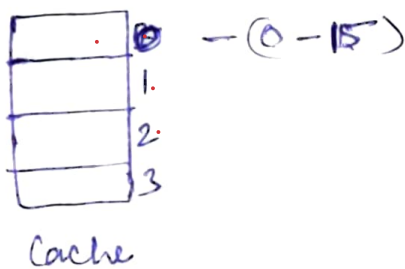


Associative Mapping

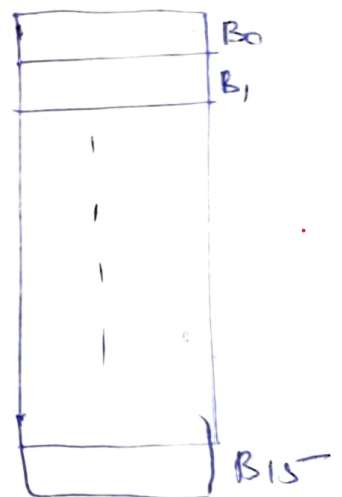
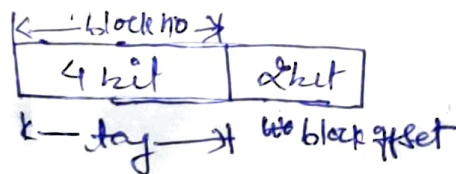
In full Associative Mapping

- A block of main memory can map any line of the cache that is freely available at that moment.
- This makes fully associative mapping more flexible than direct mapping.

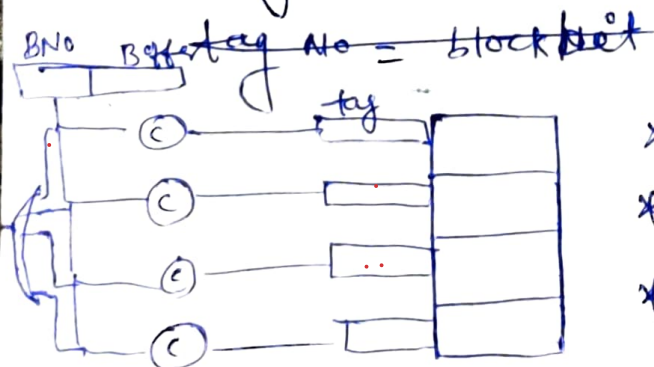
Suppose physical address bit = 6



block size = 4



any block of MM can map any cache lines



No. of tag bit = no. of block bit

- * more tag bit
- * more comparators needed
- * H/w cost increased.

Set Associative Mapping

Mapping function

Suppose MM Size = 64 Byte

Cache Size = 32 Byte

Block Size = 4 Byte

Set Size = 2 lines

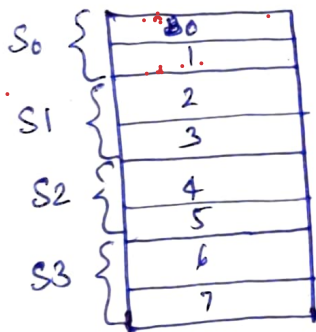
Cache Set No = (MM Block No) modulo

(No. of Sets in Cache)

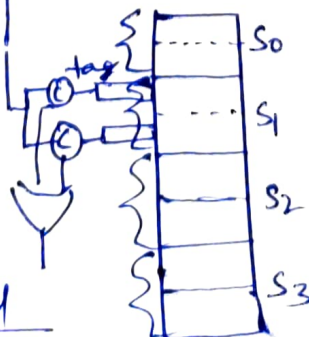
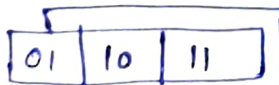
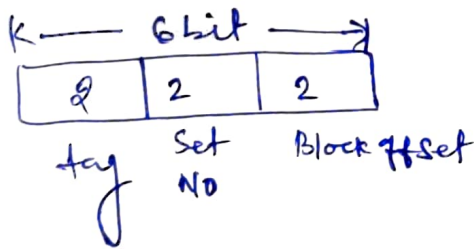
2. way Set Associative

$$\text{lines} = \frac{\text{Cache Size}}{\text{Block Size}} = \frac{32}{4} = 8 \text{ lines}$$

$$\text{Sets} = \frac{\text{lines}}{\text{Set Size}} = \frac{8}{2} = 4 \text{ Sets.}$$

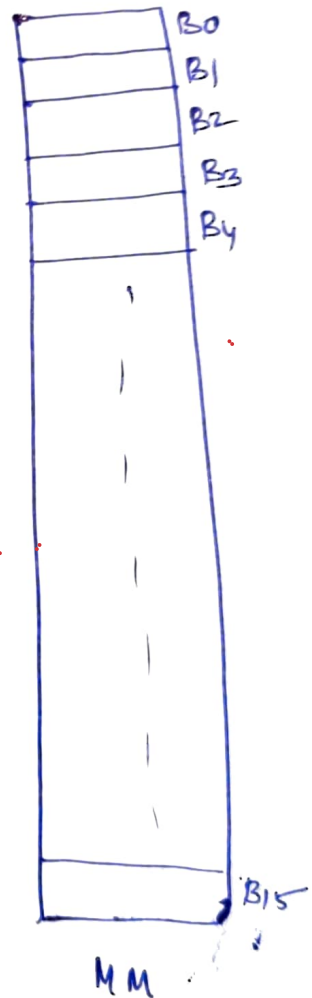


Cache



2 Comparators Needed

Cache



k-way set associative
k Comparators Needed