0	64	128	...	
1	65	129	...	
2	66	67	...	
...	...	...	...	...
63	127	191	...	2047

Main Memory

0
1
...
...
2046
2047

Cache

0
1
...
...
62
63

Page

Word0	Word2	Word3	Word4

MAR

Tag 5	Line (Index) 6	Offset 2

Main Memory (2048 pages)

0	64	128	...	1983
1	65	129	...	1984
2	66	67	...	1985
...	...	...	...	...
63	127	191	...	2047

64

32

Cache

0
1
2
...
62
63

Address (4 bits)

Tag	Index (2 bits)	
n	nn	n ← Block offset

2

Index	Valid	Tag	Data	
0	1	0	0xCA	0xFE
1	1	1	0xDE	0xAD
2	1	0	0xBE	0xEF
3	0	1	0xFE	0xED

8   8

0   Mux   1

8

Hit   Data
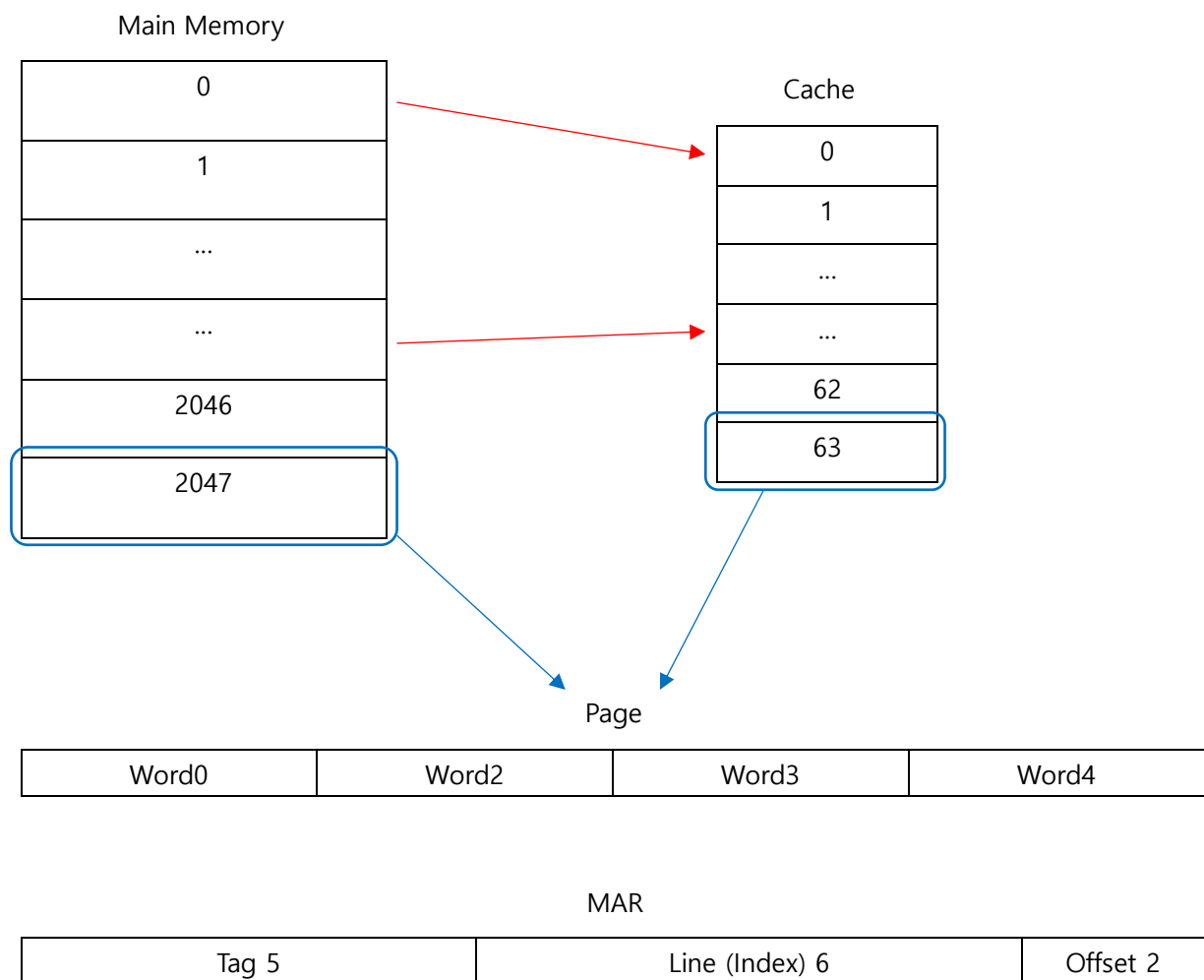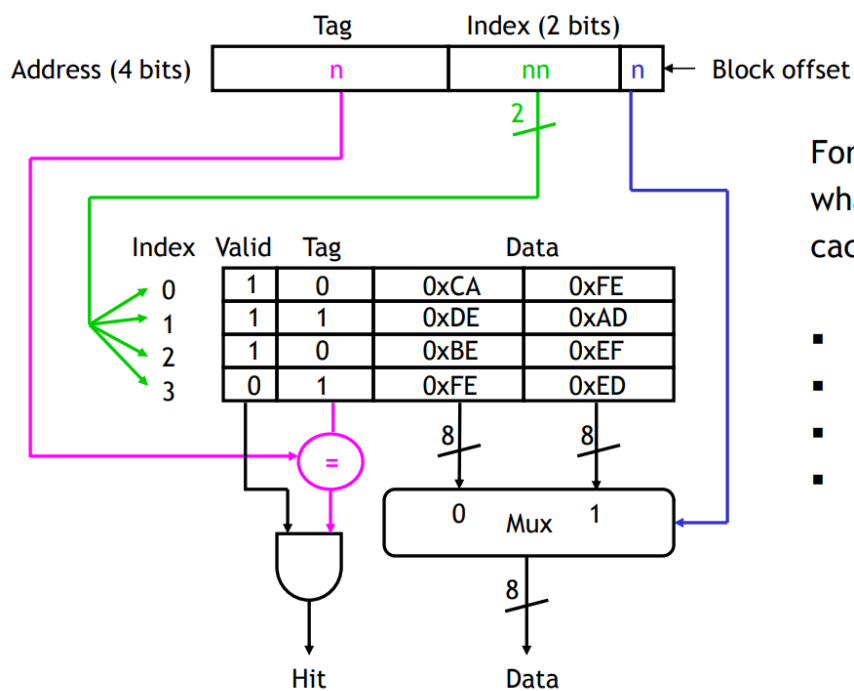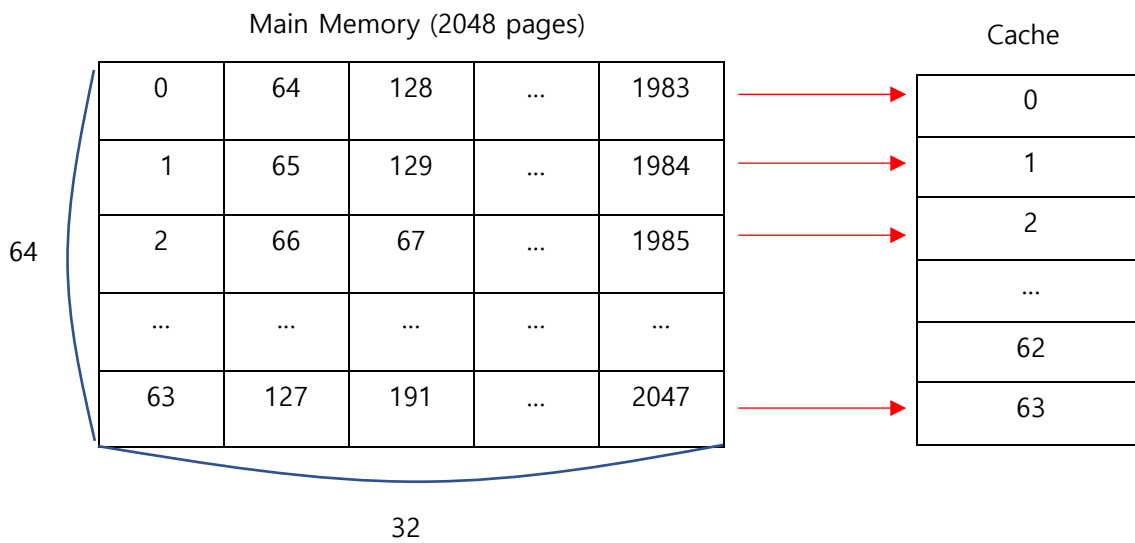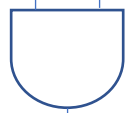
For the addresses below, what byte is read from the cache (or is there a miss)?

- 1010
- 1110
- 0001
- 1101

Address 13 bits	Tag 11001	Line (Index) 000001	Offset 10

Line	Valid	Tag	Data			
0	1	00101	A0	A1	A2	A3
1	1	11001	B0	B1	B2	B3
...	...	...	...	...	...	...
62	0	00000	E0	E1	E2	E3
63	1	11011	F0	F1	F2	F3

=

MUX

Hit

B2

Main Memory

0
1
...
...
2046
2047

Cache

0
1
...
...
62
63

Address (32 bits)

32

Tag

Index	Valid	Tag (32 bits)	Data
...			
...			
...			

Hit

Main Memory (2048 pages)

0	32	64	...	2016
1	33	65	...	2017
2	44	66	...	2018
...	...	...	...	...
31	63	95	...	2047

32

64

Cache

Set	Line
0	0
	1
1	2
	3
...	
31	62
	63
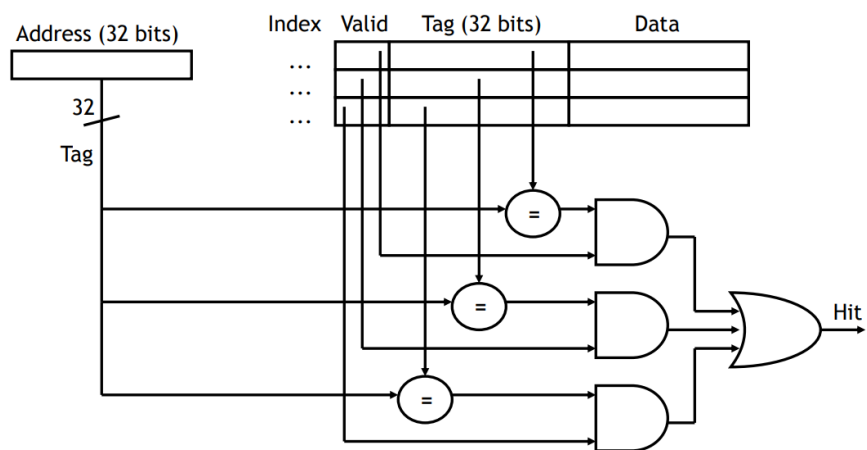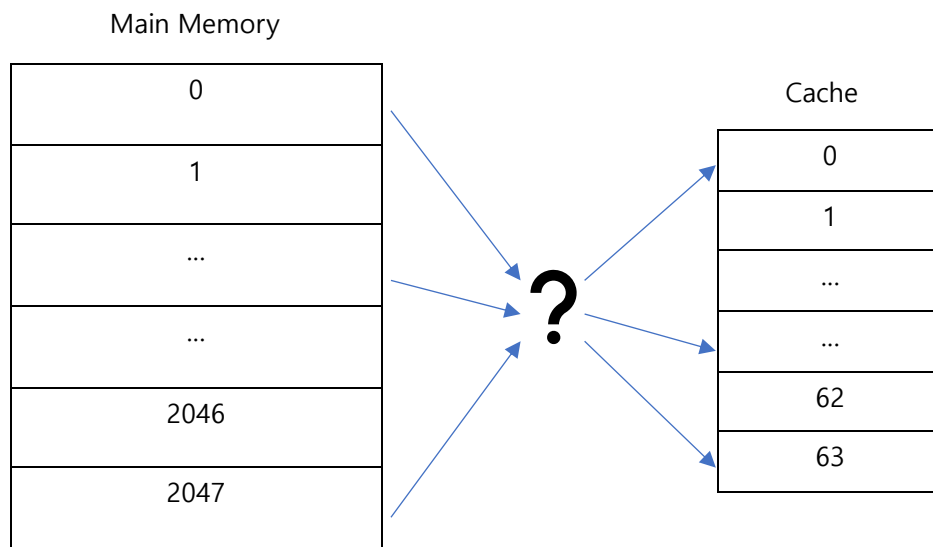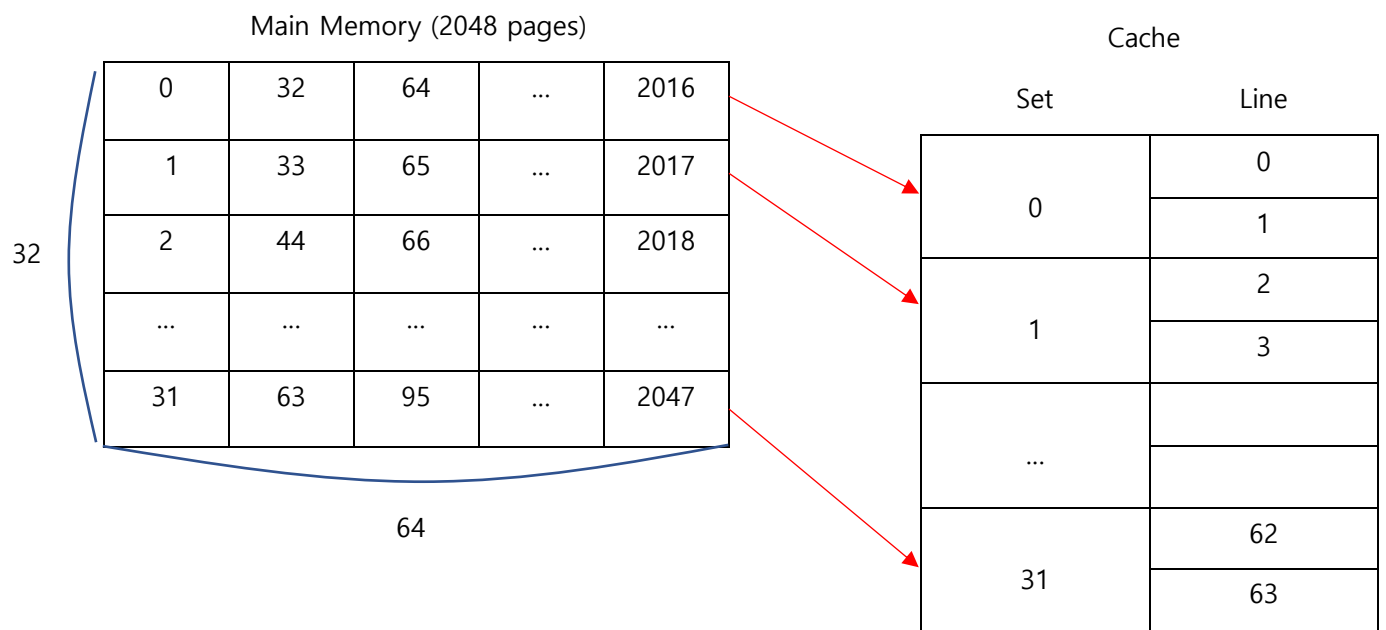
MAR

Tag 11	Offset 2

MAR

Tag 6	Line 5	Offset 2

Line	Valid	Tag	Data				
...	1	...	...	...	...	...	...
...	1	...	...	...	...	...	...
...	...	...	...	...	...	...	...

Address (13 bit)

Tag

Hit