LAB REPORT

Lab 06

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SECTION 06

SPRING 2019

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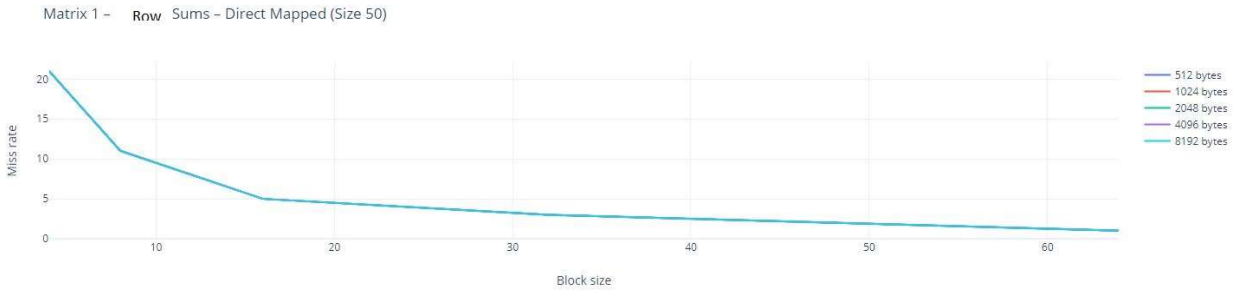
DIRECT MAPPED

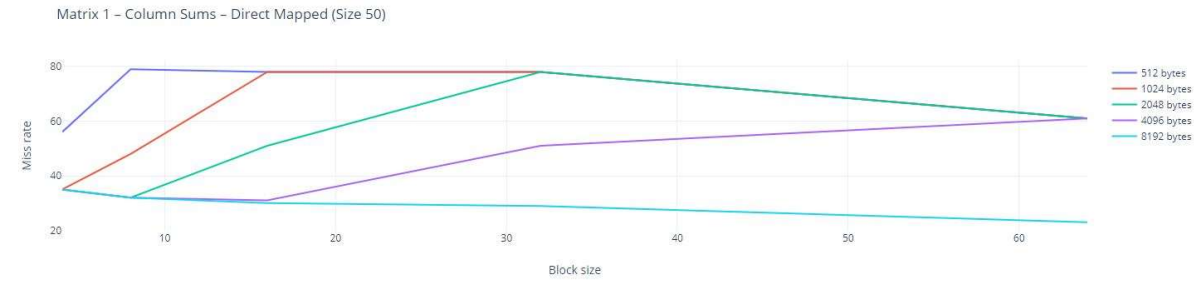
Matrix 1 – Row Sums – Direct Mapped (Size 50) – Cache size vs. words per block

	4 words	8 words	16 words	32 words	64 words
512 bytes	672 (21%)	338 (11%)	171 (5%)	87 (3%)	45 (1%)
1024 bytes	672 (21%)	338 (11%)	171 (5%)	86 (3%)	44 (1%)
2048 bytes	672 (21%)	338 (11%)	171 (5%)	86 (3%)	44 (1%)
4096 bytes	672 (21%)	338 (11%)	171 (5%)	86 (3%)	44 (1%)
8192 bytes	672 (21%)	338 (11%)	171 (5%)	86 (3%)	44 (1%)



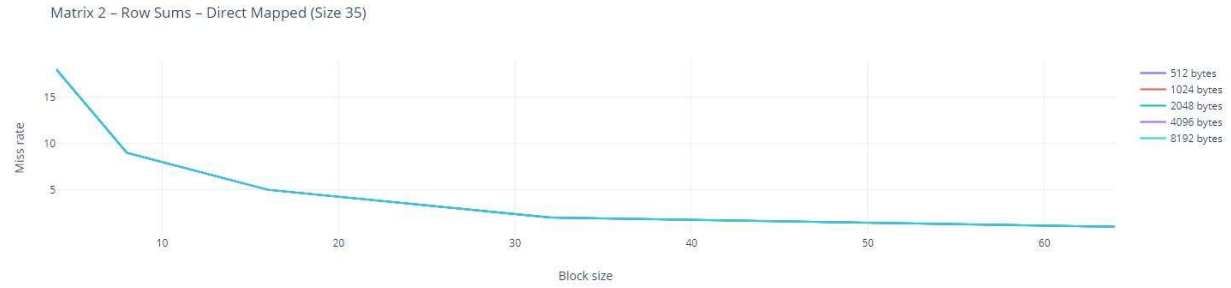
Matrix 1 – Column Sums – Direct Mapped (Size 50) – Cache size vs. words per block

	4 words	8 words	16 words	32 words	64 words
512 bytes	1812 (56%)	2525 (79%)	2513 (78%)	2508 (78%)	1959 (61%)
1024 bytes	1138 (35%)	1549 (48%)	2513 (78%)	2507 (78%)	1958 (61%)
2048 bytes	1138 (35%)	1037 (32%)	1626 (51%)	2507 (78%)	1958 (61%)
4096 bytes	1138 (35%)	1037 (32%)	985 (31%)	1640 (51%)	1958 (61%)
8192 bytes	1123 (35%)	1014 (32%)	958 (30%)	930 (29%)	736 (23%)



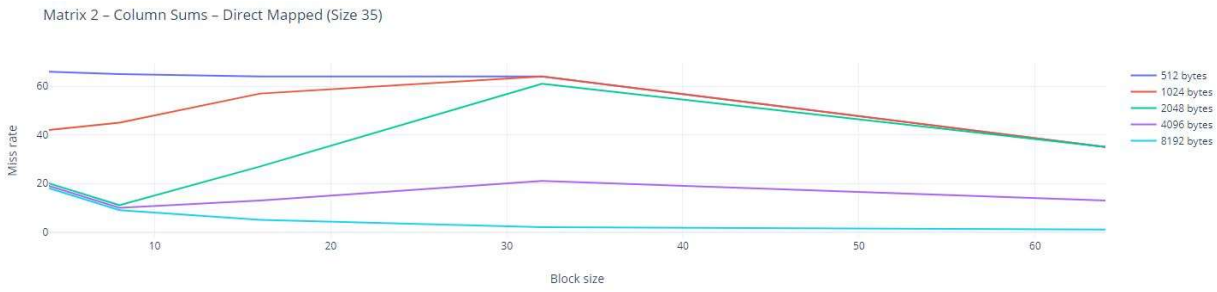
Matrix 2 – Row Sums – Direct Mapped (Size 35) – Cache size vs. words per block

	4 words	8 words	16 words	32 words	64 words
512 bytes	354 (18%)	179 (9%)	91 (5%)	47 (2%)	25 (1%)
1024 bytes	354 (18%)	179 (9%)	91 (5%)	46 (2%)	24 (1%)
2048 bytes	354 (18%)	179 (9%)	91 (5%)	46 (2%)	24 (1%)
4096 bytes	354 (18%)	179 (9%)	91 (5%)	46 (2%)	24 (1%)
8192 bytes	354 (18%)	179 (9%)	91 (5%)	46 (2%)	24 (1%)



Matrix 2 – Column Sums – Direct Mapped (Size 35) – Cache size vs. words per block

	4 words	8 words	16 words	32 words	64 words
512 bytes	1271 (66%)	1250 (65%)	1238 (64%)	1233 (64%)	679 (35%)
1024 bytes	822 (42%)	873 (45%)	1104 (57%)	1232 (64%)	678 (35%)
2048 bytes	379 (20%)	209 (11%)	530 (27%)	1174 (61%)	678 (35%)
4096 bytes	361 (19%)	188 (10%)	251 (13%)	399 (21%)	244 (13%)
8192 bytes	353 (18%)	179 (9%)	90 (5%)	46 (2%)	24 (1%)



FULLY ASSOCIATIVE

Matrix 1 – Row Sums – fully associative (Size 50) – Cache size vs. words per block

	Direct Mapped	Fully assoc. (LRU)	Fully assoc. (random replacement)
4 words/ 512 bytes	79%	79%	79%
16 words/ 2048 bytes	95%	95%	95%
64 words/ 8192 bytes	99%	99%	99%

Matrix 1 – Column Sums – fully associative (Size 50) – Cache size vs. words per block

	Direct Mapped	Fully assoc. (LRU)	Fully assoc. (random replacement)
4 words/ 512 bytes	44%	21%	37%
16 words/ 2048 bytes	49%	22%	47%
64 words/ 8192 bytes	77%	39%	78%

Matrix 2 – Row Sums – fully associative (Size 35) – Cache size vs. words per block

	Direct Mapped	Fully assoc. (LRU)	Fully assoc. (random replacement)
4 words/ 512 bytes	82%	82%	82%
16 words/ 2048 bytes	95%	95%	95%
64 words/ 8192 bytes	99%	99%	99%

Matrix 2 – Column Sums – fully associative (Size 35) – Cache size vs. words per block

	Direct Mapped	Fully assoc. (LRU)	Fully assoc. (random replacement)
4 words/ 512 bytes	34%	34%	57%
16 words/ 2048 bytes	73%	36%	74%
64 words/ 8192 bytes	99%	99%	99%

N-WAY SET ASSOCIATIVE

Matrix 1 – Column Sums – N-way (Size 50) – Bad config.

	n = 2	n = 4	n = 8	n = 16
Miss rate	75%	79%	79%	79%
Misses	2420	2546	2546	2546

Matrix 1 – Column Sums – N-way (Size 50) – Average config.

	n = 2	n = 4	n = 8	n = 16
Miss rate	63%	78%	78%	78%
Misses	2021	2513	2513	2513

Matrix 1 – Column Sums – N-way (Size 50) – Good config.

	n = 2	n = 4	n = 8	n = 16
Miss rate	34%	55%	61%	61%
Misses	1082	1774	1958	1958

Matrix 1 – Row Sums – N-way (Size 50) – Bad config.

	n = 2	n = 4	n = 8	n = 16
Miss rate	21%	21%	21%	21%
Misses	672	672	672	672

Matrix 1 – Row Sums – N-way (Size 50) – Average config.

	n = 2	n = 4	n = 8	n = 16

Miss rate	5%	5%	5%	5%
Misses	171	171	171	171

Matrix 1 – Row Sums – N-way (Size 50) – Good config.

	n = 2	**n = 4**	**n = 8**	**n = 16**
Miss rate	1%	1%	1%	1%
Misses	44	44	44	44

Matrix 1 – Column Sums – Direct Mapped (Size 100) – Cache size vs. words per block

	4 words	**8 words**	**16 words**	**32 words**	**64 words**
512 bytes	12635 (43%)	10025 (6%)	10013 (7%)	10018 (7%)	10015 (7%)
1024 bytes	7946 (26%)	10025 (6%)	10013 (7%)	10007 (7%)	10013 (7%)
2048 bytes	2546 (76%)	7925 (26%)	10013 (7%)	10007 (7%)	10007 (4%)