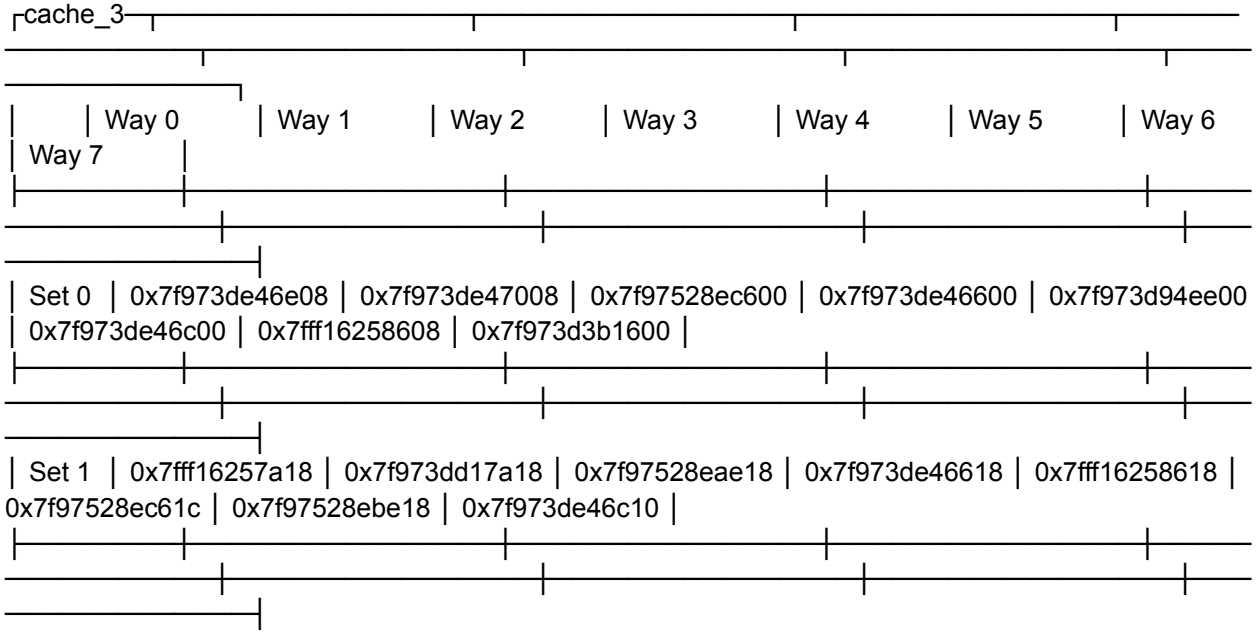
Gather Operation:

Varying Block Size :

Matrix Size 128x128:

Block Size 16

Number of instructions: 184040
Total cycles taken: 5496376
cache_3
    Number of accesses: 5948
    Number of hits: 3178
    Number of misses: 2770
cache_2
    Number of accesses: 38811
    Number of hits: 32660
    Number of misses: 6151
cache_1
    Number of accesses: 184040
    Number of hits: 136195
    Number of misses: 47845
AMATs:
{'cache_1': 28.467450815132374,
 'cache_2': 105.65596505417415,
 'cache_3': 565.7027572293208,
 'mem': 1000}



Set 2	0x7fff16258620	0x7f97528eb028	0x7f973de46628	0x7f97528ebe20	0x7f973de46220	0x7f973d5cd020	0x7f973de46428	0x7f973d3b0a28
Set 3	0x7f97528eba38	0x7f973dd18430	0x7fff16257a30	0x605230	0x604e38	0x7f97528ebe3c	0x7f973de46230	0x7fff16258638
Set 4	0x7fff16258640	0x7fff16257a48	0x7f973dd19840	0x7f97528ec248	0x7f973dd17040	0x7f973dd16a48	0x7f973d5ccc40	0x7f973d3b2848
.								
.								
.								
Set 31	0x7fff162585f0	0x7f97528ec7f8	0x7f973de46ff8	0x7f97528ec5f8	0x7f973dd0d7f8	0x7f973d94edf0	0x7f973d94eff0	0x7f973d5ccff8

cache_2

	Way 0	Way 1	Way 2	Way 3
Set 0	0x7f973d3b1d0c	0x7f973d3b1700	0x7f973d3b1600	0x7fff16258604
Set 1	0x7f973de46918	0x7f973de46c10	0x7f97528eae18	0x7fff16258610
Set 2	0x7f973d3b1d28	0x7f97528eb020	0x7f973d3b1620	0x7f973d3b0a28
Set 3	0x7f973dd16330	0x7fff16258638	0x7f973d3b1d30	0x7f973d94f134

Set 4	0x7fff16258648	0x7f973d3b5740	0x7f973d3b2848	0x7f973d3b1748
.				
.				
.				
Set 15	0x7f973d5ccff8	0x7f973de472fc	0x7f973de470f0	0x7f97528ebaf8

cache_1

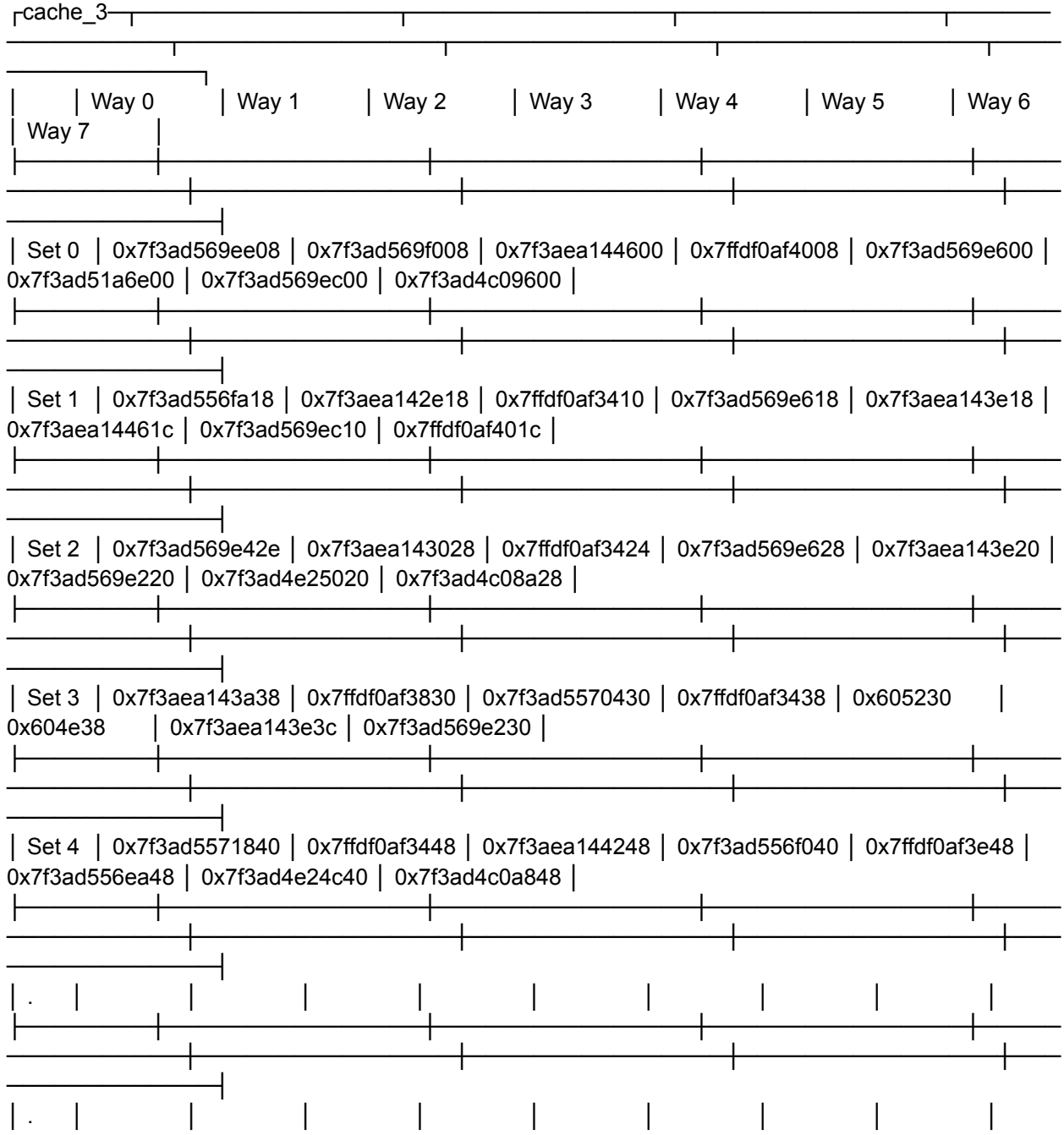
	Way 0	Way 1
Set 0	0x7f973d3b0a80	0x7fff16258604
Set 1	0x7fff16258598	0x7fff16258618
Set 2	0x7f973d3b17a0	0x7f973d3b0a28
Set 3	0x7f973d3b2830	0x7fff16258638
Set 4	0x7f973d3b2844	0x7fff16258648
Set 5	0x7f973d3b5750	0x7fff16258650
Set 6	0x7fff16258660	0x7f973d3afe68
Set 7	0x7fff16258670	0x7fff162585f8

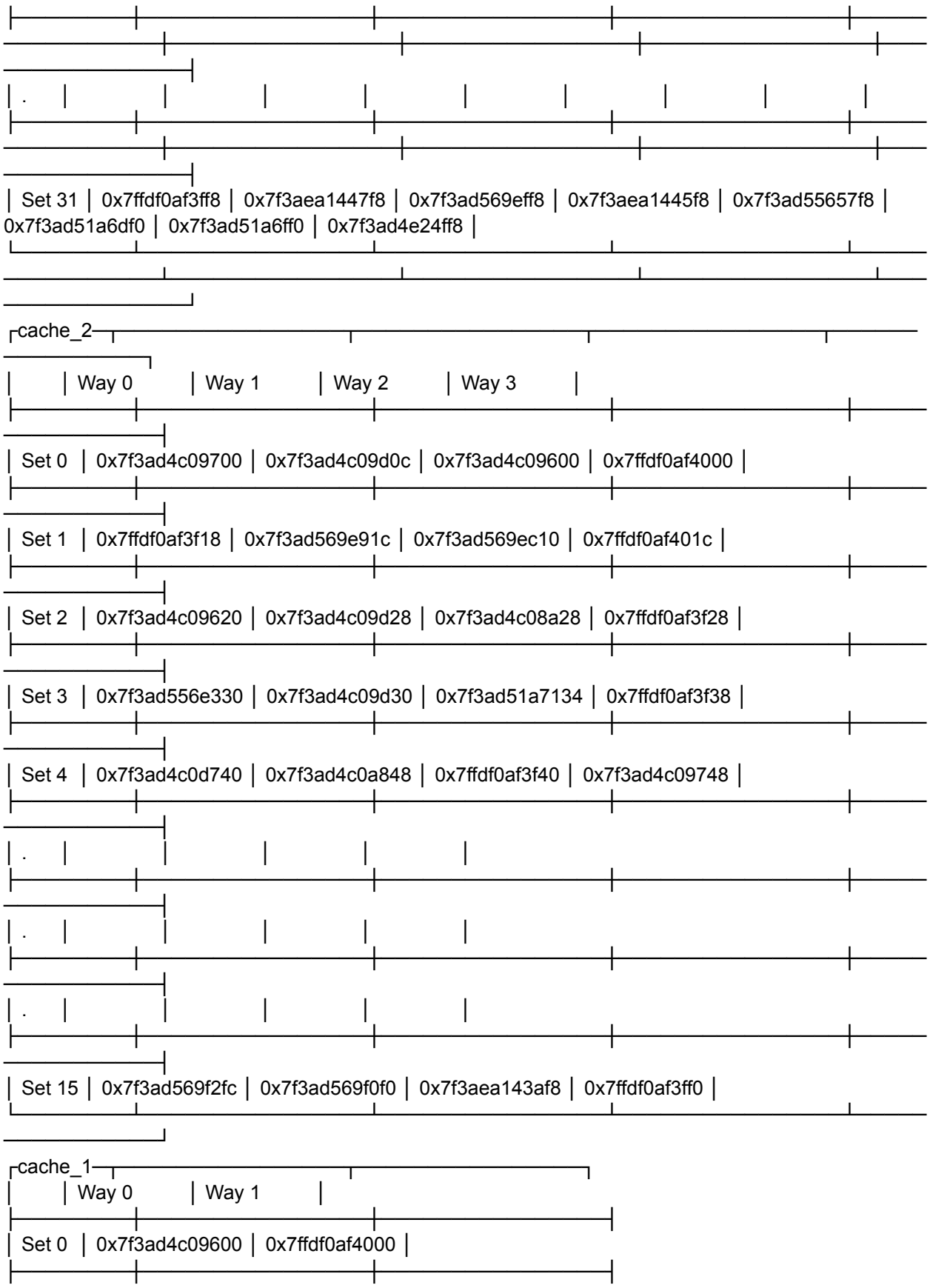
real 1m40.900s
user 0m10.144s
sys 0m1.051s

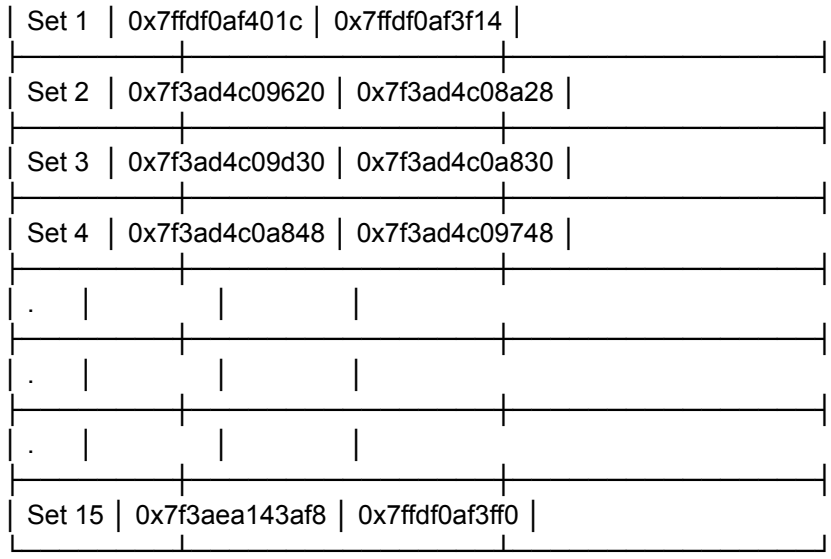
Block Size 32

Number of instructions: 184040
Total cycles taken: 5000588
cache_3
    Number of accesses: 5500
    Number of hits: 2719
    Number of misses: 2781
cache_2
    Number of accesses: 21631

Number of hits: 15841
Number of misses: 5790
cache_1
Number of accesses: 184040
Number of hits: 159743
Number of misses: 24297
AMATs:
{'cache_1': 24.514322372133957,
'cache_2': 178.11153185033268,
'cache_3': 605.6363636363637,
'mem': 1000}



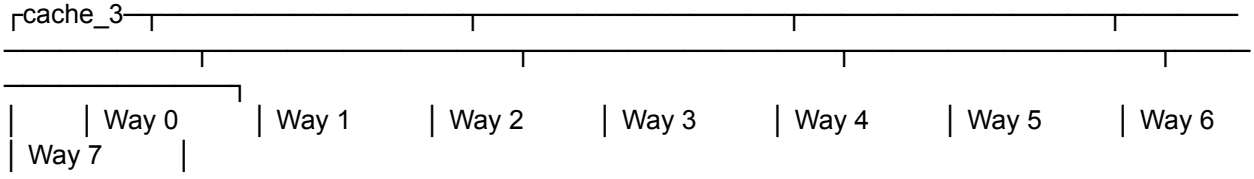

.
Set 31 | 0x7ffdf0af3ff8 | 0x7f3aea1447f8 | 0x7f3ad569eff8 | 0x7f3aea1445f8 | 0x7f3ad55657f8 | 0x7f3ad51a6df0 | 0x7f3ad51a6ff0 | 0x7f3ad4e24ff8 |
cache_2
Way 0
Way 1
Way 2
Way 3
Set 0 | 0x7f3ad4c09700 | 0x7f3ad4c09d0c | 0x7f3ad4c09600 | 0x7ffdf0af4000 |
Set 1 | 0x7ffdf0af3f18 | 0x7f3ad569e91c | 0x7f3ad569ec10 | 0x7ffdf0af401c |
Set 2 | 0x7f3ad4c09620 | 0x7f3ad4c09d28 | 0x7f3ad4c08a28 | 0x7ffdf0af3f28 |
Set 3 | 0x7f3ad556e330 | 0x7f3ad4c09d30 | 0x7f3ad51a7134 | 0x7ffdf0af3f38 |
Set 4 | 0x7f3ad4c0d740 | 0x7f3ad4c0a848 | 0x7ffdf0af3f40 | 0x7f3ad4c09748 |
.
.
.
Set 15 | 0x7f3ad569f2fc | 0x7f3ad569f0f0 | 0x7f3aea143af8 | 0x7ffdf0af3ff0 |
cache_1
Way 0
Way 1
Set 0 | 0x7f3ad4c09600 | 0x7ffdf0af4000 |

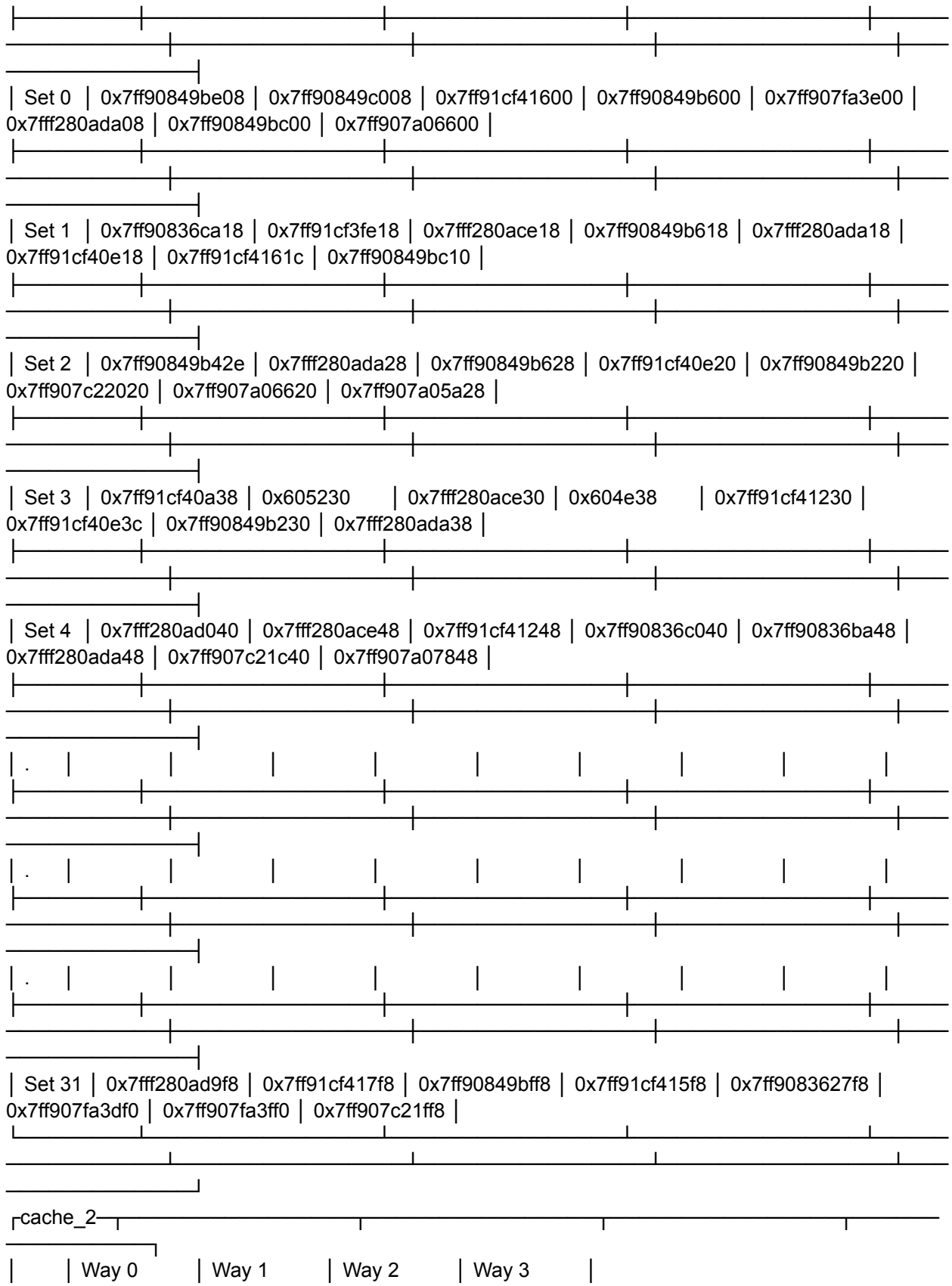


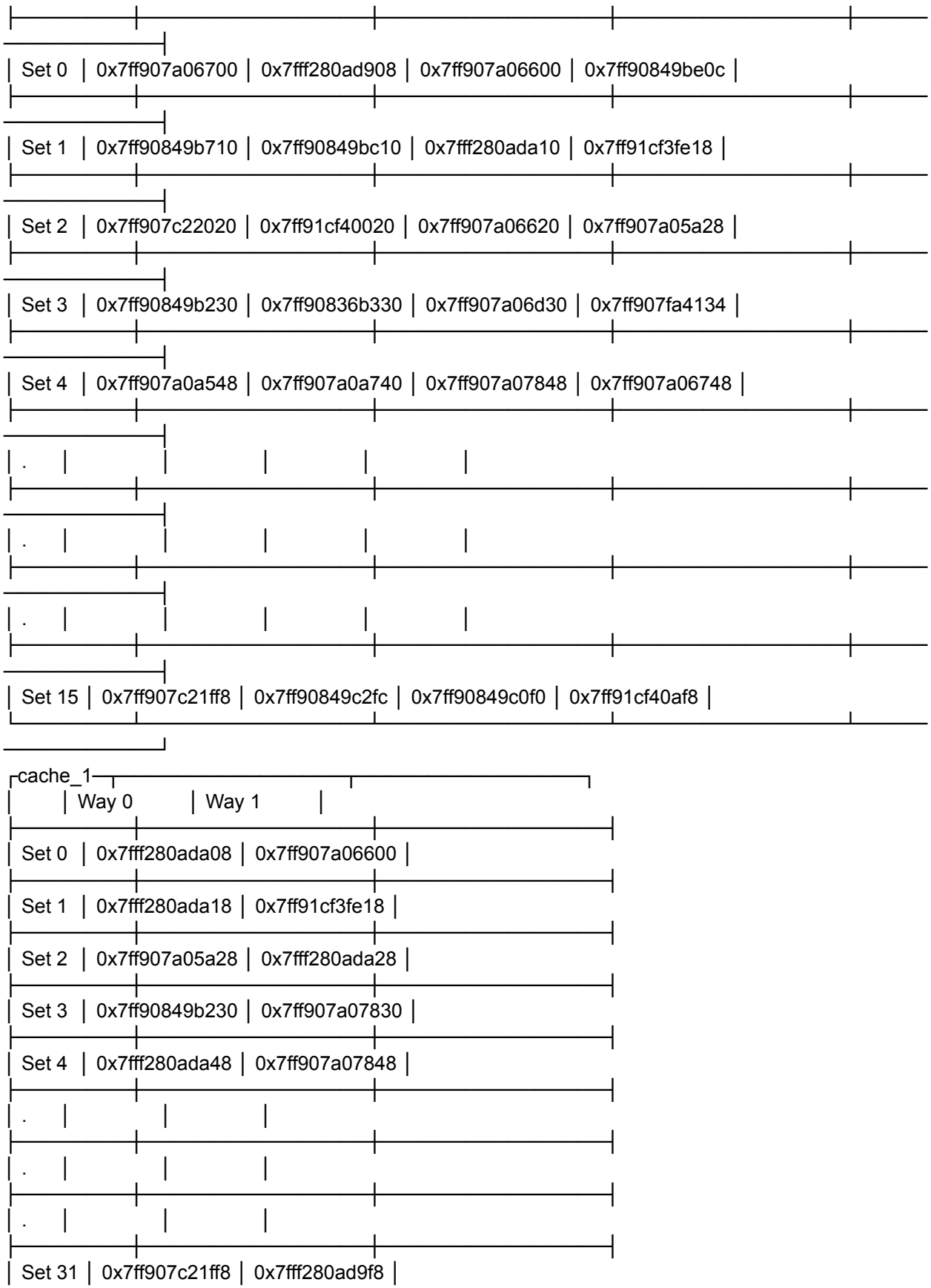
real 2m24.613s
user 0m9.614s
sys 0m0.956s
gather_traces_stats

Block Size 64

Number of instructions: 184040
Total cycles taken: 4479360
cache_3
Number of accesses: 4027
Number of hits: 1292
Number of misses: 2735
cache_2
Number of accesses: 9720
Number of hits: 5489
Number of misses: 4231
cache_1
Number of accesses: 184040
Number of hits: 172423
Number of misses: 11617
AMATs:
{'cache_1': 23.418556597297083,
'cache_2': 355.16150091818497,
'cache_3': 779.1656319841073,
'mem': 1000}




Set 0	0x7ff90849be08	0x7ff90849c008	0x7ff91cf41600	0x7ff90849b600	0x7ff907fa3e00	0x7fff280ada08	0x7ff90849bc00	0x7ff907a06600
Set 1	0x7ff90836ca18	0x7ff91cf3fe18	0x7fff280ace18	0x7ff90849b618	0x7fff280ada18	0x7ff91cf40e18	0x7ff91cf4161c	0x7ff90849bc10
Set 2	0x7ff90849b42e	0x7fff280ada28	0x7ff90849b628	0x7ff91cf40e20	0x7ff90849b220	0x7ff907c22020	0x7ff907a06620	0x7ff907a05a28
Set 3	0x7ff91cf40a38	0x605230	0x7fff280ace30	0x604e38	0x7ff91cf41230	0x7ff91cf40e3c	0x7ff90849b230	0x7fff280ada38
Set 4	0x7fff280ad040	0x7fff280ace48	0x7ff91cf41248	0x7ff90836c040	0x7ff90836ba48	0x7fff280ada48	0x7ff907c21c40	0x7ff907a07848
.
.
.
Set 31	0x7fff280ad9f8	0x7ff91cf417f8	0x7ff90849bff8	0x7ff91cf415f8	0x7ff9083627f8	0x7ff907fa3df0	0x7ff907fa3ff0	0x7ff907c21ff8
cache_2
	Way 0	Way 1	Way 2	Way 3


Set 0 | 0x7ff907a06700 | 0x7fff280ad908 | 0x7ff907a06600 | 0x7ff90849be0c |
Set 1 | 0x7ff90849b710 | 0x7ff90849bc10 | 0x7fff280ada10 | 0x7ff91cf3fe18 |
Set 2 | 0x7ff907c22020 | 0x7ff91cf40020 | 0x7ff907a06620 | 0x7ff907a05a28 |
Set 3 | 0x7ff90849b230 | 0x7ff90836b330 | 0x7ff907a06d30 | 0x7ff907fa4134 |
Set 4 | 0x7ff907a0a548 | 0x7ff907a0a740 | 0x7ff907a07848 | 0x7ff907a06748 |
Set 15 | 0x7ff907c21ff8 | 0x7ff90849c2fc | 0x7ff90849c0f0 | 0x7ff91cf40af8 |
cache_1
Way 0
Way 1
Set 0 | 0x7fff280ada08 | 0x7ff907a06600 |
Set 1 | 0x7fff280ada18 | 0x7ff91cf3fe18 |
Set 2 | 0x7ff907a05a28 | 0x7fff280ada28 |
Set 3 | 0x7ff90849b230 | 0x7ff907a07830 |
Set 4 | 0x7fff280ada48 | 0x7ff907a07848 |
Set 31 | 0x7ff907c21ff8 | 0x7fff280ad9f8 |

```
real    1m36.147s
user    0m9.165s
sys     0m0.980s
```

Matrix Size 150x150:

Block Size 16

Number of instructions: 188395

Total cycles taken: 5629227

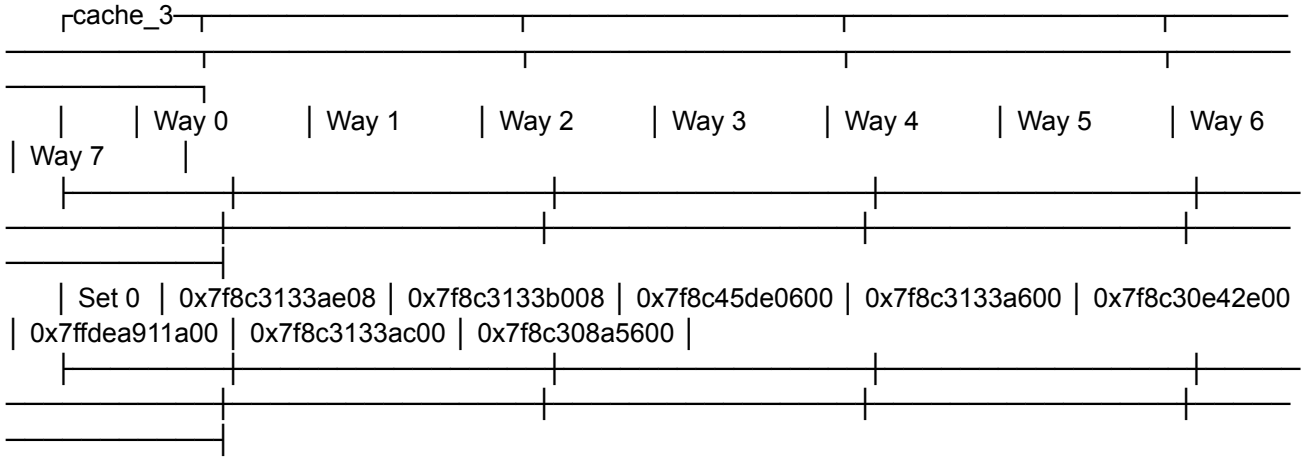
cache_3
- Number of accesses: 5953
- Number of hits: 3054
- Number of misses: 2899

cache_2
- Number of accesses: 41033
- Number of hits: 34845
- Number of misses: 6188

cache_1
- Number of accesses: 188395
- Number of hits: 140965
- Number of misses: 47430

AMATs:

```
{'cache_1': 27.31377145734172,
 'cache_2': 104.51998679540151,
 'cache_3': 586.9813539391903,
 'mem': 1000}
```



| Set 1 | 0x7f8c308a5610 | 0x7f8c3120ba18 | 0x7f8c45ddee18 | 0x7f8c3133a618 | 0x7f8c45ddfe18 | 0x7f8c45de061c | 0x7ffdea911a1f | 0x7f8c3133ac10 |

| Set 2 | 0x7ffdea911a28 | 0x7f8c3133a42e | 0x7f8c45ddf028 | 0x7f8c3133a628 | 0x7f8c45ddfe20 | 0x7f8c3133a220 | 0x7f8c30ac1020 | 0x7f8c308a4a28 |

| Set 3 | 0x7f8c45ddfa38 | 0x7ffdea911038 | 0x7f8c3120c430 | 0x605230 | 0x604e38 | 0x7f8c45ddfe3c | 0x7f8c3133a230 | 0x7ffdea911a38 |

| Set 4 | 0x7ffdea911a48 | 0x7f8c3120e440 | 0x7f8c3120d840 | 0x7f8c45de0248 | 0x7f8c3120b040 | 0x7f8c3120aa48 | 0x7f8c30ac0c40 | 0x7f8c308a6848 |

| . |

| . |

| . |

| Set 31 | 0x7f8c45de07f8 | 0x7f8c3133aff8 | 0x7f8c45de05f8 | 0x7f8c312017f8 | 0x7ffdea9119f8 | 0x7f8c30e42df0 | 0x7f8c30e42ff0 | 0x7f8c30ac0ff8 |

cache_2

| | Way 0 | Way 1 | Way 2 | Way 3 |

| Set 0 | 0x7ffdea911b00 | 0x7f8c308a5d0c | 0x7f8c308a5700 | 0x7f8c308a5600 |

| Set 1 | 0x7ffdea911a18 | 0x7f8c3133a91c | 0x7f8c3133ac10 | 0x7ffdea911b1c |

Set 2	0x7f8c308a5620	0x7f8c308a5d28	0x7ffdea911a28	0x7f8c308a4a28
Set 3	0x7f8c3120a330	0x7f8c308a5d30	0x7ffdea911a38	0x7f8c30e43134
Set 4	0x7ffdea911a40	0x7f8c308a9740	0x7f8c308a6848	0x7f8c308a5748
.				
.				
.				
Set 15	0x7f8c3133b2fc	0x7f8c3133b0f0	0x7f8c45ddfaf8	0x7ffdea911af0

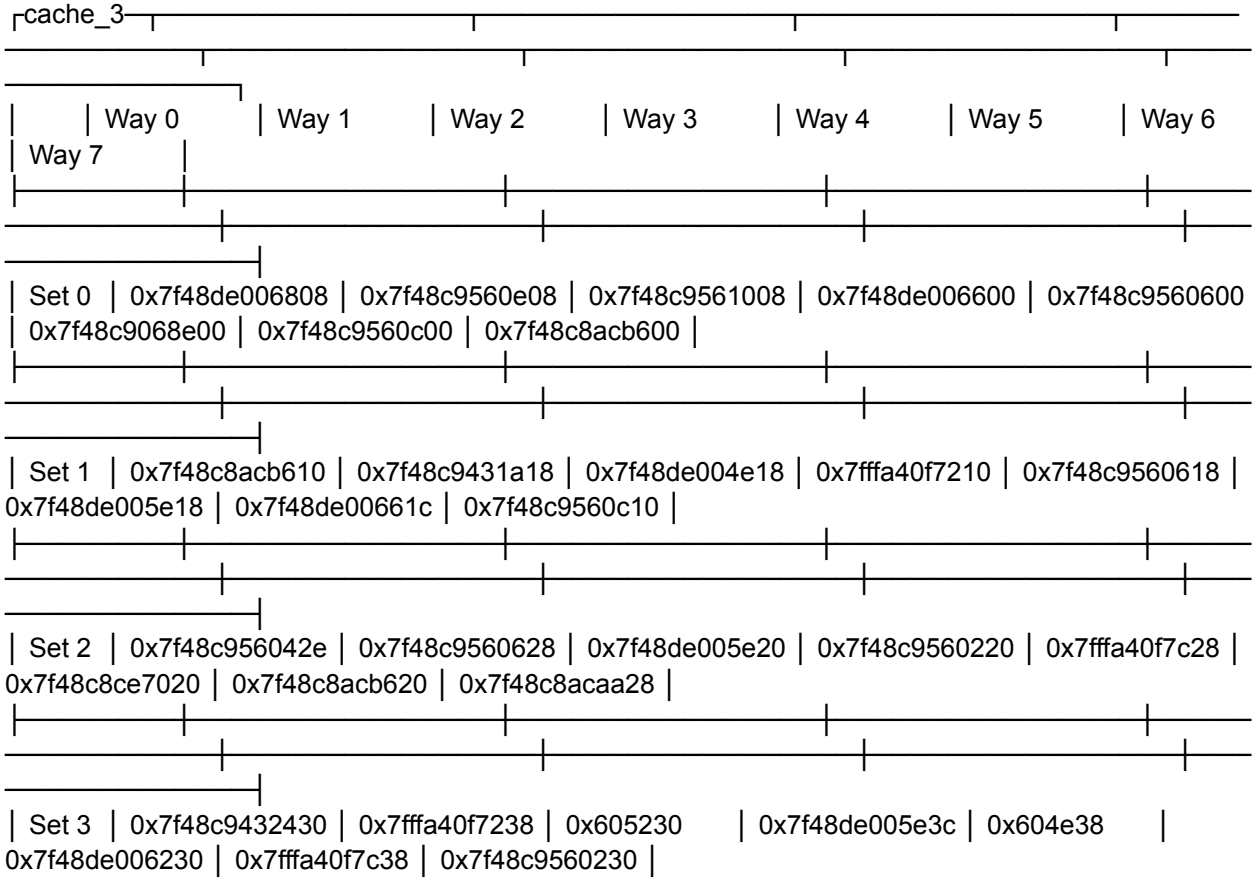
cache_1

	Way 0	Way 1
Set 0	0x7f8c308a4a80	0x7ffdea911b00
Set 1	0x7ffdea911a14	0x7ffdea911a94
Set 2	0x7f8c308a57a0	0x7f8c308a4a28
Set 3	0x7f8c308a5d30	0x7f8c308a6830
Set 4	0x7f8c308a6844	0x7ffdea911ac8
Set 5	0x7f8c308a9750	0x7ffdea911ad8
Set 6	0x7ffdea911ae0	0x7f8c308a3e68
Set 7	0x7ffdea911af0	0x7ffdea911a78

real 2m34.573s
user 0m10.223s
sys 0m1.079s

Block Size 32

Number of instructions: 188395
Total cycles taken: 5223015
cache_3
    Number of accesses: 5794
    Number of hits: 2846
    Number of misses: 2948
cache_2
    Number of accesses: 21311
    Number of hits: 15207
    Number of misses: 6104
cache_1
    Number of accesses: 188395
    Number of hits: 164820
    Number of misses: 23575
AMATs:
{'cache_1': 24.822904719537224,
 'cache_2': 190.37608206308443,
 'cache_3': 608.8022091819123,
 'mem': 1000}



Set 4	0x7f48c9433840	0x7fffa40f7248	0x7f48de006248	0x7f48c9431040	0x7fffa40f7c48	0x7f48c9430a48	0x7f48c8ce6c40	0x7f48c8acc848
.								
.								
.								
Set 31	0x7f48de0067f8	0x7f48c9560ff8	0x7f48de0065f8	0x7f48c94277f8	0x7f48c9068df0	0x7f48c9068ff0	0x7f48c8ce6ff8	0x7fffa40f7dfc

cache_2

	Way 0	Way 1	Way 2	Way 3
Set 0	0x7f48c8acb700	0x7f48c8acbd0c	0x7f48c8acb600	0x7fffa40f7d08
Set 1	0x7fffa40f7d18	0x7f48c956091c	0x7f48de004e18	0x7f48c9560c10
Set 2	0x7fffa40f7d28	0x7f48c8acb620	0x7f48c8acbd28	0x7f48c8acaa28
Set 3	0x7f48c9560230	0x7f48c9430330	0x7f48c8acbd30	0x7f48c9069134
Set 4	0x7f48c8acf740	0x7f48c8acc848	0x7fffa40f7d40	0x7f48c8acb748
.				
.				

.				
Set 15	0x7f48c95612fc	0x7f48c95610f0	0x7f48de005af8	0x7fffa40f7dfc

cache_1

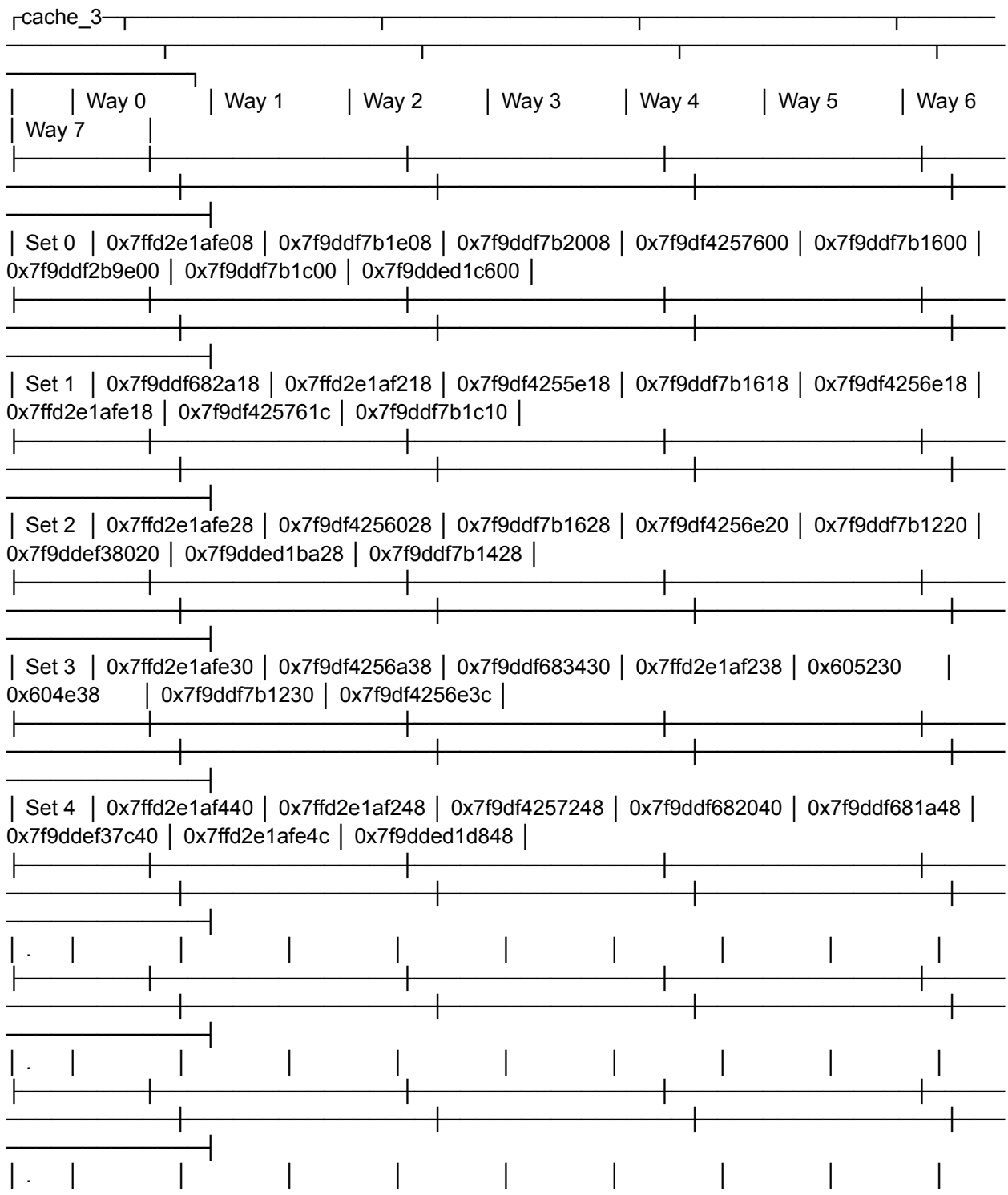
	Way 0	Way 1
Set 0	0x7f48c8acb700	0x7f48c8acb600
Set 1	0x7fffa40f7d18	0x7f48de004e18
Set 2	0x7f48c8acaa28	0x7fffa40f7d28
Set 3	0x7fffa40f7d38	0x7f48c8acc830
Set 4	0x7f48c8acc848	0x7f48c8acb748
.		
.		
.		
Set 15	0x7fffa40f7dfc	0x7fffa40f7cf4

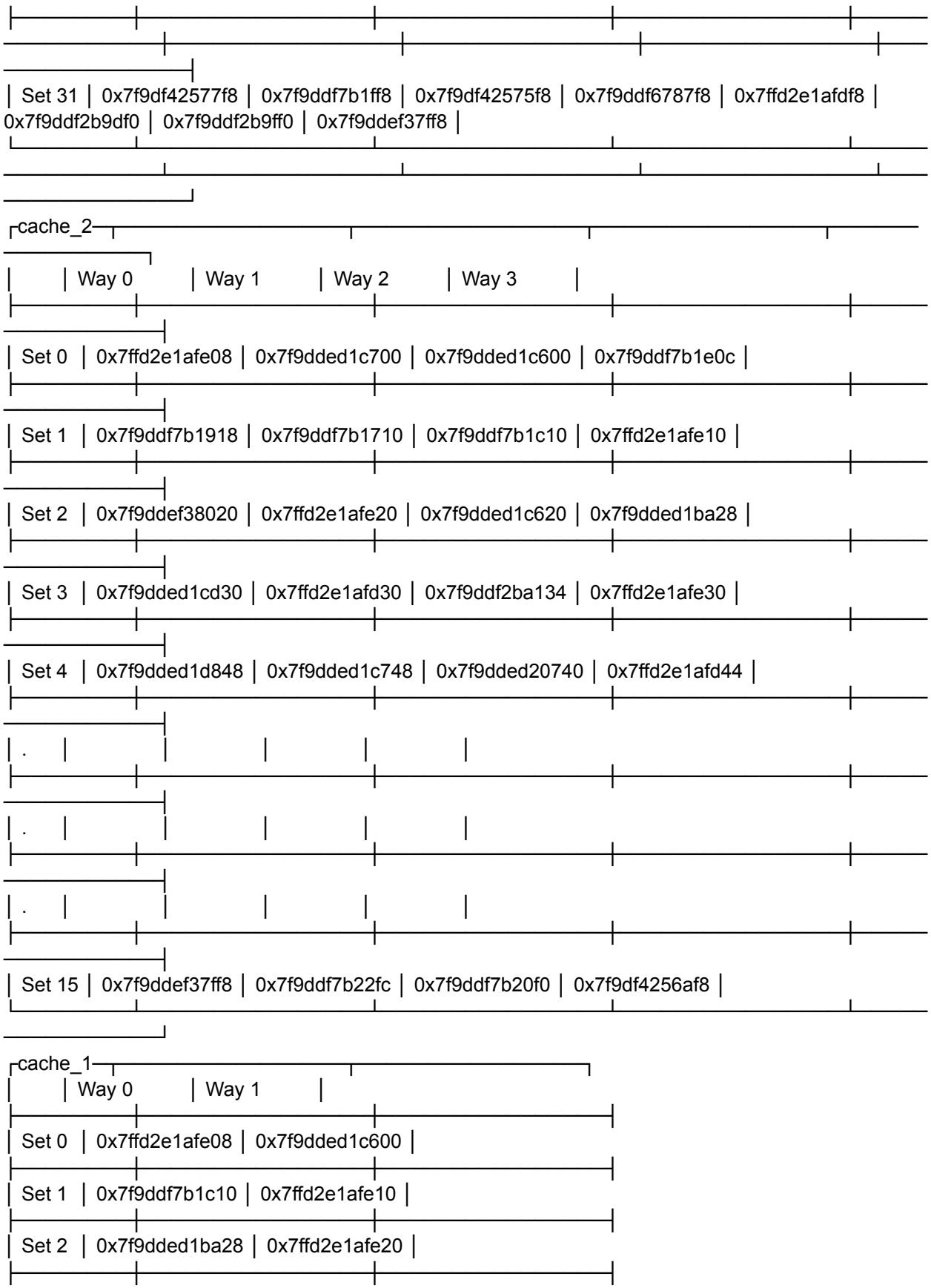
real 1m48.720s
user 0m9.853s
sys 0m0.987s

Block Size 64

Number of instructions: 188395
Total cycles taken: 4755659
cache_3
    Number of accesses: 4632
    Number of hits: 1763
    Number of misses: 2869
cache_2
    Number of accesses: 10364
    Number of hits: 5499
    Number of misses: 4865
cache_1
    Number of accesses: 188395
    Number of hits: 175830

Number of misses: 12565
AMATs:
{'cache_1': 24.5893330660654,
 'cache_2': 353.68980525120503,
 'cache_3': 719.3868739205527,
 'mem': 1000}




| Set 31 | 0x7f9df42577f8 | 0x7f9ddf7b1ff8 | 0x7f9df42575f8 | 0x7f9ddf6787f8 | 0x7ffd2e1afdf8 | 0x7f9ddf2b9df0 | 0x7f9ddf2b9ff0 | 0x7f9ddef37ff8 |
cache_2
	Way 0	Way 1	Way 2	Way 3
Set 0	0x7ffd2e1afe08	0x7f9dded1c700	0x7f9dded1c600	0x7f9ddf7b1e0c
Set 1	0x7f9ddf7b1918	0x7f9ddf7b1710	0x7f9ddf7b1c10	0x7ffd2e1afe10
Set 2	0x7f9ddef38020	0x7ffd2e1afe20	0x7f9dded1c620	0x7f9dded1ba28
Set 3	0x7f9dded1cd30	0x7ffd2e1afd30	0x7f9ddf2ba134	0x7ffd2e1afe30
Set 4	0x7f9dded1d848	0x7f9dded1c748	0x7f9dded20740	0x7ffd2e1afd44
.				
.				
.				
Set 15	0x7f9ddef37ff8	0x7f9ddf7b22fc	0x7f9ddf7b20f0	0x7f9df4256af8
cache_1
	Way 0	Way 1
Set 0	0x7ffd2e1afe08	0x7f9dded1c600
Set 1	0x7f9ddf7b1c10	0x7ffd2e1afe10
Set 2	0x7f9dded1ba28	0x7ffd2e1afe20

Set 3	0x7ffd2e1afe30	0x7f9dded1d830
Set 4	0x7ffd2e1afe4c	0x7f9dded1d848
.		
.		
.		
Set 31	0x7ffd2e1afdf8	0x7f9ddef37ff8

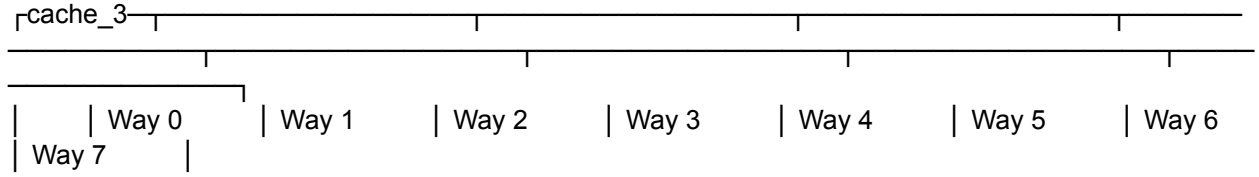
real 1m47.028s
user 0m9.525s
sys 0m0.974s

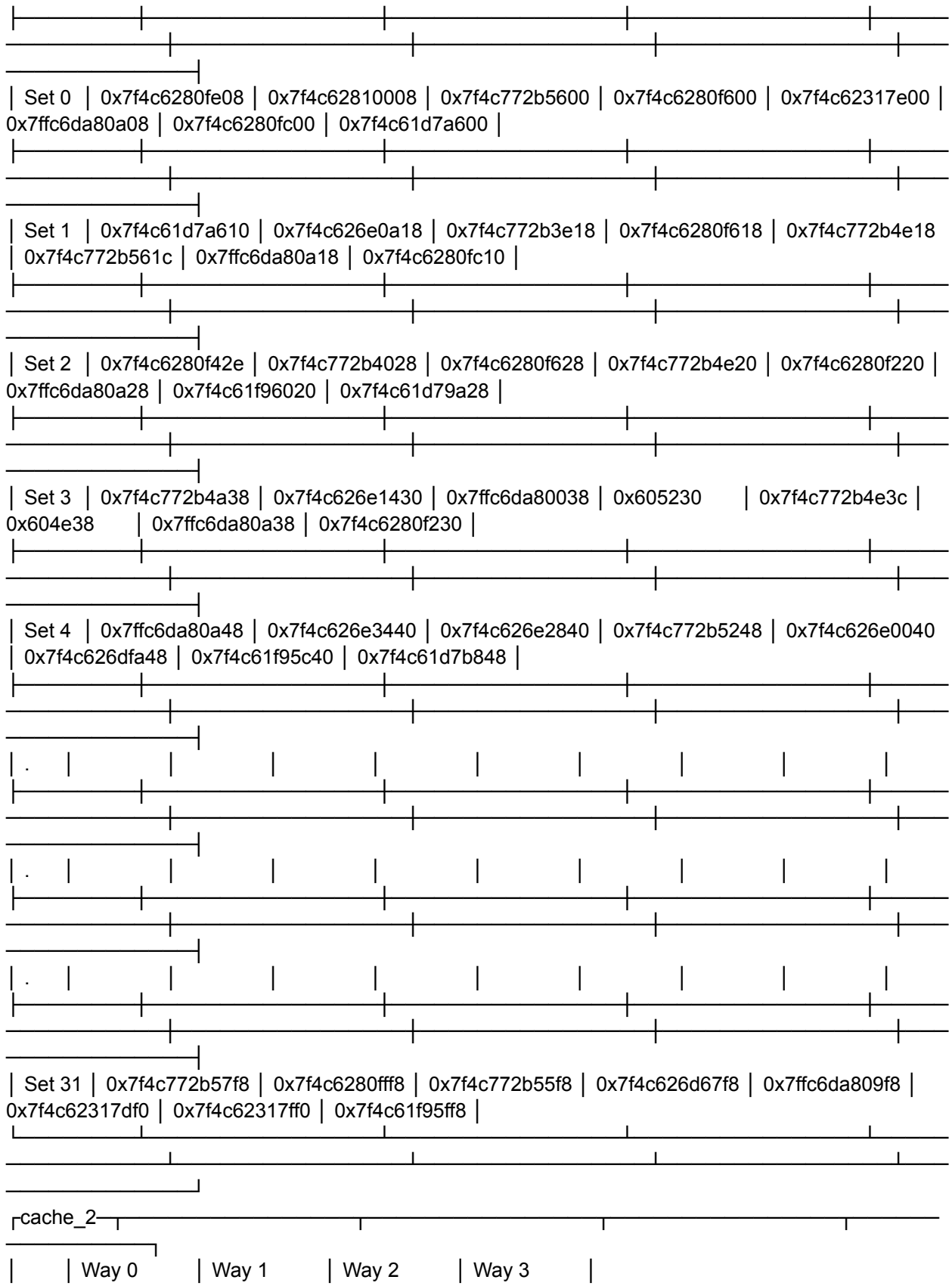
Varying Associativity :

Matrix Size 128x128:

Associativity : 2

Number of instructions: 184040
Total cycles taken: 5323824
cache_3
    Number of accesses: 5490
    Number of hits: 2742
    Number of misses: 2748
cache_2
    Number of accesses: 37780
    Number of hits: 31967
    Number of misses: 5813
cache_1
    Number of accesses: 184040
    Number of hits: 138094
    Number of misses: 45946
AMATs:
{'cache_1': 28.062994406602908,
 'cache_2': 108.40276608608364,
 'cache_3': 600.5464480874316,
 'mem': 1000}




Set 0	0x7f4c6280fe08	0x7f4c62810008	0x7f4c772b5600	0x7f4c6280f600	0x7f4c62317e00	0x7ffc6da80a08	0x7f4c6280fc00	0x7f4c61d7a600
Set 1	0x7f4c61d7a610	0x7f4c626e0a18	0x7f4c772b3e18	0x7f4c6280f618	0x7f4c772b4e18	0x7f4c772b561c	0x7ffc6da80a18	0x7f4c6280fc10
Set 2	0x7f4c6280f42e	0x7f4c772b4028	0x7f4c6280f628	0x7f4c772b4e20	0x7f4c6280f220	0x7ffc6da80a28	0x7f4c61f96020	0x7f4c61d79a28
Set 3	0x7f4c772b4a38	0x7f4c626e1430	0x7ffc6da80038	0x605230	0x7f4c772b4e3c	0x604e38	0x7ffc6da80a38	0x7f4c6280f230
Set 4	0x7ffc6da80a48	0x7f4c626e3440	0x7f4c626e2840	0x7f4c772b5248	0x7f4c626e0040	0x7f4c626dfa48	0x7f4c61f95c40	0x7f4c61d7b848
.								
.								
.								
Set 31	0x7f4c772b57f8	0x7f4c6280fff8	0x7f4c772b55f8	0x7f4c626d67f8	0x7ffc6da809f8	0x7f4c62317df0	0x7f4c62317ff0	0x7f4c61f95ff8
cache_2
	Way 0	Way 1	Way 2	Way 3

Set 0	0x7ffc6da80b08	0x7f4c61d7ad0c	0x7f4c61d7a700	0x7f4c61d7a600
Set 1	0x7ffc6da80b10	0x7f4c6280f91c	0x7f4c772b3e18	0x7f4c6280fc10
Set 2	0x7f4c61d7ad28	0x7f4c61d7a620	0x7ffc6da80b28	0x7f4c61d79a28
Set 3	0x7f4c626df330	0x7f4c61d7ad30	0x7ffc6da80b38	0x7f4c62318134
Set 4	0x7f4c61d7e548	0x7f4c61d7b848	0x7f4c61d7a748	0x7ffc6da80b44
.				
.				
.				
Set 15	0x7ffc6da80af8	0x7f4c628102fc	0x7f4c628100f0	0x7f4c772b4af8

cache_1

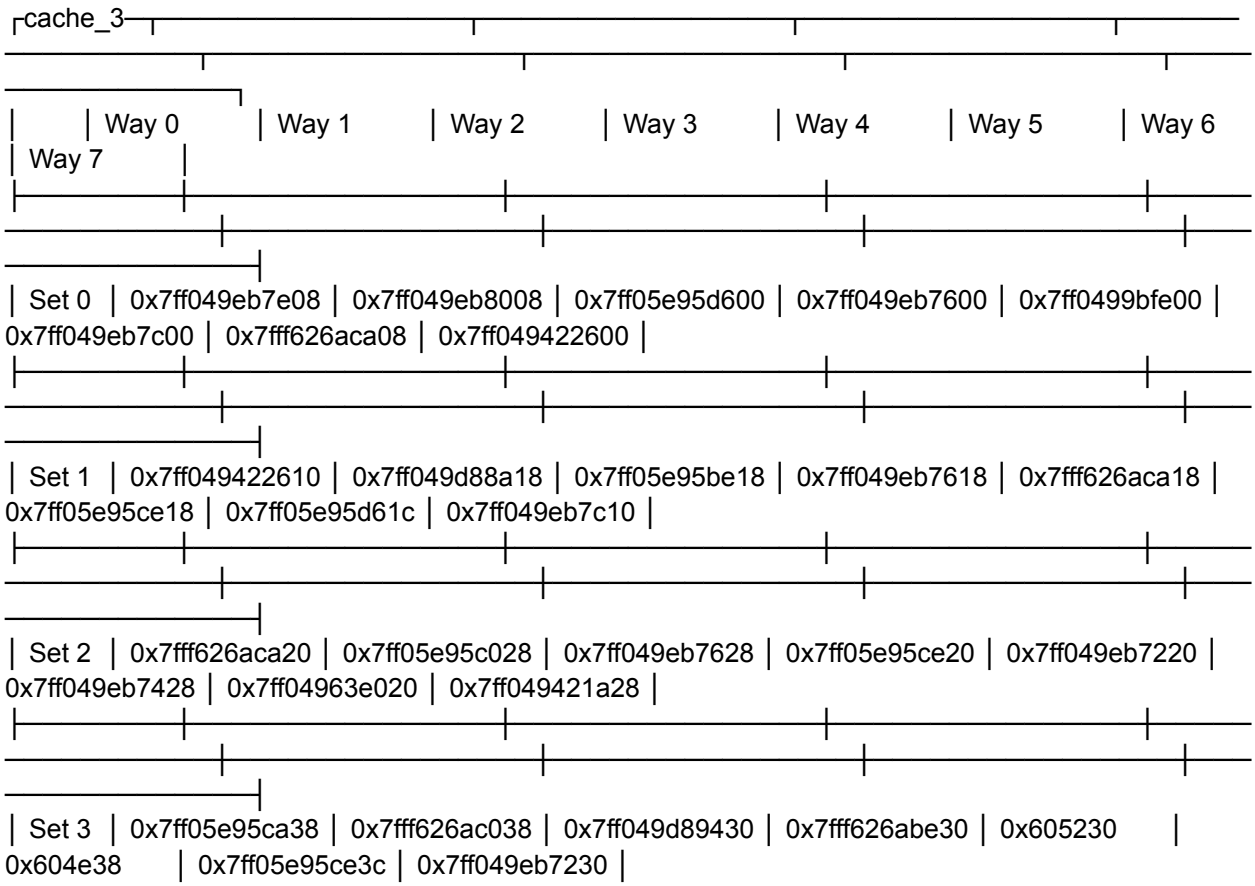
	Way 0	Way 1
Set 0	0x7f4c61d79a80	0x7ffc6da80b88
Set 1	0x7ffc6da80b90	0x7ffc6da80b18
Set 2	0x7f4c61d79a28	0x7ffc6da80ba0
Set 3	0x7f4c61d7b830	0x7ffc6da80bb0
Set 4	0x7f4c61d7b844	0x7ffc6da80b44
Set 5	0x7f4c61993f50	0x7f4c61d7e750
Set 6	0x7f4c61993f68	0x7f4c61d78e68
Set 7	0x7ffc6da80b74	0x7ffc6da80af8

real 0m34.506s

user 0m10.048s
sys 0m0.937s

Associativity : 4

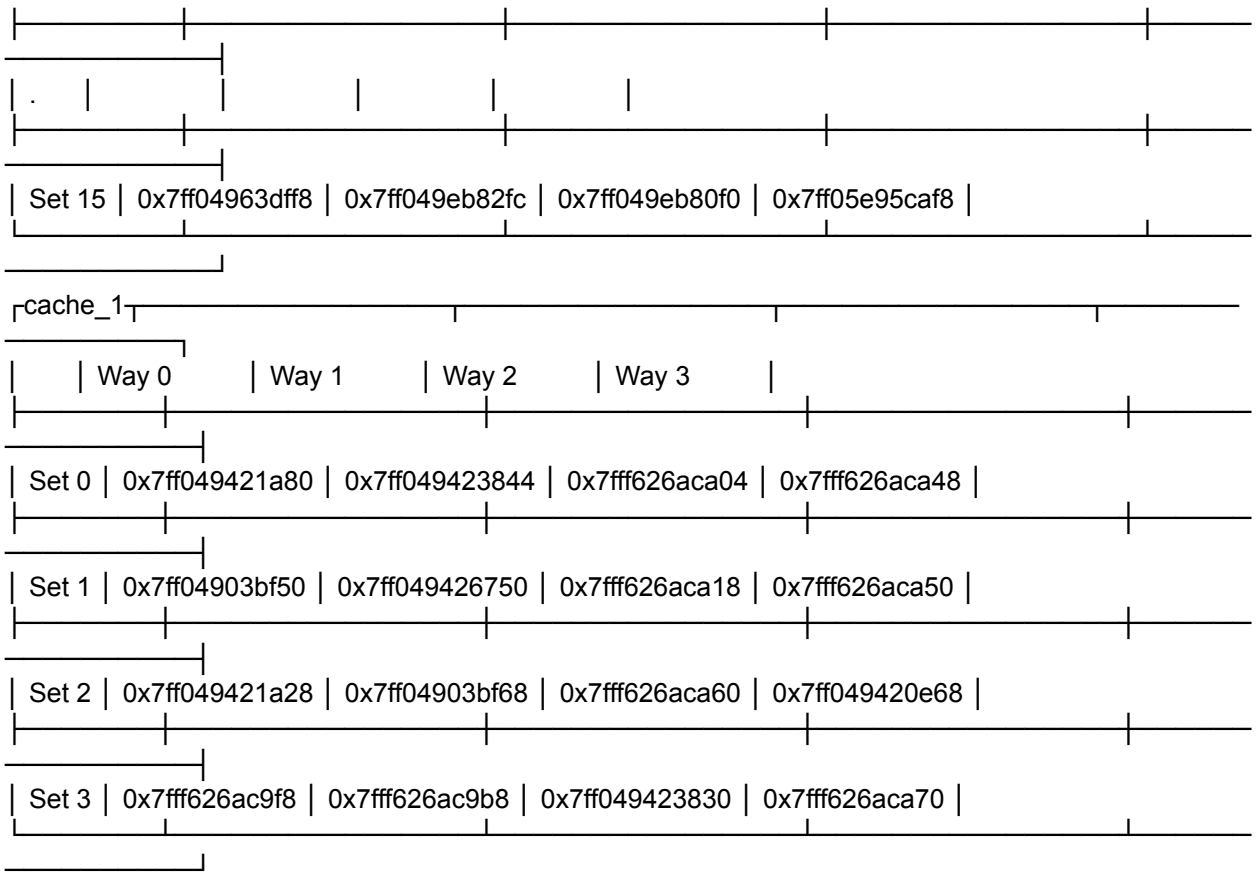
Number of instructions: 184040
Total cycles taken: 5406792
cache_3
Number of accesses: 5939
Number of hits: 3150
Number of misses: 2789
cache_2
Number of accesses: 37935
Number of hits: 31619
Number of misses: 6316
cache_1
Number of accesses: 184040
Number of hits: 139187
Number of misses: 44853
AMATs:
{'cache_1': 28.01245681234136,
'cache_2': 110.83701317065311,
'cache_3': 569.6076780602796,
'mem': 1000}



Set 4	0x7fff626abe48	0x7ff049d8a840	0x7ff05e95d248	0x7ff049d88040	0x7fff626aca48	0x7ff049d87a48	0x7ff04963dc40	0x7ff049423848
.								
.								
.								
Set 31	0x7ff05e95d7f8	0x7ff049eb7ff8	0x7ff05e95d5f8	0x7fff626ac9f8	0x7ff049d7e7f8	0x7ff0499bfdf0	0x7ff0499bfff0	0x7ff04963dff8

cache_2

	Way 0	Way 1	Way 2	Way 3
Set 0	0x7ff049422d0c	0x7ff049422700	0x7ff049422600	0x7fff626aca04
Set 1	0x7ff049eb7918	0x7ff049eb7c10	0x7ff05e95be18	0x7fff626aca10
Set 2	0x7ff049422d28	0x7ff05e95c020	0x7ff049422620	0x7ff049421a28
Set 3	0x7fff626aca38	0x7ff049d87330	0x7ff049422d30	0x7ff0499c0134
Set 4	0x7fff626aca48	0x7ff049426740	0x7ff049423848	0x7ff049422748
.				
.				

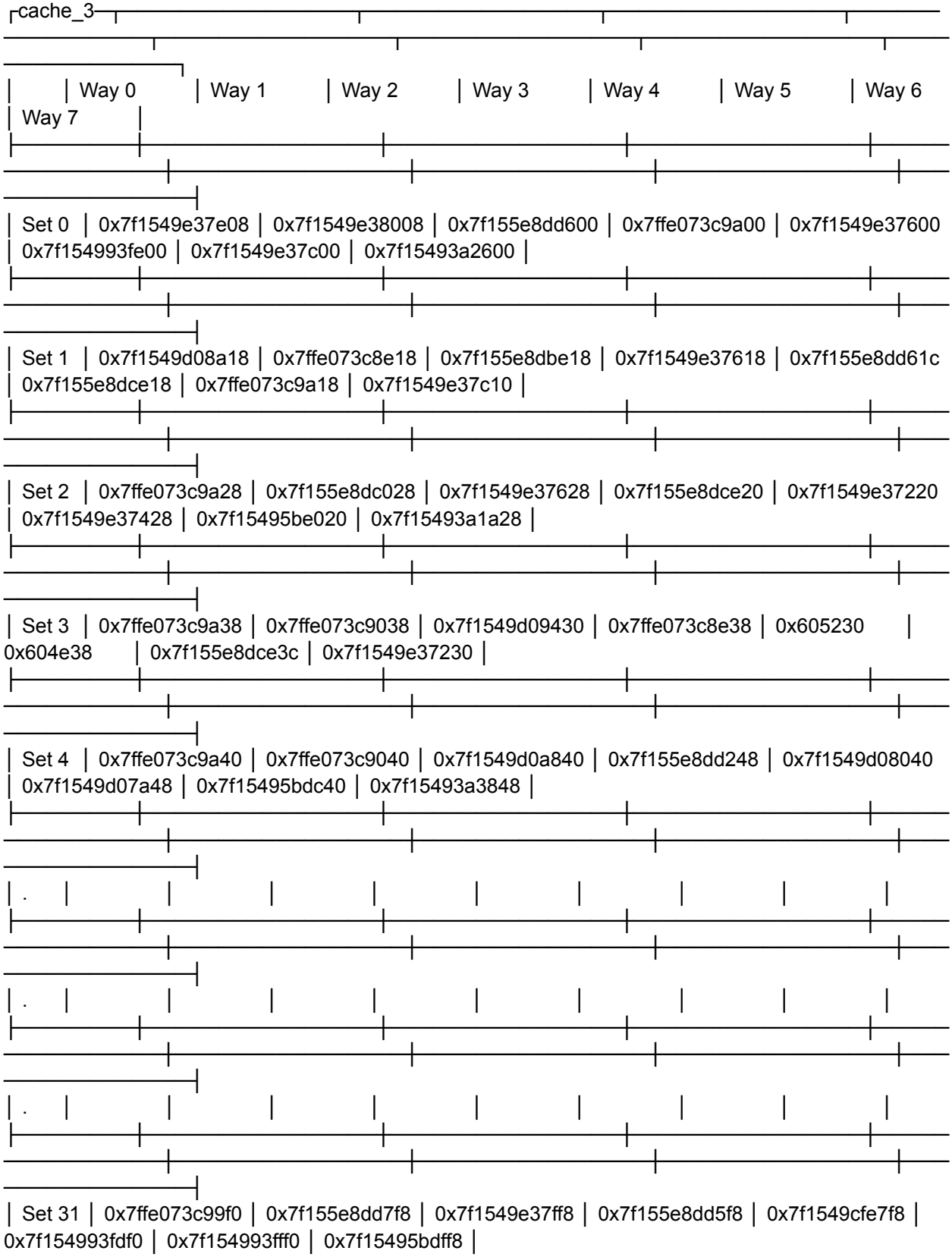


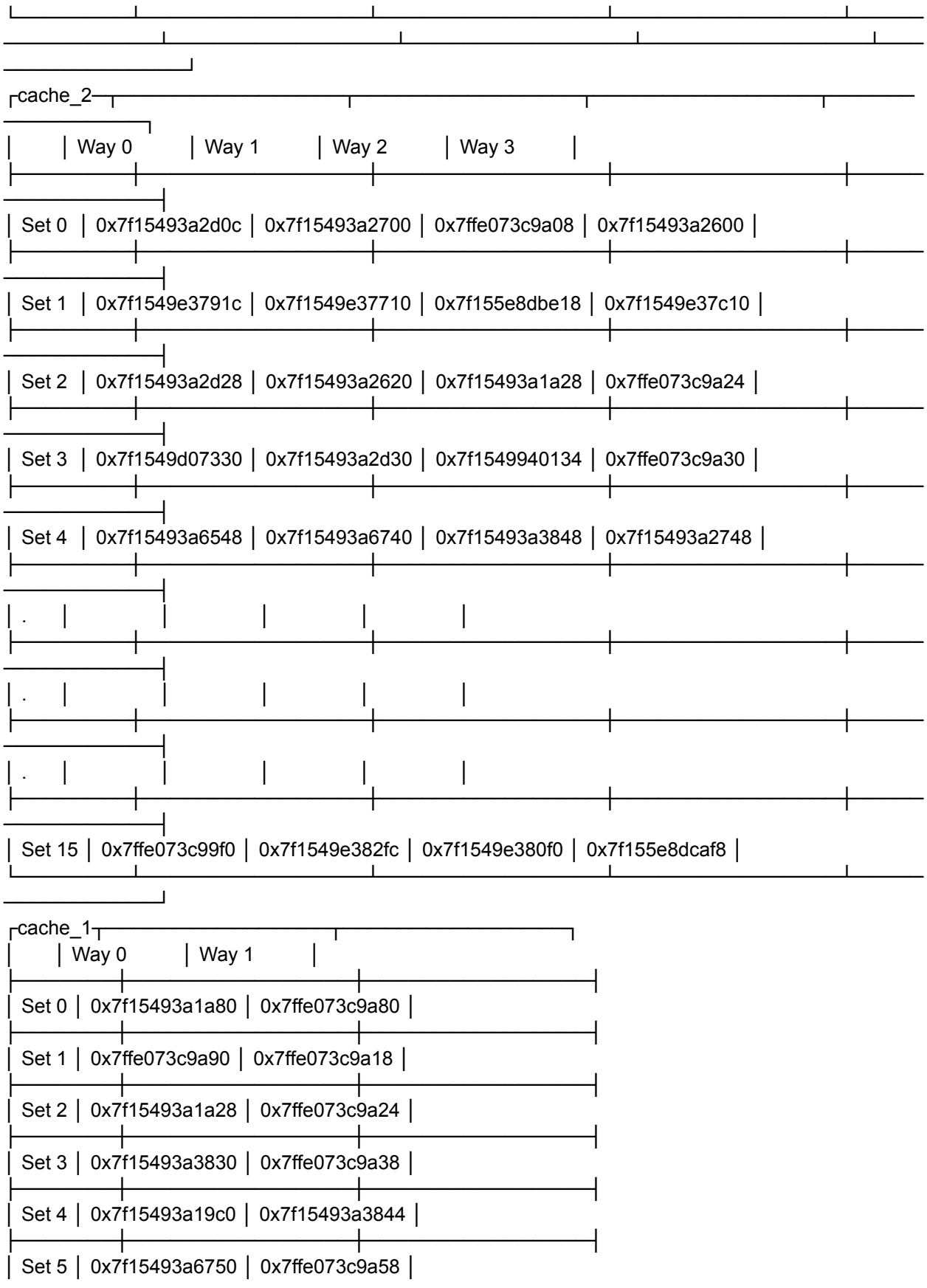
real 0m38.286s
user 0m10.029s
sys 0m1.000s

Associativity : 8

Number of instructions: 184040
Total cycles taken: 5343248
cache_3
    Number of accesses: 5585
    Number of hits: 2810
    Number of misses: 2775
cache_2
    Number of accesses: 38525
    Number of hits: 32618
    Number of misses: 5907
cache_1
    Number of accesses: 184040
    Number of hits: 138779
    Number of misses: 45261
AMATs:
{'cache_1': 27.44167202014284,
 'cache_2': 107.51696424266119,

'cache_3': 596.8666069829901,
'mem': 1000}




cache_2
Way 0
Way 1
Way 2
Way 3
Set 0
0x7f15493a2d0c
0x7f15493a2700
0x7ffe073c9a08
0x7f15493a2600
Set 1
0x7f1549e3791c
0x7f1549e37710
0x7f155e8dbe18
0x7f1549e37c10
Set 2
0x7f15493a2d28
0x7f15493a2620
0x7f15493a1a28
0x7ffe073c9a24
Set 3
0x7f1549d07330
0x7f15493a2d30
0x7f1549940134
0x7ffe073c9a30
Set 4
0x7f15493a6548
0x7f15493a6740
0x7f15493a3848
0x7f15493a2748
.
.
.
Set 15
0x7ffe073c99f0
0x7f1549e382fc
0x7f1549e380f0
0x7f155e8dcaf8
cache_1
Way 0
Way 1
Set 0
0x7f15493a1a80
0x7ffe073c9a80
Set 1
0x7ffe073c9a90
0x7ffe073c9a18
Set 2
0x7f15493a1a28
0x7ffe073c9a24
Set 3
0x7f15493a3830
0x7ffe073c9a38
Set 4
0x7f15493a19c0
0x7f15493a3844
Set 5
0x7f15493a6750
0x7ffe073c9a58

Set 6	0x7ffe073c9a68	0x7f15493a0e68
Set 7	0x7ffe073c9a70	0x7ffe073c99f8

real 1m20.420s
user 0m10.025s
sys 0m0.985s

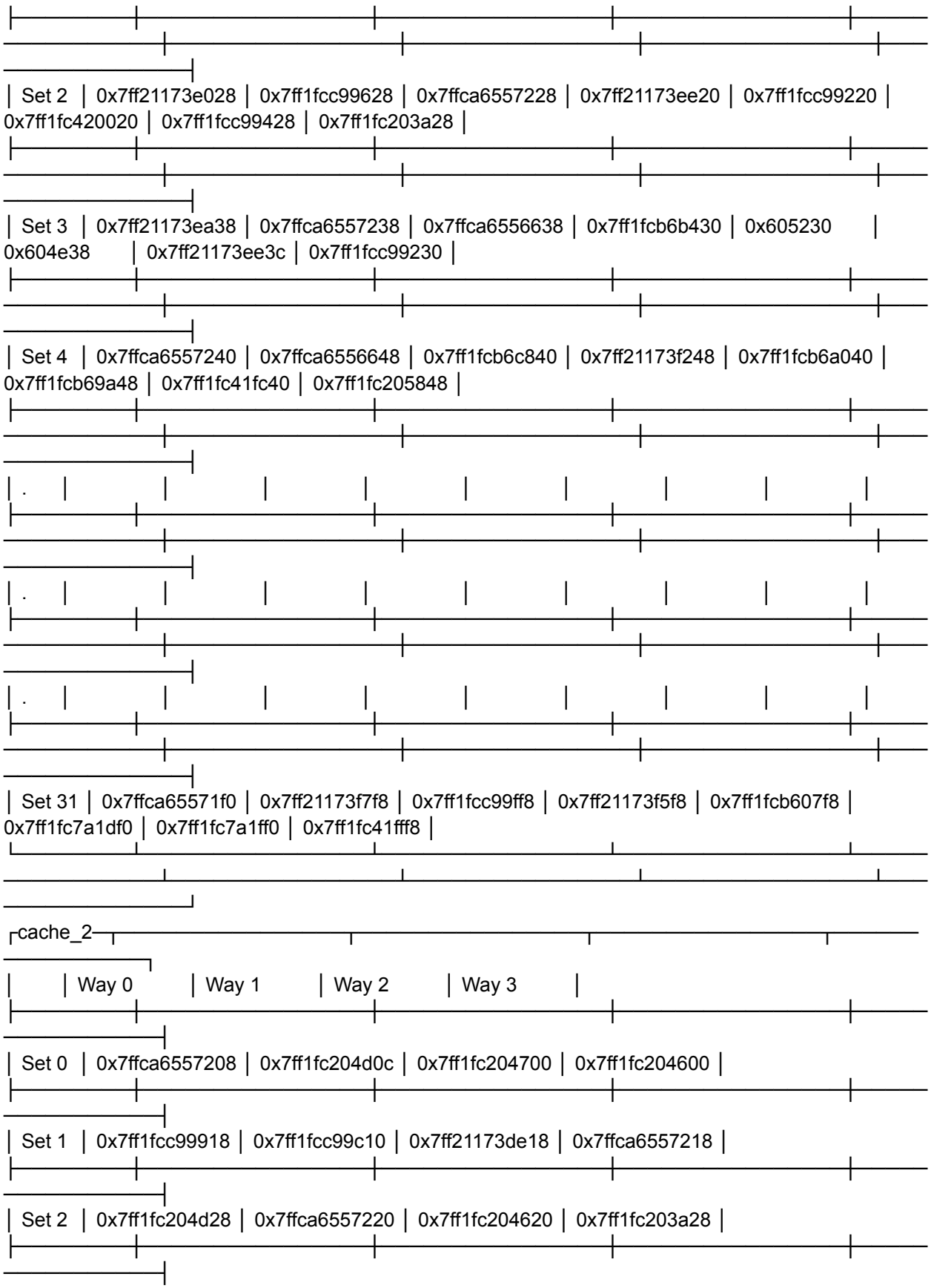
Matrix Size 150x150:

Associativity : 2

Number of instructions: 188395
Total cycles taken: 5549971
cache_3
Number of accesses: 6254
Number of hits: 3350
Number of misses: 2904
cache_2
Number of accesses: 37305
Number of hits: 30826
Number of misses: 6479
cache_1
Number of accesses: 188395
Number of hits: 145025
Number of misses: 43370
AMATs:
{'cache_1': 27.246696209401392,
'cache_2': 114.01305815933075,
'cache_3': 564.3428205948193,
'mem': 1000}

cache_3

	Way 0	Way 1	Way 2	Way 3	Way 4	Way 5	Way 6	Way 7
Set 0	0x7ff21173f808	0x7ff1fcc99e08	0x7ff1fcc9a008	0x7ff21173f600	0x7ff1fcc99600	0x7ff1fc7a1e00	0x7ff1fcc99c00	0x7ff1fc204600
Set 1	0x7ff1fc204610	0x7ff1fcb6aa18	0x7ff21173de18	0x7ff1fcc99618	0x7ffca6557218	0x7ff21173ee18	0x7ff21173f61c	0x7ff1fcc99c10


Set 2	0x7ff21173e028	0x7ff1fcc99628	0x7ffca6557228	0x7ff21173ee20	0x7ff1fcc99220	0x7ff1fc420020	0x7ff1fcc99428	0x7ff1fc203a28
Set 3	0x7ff21173ea38	0x7ffca6557238	0x7ffca6556638	0x7ff1fcb6b430	0x605230	0x604e38	0x7ff21173ee3c	0x7ff1fcc99230
Set 4	0x7ffca6557240	0x7ffca6556648	0x7ff1fcb6c840	0x7ff21173f248	0x7ff1fcb6a040	0x7ff1fcb69a48	0x7ff1fc41fc40	0x7ff1fc205848
.
.
.
Set 31	0x7ffca65571f0	0x7ff21173f7f8	0x7ff1fcc99ff8	0x7ff21173f5f8	0x7ff1fcb607f8	0x7ff1fc7a1df0	0x7ff1fc7a1ff0	0x7ff1fc41fff8
cache_2
Way 0	Way 1	Way 2	Way 3
Set 0	0x7ffca6557208	0x7ff1fc204d0c	0x7ff1fc204700	0x7ff1fc204600
Set 1	0x7ff1fcc99918	0x7ff1fcc99c10	0x7ff21173de18	0x7ffca6557218
Set 2	0x7ff1fc204d28	0x7ffca6557220	0x7ff1fc204620	0x7ff1fc203a28

Set 3	0x7ff1fcb69330	0x7ff1fc204d30	0x7ff1fc7a2134	0x7ffca6557230
Set 4	0x7ffca6557240	0x7ff1fc208740	0x7ff1fc205848	0x7ff1fc204748
.				
.				
.				
Set 15	0x7ff1fcc9a2fc	0x7ff1fcc9a0f0	0x7ffca65571f8	0x7ff21173eaf8

cache_1

	Way 0	Way 1
Set 0	0x7ff1fc203a80	0x7ffca6557208
Set 1	0x7ffca6557218	0x7ffca6557198
Set 2	0x7ff1fc203a28	0x7ffca6557220
Set 3	0x7ff1fc205830	0x7ffca6557230
Set 4	0x7ff1fc205844	0x7ffca6557240
Set 5	0x7ff1fc208750	0x7ffca65571d4
Set 6	0x7ff1fbe1df68	0x7ff1fc202e68
Set 7	0x7ff21173eaf8	0x7ff1fc204d70

real 1m0.803s
user 0m10.175s
sys 0m1.180s

Associativity : 4

Number of instructions: 188395
Total cycles taken: 5588359
cache_3
    Number of accesses: 5874
    Number of hits: 2948

Number of misses: 2926
cache_2
Number of accesses: 39315
Number of hits: 33130
Number of misses: 6185
cache_1
Number of accesses: 188395
Number of hits: 141803
Number of misses: 46592
AMATs:
{'cache_1': 28.22807065108747,
'cache_2': 110.0968486073065,
'cache_3': 598.12734082397,
'mem': 1000}

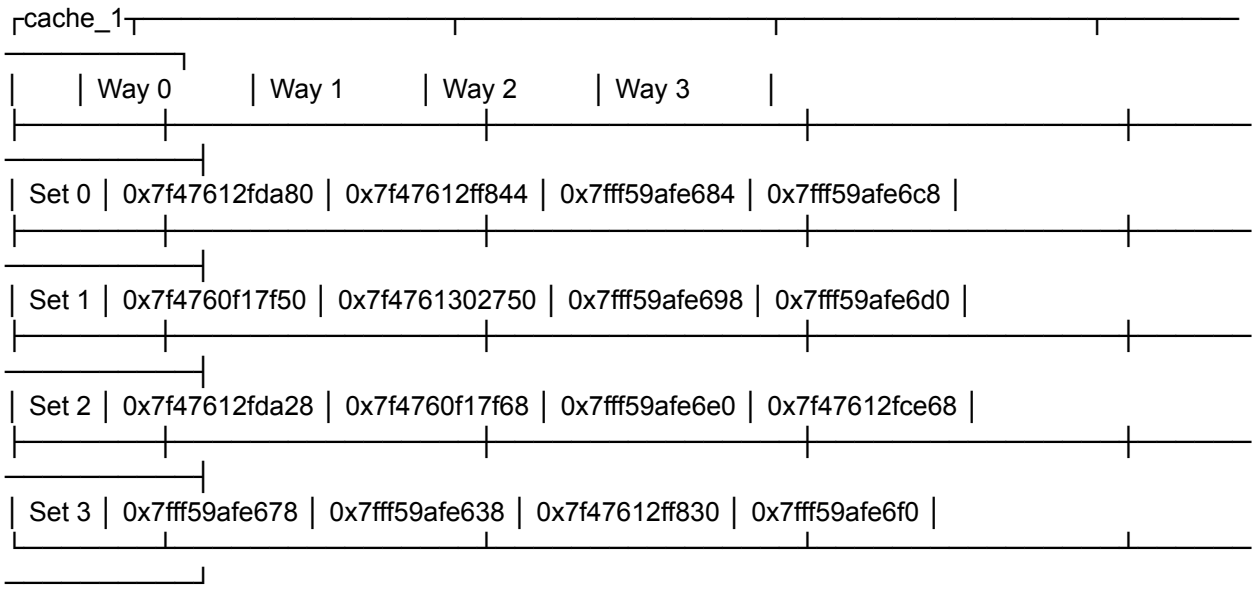
cache_3

	Way 0	Way 1	Way 2	Way 3	Way 4	Way 5	Way 6	Way 7
Set 0	0x7f4761d93e08	0x7f4761d94008	0x7f4776839600	0x7f4761d93600	0x7f476189be00	0x7f4761d93c00	0x7fff59afe60f	0x7f47612fe600
Set 1	0x605210	0x7f47612fe610	0x7f4761c64a18	0x7f4776837e18	0x7f4761d93618	0x7f4776838e18	0x7f477683961c	0x7f4761d93c10
Set 2	0x7fff59afe628	0x7f4761d9342e	0x7f4776838028	0x7f4761d93628	0x7f4776838e20	0x7f4761d93220	0x7f476151a020	0x7f47612fda28
Set 3	0x7fff59afe638	0x7f4776838a38	0x7fff59afdc38	0x7f4761c65430	0x605230	0x7f4776838e3c	0x604e38	0x7f4761d93230
Set 4	0x7fff59afe648	0x7f4761c67440	0x7f4761c66840	0x7f4776839248	0x7f4761c64040	0x7f4761c63a48	0x7f4761519c40	0x7f47612ff848
.								

.								
.								
Set 31	0x7f47768397f8	0x7f4761d93ff8	0x7f47768395f8	0x7f4761c5a7f8	0x7fff59afe5f0	0x7f476189bdf0	0x7f476189bff0	0x7f4761519ff8

cache_2

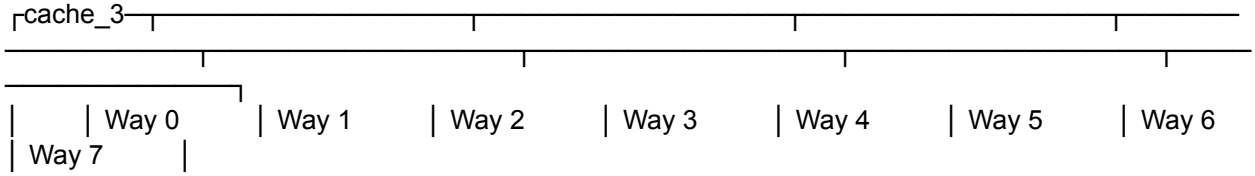
	Way 0	Way 1	Way 2	Way 3
Set 0	0x7f47612fed0c	0x7f47612fe700	0x7fff59afe604	0x7f47612fe600
Set 1	0x7fff59afe610	0x7f4761d9391c	0x7f4776837e18	0x7f4761d93c10
Set 2	0x7f47612fed28	0x7f4776838020	0x7f47612fe620	0x7f47612fda28
Set 3	0x7f4761c63330	0x7f47612fed30	0x7fff59afe638	0x7f476189c134
Set 4	0x7fff59afe640	0x7f4761302740	0x7f47612ff848	0x7f47612fe748
.				
.				
.				
Set 15	0x7f4761d942fc	0x7f4761d940f0	0x7f4776838af8	0x7fff59afe6f0

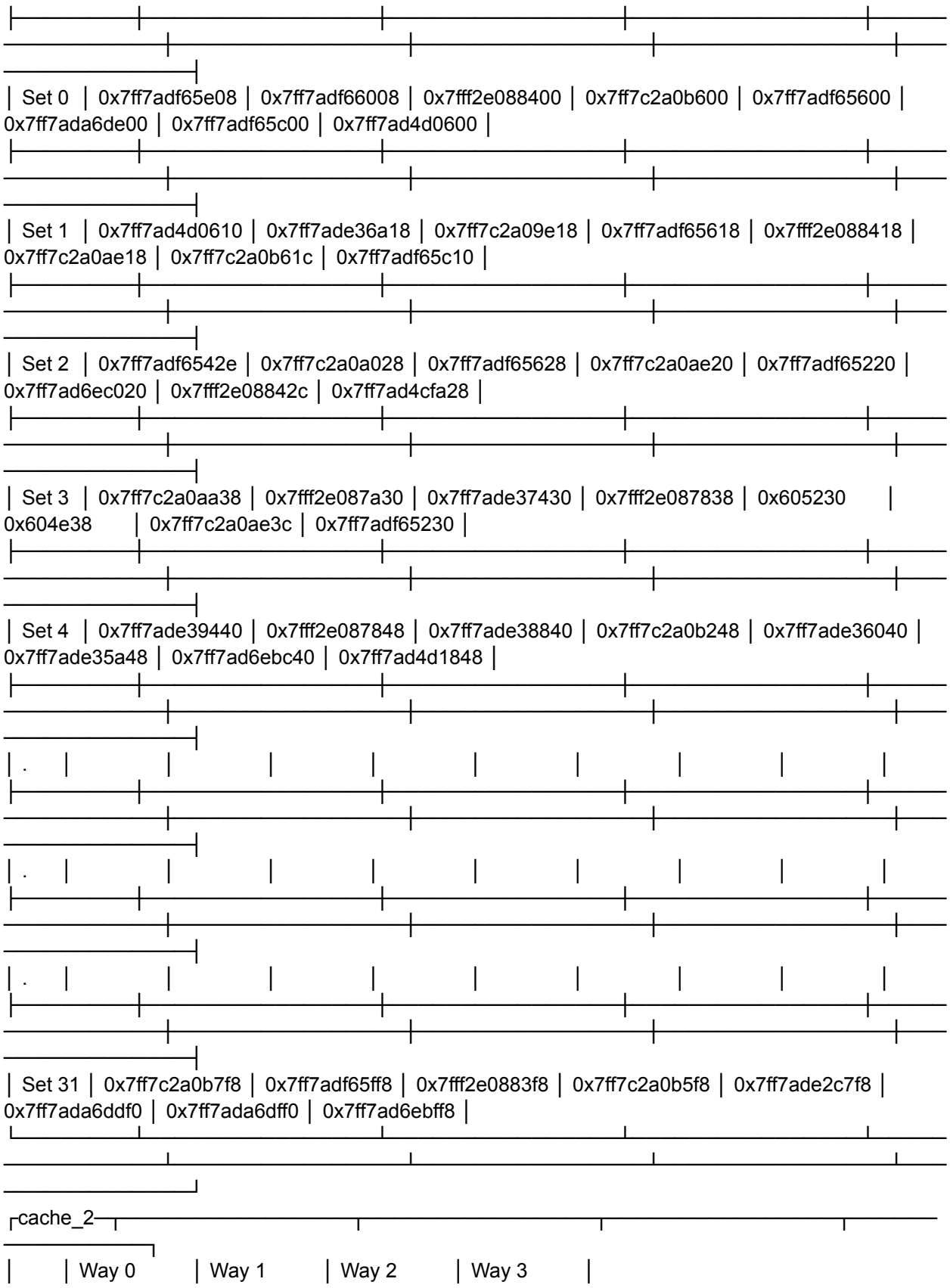


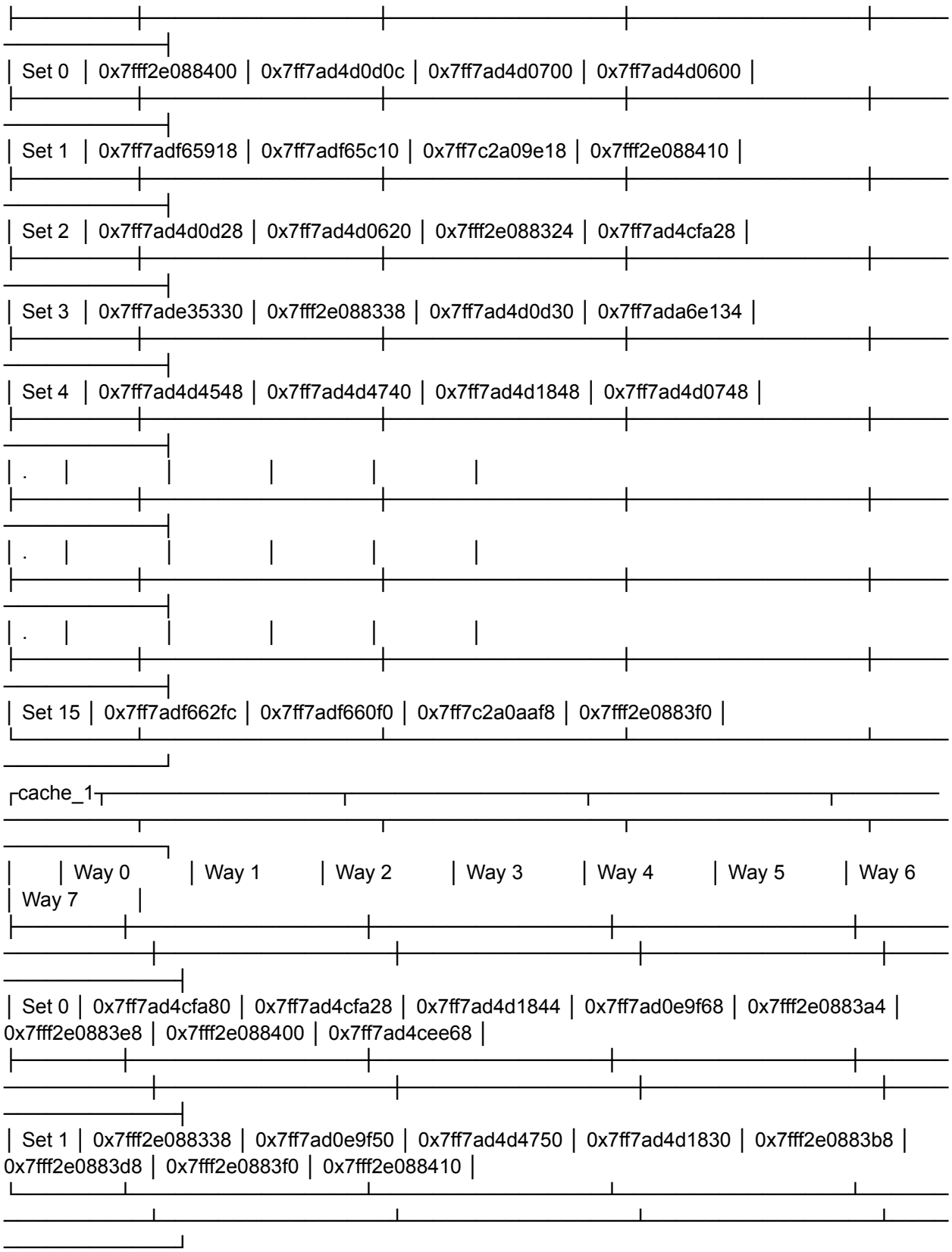
real 1m56.964s
user 0m18.109s
sys 0m2.372s
/home/grads/vmn5118/CachePerformanceOnMatMul

Associativity : 8

Number of instructions: 188395
Total cycles taken: 5667199
cache_3
Number of accesses: 6386
Number of hits: 3487
Number of misses: 2899
cache_2
Number of accesses: 42621
Number of hits: 35932
Number of misses: 6689
cache_1
Number of accesses: 188395
Number of hits: 137718
Number of misses: 50677
AMATs:
{'cache_1': 28.69005234514218,
'cache_2': 102.93954676802221,
'cache_3': 553.9617914187285,
'mem': 1000}




Set 0	0x7ff7adf65e08	0x7ff7adf66008	0x7fff2e088400	0x7ff7c2a0b600	0x7ff7adf65600	0x7ff7ada6de00	0x7ff7adf65c00	0x7ff7ad4d0600
Set 1	0x7ff7ad4d0610	0x7ff7ade36a18	0x7ff7c2a09e18	0x7ff7adf65618	0x7fff2e088418	0x7ff7c2a0ae18	0x7ff7c2a0b61c	0x7ff7adf65c10
Set 2	0x7ff7adf6542e	0x7ff7c2a0a028	0x7ff7adf65628	0x7ff7c2a0ae20	0x7ff7adf65220	0x7ff7ad6ec020	0x7fff2e08842c	0x7ff7ad4cfa28
Set 3	0x7ff7c2a0aa38	0x7fff2e087a30	0x7ff7ade37430	0x7fff2e087838	0x605230	0x604e38	0x7ff7c2a0ae3c	0x7ff7adf65230
Set 4	0x7ff7ade39440	0x7fff2e087848	0x7ff7ade38840	0x7ff7c2a0b248	0x7ff7ade36040	0x7ff7ade35a48	0x7ff7ad6ebc40	0x7ff7ad4d1848
.
.
.
Set 31	0x7ff7c2a0b7f8	0x7ff7adf65ff8	0x7fff2e0883f8	0x7ff7c2a0b5f8	0x7ff7ade2c7f8	0x7ff7ada6ddf0	0x7ff7ada6dff0	0x7ff7ad6ebff8
cache_2
	Way 0	Way 1	Way 2	Way 3



real 0m37.016s
user 0m10.388s

sys 0m1.146s

Varying Number of Cache :

Matrix Size 128x128:

Using 1 Cache:

Number of instructions: 184040
Total cycles taken: 55843040
cache_1
Number of accesses: 184040
Number of hits: 139161
Number of misses: 44879
AMATs:
{'cache_1': 244.8545968267768, 'mem': 1000}

cache_1	Way 0	Way 1
Set 0	0x7f07fe236a80	0x7ffe09e94b80
Set 1	0x7ffe09e94b90	0x7ffe09e94b18
Set 2	0x7f07fe236a28	0x7ffe09e94ba0
Set 3	0x7f07fe238830	0x7ffe09e94b34
Set 4	0x7f07fe2369c0	0x7f07fe238844
Set 5	0x7f07fde50f50	0x7f07fe23b750
Set 6	0x7f07fde50f68	0x7f07fe235e68
Set 7	0x7ffe09e94b78	0x7ffe09e94af8

real 1m41.193s
user 0m16.366s
sys 0m1.981s

Using 2 Cache:

Number of instructions: 184040
Total cycles taken: 9511312
cache_2
Number of accesses: 38102
Number of hits: 31774
Number of misses: 6328
cache_1

Number of accesses: 184040
Number of hits: 139150
Number of misses: 44890

AMATs:

{'cache_1': 45.41205484983164, 'cache_2': 182.0805207075744, 'mem': 1000}

cache_2

	Way 0	Way 1	Way 2	Way 3
Set 0	0x7ffdf3366500	0x7fef9302fd0c	0x7fef9302f700	0x7fef9302f600
Set 1	0x7fef93ac4918	0x7fef93ac4c10	0x7fefa8568e18	0x7ffdf3366510
Set 2	0x7fef9302fd28	0x7ffdf3366520	0x7fef9302f620	0x7fef9302ea28
Set 3	0x7fef9302fd30	0x7fef935cd134	0x7ffdf3366438	0x7ffdf336653c
Set 4	0x7fef93030848	0x7ffdf3366448	0x7fef9302f748	0x7fef93033740
.				
.				
.				
Set 15	0x7fef93ac52fc	0x7fef93ac50f0	0x7fefa8569af8	0x7ffdf33664f8

cache_1

	Way 0	Way 1
Set 0	0x7fef9302ea80	0x7ffdf3366500
Set 1	0x7ffdf3366510	0x7ffdf3366498
Set 2	0x7fef9302ea28	0x7ffdf3366520
Set 3	0x7fef93030830	0x7ffdf33664b4
Set 4	0x7fef9302e9c0	0x7fef93030844

Set 5	0x7fef92c48f50	0x7fef93033750
Set 6	0x7fef92c48f68	0x7fef9302de68
Set 7	0x7ffdf33664f8	0x7ffdf3366478

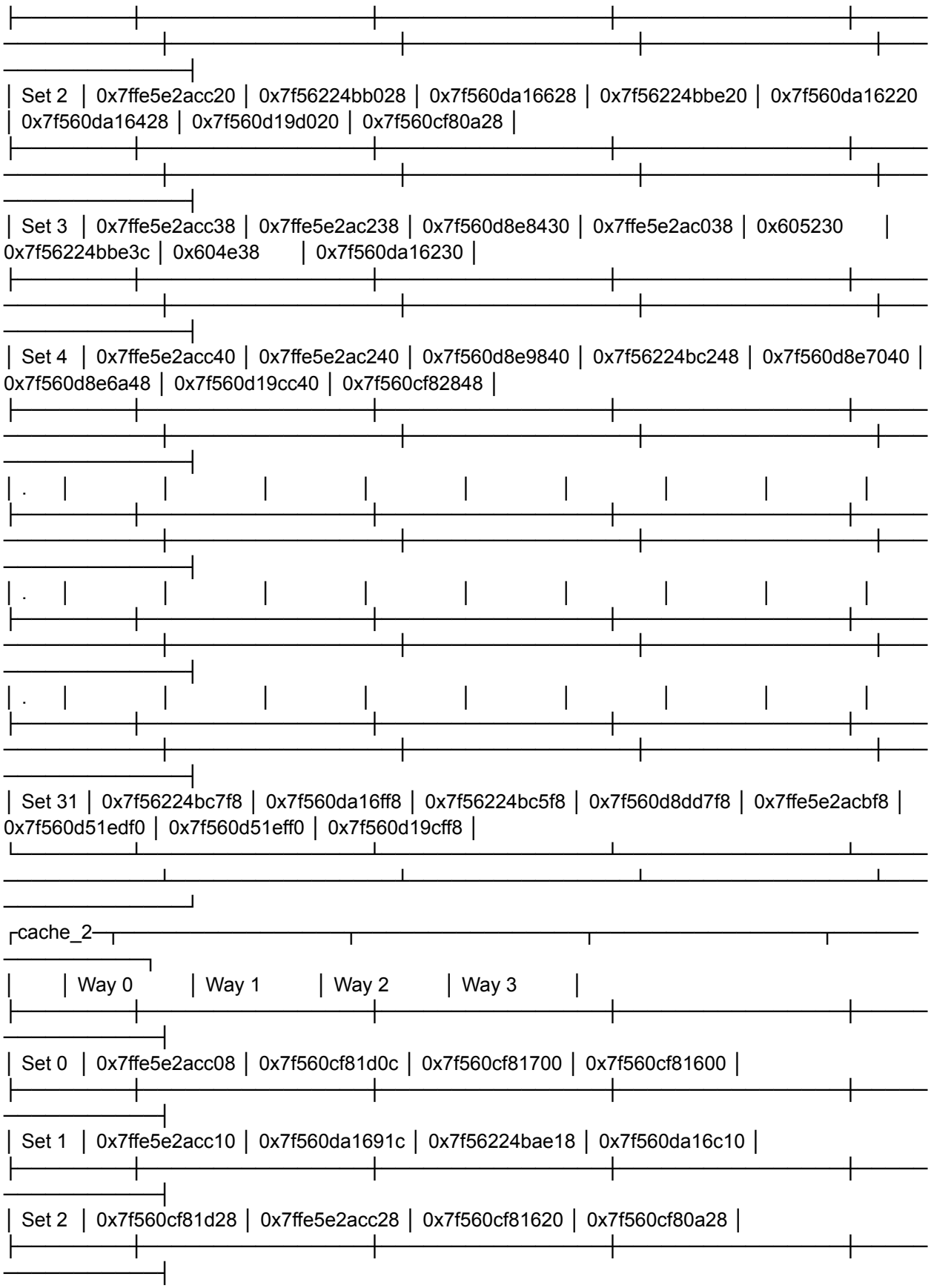
real 1m7.811s
user 0m12.040s
sys 0m1.393s

Using 3 Cache:

Number of instructions: 184040
Total cycles taken: 5187932
cache_3
Number of accesses: 5199
Number of hits: 2445
Number of misses: 2754
cache_2
Number of accesses: 35920
Number of hits: 30490
Number of misses: 5430
cache_1
Number of accesses: 184040
Number of hits: 142111
Number of misses: 41929
AMATs:
{'cache_1': 26.332801547181546,
'cache_2': 111.19389436293,
'cache_3': 629.7172533179457,
'mem': 1000}

cache_3

	Way 0	Way 1	Way 2	Way 3	Way 4	Way 5	Way 6	Way 7
Set 0	0x7f56224bc808	0x7f560da16e08	0x7f560da17008	0x7f56224bc600	0x7f560da16600	0x7f560d51ee00	0x7f560da16c00	0x7f560cf81600
Set 1	0x7f560d8e7a18	0x7ffe5e2ac018	0x7f56224bae18	0x7f560da16618	0x7f56224bbe18	0x7f56224bc61c	0x7ffe5e2acc18	0x7f560da16c10


Set 2	0x7ffe5e2acc20	0x7f56224bb028	0x7f560da16628	0x7f56224bbe20	0x7f560da16220	0x7f560da16428	0x7f560d19d020	0x7f560cf80a28
Set 3	0x7ffe5e2acc38	0x7ffe5e2ac238	0x7f560d8e8430	0x7ffe5e2ac038	0x605230	0x7f56224bbe3c	0x604e38	0x7f560da16230
Set 4	0x7ffe5e2acc40	0x7ffe5e2ac240	0x7f560d8e9840	0x7f56224bc248	0x7f560d8e7040	0x7f560d8e6a48	0x7f560d19cc40	0x7f560cf82848
.								
.								
.								
Set 31	0x7f56224bc7f8	0x7f560da16ff8	0x7f56224bc5f8	0x7f560d8dd7f8	0x7ffe5e2acbf8	0x7f560d51edf0	0x7f560d51eff0	0x7f560d19cff8
cache_2
	Way 0	Way 1	Way 2	Way 3
Set 0	0x7ffe5e2acc08	0x7f560cf81d0c	0x7f560cf81700	0x7f560cf81600
Set 1	0x7ffe5e2acc10	0x7f560da1691c	0x7f56224bae18	0x7f560da16c10
Set 2	0x7f560cf81d28	0x7ffe5e2acc28	0x7f560cf81620	0x7f560cf80a28

Set 3	0x7f560d8e6330	0x7f560cf81d30	0x7f560d51f134	0x7ffe5e2acc38
Set 4	0x7f560cf85740	0x7f560cf82848	0x7ffe5e2acc48	0x7f560cf81748
.				
.				
.				
Set 15	0x7ffe5e2acbf8	0x7f560da172fc	0x7f560da170f0	0x7f56224bbaf8

cache_1

	Way 0	Way 1
Set 0	0x7f560cf80a80	0x7ffe5e2acc88
Set 1	0x7ffe5e2acc98	0x7ffe5e2acc18
Set 2	0x7f560cf80a28	0x7ffe5e2acca0
Set 3	0x7f560cf82830	0x7ffe5e2accb0
Set 4	0x7f560cf82844	0x7ffe5e2accc0
Set 5	0x7f560cf85750	0x7ffe5e2acc54
Set 6	0x7f560cb9af68	0x7f560cf7fe68
Set 7	0x7f56224bbaf8	0x7f560cf81d70

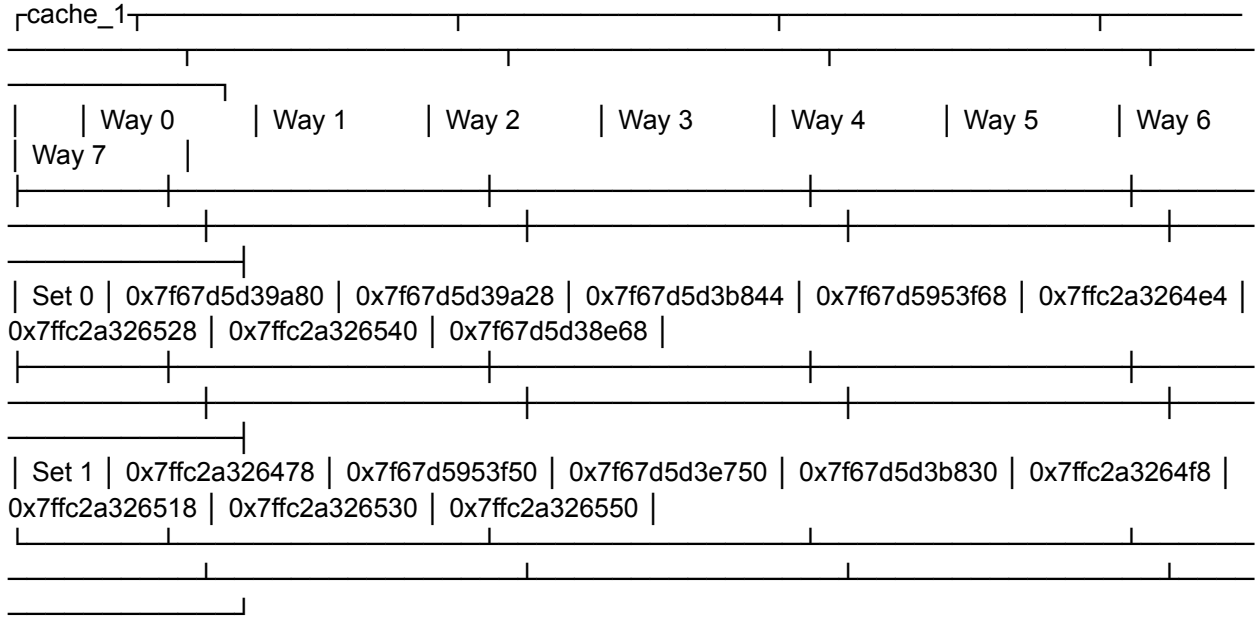
real 1m5.951s
user 0m11.988s
sys 0m1.371s

Matrix Size 150x150:

Using 1 Cache:

Number of instructions: 188296

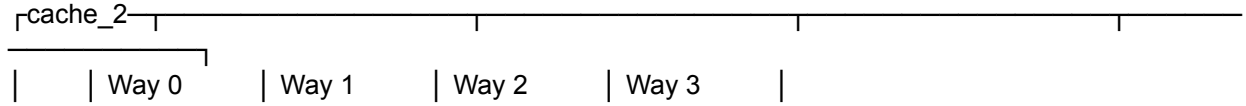
Total cycles taken: 58187296
cache_1
Number of accesses: 188296
Number of hits: 138130
Number of misses: 50166
AMATs:
{'cache_1': 267.42095424225687, 'mem': 1000}

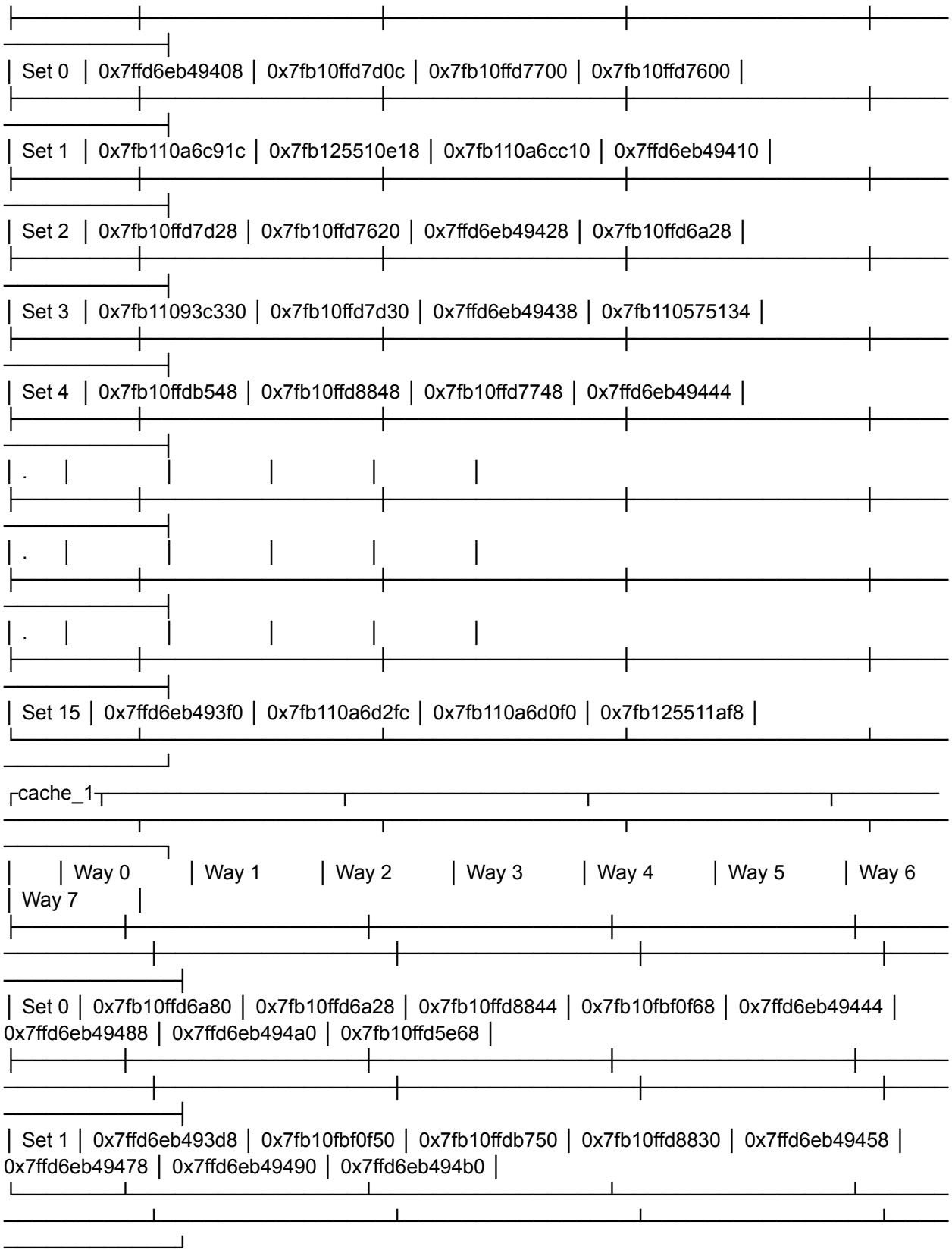


real 1m38.214s
user 0m11.194s
sys 0m1.322s

Using 2 Cache:

Number of instructions: 188296
Total cycles taken: 8932944
cache_2
Number of accesses: 42387
Number of hits: 36334
Number of misses: 6053
cache_1
Number of accesses: 188296
Number of hits: 138020
Number of misses: 50276
AMATs:
{'cache_1': 43.40127557966055, 'cache_2': 158.80321796777315, 'mem': 1000}



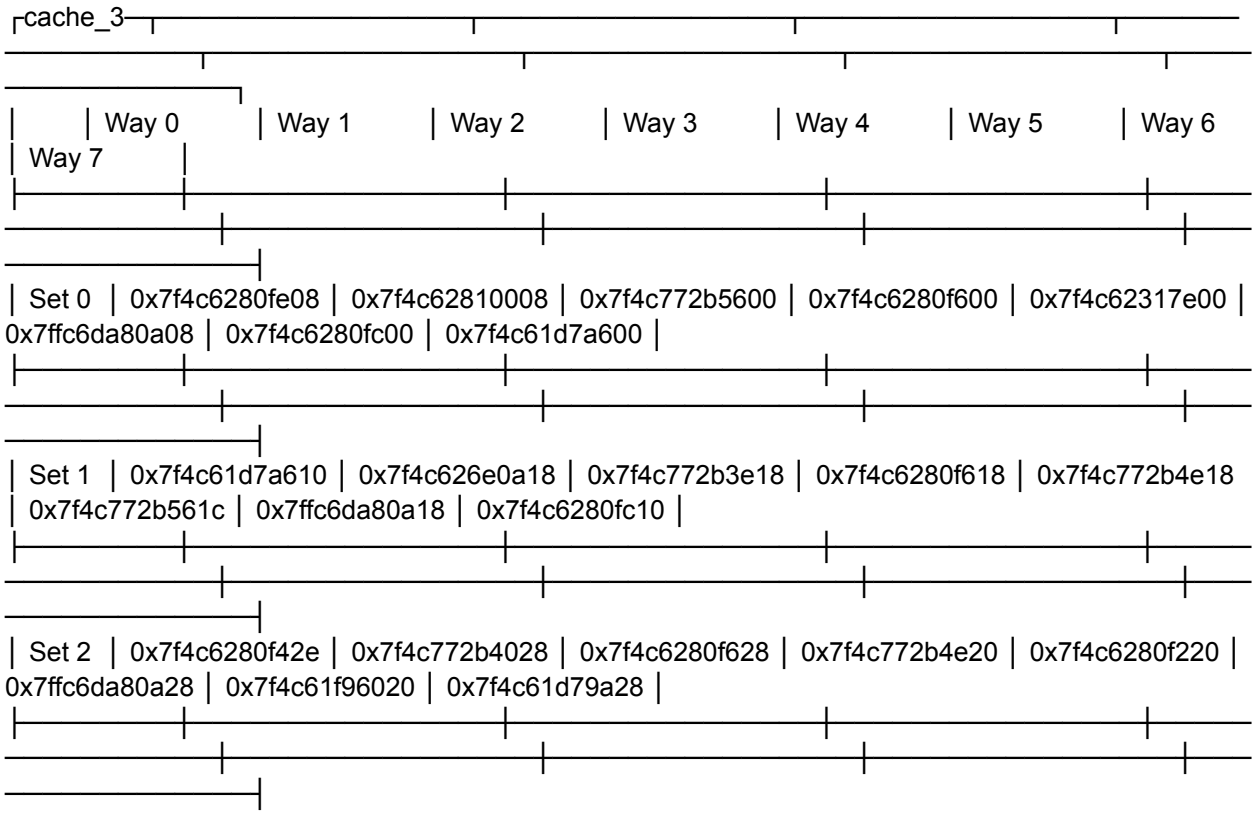


real 0m36.452s
user 0m10.123s

sys 0m1.016s
/home/grads/vmn5118/CachePerformanceOnMatMul

Using 3 Cache:

Number of instructions: 184040
Total cycles taken: 5323824
cache_3
Number of accesses: 5490
Number of hits: 2742
Number of misses: 2748
cache_2
Number of accesses: 37780
Number of hits: 31967
Number of misses: 5813
cache_1
Number of accesses: 184040
Number of hits: 138094
Number of misses: 45946
AMATs:
{'cache_1': 28.062994406602908,
'cache_2': 108.40276608608364,
'cache_3': 600.5464480874316,
'mem': 1000}



| Set 3 | 0x7f4c772b4a38 | 0x7f4c626e1430 | 0x7ffc6da80038 | 0x605230 | 0x7f4c772b4e3c | 0x604e38 | 0x7ffc6da80a38 | 0x7f4c6280f230 |

| Set 4 | 0x7ffc6da80a48 | 0x7f4c626e3440 | 0x7f4c626e2840 | 0x7f4c772b5248 | 0x7f4c626e0040 | 0x7f4c626dfa48 | 0x7f4c61f95c40 | 0x7f4c61d7b848 |

| . |

| . |

| . |

| Set 31 | 0x7f4c772b57f8 | 0x7f4c6280fff8 | 0x7f4c772b55f8 | 0x7f4c626d67f8 | 0x7ffc6da809f8 | 0x7f4c62317df0 | 0x7f4c62317ff0 | 0x7f4c61f95ff8 |

cache_2

| | Way 0 | Way 1 | Way 2 | Way 3 |

| Set 0 | 0x7ffc6da80b08 | 0x7f4c61d7ad0c | 0x7f4c61d7a700 | 0x7f4c61d7a600 |

| Set 1 | 0x7ffc6da80b10 | 0x7f4c6280f91c | 0x7f4c772b3e18 | 0x7f4c6280fc10 |

| Set 2 | 0x7f4c61d7ad28 | 0x7f4c61d7a620 | 0x7ffc6da80b28 | 0x7f4c61d79a28 |

| Set 3 | 0x7f4c626df330 | 0x7f4c61d7ad30 | 0x7ffc6da80b38 | 0x7f4c62318134 |

| Set 4 | 0x7f4c61d7e548 | 0x7f4c61d7b848 | 0x7f4c61d7a748 | 0x7ffc6da80b44 |

| . |

.				
.				
Set 15	0x7ffc6da80af8	0x7f4c628102fc	0x7f4c628100f0	0x7f4c772b4af8

cache_1

	Way 0	Way 1
Set 0	0x7f4c61d79a80	0x7ffc6da80b88
Set 1	0x7ffc6da80b90	0x7ffc6da80b18
Set 2	0x7f4c61d79a28	0x7ffc6da80ba0
Set 3	0x7f4c61d7b830	0x7ffc6da80bb0
Set 4	0x7f4c61d7b844	0x7ffc6da80b44
Set 5	0x7f4c61993f50	0x7f4c61d7e750
Set 6	0x7f4c61993f68	0x7f4c61d78e68
Set 7	0x7ffc6da80b74	0x7ffc6da80af8

real 0m34.506s
user 0m10.048s
sys 0m0.937s