

CS224

Section No.: 3

Spring 2021

Lab No.: 6

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PART II

FOR 100 INPUTS

a) Direct Mapped Caches

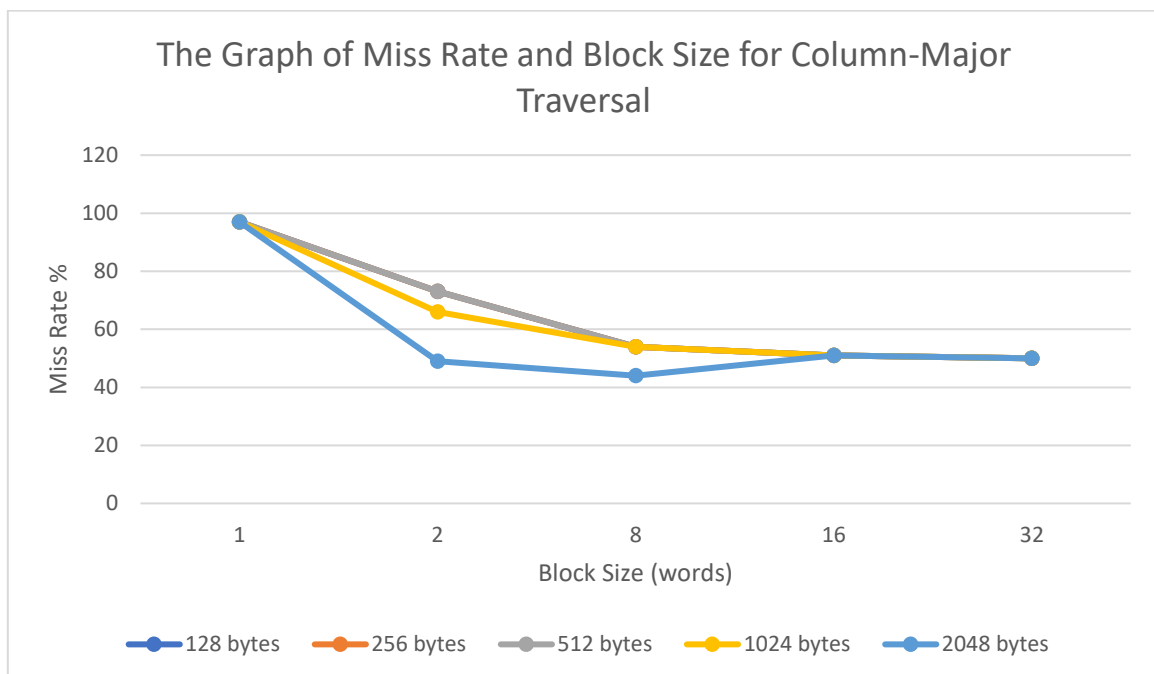
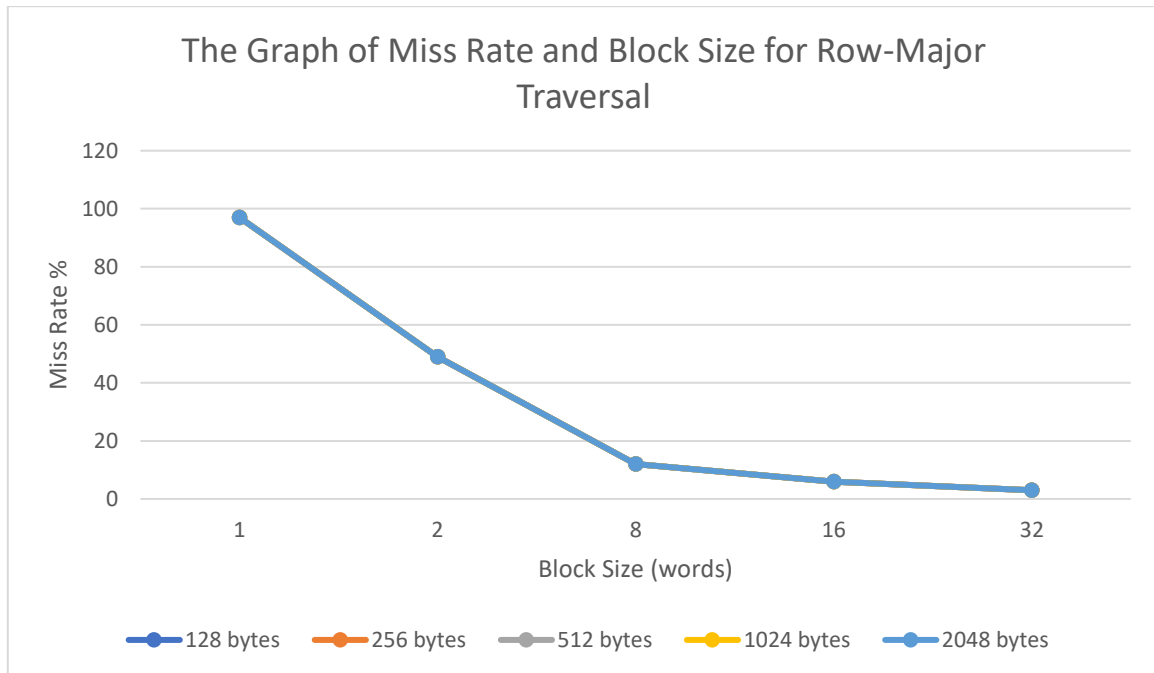
- Row-major averaging, for 100 inputs

		Block Size (words)				
		1	2	8	16	32
Cache Memory (bytes)	128	Miss rate: %97 # of misses: 20179	Miss rate: %49 # of misses: 10090	Miss rate: %12 # of misses: 2524	Miss rate: %6 # of misses: 1263	Miss rate: %3 # of misses: 633
	256	Miss rate: %97 # of misses: 20179	Miss rate: %49 # of misses: 10090	Miss rate: %12 # of misses: 2524	Miss rate: %6 # of misses: 1263	Miss rate: %3 # of misses: 633
	512	Miss rate: %97 # of misses: 20179	Miss rate: %49 # of misses: 10090	Miss rate: %12 # of misses: 2524	Miss rate: %6 # of misses: 1263	Miss rate: %3 # of misses: 633
	1024	Miss rate: %97 # of misses: 20179	Miss rate: %49 # of misses: 10090	Miss rate: %12 # of misses: 2524	Miss rate: %6 # of misses: 1263	Miss rate: %3 # of misses: 633
	2048	Miss rate: %97 # of misses: 20179	Miss rate: %49 # of misses: 10090	Miss rate: %12 # of misses: 2524	Miss rate: %6 # of misses: 1263	Miss rate: %3 # of misses: 633

- Column-major averaging, for 100 inputs

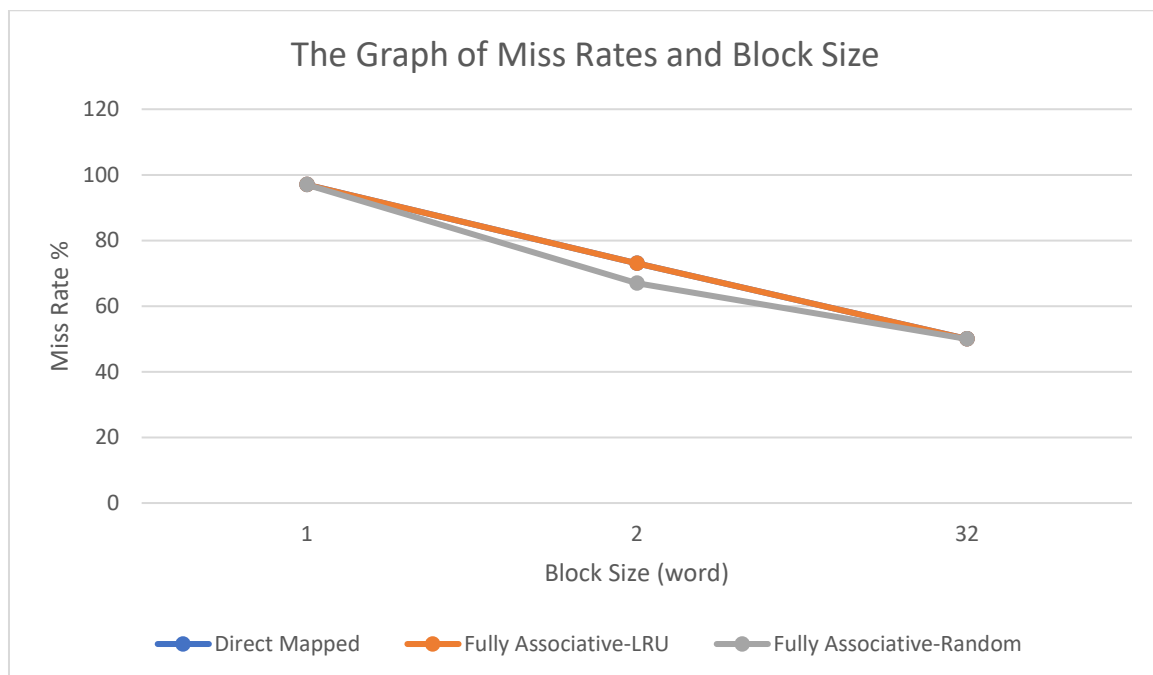
		Block Size (words)				
		1	2	8	16	32
Cache Memory (bytes)	128	Miss rate: %97 # of misses: 20180	Miss rate: %73 # of misses: 15090	Miss rate: %54 # of misses: 11274	Miss rate: %51 # of misses: 10639	Miss rate: %50 # of misses: 10321
	256	Miss rate: %97 # of misses: 20180	Miss rate: %73 # of misses: 15090	Miss rate: %54 # of misses: 11274	Miss rate: %51 # of misses: 10639	Miss rate: %50 # of misses: 10321
	512	Miss rate: %97 # of misses: 20180	Miss rate: %73 # of misses: 15090	Miss rate: %54 # of misses: 11274	Miss rate: %51 # of misses: 10639	Miss rate: %50 # of misses: 10321
	1024	Miss rate: %97 # of misses: 20180	Miss rate: %66 # of misses: 13690	Miss rate: %54 # of misses: 11274	Miss rate: %51 # of misses: 10639	Miss rate: %50 # of misses: 10321
	2048	Miss rate: %97 # of misses: 20180	Miss rate: %49 # of misses: 10080	Miss rate: %44 # of misses: 9174	Miss rate: %51 # of misses: 10639	Miss rate: %50 # of misses: 10321

- **Graphs:**



b) Fully Associative Caches

	Direct Mapped Caches	Fully Associative Caches (with LRU policy)	Fully Associative Caches (with Random policy)
Good Hit Rate Cache Memory: 512 bytes Block Size: 32 words	Miss rate: %50 # of misses: 10321	Miss rate: %50 # of misses: 10321	Miss rate: %50 # of misses: 10321
Medium Hit Rate Cache Memory: 512 bytes Block Size: 2 words	Miss rate: %73 # of misses: 15090	Miss rate: %73 # of misses: 15090	Miss rate: %67 # of misses: 13810
Poor Hit Rate Cache Memory: 512 bytes Block Size: 1 word	Miss rate: %97 # of misses: 20180	Miss rate: %97 # of misses: 20180	Miss rate: %97 # of misses: 20179



c) N-way Set Associative Caches

	N = 2	N = 4	N = 8	N = 16
Cache Memory: 512 bytes Block Size: 2 words	Miss rate: %73 # of misses: 15090	Miss rate: %73 # of misses: 15090	Miss rate: %73 # of misses: 15090	Miss rate: %73 # of misses: 15090
Cache Memory: 512 bytes Block Size: 32 words	Miss rate: %50 # of misses: 10321	Miss rate: %50 # of misses: 10321	-	-
Cache Memory: 2048 bytes Block Size: 32 words	Miss rate: %50 # of misses: 10321	Miss rate: %50 # of misses: 10321	Miss rate: %50 # of misses: 10321	Miss rate: %50 # of misses: 10321
Cache Memory: 512 bytes Block Size: 1 word	Miss rate: %97 # of misses: 20180	Miss rate: %97 # of misses: 20180	Miss rate: %97 # of misses: 20180	Miss rate: %97 # of misses: 20180

FOR 50 INPUTS

a) Direct Mapped Caches

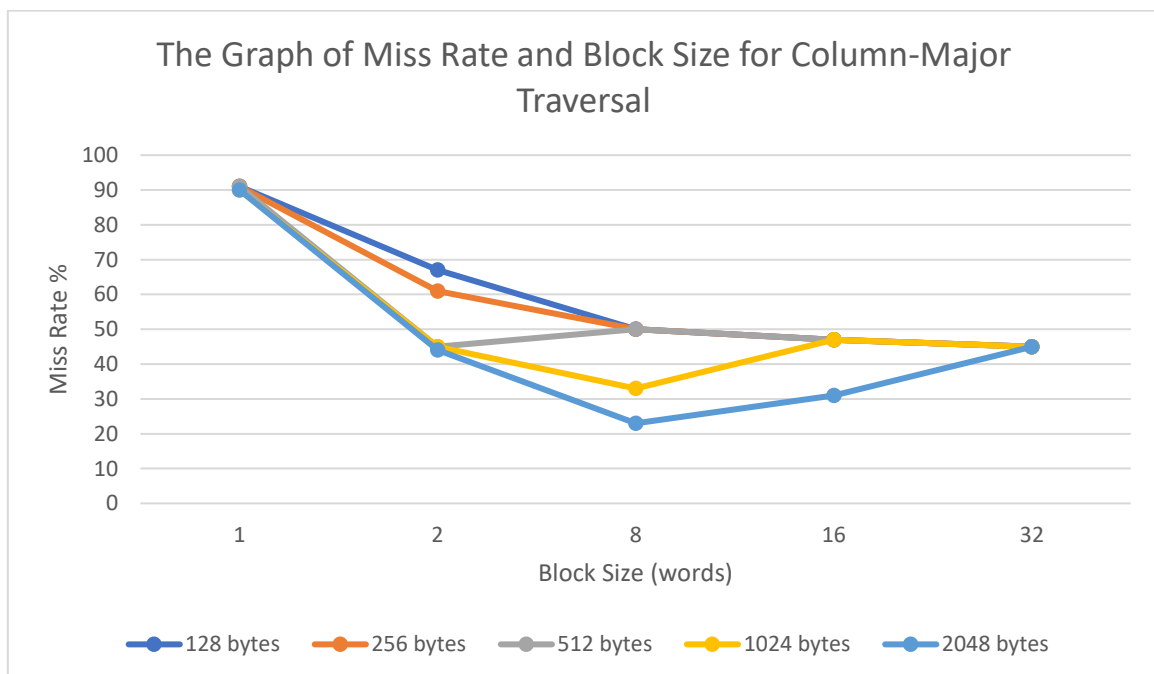
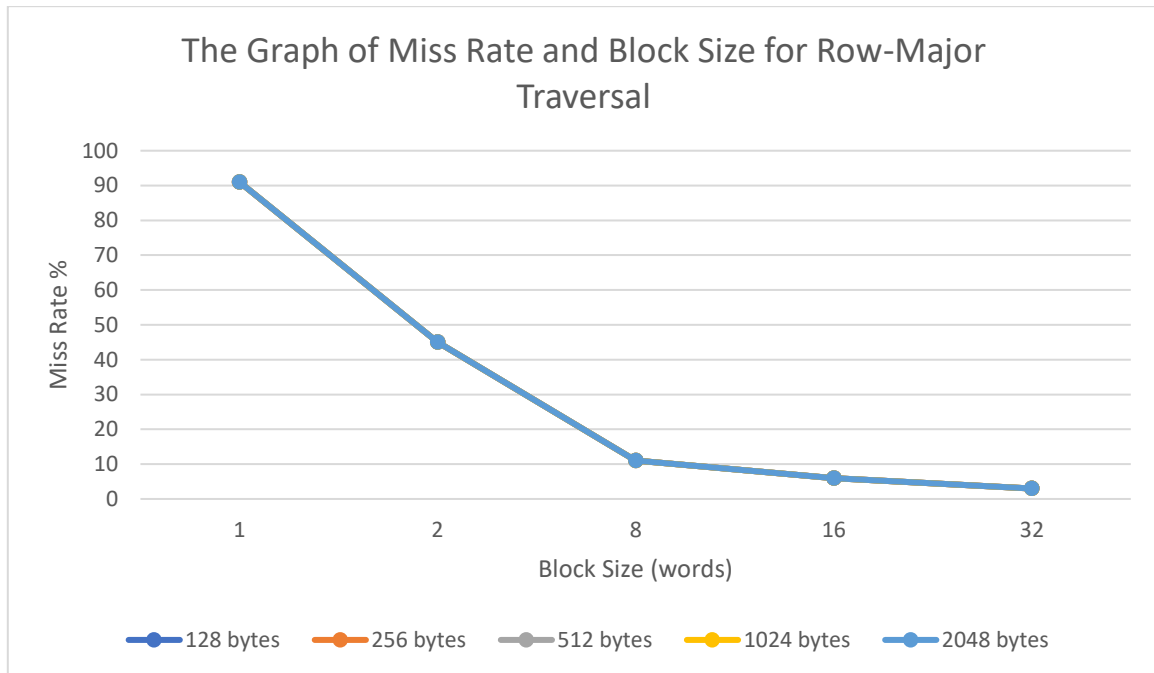
- Row-major averaging, for 50 inputs

		Block Size (words)				
		1	2	8	16	32
Cache Memory (bytes)	128	Miss rate: %91 # of misses: 5179	Miss rate: %45 # of misses: 2590	Miss rate: %11 # of misses: 650	Miss rate: %6 # of misses: 327	Miss rate: %3 # of misses: 165
	256	Miss rate: %91 # of misses: 5179	Miss rate: %45 # of misses: 2590	Miss rate: %11 # of misses: 650	Miss rate: %6 # of misses: 327	Miss rate: %3 # of misses: 165
	512	Miss rate: %91 # of misses: 5179	Miss rate: %45 # of misses: 2590	Miss rate: %11 # of misses: 650	Miss rate: %6 # of misses: 327	Miss rate: %3 # of misses: 165
	1024	Miss rate: %91 # of misses: 5179	Miss rate: %45 # of misses: 2590	Miss rate: %11 # of misses: 650	Miss rate: %6 # of misses: 327	Miss rate: %3 # of misses: 165
	2048	Miss rate: %91 # of misses: 5179	Miss rate: %45 # of misses: 2590	Miss rate: %11 # of misses: 650	Miss rate: %6 # of misses: 327	Miss rate: %3 # of misses: 165

- Column-major averaging, for 50 inputs

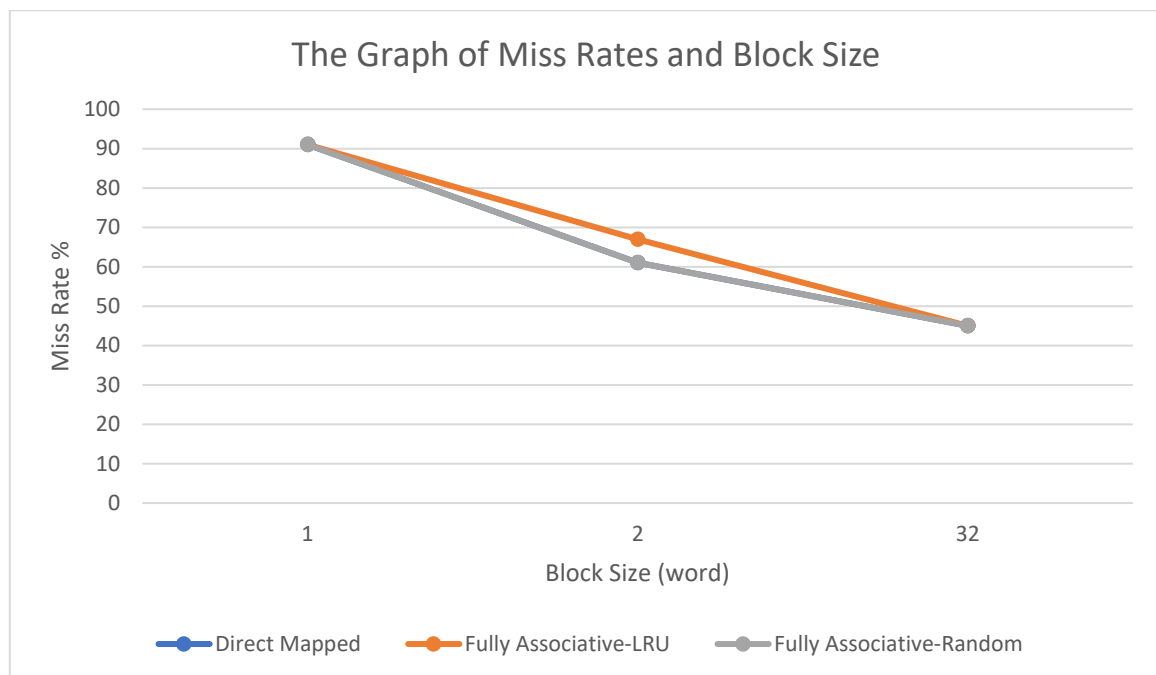
		Block Size (words)				
		1	2	8	16	32
Cache Memory (bytes)	128	Miss rate: %91 # of misses: 5180	Miss rate: %67 # of misses: 3840	Miss rate: %50 # of misses: 2837	Miss rate: %47 # of misses: 2671	Miss rate: %45 # of misses: 2587
	256	Miss rate: %91 # of misses: 5180	Miss rate: %61 # of misses: 3490	Miss rate: %50 # of misses: 2837	Miss rate: %47 # of misses: 2671	Miss rate: %45 # of misses: 2587
	512	Miss rate: %91 # of misses: 5178	Miss rate: %45 # of misses: 2589	Miss rate: %50 # of misses: 2837	Miss rate: %47 # of misses: 2671	Miss rate: %45 # of misses: 2587
	1024	Miss rate: %90 # of misses: 5162	Miss rate: %45 # of misses: 2581	Miss rate: %33 # of misses: 1861	Miss rate: %47 # of misses: 2671	Miss rate: %45 # of misses: 2587
	2048	Miss rate: %90 # of misses: 5162	Miss rate: %44 # of misses: 2537	Miss rate: %23 # of misses: 1342	Miss rate: %31 # of misses: 1784	Miss rate: %45 # of misses: 2587

- **Graphs:**



b) Fully Associative Caches

	Direct Mapped Caches	Fully Associative Caches (with LRU policy)	Fully Associative Caches (with Random policy)
Good Hit Rate Cache Memory: 256 bytes Block Size: 32 word	Miss rate: %45 # of misses: 2587	Miss rate: %45 # of misses: 2587	Miss rate: %45 # of misses: 2587
Medium Hit Rate Cache Memory: 256 bytes Block Size: 2 words	Miss rate: %61 # of misses: 3490	Miss rate: %67 # of misses: 3840	Miss rate: %61 # of misses: 3509
Poor Hit Rate Cache Memory: 256 bytes Block Size: 1 word	Miss rate: %91 # of misses: 5180	Miss rate: %91 # of misses: 5180	Miss rate: %91 # of misses: 5180



c) N-way Set Associative Caches

	N = 2	N = 4	N = 8	N = 16
Cache Memory: 256 bytes Block Size: 32 words	Miss rate: %45 # of misses: 2587	-	-	-
Cache Memory: 1024 bytes Block Size: 16 words	Miss rate: %47 # of misses: 2671	Miss rate: %47 # of misses: 2671	Miss rate: %47 # of misses: 2671	Miss rate: %47 # of misses: 2671
Cache Memory: 256 bytes Block Size: 2 words	Miss rate: %67 # of misses: 3840	Miss rate: %67 # of misses: 3840	Miss rate: %67 # of misses: 3840	Miss rate: %67 # of misses: 3840
Cache Memory: 256 bytes Block Size: 1 word	Miss rate: %91 # of misses: 5180	Miss rate: %91 # of misses: 5180	Miss rate: %91 # of misses: 5180	Miss rate: %91 # of misses: 5180