

Computer Organization - HW02-2

1. $sll \ \$t0, \$s4, 2 \quad \# \ \$t0 = 4 \times j$
 $add \ \$t0, \$t0, \$s7 \quad \# \ \$t0 = 8B[j]$
 $lw \ \$t1, 20(\$t0) \quad \# \ \$t1 = B[j+5]$
 $lw \ \$t0, 16(\$s6) \quad \# \ \$t0 = A[4]$
 $sub \ \$t2, \$t0, \$t1 \quad \# \ \$t2 = A[4] - B[j+5]$
 $sll \ \$t0, \$s3, 2 \quad \# \ \$t0 = 4 \times i$
 $add \ \$t0, \$t0, \$s6 \quad \# \ \$t0 = 8A[i]$
 $sw \ \$t2, 12(\$t0) \quad \# \ A[i+3] = A[i] - B[j+5]$

2.

$\# 8A[4]$

$\# A[4]$

$\# B[j] \times 2^3$

$$J = z \cdot B[j] + 8 \cdot A[4] + h - 4 \quad \#$$

$\# \$t1 \leftarrow q \times 2^2$

$\# 8B[j]$

$\# B[j]$

$\# B[j] \times 2$

$\# \$t0 = B[j] \times 2 + A[4] \times 8$

$\# (B[j] \times 2 + A[4] \times 8) + h - 4 \quad \#$

3.

$lw \ \$t0, 0x23$

I $\$t1 \Rightarrow 9$

format $\$s1 \Rightarrow 17$

$add \ \$t0, \$t0, \$s1$

$add \ \$t0, \$t0, \$s1$

R $\$t0 \Rightarrow 8$

format $\$s3 \Rightarrow 19$

opcode	rs(\$s)	rt(\$t)	immediate (20)
100011	10001	01001	0000 0000 0001 0100
8	E	2	9
			0 0 1 4

opcode	rs(\$s)	rt(\$t)	rd(\$t)	shift(s)	immediate
000000	10011	01101	01000	000000	10 0000
0	2	6	4	0	2 0

四.

I-format \Rightarrow 100011 01011 10100 0001001110001000

lw \$s4, 5000(\$t3)
#

五. A D^(rs) 6^(rt) D 0 0 2 2
 1010 1101 0110 1101 0000 0000 0010 0010
 0x2B 11 13 34

sw \$t5, 34(\$t3)
#

六. $256 = 2^8 \Rightarrow 8\text{bits}$ OPCODE $\Rightarrow 2^6 \times 2 = 2^7 \Rightarrow 7\text{bits}$

R-format: OPCODE (7bits) + rs (8bits) + rt (8bits) + rd (8bits) + shiftc (5bits) + funct (uncertain)
#

I-format: OPCODE (7bits) + rs (8bits) + rt (8bits) + immediate (16bits)
#

七. addi \$t0, \$s0, 8

ori \$t0, \$t0, 2

add \$t0, \$t0, \$s2

lw \$t1, 0(\$t0)

ori \$s1, \$t1, 2
#

八.

0	0	19	9	2	0
0	22	9	9	0	32
35	9	8		0	
5	8	21		2	
8	19	19		1	
16	20000				