

CSE 3038
COMPUTER
ORGANIZATION
HOMEWORK #1

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1) `sll $s6, $s6, 2` ; $\$s6$ equals $4*j$
`add $t7, $6, $s5` ; $\$t7$ equals $i+4*j$
`addi $s5, $s5, 3` ; $\$s5$ equals $i+3$
`add $s0, $s0, $t7` ; $\$s0$ equals address of $A + i+4*j$
`add $s1, $s1, $s5` ; $\$s1$ equals address of $B + i+3$
`lw $t7, 0($s0)`
`sw $t7, 0($s1)`

2) Big Endian

Little Endian

0	ca
1	bd
2	1f
3	2e

0	2e
1	1f
2	bd
3	ca

3) `sll $s3, $s3, 2` ; $\$s3$ equals $i*4$
`sll $s4, $s4, 2` ; $\$s4$ equals $j*4$
`add $t7, $s3, $s4` ; $\$t7$ equals $i+j$
`addi $t0, $t7, -2` ; $\$t0$ equals $i+j-2$
`add $t0, $t0, $s6` ; $\$t0$ equals address of $A + i+j-2$
`lw $t0, 0($t0)` ; load word to $\$t0$
`sub $t1, $s3, $s4` ; $\$t1$ equals $i-j$
`addi $t1, $t1, 1` ; $\$t1$ equals $i-j+1$
`add $t1, $t1, $s6` ; $\$t1$ equals address of $A + i-j+1$
`lw $t1, 0($t1)` ; load word to $\$t1$
`add $t2, $t0, $t1` ; $\$t2$ equals $A[i+j-2] + A[i-j+1]$
`addi $t7, $t7, 1` ; $\$t7$ equals $i+j+1$
`add $t7, $t7, $s7` ; $\$t7$ equals address of $B + i+j+1$ (continued)

sw \$t2, 0(\$t7) ; save word to address $B+i+j+L$

7)

4) $rs=5 \rightarrow \$t2$
 $rt=8 \rightarrow \$t3$
 $rd=20 \rightarrow \$t1$

Binary Representation
 $-000000\ 00101\ 01000\ 10100\ 00000\ 10010$
 $\downarrow\ \downarrow\ \downarrow\ \downarrow\ \downarrow\ \downarrow$
 $op\ rs\ rt\ rd\ shamt\ funct$

$op=0$
 $shamt=0$
 $funct=36 \rightarrow \text{and } rd, rs, rt$

and \$t1, \$t2, \$t3

5) lw \$t1, 0(\$s1)
 sll \$t1, \$t1, 8

6) and \$t1, \$t1, \$0 ; $j=0$

loop1: sll \$t2, \$t1, \$s0

bne \$t2, 1, exit1

and \$t0, \$t0, \$0 ; $i=0$

loop2: sll \$t2, \$t0, \$s1

bne \$t2, 1, exit2

sll \$t3, \$t0, 1 ; \$t3 equals $i*2$

add \$t4, \$t3, \$s2 ; \$t4 equals address of array D + $i*2$

add \$t5, \$t0, \$t1 ; \$t5 equals $i+j$

add \$t5, \$t5, -5 ; \$t5 equals $i+j-5$

sw \$t5, 0(\$t4)

addi \$t0, \$t0, 1

j loop2

exit2: addi \$t1, \$t1, 1

j loop1

exit1:

7) Inner loop = $1 + (8 \times 1) + 2 = 11$

Outer loop = $1 + (3 + 11) \times 10 + 2 = 143$