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Lab 9 - Assignment

Line 7:

addi \$s0, \$zero, -15

I-format:

OP	rs	rt	imm
001000	00000	10000	

→ 0000 0000 0000 1111

★ 2's Complement: 0000 0000 0000 1111
(because -)

= 1111 1111 1111 0000
+1

= 1111 1111 1111 0001

OP	rs	rt	imm
001000	00000	10000	1111 1111 1111 0001

binary: 0010 0000 0001 0000 1111 1111 1111 0001
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 2 0 1 0 15=F 15=F 15=F 15=F

hex: 0x2010ffff

Line 14:

Slt \$t0, \$s0, \$s1

R-format:

opcode	rs	rt	rd	shamt	funct
000000	10000	10001	01000	00000	101010

binary: 0000 0010 0001 0001 0100 0000 0010 1010

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

0 2 1 1 4 0 2 10=A

hex: 0x0211402a

Line 17:

beq \$t0, \$zero, LEEQ

I-format:

Op	rs	rt	imm
000100	01000	00000	0000 0000 0000 0110

★ imm = # of instructions from Beq to the label.

Or in terms of addresses, difference between the address associated with the label and the pc, divided by 4.

$$4194352 - 4194328 = 24 / 4 = 6$$

or can count instructions in Proc2 between Beq and LEEQ

Binary: 0001 0001 0000 0000 0000 0000 0000 0110

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
1 1 0 0 0 0 0 6

hex: 0x11000006

Line 20: J GRT

J-format:

Op	address
000010	0000 0100 0000 0000 0000 0001 11

GRT = 0040001C (address @ GRT)

0000 0000 0100 0000 0000 0001 1100
↓ ↓ ↓ ↓ ↓ ↓ ↓
0000 0000 0000 0000 0000 0001 1100

0000 0000 0100 0000 0000 0000 0001 1100
remove upper 4 and lower 2.

0000 0100 0000 0000 0000 0001 11

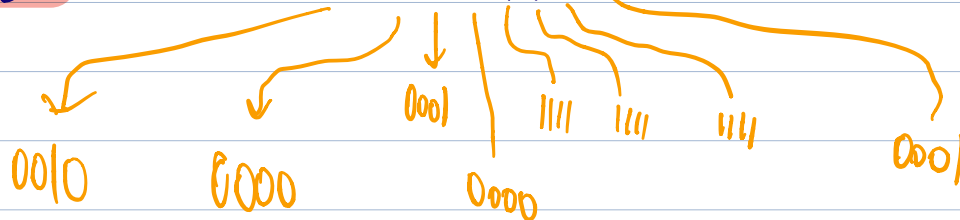
Binary: 0000 1000 0001 0000 0000 0000 0000 0111

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
0 8 1 0 0 0 0 7

Hex: 0x08100007

Lab 9 resubmission update:

Line 7 hex: 0x2010ffff



opcode: 001000 = 8 = addi

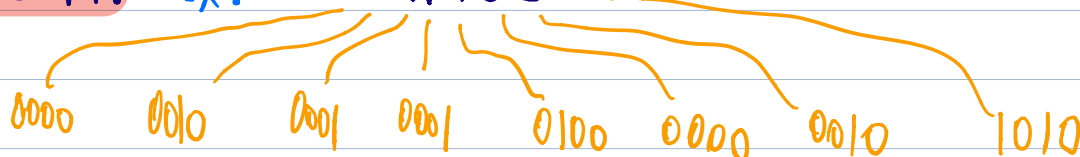
rs: 00000 = value 0 = \$zero

rt: 10000 = value 16 = \$50

imm: 1111 1111 1111 0001 = -15

addi \$50, \$zero, -15

Line 14: hex: 0x0211402a



opcode: 000000 = R-form

rs: 10000 = 16 = \$s0

rt: 10001 = 9 = \$t1

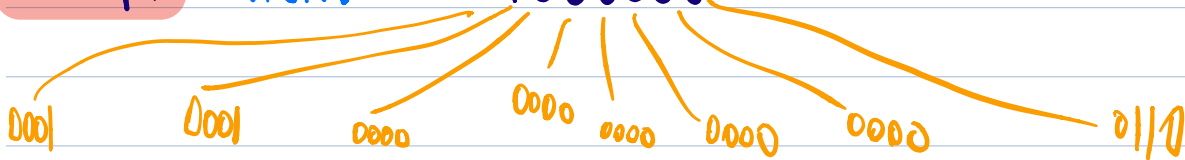
rd: 01000 = 8 = \$t0

shamt: 00000 = 0

func: 101010 = 2a = SLT

SLT \$t0, \$s0, \$s1

Line 17: hex: 0x1100000b



Op: 000100 = 4 = l-format = beq

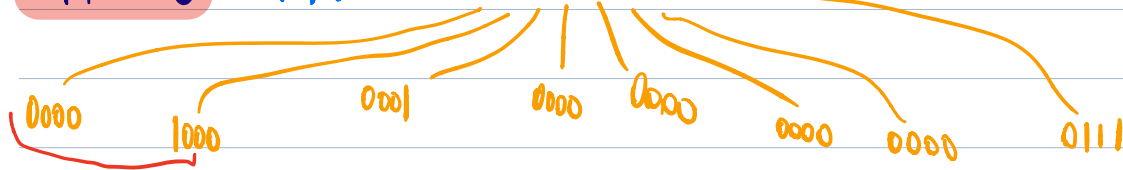
rs: 01000 = 8 = \$t0

rt: 00000 = 0 = \$zero

Imm: 0000 0000 0000 0110 = 6 = LEEQ

beq \$t0, \$zero, LEEQ

Line 20: hex: 0x08100007



Op: 0000/0 = 2 = J = J-format

address: 0000 0100 0000 0000 0000 0001 11
↳ = Grt

J Grt