

HARSH MOHAN SASON

1.]

lw \$t0, 16(\$s2)

lw \$t1, 36(\$s2)

sw \$t0, 36(\$s2)

sw \$t1, 16(\$s2)

2.]

\$s2 = A2 B2 C3 D4

In: Binary = 1010 0001 1011 0010 1100 0011 1101 0100

sar \$t2, \$s2, 3

The most significant bit is 1, thus we add 3 one's to from left & removing the last 3 bits (0100)

= 1111 0100 0011 0110 0101 1000 0111 1010

= F 4 3 6 5 8 7 A

\$t2 = F436587A

slr \$t2, \$t2, 1.

We shift the right most bit and add a zero from the left

Thus \$t2 = 0111 1010 0001 1011 0010 1100 0011 1101

\$t2 = 7A1B2C3D

30)

sw \$s1, 4(\$zero)

sw \$s2, 8(\$zero)

lw \$s1, 6(\$zero)

# ~~0~~ A1B2C3D4 is stored at address 0x... 04.

# 5A6B7C8D is stored at address 0x... 08

# throw an error because there is address needs to be a multiple of 4

\$s1 = A1B2C3D4

two memory accesses are made

40)

(a) Start: add \$t1, \$s2, \$s1  
lw \$t0, 4(\$t1)  
bne \$t0, \$s5, End  
addi \$s1, \$s1, 2  
subi \$s1, \$s1, 1  
Start

End:

Inst. type

R type

I type

I type

I type

I type

J type

Addressing mode

Register mode

Base/displ. mode

PC-relative

Immediate

Immediate

~~Immediate~~

~~mode~~

Pseudo-

direct

addressing

mode

b0)

35	89	8	4
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6 bit

5 bit

5 bit

16 bit

100011

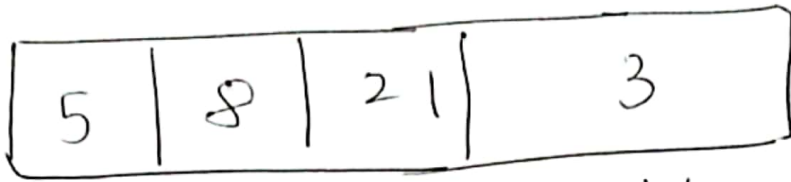
001001

01000

0000000000000000 100

Hex form 8D280004

(C)



6
5
5
16

000101
01000
10101
0000000000000011

(skips 3 instructions for immediate value)

~~7~~      ~~8~~  
 In Hex  $\Rightarrow$  15150003

5. The mode used in the jump instruction is Pseudo-direct addressing mode.

- It is used for jump instruction where ~~28 bits~~ <sup>26 bits</sup> of the address is embedded as the immediate and is used as instruction offset within the current 256 MB (B) region defined by the 4 bits of PC. For eg:  $\Phi$  Loop.

