Bilkent University
CS 224 - Section 1 - Lab Report - Lab 6

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1 Matrix Size: 100 x 100

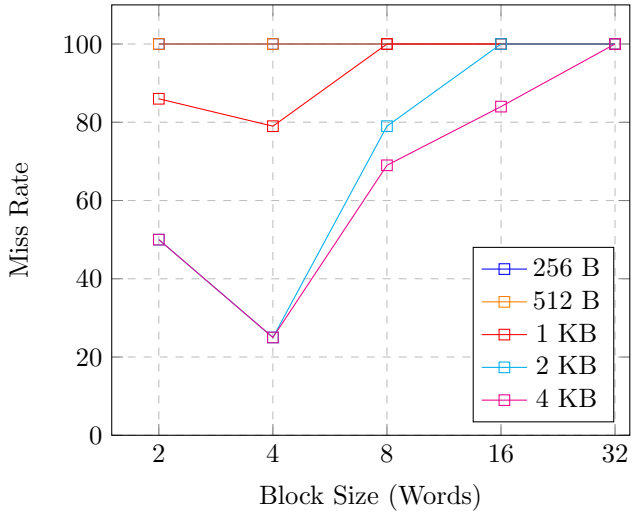
1.1 Direct Mapped Caches

Cache Size \ Block Size	2 Words	4 Words	8 Words	16 Words	32 Words
256 B	50% 5000	25% 2500	12% 1250	6% 625	3% 313
512 B	50% 5000	25% 2500	12% 1250	6% 625	3% 313
1 KB	50% 5000	25% 2500	12% 1250	6% 625	3% 313
2 KB	50% 5000	25% 2500	12% 1250	6% 625	3% 313
4 KB	50% 5000	25% 2500	12% 1250	6% 625	3% 313

Miss Rates and Counts of Corresponding Cache and Block Sizes for Row-Major Addition

Cache Size \ Block Size	2 Words	4 Words	8 Words	16 Words	32 Words
256 B	100% 10000	100% 10000	100% 10000	100% 10000	100% 10000
512 B	100% 10000	100% 10000	100% 10000	100% 10000	100% 10000
1 KB	86% 8600	79% 7900	100% 10000	100% 10000	100% 10000
2 KB	50% 5000	25% 2500	79% 7900	100% 10000	100% 10000
4 KB	50% 5000	25% 2500	69% 6928	84% 8464	100% 10000

Miss Rates and Counts of Corresponding Cache and Block Sizes for Column-Major Addition



Graph of Miss Rate versus Block Size, parameterized by Cache Size

1.2 Fully Associative Caches

	Good Hit Rate	Medium Hit Rate	Poor Hit Rate
Block Size	4 Words	8 Words	2 Words
Cache Size	4 KB	4 KB	512 B

Picked Parameter Points

Performance	Good Hit Rate	Medium Hit Rate	Poor Hit Rate
Block Size	4 Words	8 Words	2 Words
Cache Size	4 KB	4 KB	512 B
Fully Associative (LRU)	25% 2500	13% 1300	87% 8714
Fully Associative (Random)	32% 3119	29% 2981	100% 10000
Direct Mapped	25% 2500	69% 6928	100% 10000

Miss Rates and Counts of Picked Parameter Points for Column-Major Addition in Different Cache Designs

1.3 N-Way Associative Caches

Performance	Good Hit Rate	Medium Hit Rate	Poor Hit Rate
Block Size	4 Words	8 Words	2 Words
Cache Size	4 KB	4 KB	512 B
Set Size: 4	25% 2500	13% 1300	100% 10000
Set Size: 16	25% 2500	13% 1300	100% 10000
Set Size: 64	25% 2500	13% 1300	100% 10000

Miss Rates and Counts of Picked Parameter Points for Column-Major Addition in Different Cache Designs

2 Matrix Size: 50 x 50

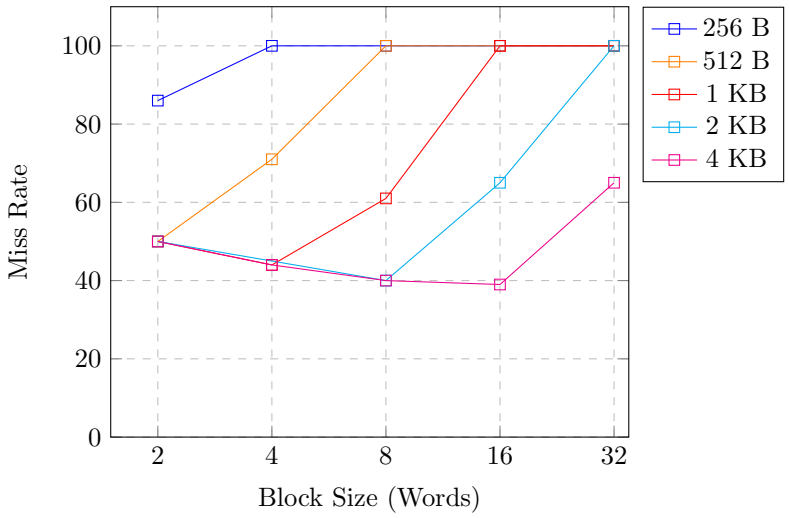
2.1 Direct Mapped Caches

Cache Size \ Block Size	2 Words	4 Words	8 Words	16 Words	32 Words
256 B	50% 1250	25% 625	12% 313	6% 157	3% 79
512 B	50% 1250	25% 625	12% 313	6% 157	3% 79
1 KB	50% 1250	25% 625	12% 313	6% 157	3% 79
2 KB	50% 1250	25% 625	12% 313	6% 157	3% 79
4 KB	50% 1250	25% 625	12% 313	6% 157	3% 79

Miss Rates and Counts of Corresponding Cache and Block Sizes for Row-Major Addition

Cache Size \ Block Size	2 Words	4 Words	8 Words	16 Words	32 Words
256 B	86% 2150	100% 2500	100% 2500	100% 2500	100% 2500
512 B	50% 1250	71% 1766	100% 2500	100% 2500	100% 2500
1 KB	50% 1250	44% 1092	61% 1524	100% 2500	100% 2500
2 KB	50% 1250	44% 1092	40% 1012	65% 1613	100% 2500
4 KB	50% 1250	44% 1092	40% 1012	39% 972	65% 1633

Miss Rates and Counts of Corresponding Cache and Block Sizes for Column-Major Addition



Graph of Miss Rate versus Block Size, parameterized by Cache Size

2.2 Fully Associative Caches

	Good Hit Rate	Medium Hit Rate	Poor Hit Rate
Block Size	16 Words	32 Words	4 Words
Cache Size	4 KB	4 KB	512 B

Picked Parameter Points

Performance	Good Hit Rate	Medium Hit Rate	Poor Hit Rate
Block Size	16 Words	32 Words	4 Words
Cache Size	4 KB	4 KB	512 B
Fully Associative (LRU)	8% 200	100% 2500	100% 2500
Fully Associative (Random)	20% 494	66% 1653	78% 1954
Direct Mapped	39% 972	65% 1633	71% 1766

Miss Rates and Counts of Picked Parameter Points for Column-Major Addition in Different Cache Designs

2.3 N-Way Associative Caches

Performance	Good Hit Rate	Medium Hit Rate	Poor Hit Rate
Block Size	16 Words	32 Words	4 Words
Cache Size	4 KB	4 KB	512 B
Set Size: 2	21% 533	86% 2140	95% 2374
Set Size: 4	18% 445	100% 2500	100% 2500
Set Size: 8	8% 200	100% 2500	100% 2500

Miss Rates and Counts of Picked Parameter Points for Column-Major Addition in Different Cache Designs