

# EGC442

## Class Notes

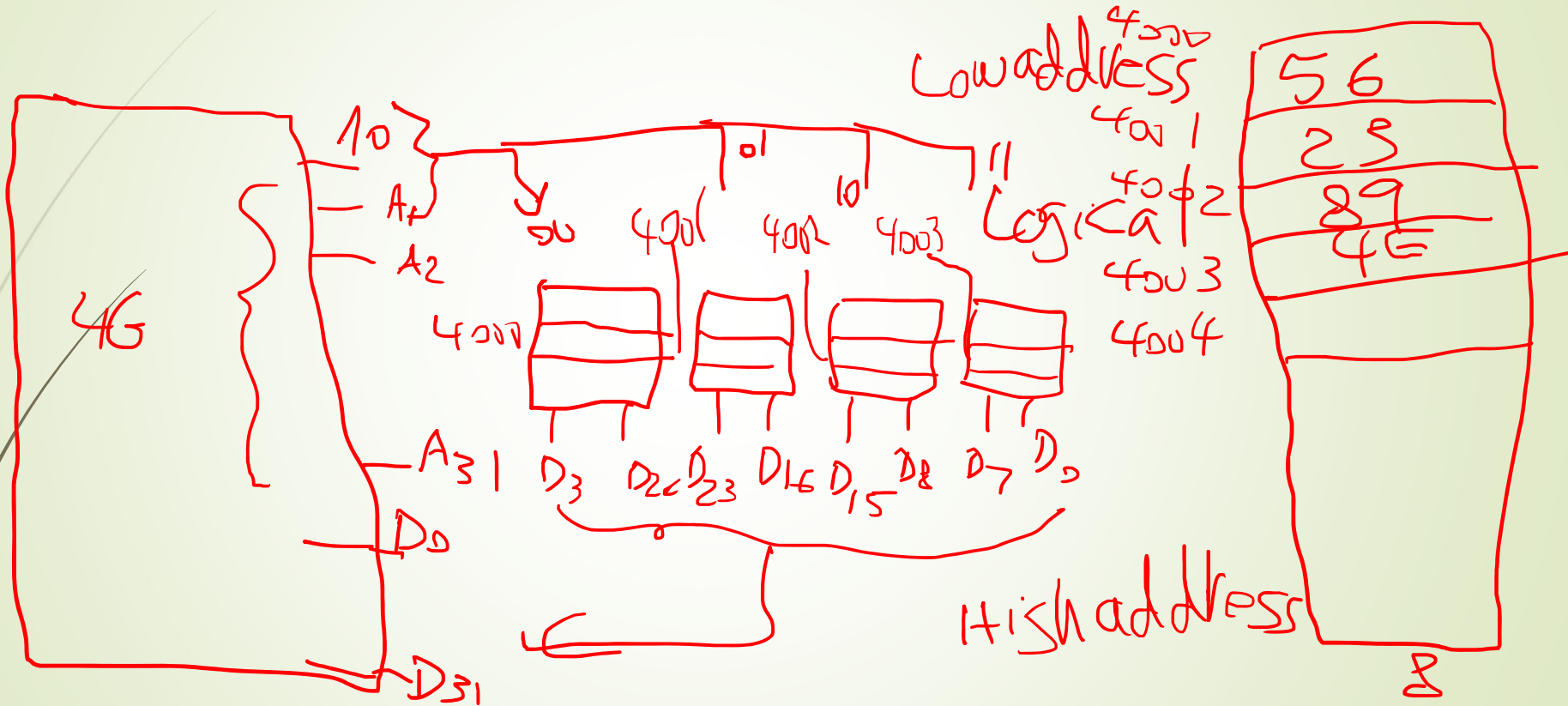
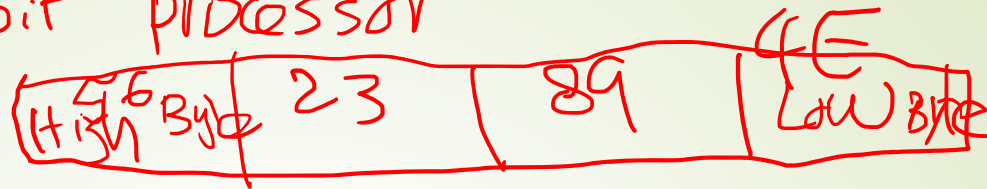
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MIPS 32 bit processor



AC#3 5004  
 ← 5007

\*address (&AC13)

ptr ← address  
 \* ptr ← content

address

Assume \$s3 has 5000, and words addressed 5000..5002 have the data shown:

5000: 99  
 5001: 77  
 5002: 323

value or content

\$s3 = 5000

5002

1) What address will be computed by:  
 lw \$t0, 2(\$s3)

\$t0 = 323  
 0x85992A70

\$s3 + 2 = 5002

2) What value will be put in \$t0 by:  
 lw \$t0, 0(\$s3)

5000 5001 5002 5003  
 0x9977234E

5002 0x85  
 5003 0x99  
 5004 → 0x23  
 5005 0x70

MC 5000 5003

3) What value will be put in \$t1 by:  
 lw \$t1, 2(\$s3)

content of \$t1 = 0x85992A70

4) Assume \$s2 has 5001. What value will be put in \$t2 by:  
 lw \$t2, 1(\$s2)

5002  
 \$t2 = M[5002-5005]  
 0x234E11E2

5000 0x99  
 5001 0x77  
 5002 0x23  
 5003  
 5004 0x4E  
 5005 0xE2

MEM unit = word = 32 bits  
0x1234ABCD

5000  
A[0]

lw \$a2, 0(\$s3)  
A[0]

5000

A[1]  
\* 4

lw \$a3, 4(\$s3)  
A[2]

5000

\$a2

5003

5004

5007

5008

500B

0x12  
0x34  
0xAB  
0xCD

(Empty memory location)

(Empty memory location)

Word

→

$AC(0) \uparrow$        $\downarrow AC(1)$        $\leftarrow AC(3)$

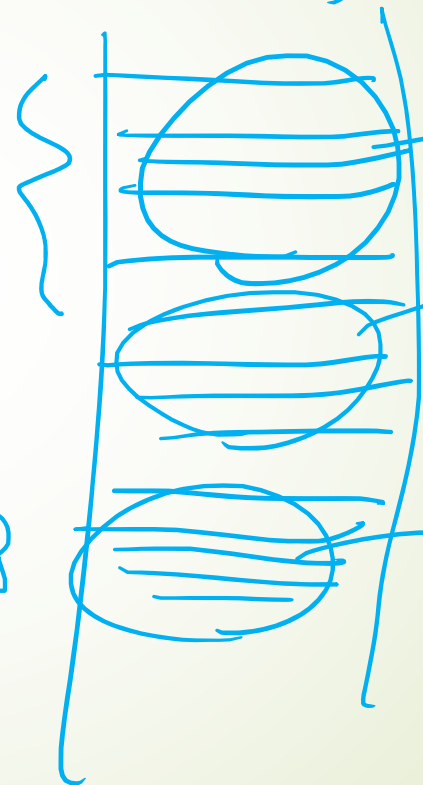
$AC(3) = \{0, 1, 32, 45\}$

\$53

$\leftarrow 0x5000$

$0x5004$

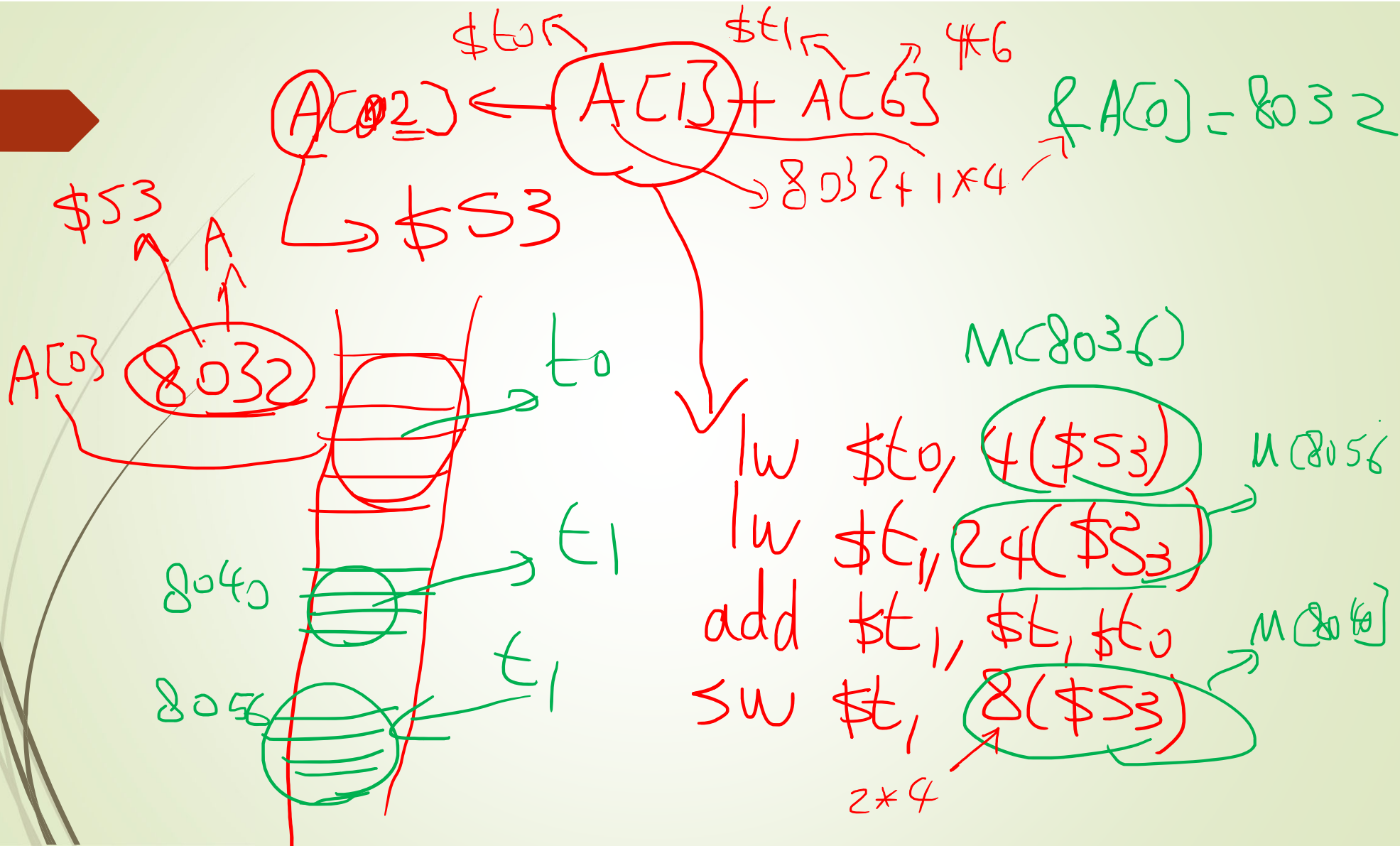
$0x5008$



$AC(0)$   
 $= 0$

$AC(1)$   
 $= 1$

$32$



low  $r_t$ ,  $d(16)$

$$r_t \leftarrow M[r_s + d(16)]$$

low  $r_t$ ,  $d(16)$

$$r_t \rightarrow M[r_s + d(16)]$$

• If \$s3 has 900, \$t0 has 77, and memory locations 900, 904, and 908 have 10, 15, 20 respectively, what do those locations have after the following instruction?

sw \$t0, 4(\$s3)

$\$t_0 \rightarrow M[900+4]$   
 ~~$\$s_3 = 900$~~   
 $\$t_0 = 77$

904 00  
905 00  
906 77  
907 ←

900 10

904 ~~15~~ 77

908 20



23) Which MIPS instruction does the following represent?

sub t2, t0, t1

op	rs	rt	rd	shamt	funct
6 bits	5 bits	5 bits	5 bits	5 bits	6 bits

op	rs	rt	rd	shamt	funct
0	8	9	10	0	34

t0  
t1  
t2