Mim: MIPS Reference Data Improved
(for CS2100 AY2024/25 S2)

Register Encoding

Aside from the constant zeroes, we have t for temporaries and s for saved temporaries.

$zero	$t0	$t1	$t2	$t3	$t4	$t5	$t6	$t7
00000	01000	01001	01010	01011	01100	01101	01110	01111

$t8	$t9	$s0	$s1	$s2	$s3	$s4	$s5	$s6	$s7
11000	11001	10000	10001	10010	10011	10100	10101	10110	10111

Instruction Encoding

I found the given reference sheet quite difficult to use. I made a list that allows faster format conversion and reduces human errors when converting between binary, hex, and decimal.

R-Format Instructions						
Mnemonic	opcode (6)	rs (5)	rt (5)	rd (5)	shamt (5)	funct (6)
add rd, rs, rt	000000	rs	rt	rd	00000	100000
sub rd, rs, rt	000000	rs	rt	rd	00000	100010
sll rd, rt, shamt	000000	00000	rt	rd	shamt	000000
srl rd, rt, shamt	000000	00000	rt	rd	shamt	000010
and rd, rs, rt	000000	rs	rt	rd	00000	100100
or rd, rs, rt	000000	rs	rt	rd	00000	100101
xor rd, rs, rt	000000	rs	rt	rd	00000	100110
nor rd, rs, rt	000000	rs	rt	rd	00000	100111
slt rd, rs, rt	000000	rs	rt	rd	00000	101010
I-Format Instructions						
Mnemonic	opcode (6)	rs (5)	rt (5)	immediate (16)		
beq rs, rt, relative address	000100	rs	rt	relative address		
bne rs, rt, relative address	000101	rs	rt	relative address		
addi rt, rs, immediate	001000	rs	rt	immediate		
andi rt, rs, immediate	001100	rs	rt	immediate		
ori rt, rs, immediate	001101	rs	rt	immediate		
xori rt, rs, immediate	001110	rs	rt	immediate		
lui rt, immediate	001111	00000	rt	immediate		
lb rt, immediate(rs)	100000	rs	rt	immediate		
lw rt, immediate(rs)	100011	rs	rt	immediate		
sb rt, immediate(rs)	101000	rs	rt	immediate		
sw rt, immediate(rs)	101011	rs	rt	immediate		
J-Format Instructions						
Mnemonic	opcode (6)	address (26)				
j address	000010	26-bit target address (shifted left by 2 when used)				