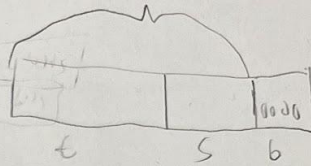CS354 p4B Worksheet: For given cach config, determine hits (H) and misses (M) for each instruction in the trace

```
csim-ref [-hv] -s <s> -E <E> -b <b> -t <tracefile>
-h: Optional help flag that prints usage info
-v: Optional verbose flag that displays trace info
-s <s>: Number of s bits for set index
-E <E>: number of lines per set (associativity)
-b <b>: Number of b bits for block offsets
-t <tracefile>: Name of the valgrind trace to replay
```

4 sets, 2 lines, 4 bits

./csim -s 4 -E 2 -b 4 -t traces/trace1

operation	address,size
L 0,1	0000
L 1,1	0001
L 2,1	0010
L 3,1	0011
S 4,1	0100
L 5,1	0101
S 6,1	0110
L 7,1	0111
S 8,1	1000
L 9,1	1001
S a,1	1010
L b,1	1011
S c,1	1100
L d,1	1101
S e,1	1110
M f,1	1111

block #

t   s   b

./csim -s 4 -E 1 -b 4 -t traces/trace2

L 10,1	0001 0000
M 20,1	0010 0000
L 22,1	0010 0010
S 18,1	0001 1000
L 110,1	0001 0001 0000
L 210,1	0010 0001 0000
M 12,1	0001 0010

0x10 [0000 0000] H

0x110 [0001 0001 0000] M
0x210 [0010 0001 0000] H
0x12 [0001 0010] M

./csim -s 2 -E 3 -b 3 -t traces/trace3

L 10,4	0001 0000	M
S 18,4	0001 1000	H
L 20,4		M
S 28,4		M
S 50,4		H

0x50 [0101 0000] M

./csim -s 3 -E 4 -b 5 -t traces/trace4 (this only partical list of trace4)

```
 S 00600aa0,1   M
I  004005b6,5
 S 7ff000398,8  H
I  0040051e,1
 S 7ff000390,8  M
I  0040051f,3   H
I  00400522,4
 S 7ff000378,8  H
I  00400526,4
 S 7ff000370,8  M
I  0040052a,7
 S 7ff000384,4  H
I  00400531,2
I  00400581,4
 L 7ff000384,4  H
```

Draw memory diagram of cache with S=4 and E=2.
Label memory type of each mem location: cache_line_t, cache_set_t, cache_t

Cache

cache_t
cache_set_t ☆

Stack

Heap

S=0
| 1 | v | tag | | other |
| 0 | v | tag | | other |

S=1
| 1 | v | tag | other |
| 0 | v | tag | other |

S=2
| 1 | v | tag | other |
| 0 | v | tag | other |

S=3
| 1 | v | tag | other |
| 0 | v | tag | other |
Cache_line_t

3
2
1
0

Cache_set_t

cache_line_t ✗