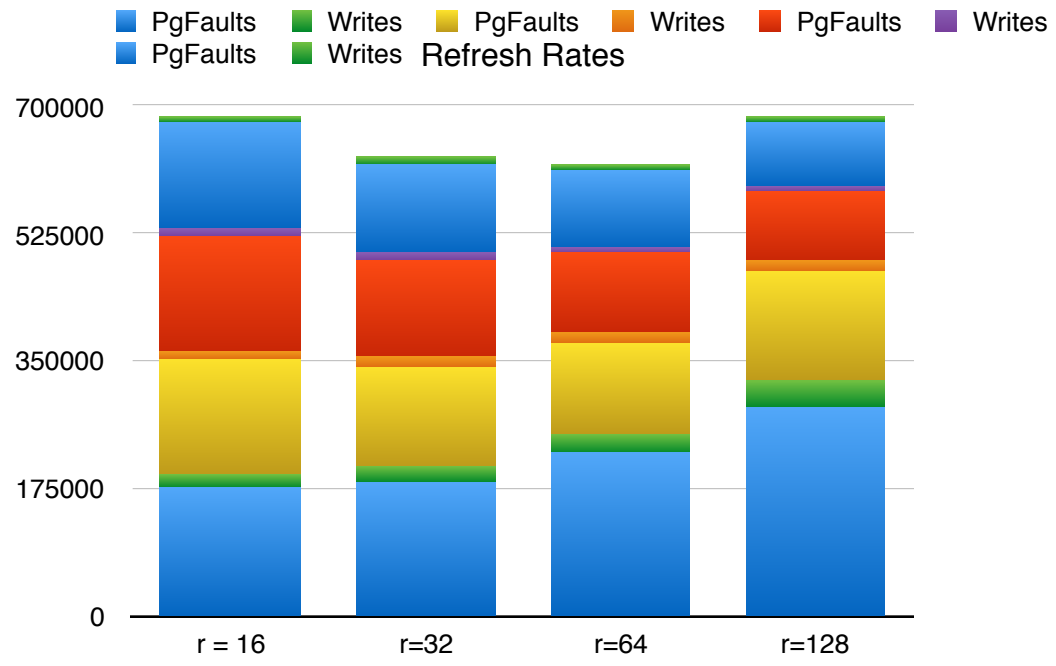
Graphs showing page faults, writes to disk and refresh rates can be seen on the next page, while all information from all possible runs can be seen on the spreadsheet on page 3.


Opt
Clock
NRU r=32
Aging r=32
GCC.Trace Page Faults
200000
150000
100000
50000
0
8 Frames
16 Frames
32 Frames
64 Frames


Opt
Clock
NRU r=32
Aging r=32
BZip.Trace Page Faults
50000
37500
25000
12500
0
8 Frames
16 Frames
32 Frames
64 Frames


Opt
Clock
NRU r=32
Aging r=32
GCC.Trace Writes to Disk
30000
22500
15000
7500
0
8 Frames
16 Frames
32 Frames
64 Frames


Opt
Clock
NRU r=32
Aging r=32
BZip.Trace Writes to Disk
18000
13500
9000
4500
0
8 Frames
16 Frames
32 Frames
64 Frames


PgFaults
Writes
PgFaults
Writes
PgFaults
Writes
PgFaults
Writes
Refresh Rates
700000
525000
350000
175000
0
r = 16
r=32
r=64
r=128

Total Stats

Stats V Algo ->	Opt	Clock	NRU r=32	Aging r=32		Opt	Clock	NRU r=32	Aging r=32	r = 16	r=32	r=64	r=128
GCC.Trace					BZip.Trace								
8 Frames					**8 Frames**								
MemAcc	1000000	1000000	1000000	1000000	**MemAcc**	100000	100000	100000	100000	10000	10000	10000	10000
PgFaults	118480	181856	184383	182461	**PgFaults**	18251	46164	34977	31225	17719	18438	22369	28858
Writes	15031	29401	22128	24420	**Writes**	7580	17568	6678	11082	18438	22128	26712	34131
16 Frames					**16 Frames**								
MemAcc	1000000	1000000	1000000	1000000	**MemAcc**	100000	100000	100000	100000	10000	10000	10000	10000
PgFaults	80307	121682	136883	116035	**PgFaults**	2427	3468	26359	3376	15565	13688	12471	15007
Writes	11316	16376	11894	14455	**Writes**	847	1128	3774	1078	12238	11894	13348	16961
32 Frames					**32 Frames**								
MemAcc	1000000	1000000	1000000	1000000	**MemAcc**	100000	100000	100000	100000	10000	10000	10000	10000
PgFaults	55802	87686	131344	84625	**PgFaults**	1330	2203	18881	2597	15562	13134	10868	92474
Writes	8274	12293	11248	11713	**Writes**	460	734	1363	823	12200	11248	9456	9452
64 Frames					**64 Frames**								
MemAcc	1000000	1000000	1000000	1000000	**MemAcc**	100000	100000	100000	100000	10000	10000	10000	10000
PgFaults	38050	61640	123129	65732	**PgFaults**	821	1318	6829	2179	14513	12312	10399	86269
Writes	5730	9346	9469	9361	**Writes**	283	443	582	636	9870	9469	8551	8008