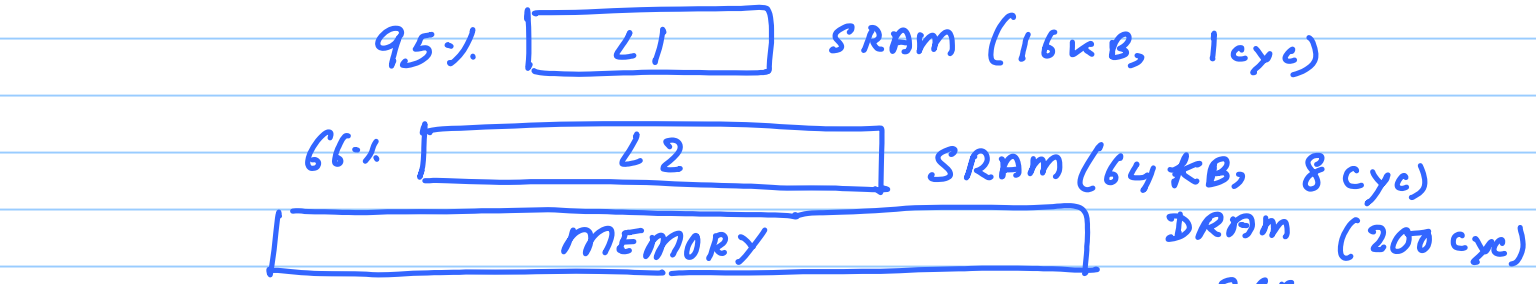
# Oct -16

Note Title 16-10-2012




$f \rightarrow$ fraction of mem instrs. $= 1/3$

$$CPI = CPI_{ideal} + f\,[0.05 \times 8 + 0.05 \times 1/3 \times 200]$$

$$= CPI_{ideal} + 1/3\,[0.4 + 3.33]$$

$$= [CPI_{ideal} + 1.24]$$

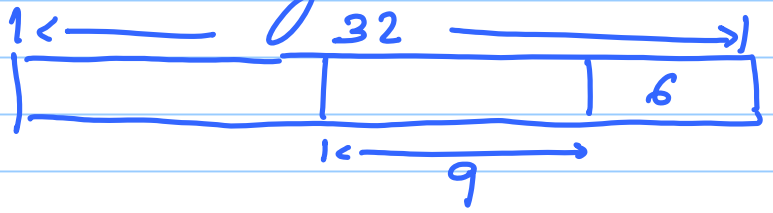
(1)

$$= \underline{2.24} \quad [\text{w/ Multilevel}]$$

$CPI = 1 + 1/3 \times 200 = 67.66$

IF ID EX MEM WB

Cache: Design.

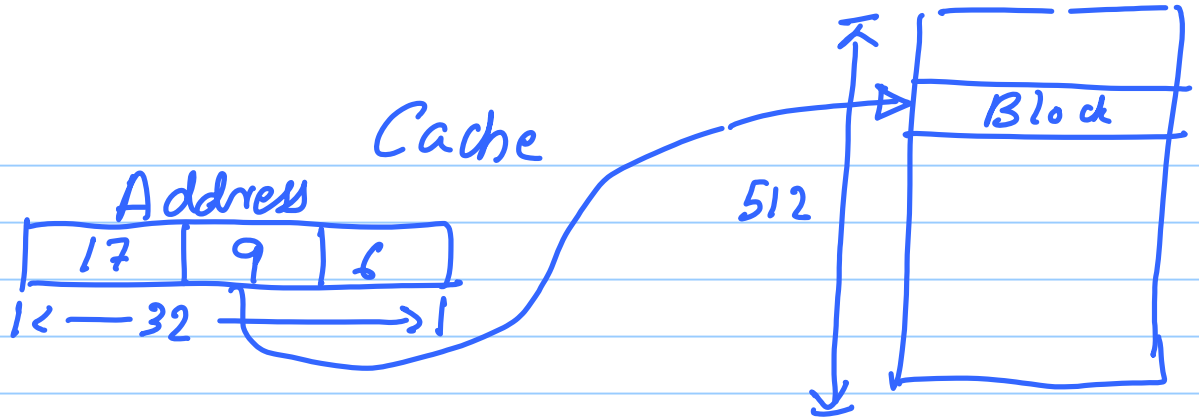



64 byte block.

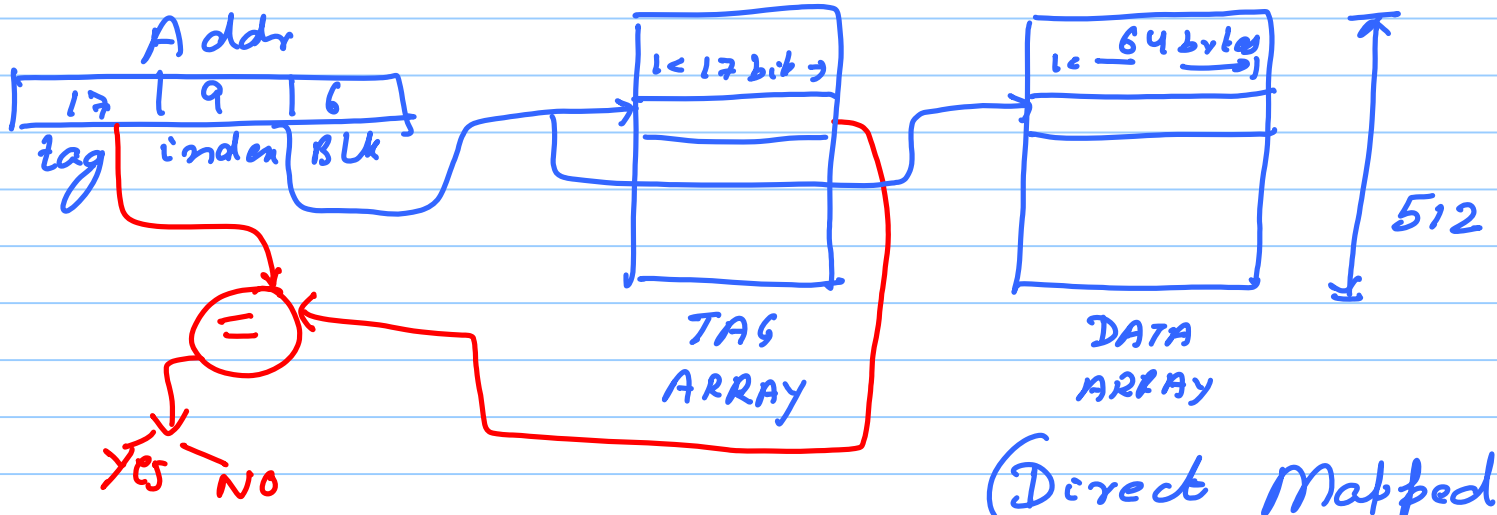
Cache size: 32 KB = $2^{15}$

Block size: 64 bytes $2^6$

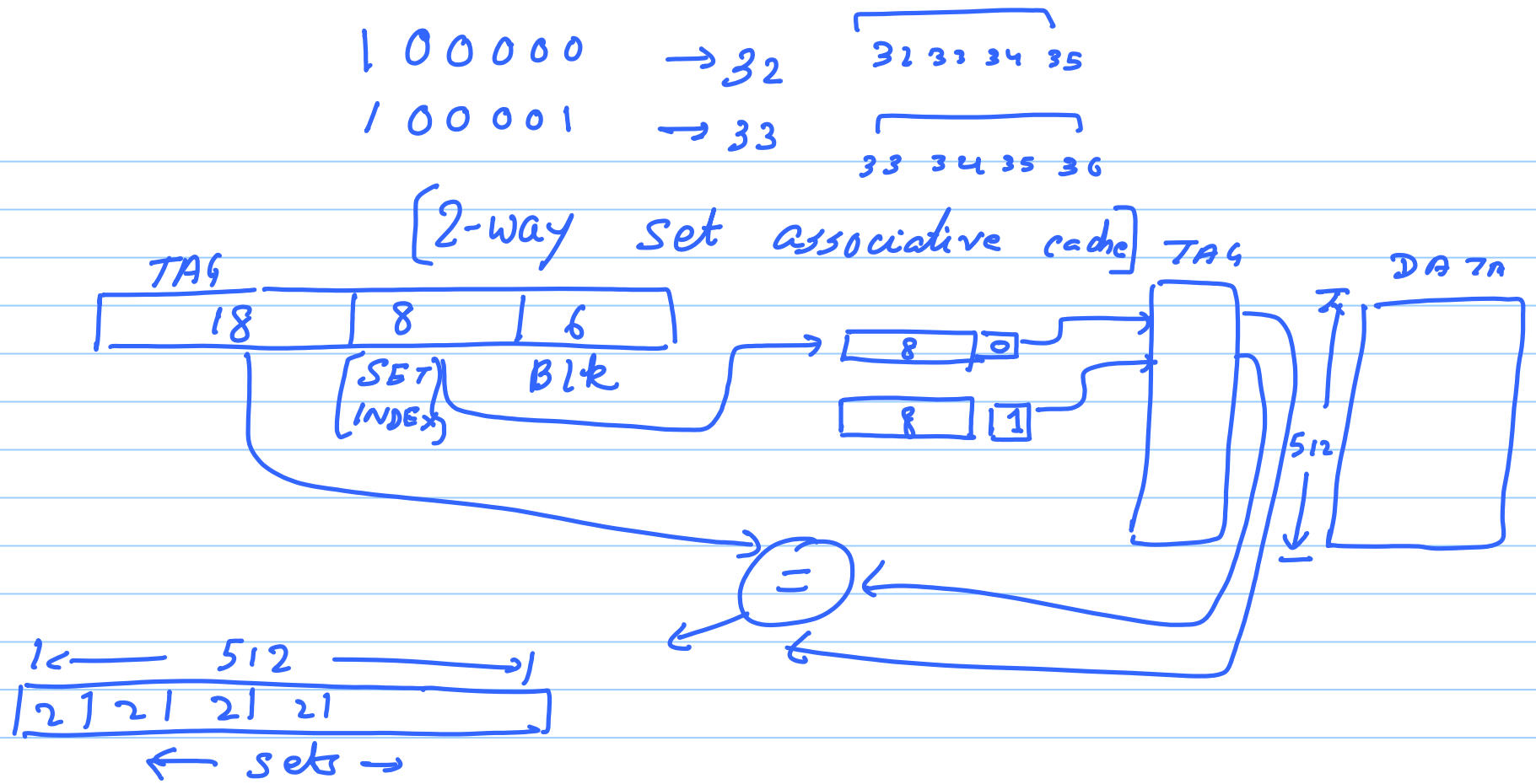
# of blocks: $2^9$ (512)



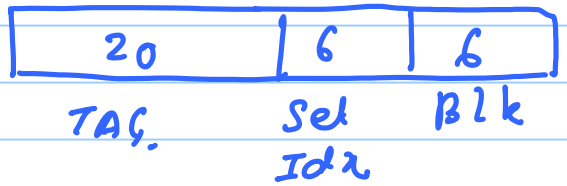

## Structure of a cache

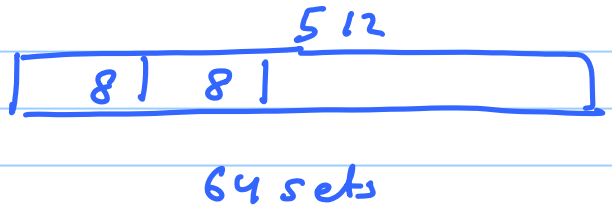



(Direct Mapped Cache)


100000 → 32
100001 → 33
32 33 34 35
33 34 35 36
[2-way set associative cache]
TAG
18
8
6
SET INDEX
Blk
TAG
DATA
8
0
8
1
512
=
1 ← 512 →
21 21 21 21
← sets →

# 8-way set associative cache




Limiting Case: 512-way set assoc. cache
(Fully Assoc. Cache)