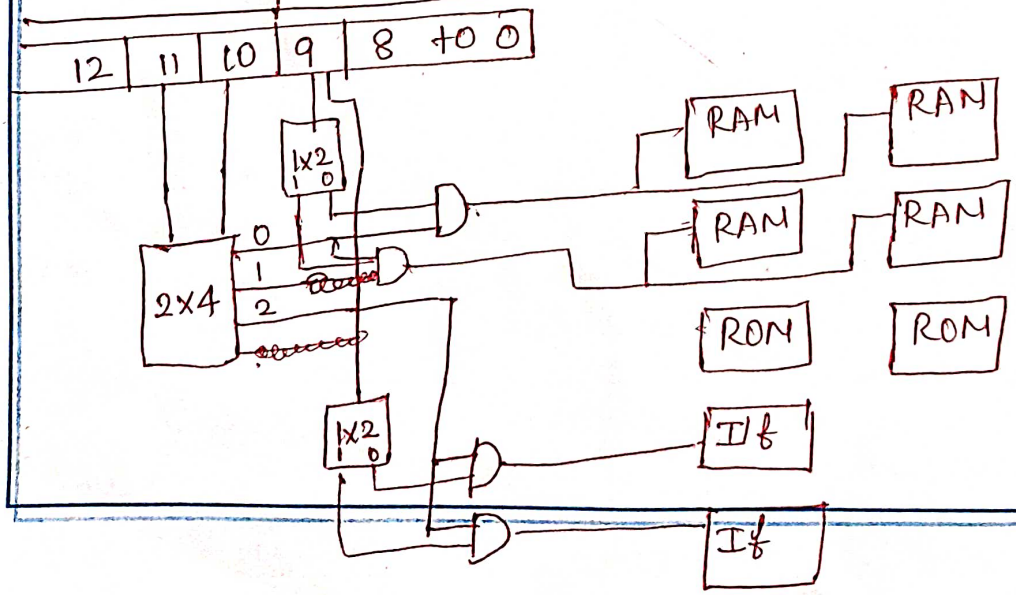
VIT
Vellore Institute of Technology

ADDITIONAL SHEET

Initial of the Hall Supervisor with date
Emp. ID.:

	P	Q	P×Q	x	y	z	total
RAM	2	2	4	9	1	2	12
ROM	1	2	2	10	0	2	12
IIf	2	1	2	8	1	2	11

			15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
RAM 1.1	0000	01FF	0 0 0 0 0 0 0 0 x x x x x x x x
RAM 1.2	0000	01FF	0 0 0 0 0 0 0 0 x x x x x x x x
RAM 2.1	0200	03FF	0 0 0 0 0 0 0 1 x x x x x x x x
RAM 2.2	0200	03FF	0 0 0 0 0 0 0 1 x x x x x x x x
ROM 1.1	0400	07FF	0 0 0 0 0 1 x x x x x x x x x x
ROM 1.2	0400	07FF	0 0 0 0 0 1 x x x x x x x x x x
IIf 1.1	0800	08FF	0 0 0 0 1 0 0 x x x x x x x x x
IIf 2.1	0A00	0AFF	0 0 0 0 1 0 1 x x x x x x x x x



word = 32-bits = 4 bytes = 2^2 bytes

cache block = 2048 bits = 256 bytes = 2^8 bytes

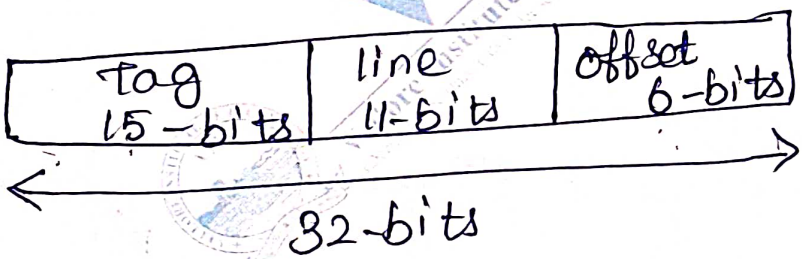
addr = 32-bits

cache = 2048 blocks = 2^{11} blocks

Block (no. of words) = $\frac{2^8 \text{ bytes}}{2^2 \text{ bytes}} = 2^6$ words

word = 6-bits

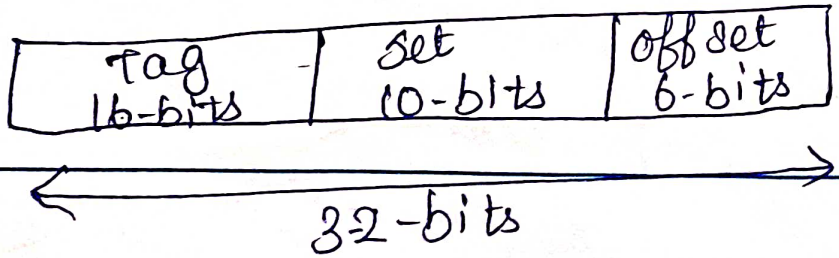
Direct mapped cache



2-way set

set = 2^1 blocks

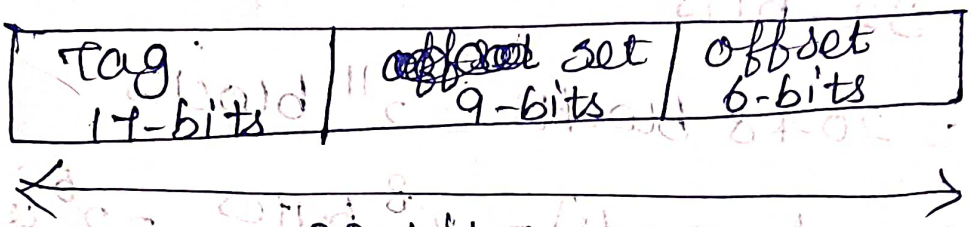
cache (no. of sets) = $\frac{2^{11} \text{ blocks}}{2^1 \text{ blocks}} = 2^{10}$ sets



4-way set also

Set = 4 blocks $= 2^2$ blocks

no of sets in cache $= \frac{2^{11} \text{ blocks}}{2^2 \text{ blocks}} = 2^9$ sets



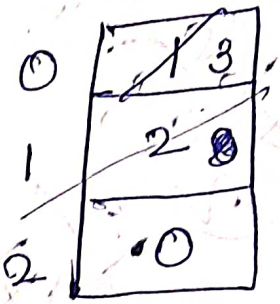
addr = 8-bit

page = 16-byte = 2^4 bytes

procus = 4 pages

frames = 3

0	2
1	0
2	1
3	



LRU

TLB → optimal

logical addresses — 7, 17, 37, 20, 40, 60

7 = 00000111 = 0

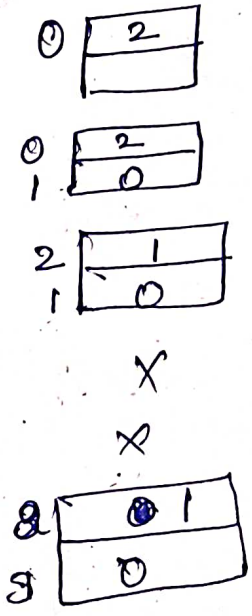
17 = 00010001 = 1

37 = 00100101 = 2

20 = 00010100 = 1

40 = 00101000 = 2

60 = 00111100 = 3



no fault

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$+21 = 00010101$ $\Rightarrow$ 1's = 11101010

$17 = 00010001$ $+1$

$-21 = 11101011$

$M = -21 = 11101011$

$Q = 17 = 00010001$

Bit recoded multiplier = 0 0 0 1 0 0 0 1 0

0 0 1 −1 0 0 +1 −1

1 1 1 0 1 0 1 1

0 0 1 −1 0 0 +1 −1

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 1 0 1 0 1

0 0 0 0 0 0 1 0 1 1

1 1 1 1 1 0 1 0 1 1

0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

1 1 1 1 1 1 1 0 1 0 0 1 1 0 1 = −357

(1)

$-13.275 = -1101.010011$

$= -1.1010100111 \times 2^3$

$E = 3 + 1023 = 1026$

1 10000000010 10101001100000....

$12.48 = 1100.0111101 \Rightarrow 1.1000111101 \times 2^3$

0 10000000010 10001111010000....

+21 × 17

BR = −21 = 11101011 (00010101)

$\overline{BR}+1 = 00010101$

Comment	AC	QR	Qn+1	SC
	00000000	00010001	0	8
AC+$\overline{BR}$+1	00010101			7
	00010101	10001000	1	
Ashr	00001010			
AC+BR	11101001			6
	11101001	11000100	0	
Ashr	11110100	01100010	0	5
Ashr	11111010	10110001	0	4
Ashr	11111101			
AC+$\overline{BR}$+1	00010101			
	00010010	01011000	1	3
Ashr	00001001			
AC+BR	11101010	00101100	0	2
Ashr	11110101	00010110	0	1
Ashr	11111010	10001011	0	0
Ashr	11111101			

−27 / 22

22 = 0010110 (2's)

27 = 011011

Q = 100101

A	Q
1111111	100101

011011
100100
1
100101