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CS 33
Discussion 1A

Homework 3
Problems 6.28, 6.30, 6.32
Work shown on pages below

6.28 -> refer to practice problem 6.12

A. List all of the hex memory addresses that will hit in set 2.

None

B. List all of the hex memory addresses that will hit in set 4.

0x18F0	0x00B0
0x18F1	0x00B1
0x18F2	0x00B2
0x18F3	0x00B3

C. List all of the hex memory addresses that will hit in set 5.

0x0E34
0x0E35
0x0E36
0x0E37

D. List all of the hex memory addresses that will hit in set 7.

0x1BDC
0x1BDD
0x1BDE
0x1BDF

6.30

A. What is the size (*C*) of this cache in bytes?

C = S x E x B = 8 * 4 * 4 = **128 bytes**

B. The box that follows shows the format of an address (1 bit per box). Indicate (by labeling the diagram) the fields that would be used to determine the following:

CO. The cache block offset
CI. The cache set index
CT. The cache tag

CT	**CT**	**CT**	**CT**	**CT**	**CT**	**CT**	**CT**	**CI**	**CI**	**CI**	**CO**	**CO**
12	11	10	9	8	7	6	5	4	3	2	1	0

6.32 – Repeat Problem 6.31 for memory address 0x16E8

A. Address format (1 bit per box):

1	**0**	**1**	**1**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**0**	**0**
12	11	10	9	8	7	6	5	4	3	2	1	0

B. Memory Reference:

Parameter	**Value**
Block offset (CO)	0x0
Index (CI)	0x2
Cache tag (CT)	0xB7
Cache hit? (Y / N)	N
Cache byte returned	--

HW 3: E = 2, B = 4, S = 8 ⇒ s = 3 b = 2 t = 13 − 5 = 8

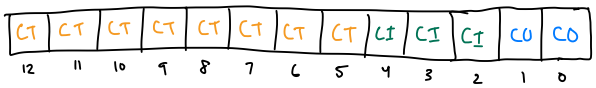
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

6.28 a) set 2

2 EB not valid

2 0B not valid

none!

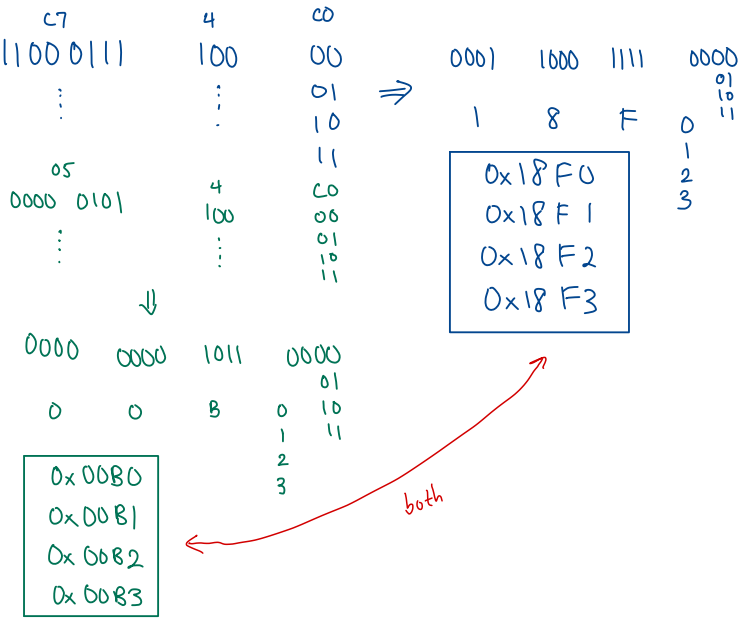


CO: block offset CI: set index CT: tag

6.28 b) set 4

4 C7 Byte: 0, 1, 2, 3 ⇒ (CI: 4, CT: C7, CO: Byte 0, 1, 2, 3)

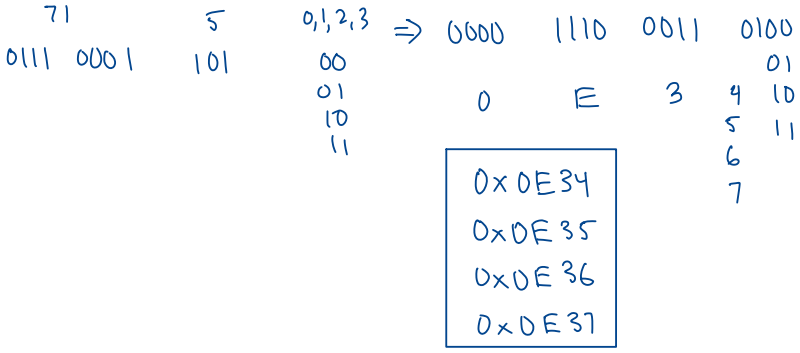
4 05 Byte: 0, 1, 2, 3 ⇒



6.28 c) set 5

5 71 Byte: 0, 1, 2, 3 ⇒

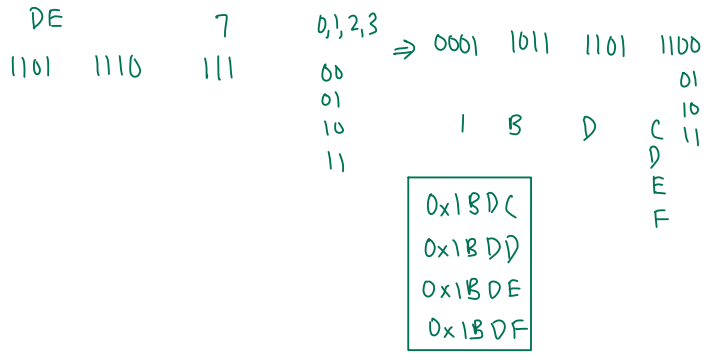
5 6E not valid!



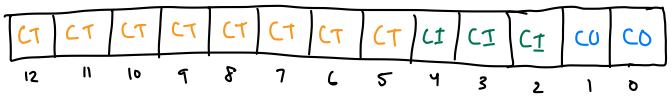
6.28 d) set 7

7 46 not valid!

7 DE Byte: 0, 1, 2, 3 ⇒



6.30) 13 bit addresses $E=4$, $B=4$, $S=8 \Rightarrow s=3$ $b=2$ $t=13-(3+2)=8$



CO: block offset CI: set index CT: tag

10	1010	A
11	1011	B
12	1100	C
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14	1110	E
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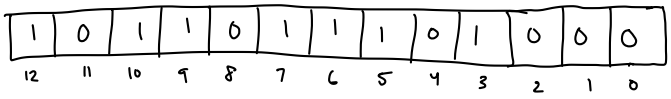
6.32) 13 bit addresses $E=4$, $B=4$, $S=8 \Rightarrow s=3$ $b=2$ $t=13-(3+2)=8$



CO: block offset CI: set index CT: tag

0x16E8

1	6	E	8
0001	0110	1110	1000
CT		CI	CO
1011	0111	010	00
B	7	2	0
0xB7		0x2	0x0

tag value does not match any tags!

no cache byte returned