

**CS224**  
**Lab 6**  
**Section 4**  
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**5/3/2024**

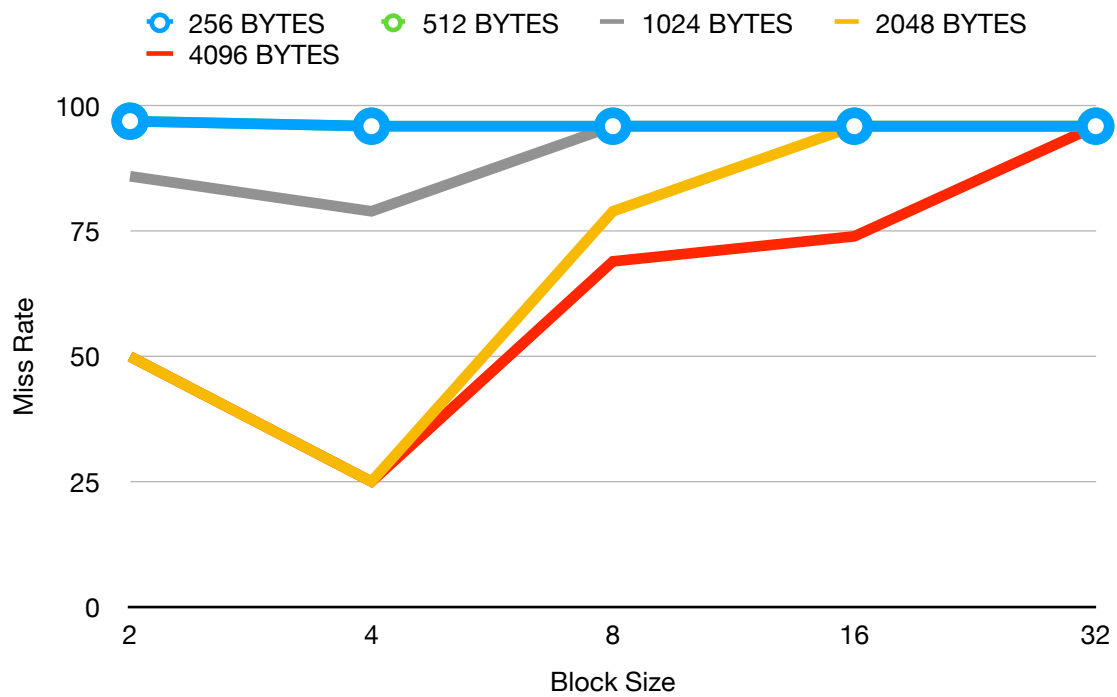
Part a.1 : Miss rates of Direct Mapped Cache (NxN matrix for N = 100, column-wise sum)

Block Size (words) ----- Cache Size (bytes)	2	4	8	16	32
256	Miss rate : 97%	Miss rate : 96%	Miss rate : 96%	Miss rate : 96%	Miss rate : 96%
512	Miss rate : 97%	Miss rate : 97%	Miss rate : 96%	Miss rate : 96%	Miss rate : 96%
1024	Miss rate: 86%	Miss rate : 79%	Miss rate : 96%	Miss rate : 96%	Miss rate : 96%
2048	Miss rate : 50%	Miss rate : 25%	Miss rate : 79%	Miss rate : 96%	Miss rate : 96%
4096	Miss rate : 50%	Miss rate : 25%	Miss rate : 69%	Miss rate : 74%	Miss rate : 96%

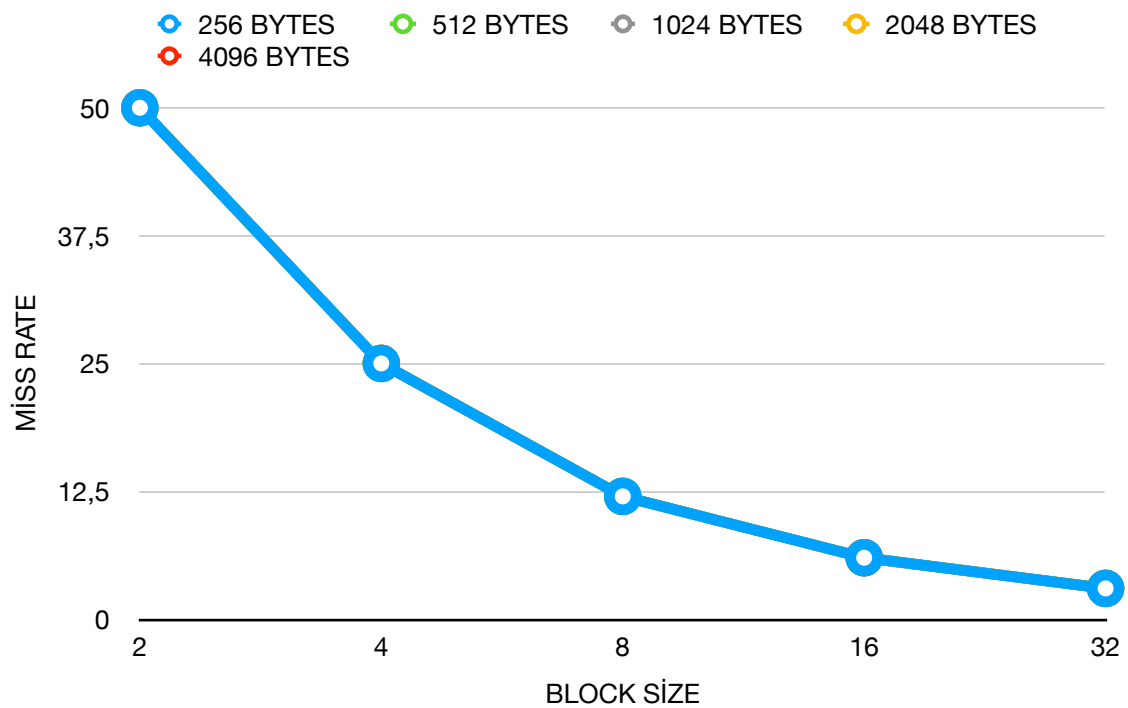
Part a.2 : Miss rates of Direct Mapped Cache (NxN matrix for N = 100, row-wise sum)

Block Size (words) ----- Cache Size (bytes)	2	4	8	16	32
256	Miss rate : 50%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
512	Miss rate : 50%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
1024	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
2048	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
4096	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%

Miss Rates of Direct Mapped Cache (N = 100, column-wise sum)



Miss Rates of Direct Mapped Cache (N = 100, row-wise sum)



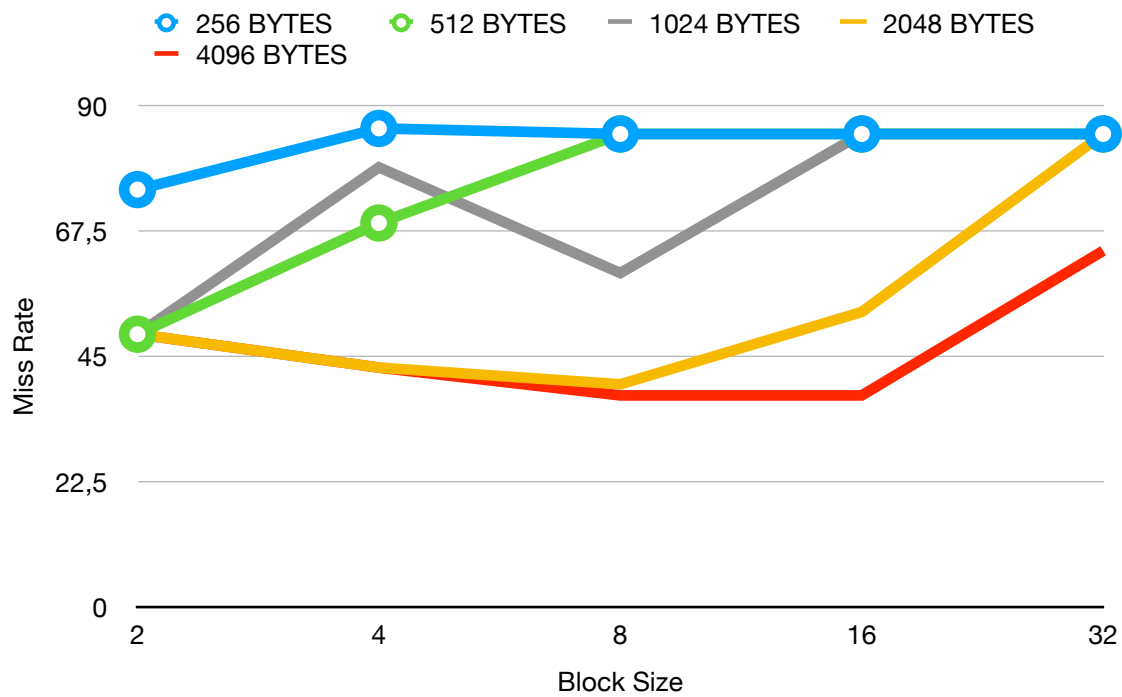
Part a.3 : Miss rates of Direct Mapped Cache (NxN matrix for N = 50, column-wise sum)

Block Size (words) ----- Cache Size (bytes)	2	4	8	16	32
256	Miss rate : 75%	Miss rate : 86%	Miss rate : 85%	Miss rate : 85%	Miss rate : 85%
512	Miss rate : 49%	Miss rate : 69%	Miss rate : 85%	Miss rate : 85%	Miss rate : 85%
1024	Miss rate : 49%	Miss rate : 79%	Miss rate : 60%	Miss rate : 85%	Miss rate : 85%
2048	Miss rate : 49%	Miss rate : 43%	Miss rate : 40%	Miss rate : 53%	Miss rate : 85%
4096	Miss rate : 49%	Miss rate : 43%	Miss rate : 38%	Miss rate : 38%	Miss rate : 64%

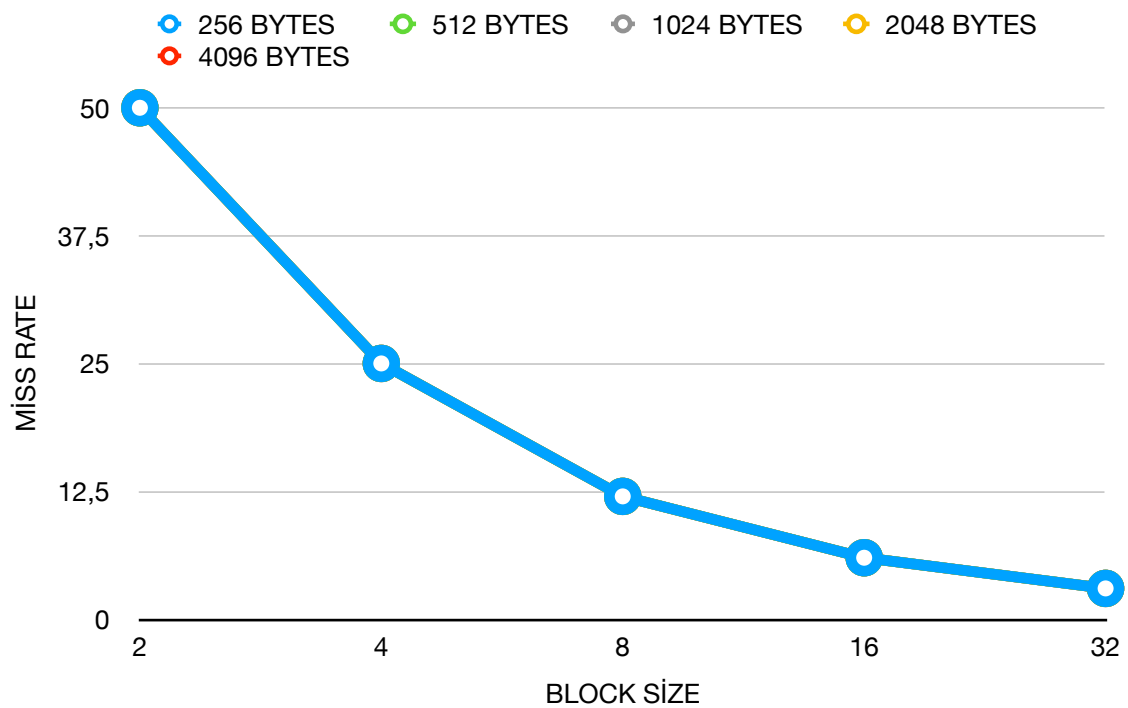
Part a.4 : Miss rates of Direct Mapped Cache (NxN matrix for N = 50, row-wise sum)

Block Size (words) ----- Cache Size (bytes)	2	4	8	16	32
256	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
512	Miss rate : 50%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
1024	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
2048	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%
4096	Miss rate : 49%	Miss rate : 25%	Miss rate : 12%	Miss rate : 6%	Miss rate : 3%

Miss Rates of Direct Mapped Cache (N = 50, column-wise sum)



Miss Rates of Direct Mapped Cache (N = 50, row-wise sum)



Part b.1 : Miss rates of different cache designs and block replacement policies (NxN matrix for N = 100)

	Poor Hit Rate 16 words block size 1024 bytes cache size	Medium Hit Rate 8 words block size 4096 bytes cache size	Good Hit Rate 4 words block size 4096 bytes cache size
Fully Associative (LRU)	Miss rate : 96%	Miss rate : 23%	Miss rate : 25%
Fully Associative (Random)	Miss rate : 95%	Miss rate : 39%	Miss rate : 31%
Direct Mapped	Miss rate : 96%	Miss rate : 69%	Miss rate : 25%

Part b.2 : Miss rates of different cache designs and block replacement policies (NxN matrix for N = 50)

	Poor Hit Rate 8 words block size 512 bytes cache size	Medium Hit Rate 16 words block size 2048 bytes cache size	Good Hit Rate 8 words block size 4096 bytes cache size
Fully Associative (LRU)	Miss rate : 84%	Miss rate : 82%	Miss rate : 14%
Fully Associative (Random)	Miss rate : 82%	Miss rate : 61%	Miss rate : 18%
Direct Mapped	Miss rate : 85%	Miss rate : 53%	Miss rate : 38%

Part c.1 : Miss rates of N-way caches (NxN matrix for N = 100)

Set Associative Cache (N-way)	Poor Hit Rate 16 words block size 1024 bytes cache size	Medium Hit Rate 8 words block size 4096 bytes cache size	Good Hit Rate 4 words block size 4096 bytes cache size
2	Miss rate : 97%	Miss rate : 15%	Miss rate : 25%
4	Miss rate : 96%	Miss rate : 13%	Miss rate : 25%
8	Miss rate : 95%	Miss rate : 13%	Miss rate : 25%
16	Miss rate : 96%	Miss rate : 13%	Miss rate : 25%

Part c.2 : Miss rates of N-way caches (NxN matrix for N = 50)

Set Associative Cache (N-way)	Poor Hit Rate 8 words block size 512 bytes cache size	Medium Hit Rate 16 words block size 2048 bytes cache size	Good Hit Rate 8 words block size 4096 bytes cache size
2	Miss rate : 96%	Miss rate : 79%	Miss rate : 83%
4	Miss rate : 96%	Miss rate : 94%	Miss rate : 96%
8	Miss rate : 96%	Miss rate : 94%	Miss rate : 98%
16	Miss rate : 96%	Miss rate : 96%	Miss rate : 98%