

CS224

Lab 6

Section 6

Bertan Uran

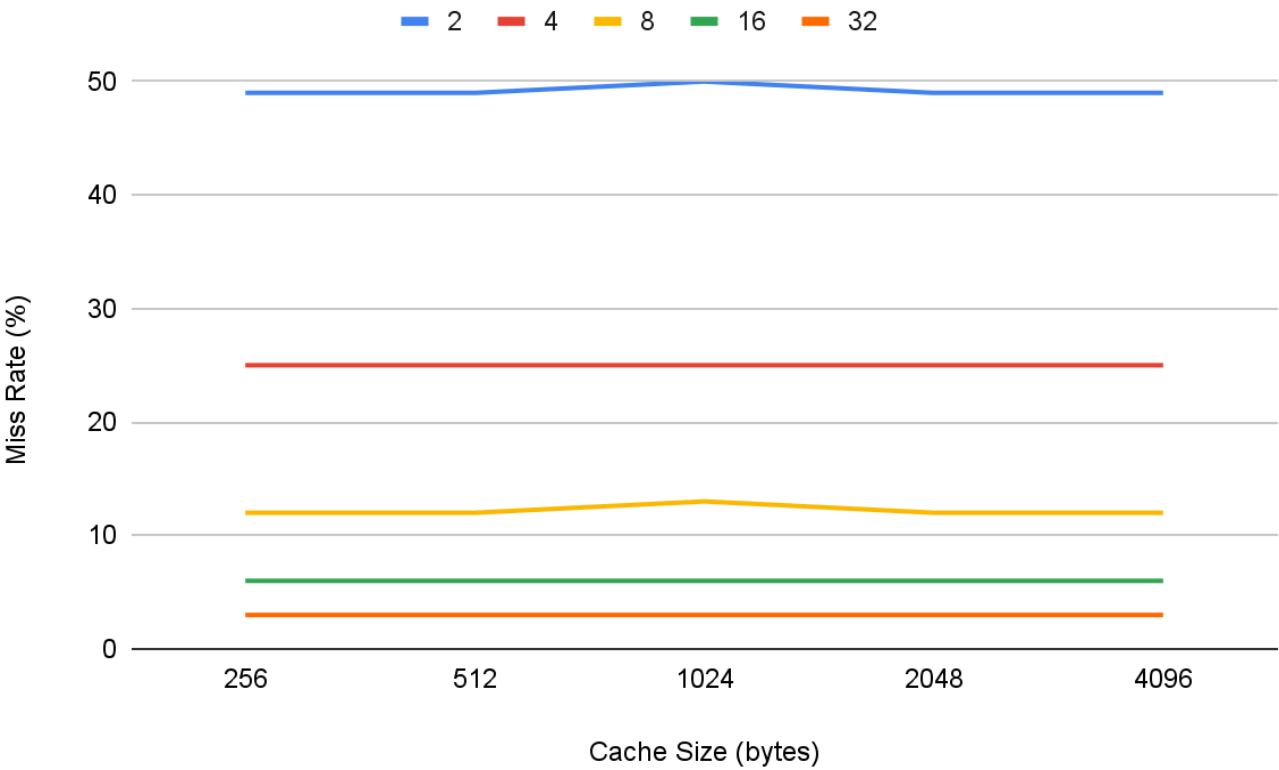
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03/05/2024

a) Direct Mapped Caches (Matrix Size = 50)

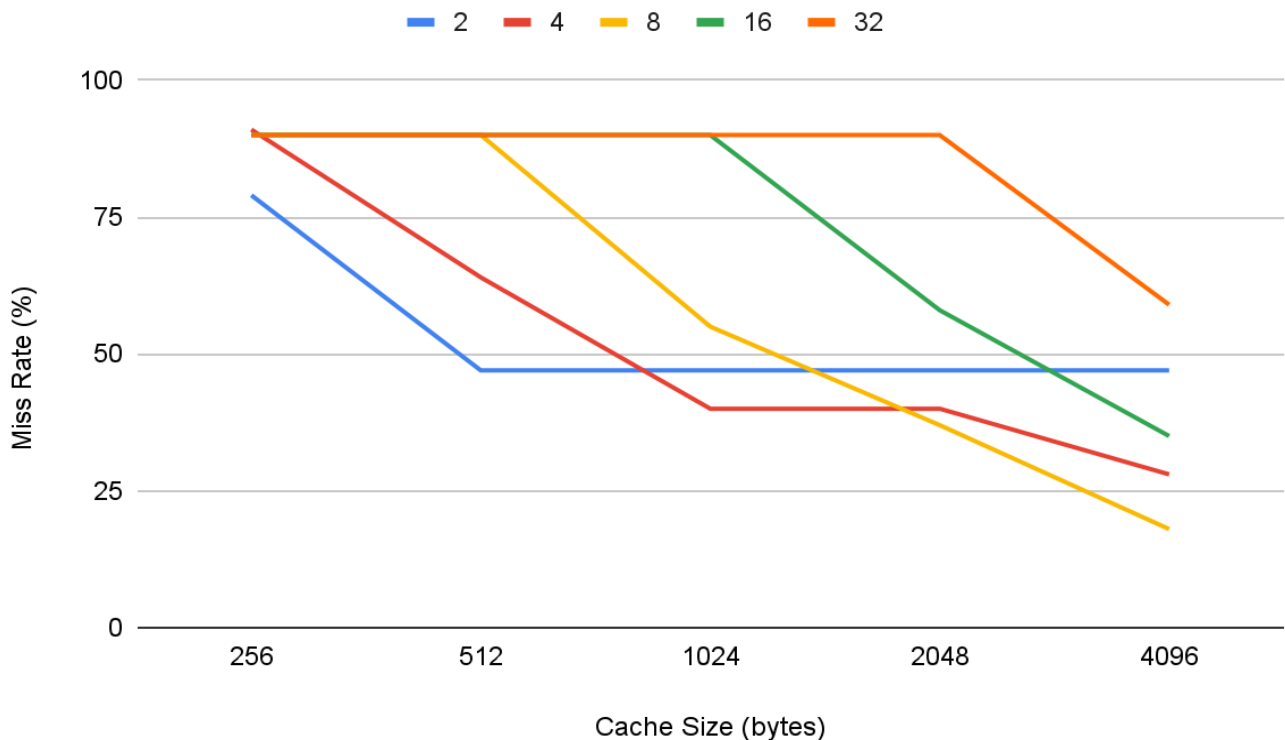
Hit-Miss Rates and Number of Misses for Direct Mapped Row-Major Summation

Cache Size (bytes) / Block Size (words)	2	4	8	16	32
256	Hit Rate: %51 Miss Rate: %49 Number of misses: 5039	Hit Rate: %75 Miss Rate: %25 Number of misses: 2521	Hit Rate: %88 Miss Rate: %12 Number of misses: 1261	Hit Rate: %94 Miss Rate: %6 Number of misses: 633	Hit Rate: %97 Miss Rate: %3 Number of misses: 319
512	Hit Rate: %51 Miss Rate: %49 Number of misses: 5039	Hit Rate: %75 Miss Rate: %25 Number of misses: 2521	Hit Rate: %88 Miss Rate: %12 Number of misses: 1262	Hit Rate: %94 Miss Rate: %6 Number of misses: 627	Hit Rate: %97 Miss Rate: %3 Number of misses: 315
1024	Hit Rate: %50 Miss Rate: %50 Number of misses: 5006	Hit Rate: %75 Miss Rate: %25 Number of misses: 2504	Hit Rate: %87 Miss Rate: %13 Number of misses: 1252	Hit Rate: %94 Miss Rate: %6 Number of Misses: 632	Hit Rate: %97 Miss Rate: %3 Number of Misses: 318
2048	Hit Rate: %51 Miss Rate: %49 Number of Misses: 5039	Hit Rate: %75 Miss Rate: %25 Number of Misses: 2521	Hit Rate: %88 Miss Rate: %12 Number of Misses: 1261	Hit Rate: %94 Miss Rate: %6 Number of Misses: 632	Hit Rate: %97 Miss Rate: %3 Number of Misses: 318
4096	Hit Rate: %51 Miss Rate: %49 Number of Misses: 5039	Hit Rate: %75 Miss Rate: %25 Number of Misses: 2521	Hit Rate: %88 Miss Rate: %12 Number of Misses: 1261	Hit Rate: %94 Miss Rate: %6 Number of Misses: 632	Hit Rate: %97 Miss Rate: %3 Number of Misses: 318



Hit-Miss Rates and Number of Misses for Direct Mapped Column-Major Summation

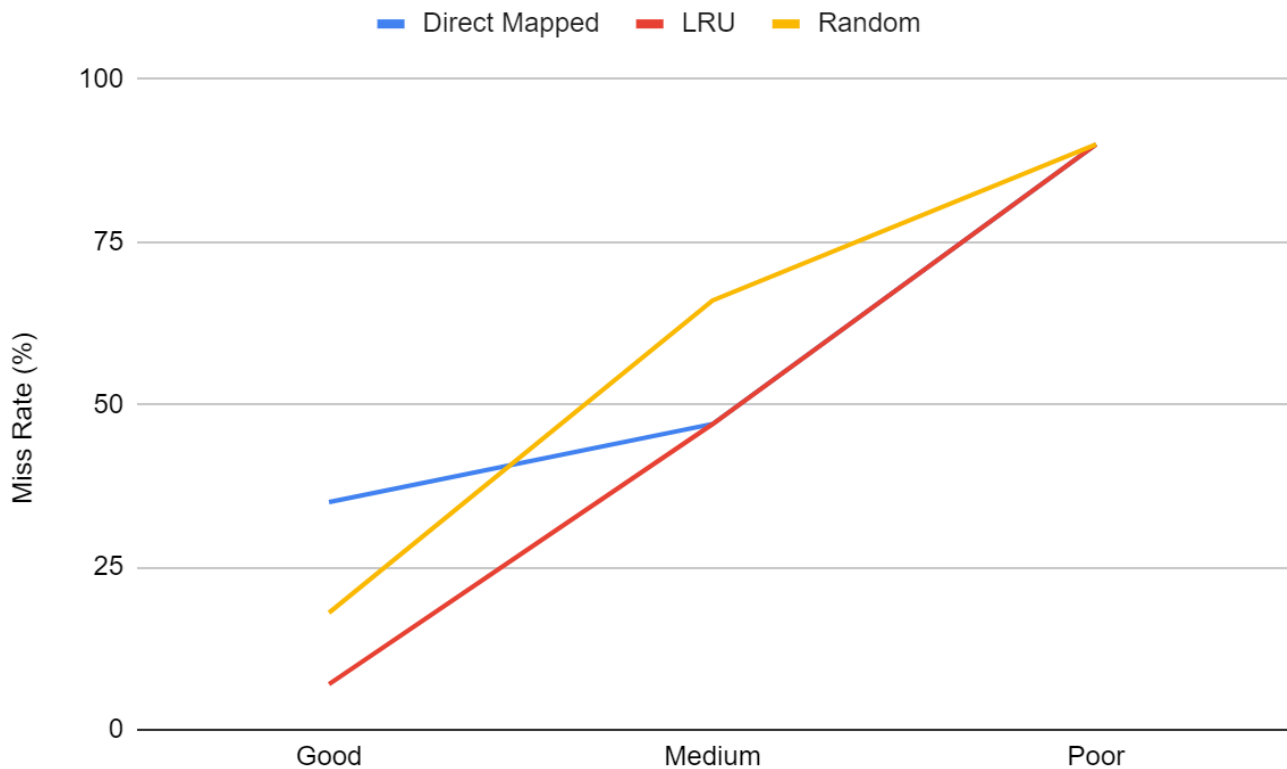
Cache Size (bytes) / Block Size (words)	2	4	8	16	32
256	Hit Rate: %21 Miss Rate: %79 Number of Misses: 2195	Hit Rate: %9 Miss Rate: %91 Number of Misses: 2523	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2513	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2508	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2506
512	Hit Rate: %53 Miss Rate: %47 Number of Misses: 1295	Hit Rate: %36 Miss Rate: %64 Number of Misses: 1789	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2513	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2507	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2505
1024	Hit Rate: %53 Miss Rate: %47 Number of Misses: 1295	Hit Rate: %60 Miss Rate: %40 Number of Misses: 1115	Hit Rate: %45 Miss Rate: %55 Number of Misses: 1537	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2507	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2505
2048	Hit Rate: %53 Miss Rate: %47 Number of Misses: 1295	Hit Rate: %60 Miss Rate: %40 Number of Misses: 1115	Hit Rate: %63 Miss Rate: %37 Number of Misses: 1025	Hit Rate: %42 Miss Rate: %58 Number of Misses: 1620	Hit Rate: %10 Miss Rate: %90 Number of Misses: 2505
4096	Hit Rate: %53 Miss Rate: %47 Number of Misses: 1295	Hit Rate: %72 Miss Rate: %28 Number of Misses: 3634	Hit Rate: %82 Miss Rate: %18 Number of Misses: 2285	Hit Rate: %65 Miss Rate: %35 Number of Misses: 979	Hit Rate: %41 Miss Rate: %59 Number of Misses: 1638



b) Fully Associative Caches (Matrix Size = 50)

Miss Rates and Number of Misses for Different Replacement Policies

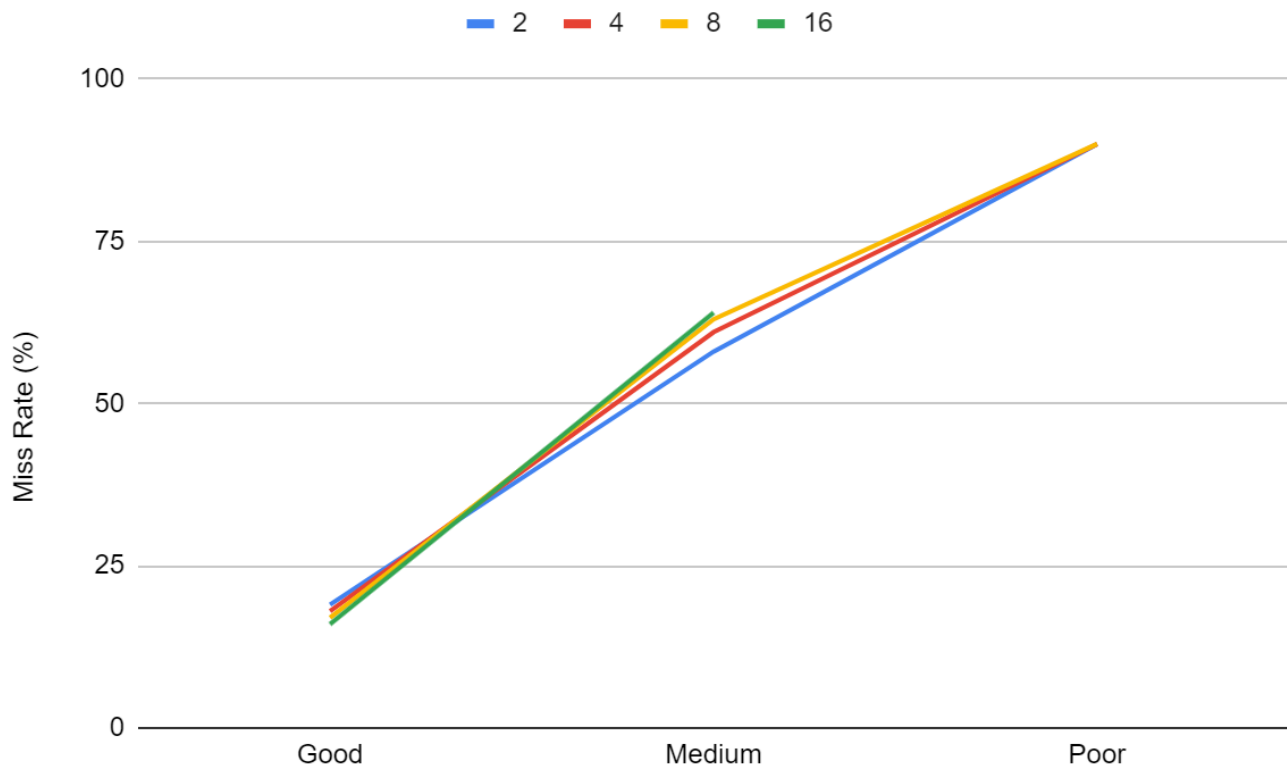
Replacement Policy / Hit Rate	Hit Rate: Good Cache Size (bytes): 4096 Block Size(words): 16	Hit Rate: Medium Cache Size (bytes): 512 Block Size(words): 2	Hit Rate: Poor Cache Size (bytes): 512 Block Size(words): 16
Direct Mapped	Miss Rate: %35 Number of Misses: 979	Miss Rate: %47 Number of Misses: 1295	Miss Rate: %90 Number of Misses: 2507
LRU	Miss Rate: %7 Number of Misses: 207	Miss Rate: %47 Number of Misses: 1295	Miss Rate: %90 Number of Misses: 2507
Random	Miss Rate: %18 Number of Misses: 493	Miss Rate: %66 Number of Misses: 1827	Miss Rate: %90 Number of Misses: 2503



c) N-way Set Associative Caches (Matrix Size = 50)

Miss Rates and Number of Misses for N-way Caches

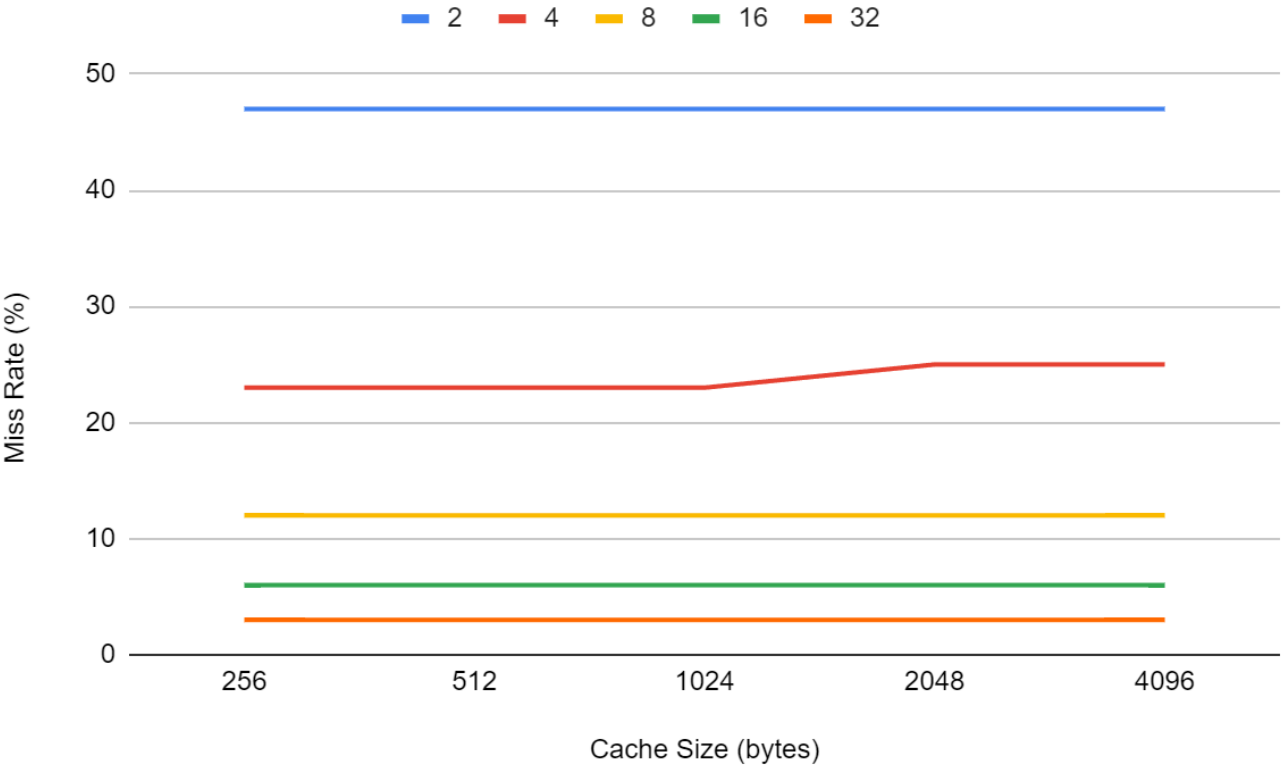
N-way / Hit Rate	Hit Rate: Good Cache Size (bytes): 4096 Block Size(words): 16	Hit Rate: Medium Cache Size (bytes): 512 Block Size(words): 2	Hit Rate: Poor Cache Size (bytes): 512 Block Size(words): 16
2	Miss Rate: %19 Number of Misses: 538	Miss Rate: %58 Number of Misses: 1617	Miss Rate: %90 Number of Misses: 2507
4	Miss Rate: %18 Number of Misses: 498	Miss Rate: %61 Number of Misses: 1707	Miss Rate: %90 Number of Misses: 2506
8	Miss Rate: %17 Number of Misses: 468	Miss Rate: %63 Number of Misses: 1753	Miss Rate: %90 Number of Misses: 2502
16	Miss Rate: %16 Number of Misses: 451	Miss Rate: %64 Number of Misses: 1779	-



a) Direct Mapped Caches (Matrix Size = 25)

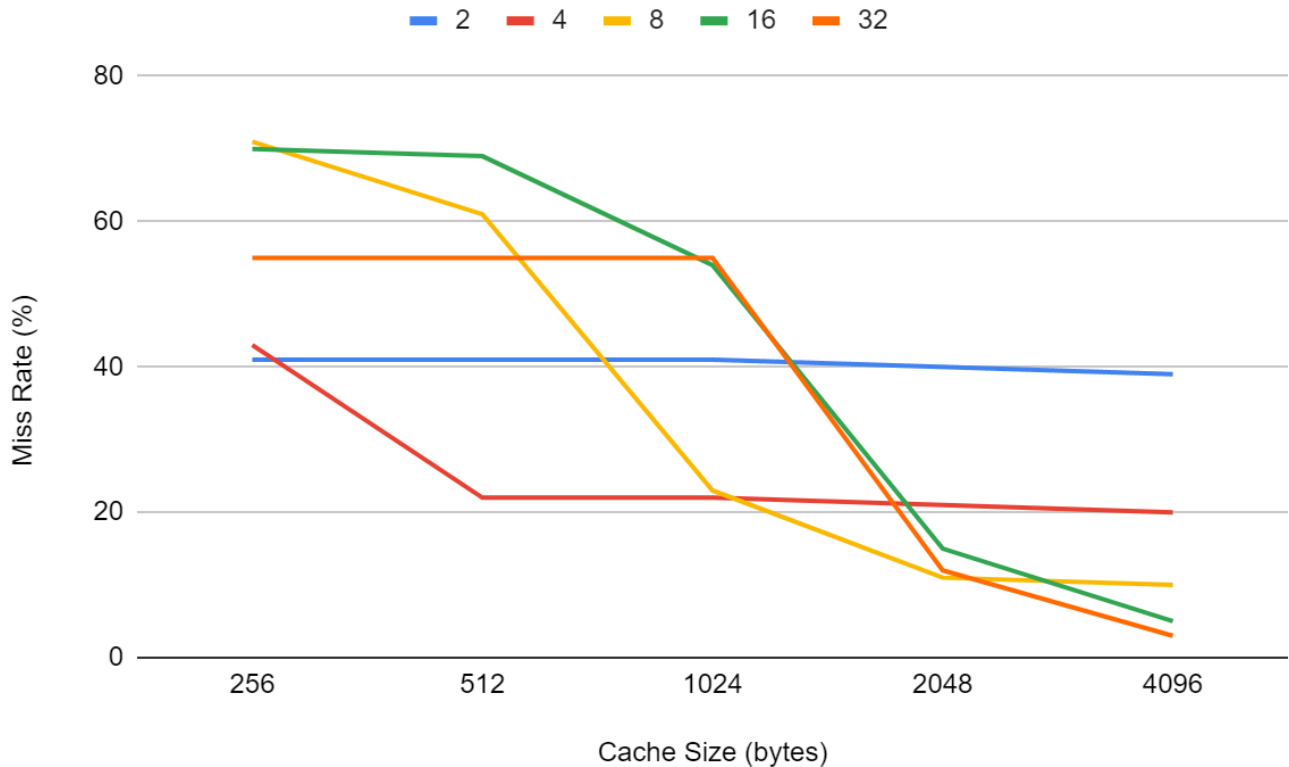
Hit-Miss Rates and Number of Misses for Direct Mapped Row-Major Summation

Cache Size (bytes) / Block Size (words)	2	4	8	16	32
256	Hit Rate: %53 Miss Rate: %47 Number of misses: 1289	Hit Rate: %77 Miss Rate: %23 Number of misses: 646	Hit Rate: %88 Miss Rate: %12 Number of misses: 324	Hit Rate: %94 Miss Rate: %6 Number of misses: 165	Hit Rate: %97 Miss Rate: %3 Number of misses: 85
512	Hit Rate: %53 Miss Rate: %47 Number of misses: 1289	Hit Rate: %77 Miss Rate: %23 Number of misses: 646	Hit Rate: %88 Miss Rate: %12 Number of misses: 324	Hit Rate: %94 Miss Rate: %6 Number of misses: 164	Hit Rate: %97 Miss Rate: %3 Number of misses: 84
1024	Hit Rate: %53 Miss Rate: %47 Number of misses: 1289	Hit Rate: %77 Miss Rate: %23 Number of misses: 646	Hit Rate: %88 Miss Rate: %12 Number of misses: 324	Hit Rate: %94 Miss Rate: %6 Number of Misses: 164	Hit Rate: %97 Miss Rate: %3 Number of Misses: 84
2048	Hit Rate: %53 Miss Rate: %47 Number of Misses: 1289	Hit Rate: %77 Miss Rate: %25 Number of Misses: 646	Hit Rate: %88 Miss Rate: %12 Number of Misses: 324	Hit Rate: %94 Miss Rate: %6 Number of Misses: 164	Hit Rate: %97 Miss Rate: %3 Number of Misses: 84
4096	Hit Rate: %53 Miss Rate: %47 Number of Misses: 1289	Hit Rate: %77 Miss Rate: %25 Number of Misses: 646	Hit Rate: %88 Miss Rate: %12 Number of Misses: 324	Hit Rate: %94 Miss Rate: %6 Number of Misses: 164	Hit Rate: %97 Miss Rate: %3 Number of Misses: 84



Hit-Miss Rates and Number of Misses for Direct Mapped Column-Major Summation

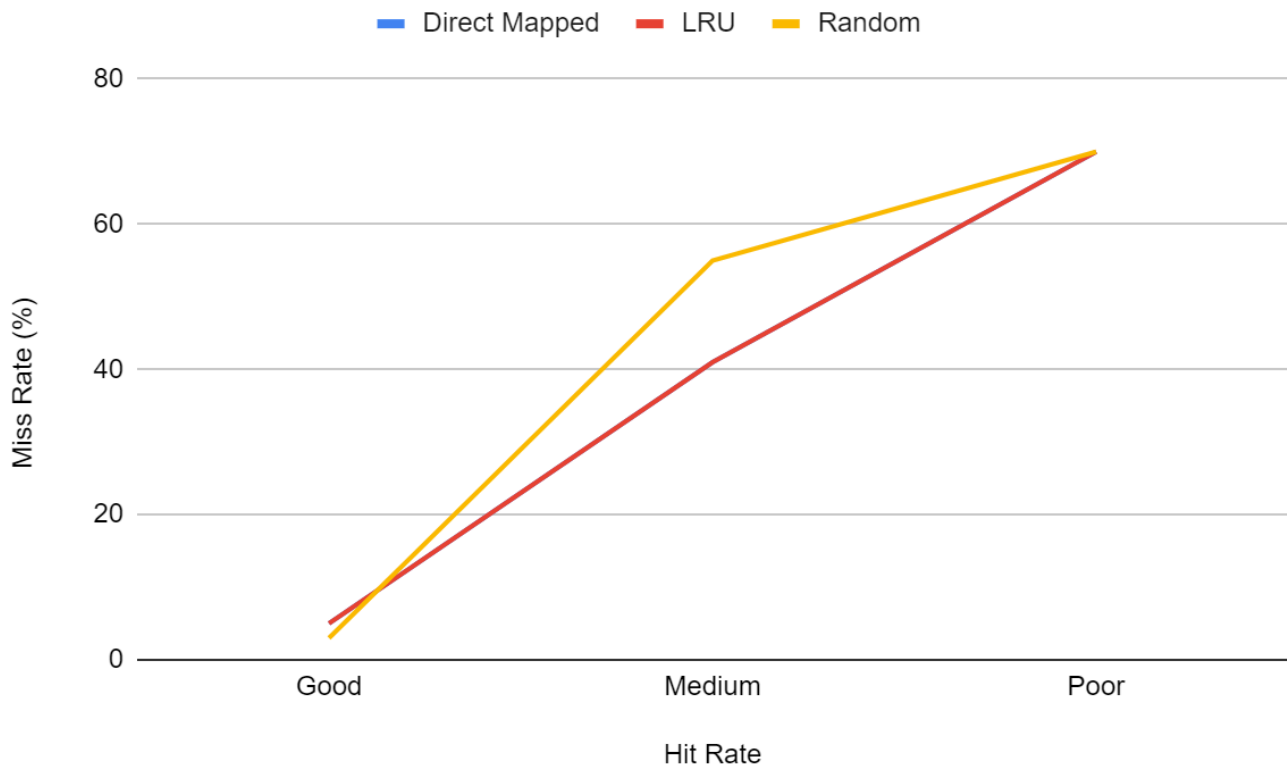
Cache Size (bytes) / Block Size (words)	2	4	8	16	32
256	Hit Rate: %59 Miss Rate: %41 Number of Misses: 370	Hit Rate: %57 Miss Rate: %43 Number of Misses: 390	Hit Rate: %29 Miss Rate: %71 Number of Misses: 638	Hit Rate: %30 Miss Rate: %70 Number of Misses: 633	Hit Rate: %45 Miss Rate: %55 Number of Misses: 498
512	Hit Rate: %59 Miss Rate: %41 Number of Misses: 370	Hit Rate: %78 Miss Rate: %22 Number of Misses: 198	Hit Rate: %39 Miss Rate: %61 Number of Misses: 548	Hit Rate: %31 Miss Rate: %69 Number of Misses: 626	Hit Rate: %45 Miss Rate: %55 Number of Misses: 497
1024	Hit Rate: %59 Miss Rate: %41 Number of Misses: 370	Hit Rate: %78 Miss Rate: %22 Number of Misses: 198	Hit Rate: %77 Miss Rate: %23 Number of Misses: 203	Hit Rate: %46 Miss Rate: %54 Number of Misses: 498	Hit Rate: %45 Miss Rate: %55 Number of Misses: 497
2048	Hit Rate: %60 Miss Rate: %40 Number of Misses: 362	Hit Rate: %79 Miss Rate: %21 Number of Misses: 186	Hit Rate: %89 Miss Rate: %11 Number of Misses: 99	Hit Rate: %85 Miss Rate: %15 Number of Misses: 136	Hit Rate: %78 Miss Rate: %12 Number of Misses: 201
4096	Hit Rate: %61 Miss Rate: %39 Number of Misses: 352	Hit Rate: %80 Miss Rate: %20 Number of Misses: 177	Hit Rate: %90 Miss Rate: %10 Number of Misses: 90	Hit Rate: %95 Miss Rate: %5 Number of Misses: 46	Hit Rate: %97 Miss Rate: %3 Number of Misses: 24



b) Fully Associative Caches (Matrix Size = 25)

Miss Rates and Number of Misses for Different Replacement Policies

Replacement Policy / Hit Rate	Hit Rate: Good Cache Size (bytes): 4096 Block Size(words): 16	Hit Rate: Medium Cache Size (bytes): 512 Block Size(words): 2	Hit Rate: Poor Cache Size (bytes): 512 Block Size(words): 16
Direct Mapped	Miss Rate: %5 Number of Misses: 46	Miss Rate: %41 Number of Misses: 370	Miss Rate: %70 Number of Misses: 633
LRU	Miss Rate: %5 Number of Misses: 46	Miss Rate: %41 Number of Misses: 370	Miss Rate: %70 Number of Misses: 633
Random	Miss Rate: %3 Number of Misses: 46	Miss Rate: %55 Number of Misses: 498	Miss Rate: %70 Number of Misses: 631



c) N-way Set Associative Caches (Matrix Size = 25)

Miss Rates and Number of Misses for N-way Caches

N-way / Hit Rate	Hit Rate: Good Cache Size (bytes): 4096 Block Size(words): 16	Hit Rate: Medium Cache Size (bytes): 512 Block Size(words): 2	Hit Rate: Poor Cache Size (bytes): 512 Block Size(words): 16
2	Miss Rate: %5 Number of Misses: 46	Miss Rate: %50 Number of Misses: 454	Miss Rate: %70 Number of Misses: 633
4	Miss Rate: %5 Number of Misses: 46	Miss Rate: %41 Number of Misses: 370	Miss Rate: %70 Number of Misses: 633
8	Miss Rate: %5 Number of Misses: 46	Miss Rate: %41 Number of Misses: 370	-
16	Miss Rate: %5 Number of Misses: 46	Miss Rate: %41 Number of Misses: 370	-

