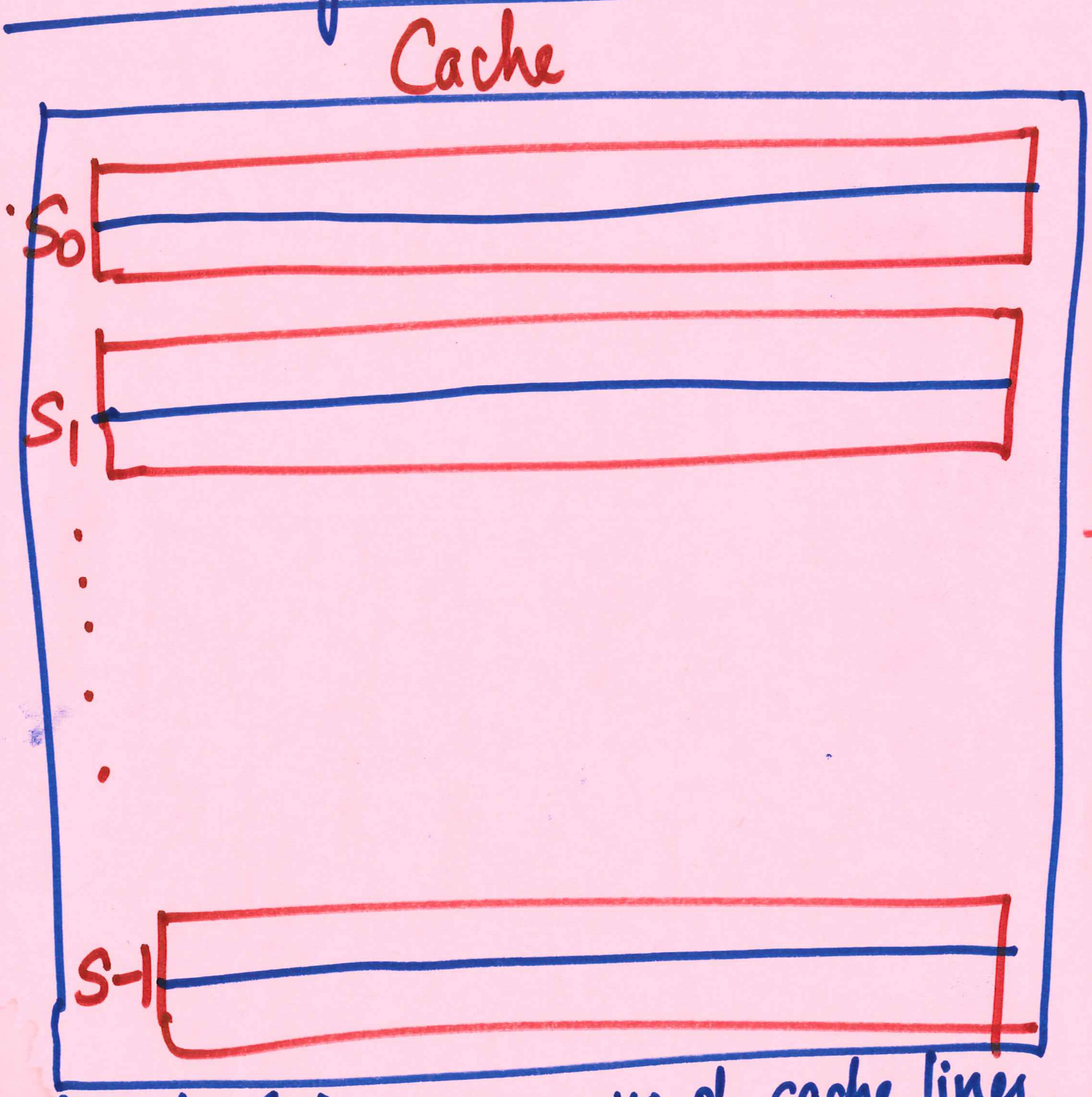
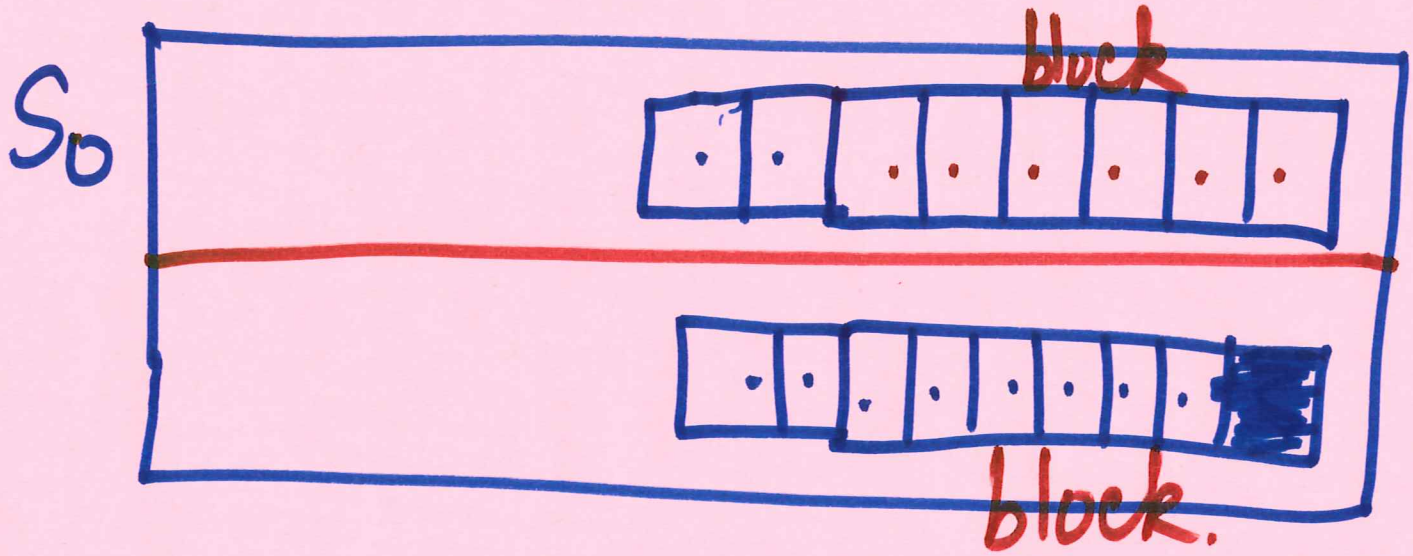
# Cache Memory

## Cache organization Review

Lecture - 26




total sets (S) = S. | no. of cache lines (E) = 2.




block → group of words

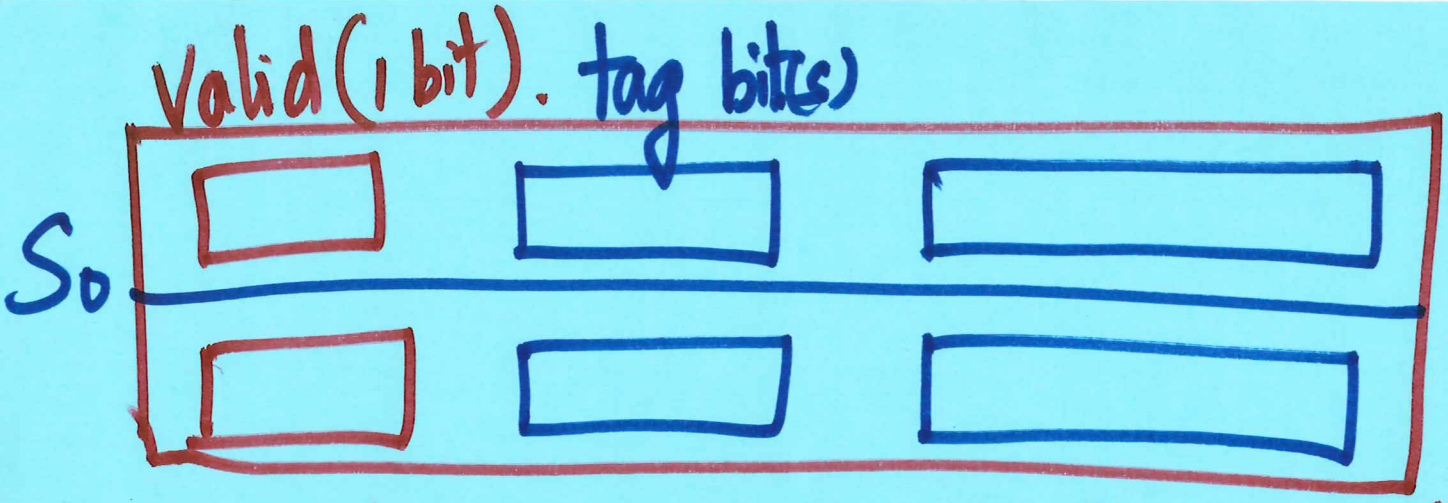
word → group of bytes.

eg. 1 word = 4 bytes

if 1 block = 2 words

⇒ 1 block = 2 × 4 = 8 bytes

No. of bytes per block (B) = ~~6~~ 8 eg.




if valid = 1 ⇒ cache line is valid.

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## Cache

1. Sets (S)

   if $S = 4$

   we need 2 bits.

   $S = 2^s$

   $s = 2$

2. Cache lines (E)

3. Block offset

   eg. $B = 8$

   $b = 3$

   $B = 2^b$

# Cache

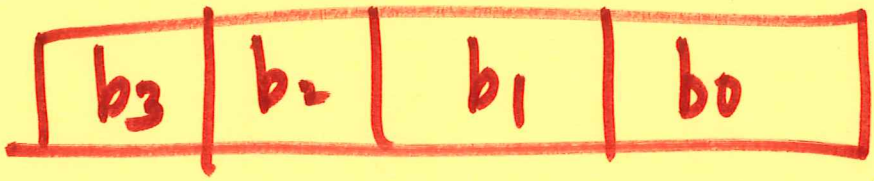
eg. $(S, E, B, m) = (128, 4, 8, 32)$

eg. $(S, E, B, m) = (4, 1, 2, 4)$

$b_3 b_2 b_1 b_0$

0000
0001
⋮
1111

} 16 addresses.

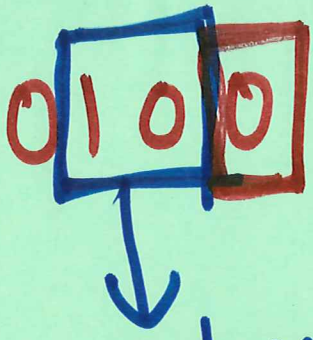



tag
$t = 1$

set index bits
$(s = 2)$

block offset
$(b = 1)$

$$t = m - (s + b)$$

eg. 


set no = 2.

No. of cache lines per set = 1

$\Rightarrow$ Direct mapped cache