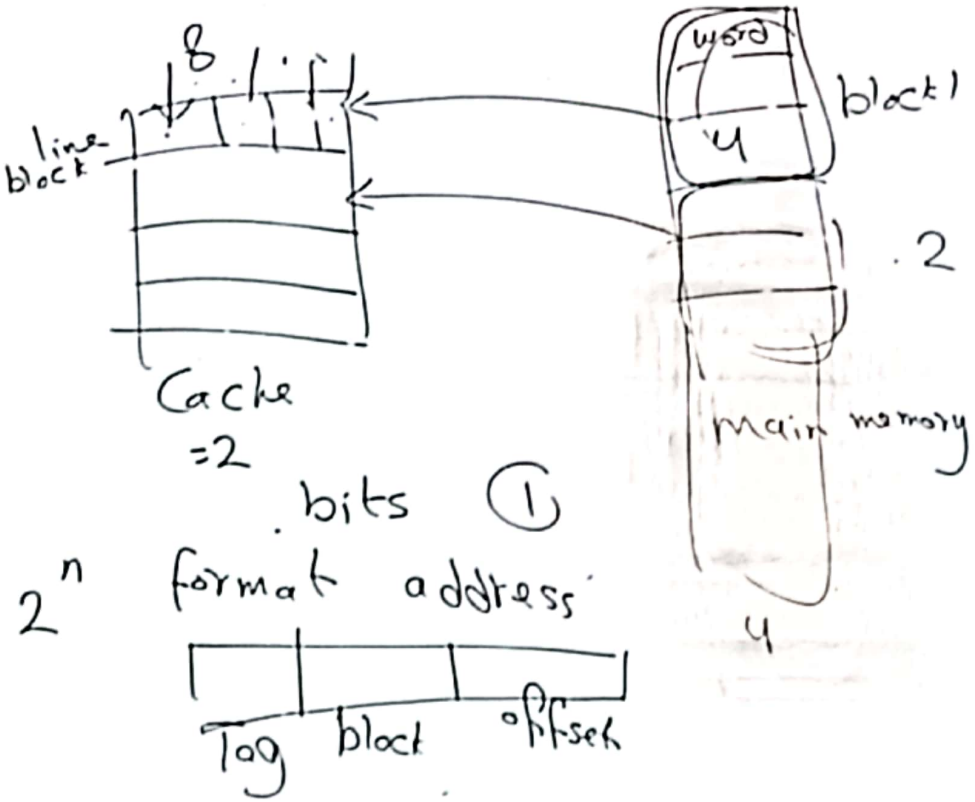
Direct Cache mapping:-



2^n format address

Consider a byte addressable main memory consist of 4 blocks and cache with 2 blocks where each block is 4 byte.

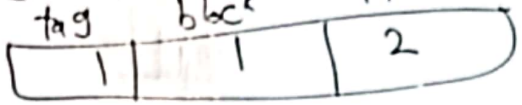
word size = 1 byte.

① memory size = $4 \times 4 = 16$ byte. $= 2^4$ byte

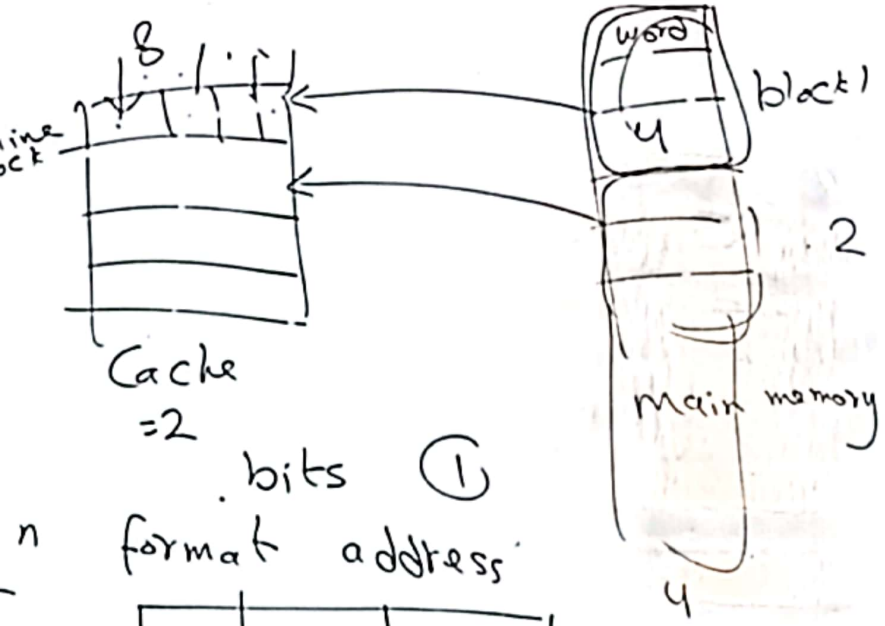
address bits = 4 bits.

offset = 2 bit

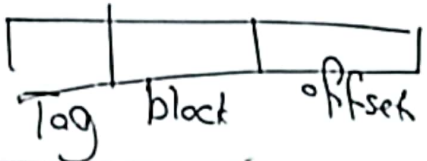
block = 1



Direct Cache mapping:-

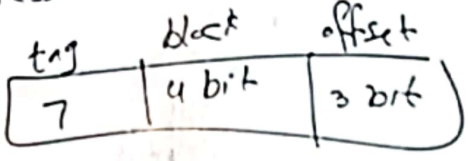


① format address

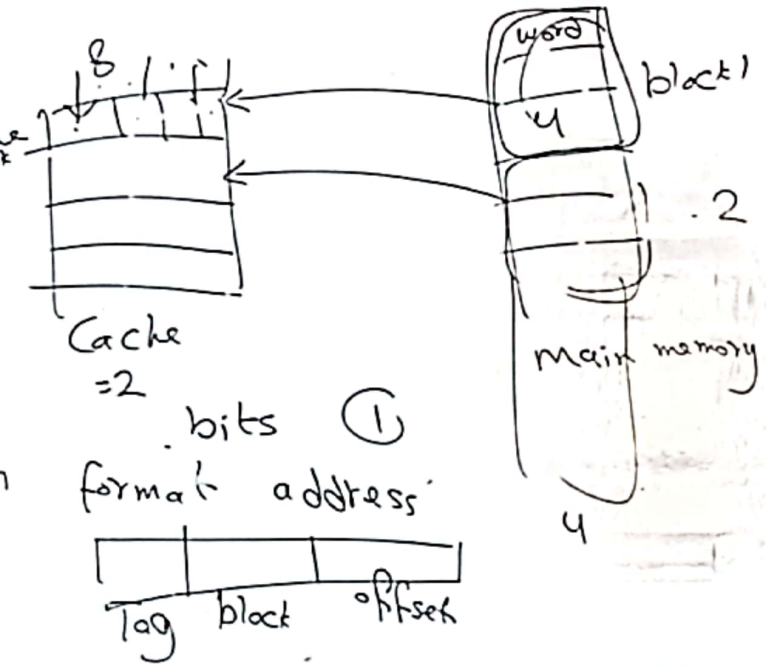


- Assume a byte-addressable memory consist of 2^{14} byte, Cache has 16 blocks, each block has 8byte.

- memory size = 2^{14} byte ⟵ 14 address bit



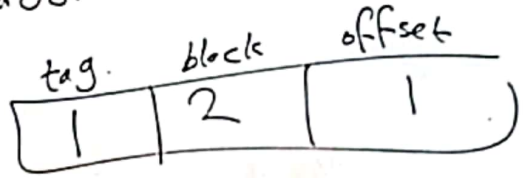
Direct Cache mapping:-



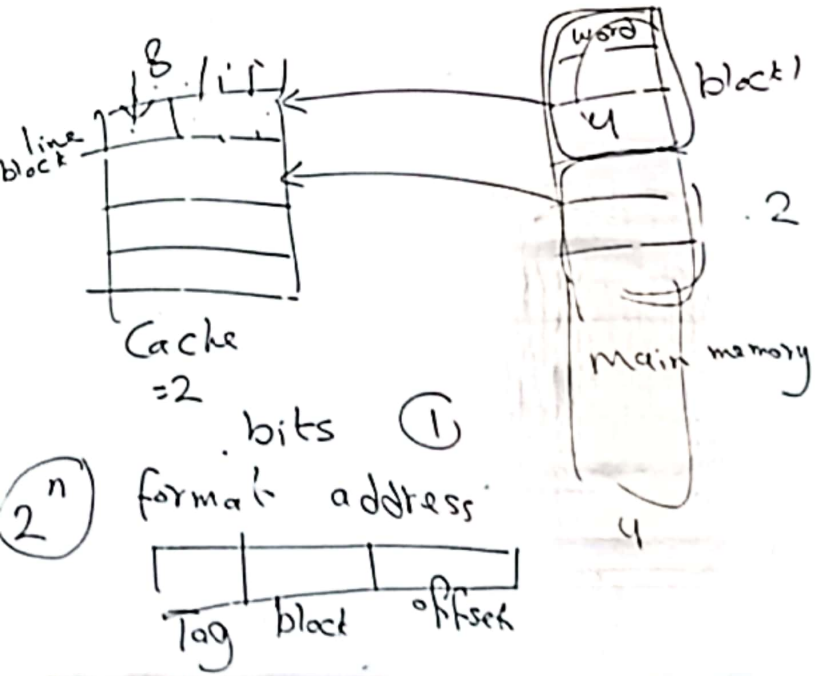
① format address:

- Assume a byte-addressable memory cosist of 16 byte divided into 8block, Cache Contain 4 block.

∴ address bit = 4 bit.



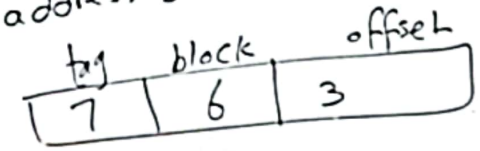
Direct Cache mapping:-



① 2^n formal address

- Assume 16-bit memory address and 64-block's of Cache where each block Cotain 8 bytes.

- address bit = 16-bit.



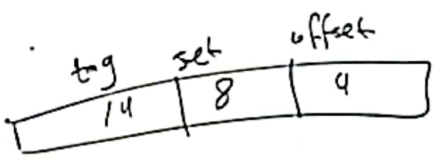
two-way associative has lines of 16 bytes and total size 8K byte, 64 Mbyte of main memory that is byte addressable.

set= 2 block

Cache size= $8K = 2^3 * 2^{10} = 2^{13}$ byte.

memory size = $64M = 2^6 * 2^{20} = 2^{26}$ byte.

address bits ←



offset = 4bit.

block each cache = $\frac{2^{13}}{2^4} = 2^9$ line.

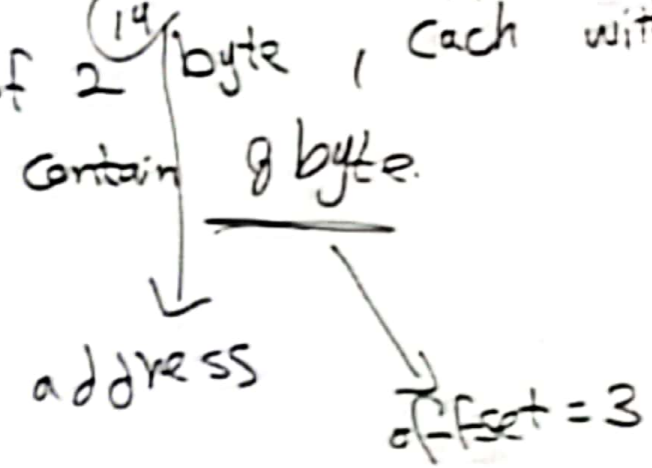
sets = $\frac{2^9}{2^1} = 2^8$

(a)

- using 2-way set associative with byte addressable

main memory of 2^14 byte, each with 16 block

each block contain 8 byte.



set = 3 bit

block = 8

- Suppose a byte addressable main memory Contain 1 MB, Cache Consist of 32 line, each block Contain 16 byte using

address bits. 2^{20} ← 1 MB

(1) Direct

tag	block	offset
11	5 bit	4 bit

0X 326f0 map in cache.

(2) fully associative

tag	offset
16	4 bit

4-way set associative.

tag	set	offset
13 bit	3bit	4

n. sets = $8 = 2^3$