

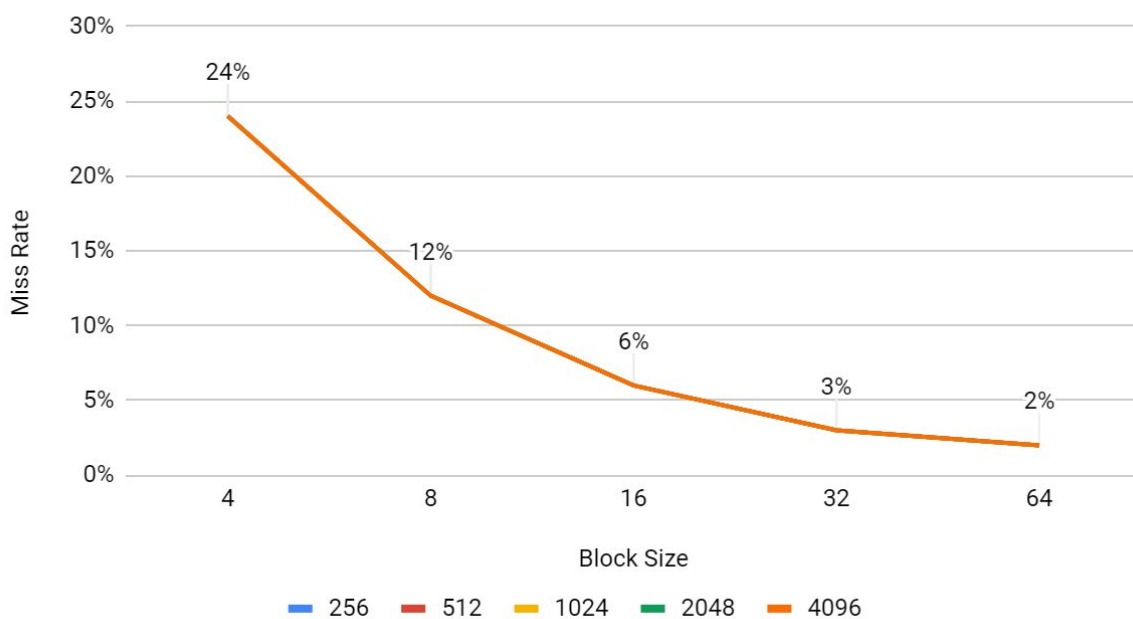
CS224
Section No.: 2
Spring 2019
Lab No. 6
Munib Emre Sevilgen / 21602416

100 x 100 Matrix:

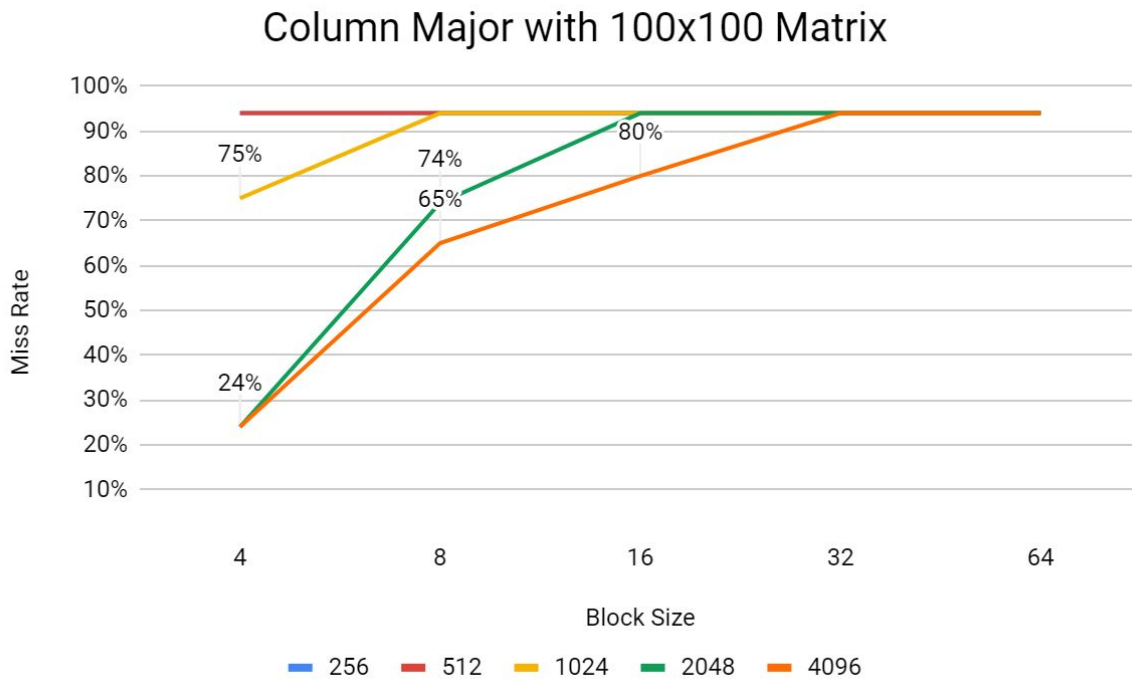
a)

Row major	Block size					
		4	8	16	32	64
Cache size (byte)	256	2545 (24%)	1273 (12%)	639 (6%)	321 (3%)	162 (2%)
	512	2545 (24%)	1273 (12%)	639 (6%)	321 (3%)	161 (2%)
	1024	2545 (24%)	1273 (12%)	638 (6%)	320 (3%)	161 (2%)
	2048	2545 (24%)	1273 (12%)	638 (6%)	320 (3%)	161 (2%)
	4096	2545 (24%)	1273 (12%)	638 (6%)	320 (3%)	161 (2%)

Row Major with 100x100 Matrix



Column major	Block size					
		4	8	16	32	64
Cache size (byte)	256	10045 (94%)	10024 (94%)	10014 (94%)	10008 (94%)	10006 (94%)
	512	10045 (94%)	10023 (94%)	10014 (94%)	10008 (94%)	10005 (94%)
	1024	7945 (75%)	10023 (94%)	10013 (94%)	10007 (94%)	10004 (94%)
	2048	2545 (24%)	7923 (74%)	10013 (94%)	10007 (94%)	10004 (94%)
	4096	2545 (24%)	6951 (65%)	8477 (80%)	10007 (94%)	10004 (94%)



b)

Fully associative caches	Worst (Block size: 4 - Cache size: 256)	Medium (Block size: 8 - Cache size: 4096)	Best (Block size: 4 - Cache size: 4096)
Direct mapped	10045 (94%)	6951 (65%)	2545 (24%)
Full associative - LRU	10045 (94%)	1323 (12%)	2545 (24%)
Full associative - Random	20078 (94%)	4254 (20%)	5742 (27%)

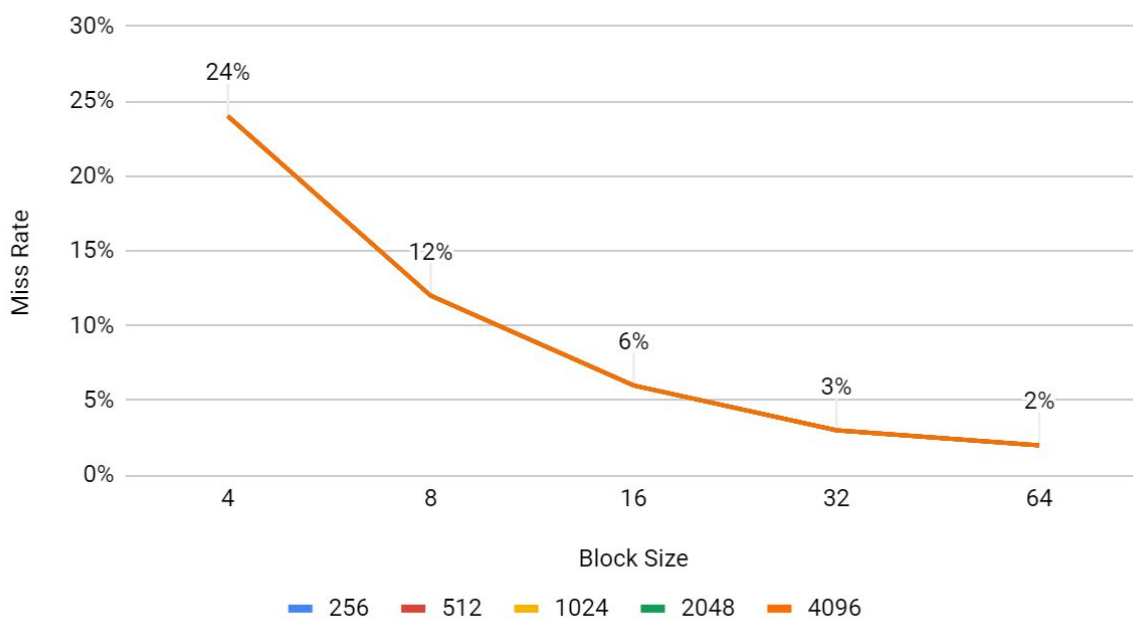
c)

N-way set associative caches	Set size (blocks)			
	1	2	4	8
Best (Block size: 4 - Cache size: 4096)	3917 (27%)	3917 (27%)	3917 (27%)	3917 (27%)
Medium (Block size: 8 - Cache size: 4096)	7818 (73%)	7818 (73%)	7818 (73%)	7818 (73%)
Worst (Block size: 4 - Cache size: 256)	10014 (94%)	10014 (94%)	10014 (94%)	10014 (94%)

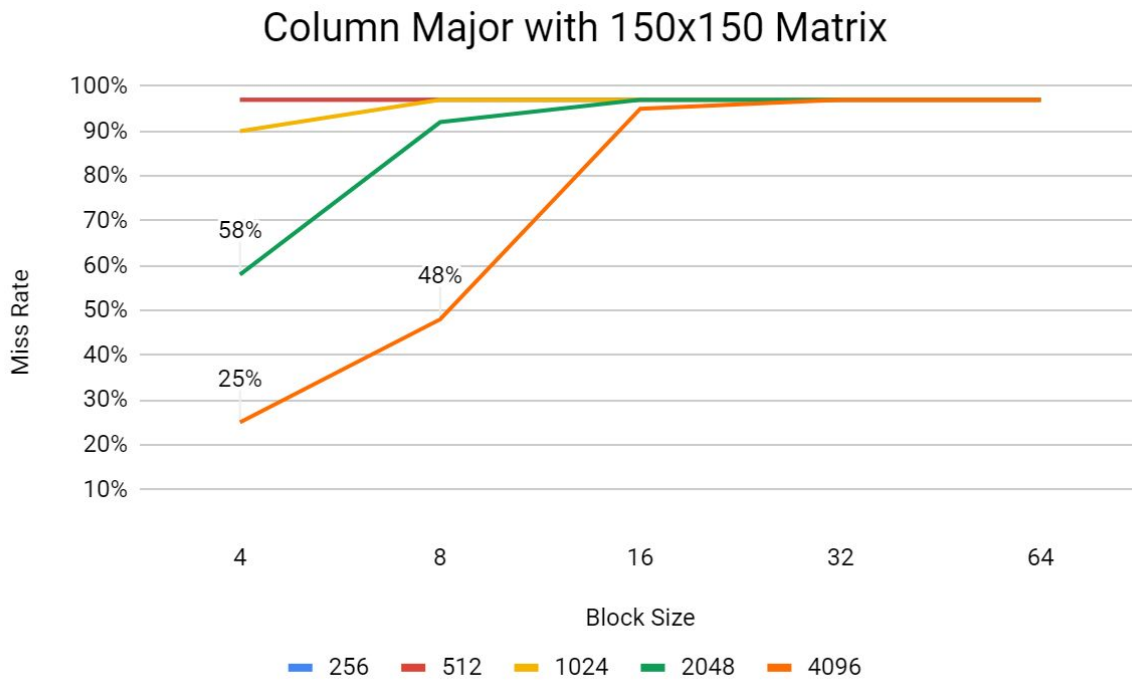
150 x 150 Matrix:

Row major	Block size					
Cache size (byte)		4	8	16	32	64
	256	5670 (24%)	2837 (12%)	1421 (6%)	712 (3%)	358 (2%)
	512	5670 (24%)	2836 (12%)	1421 (6%)	712 (3%)	357 (2%)
	1024	5670 (24%)	2836 (12%)	1420 (6%)	712 (3%)	356 (2%)
	2048	5670 (24%)	2836 (12%)	1420 (6%)	711 (3%)	356 (2%)
	4096	5670 (24%)	2836 (12%)	1420 (6%)	711 (3%)	356 (2%)

Row Major with 150x150 Matrix



Column major	Block size					
Cache size (byte)		4	8	16	32	64
	256	22545 (97%)	22545 (97%)	22514 (97%)	22508 (97%)	22506 (97%)
	512	22545 (97%)	22545 (97%)	22514 (97%)	22508 (97%)	22505 (97%)
	1024	20769 (90%)	22523 (97%)	22513 (97%)	22507 (97%)	22504 (97%)
	2048	13345 (58%)	21372 (92%)	22513 (97%)	22507 (97%)	22504 (97%)
	4096	5745 (25%)	11069 (48%)	21990 (95%)	22507 (97%)	22504 (97%)



b)

Fully associative caches	Worst (Block size: 4 - Cache size: 256)	Medium (Block size: 8 - Cache size: 4096)	Best (Block size: 4 - Cache size: 4096)
Direct mapped	22545 (97%)	11069 (48%)	5745 (25%)
Full associative - LRU	22545 (97%)	22523 (97%)	5745 (25%)
Full associative - Random	22544 (97%)	12039 (52%)	9255 (40%)

c)

N-way set associative caches	Set size (blocks)			
	1	2	4	8
Best (Block size: 4 - Cache size: 4096)	5745 (25%)	5745 (25%)	5745 (25%)	5745 (25%)
Medium (Block size: 8 - Cache size: 4096)	11069 (48%)	13978 (60%)	16637 (62%)	20287 (88%)
Worst (Block size: 4 - Cache size: 256)	22545 (97%)	22545 (97%)	22545 (97%)	22545 (97%)