pc xxxxxxxx

instr: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

instr	func7	rs2	rs1	func3	rd	opcode
xxxxxxxx	xxxxxxx	xxxxx(x)	xxxxx(x)	xxx	xxxxx(x)	xxxxxxx
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
x	x	x	x	x	x	x
imm	**pc_next**	**test**				
xxxxxxxx(x)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
4	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
8	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
12	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
16	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
20	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
24	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
28	xxxxxxxx	xxxxxxxx	xxxxxxxx	xxxxxxxx
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc xxxxxxxx

instr: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

instr	func7	rs2	rs1	func3	rd	opcode
xxxxxxxx	xxxxxxx	xxxxx(x)	xxxxx(x)	xxx	xxxxx(x)	xxxxxxx
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	xxxxxxxx(x)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
x	x	x	x	x	x	x
imm	**pc_next**	**test**				
xxxxxxxx(x)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	00000000	00000000	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000000

is_alui x20, x 0, 0x0000018f

instr: 00011000111100000110101000010011

instr	func7	rs2	rs1	func3	rd	opcode
18f06a13	0001100	01111(15)	00000(0)	110	10100(20)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	0000018f(399)	0000018f(399)	00000000(0)	00000000(0)	0000018f(399)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
0000018f(399)	00000000000000000000000000000100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	00000000	00000000	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000004

is_lui x21, 0x3fb95000

instr: 00111111101110010101101010110111

instr	func7	rs2	rs1	func3	rd	opcode
3fb95ab7	0011111	11011(27)	00000(0)	101	10101(21)	0110111
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	3fb95000(1069109248)	3fb95000(1069109248)	00000000(0)	00000000(0)	3fb95000(1069109248)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
3fb95000(1069109248)	00000000000000000000000000001000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	0000018f	00000000	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000008

is_alu x20, x20, x21

instr: 00000001010110100110101000110011

instr	func7	rs2	rs1	func3	rd	opcode
015a6a33	0000000	10101(21)	10100(20)	110	10100(20)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
0000018f(399)	3fb95000(1069109248)	3fb9518f(1069109647)	0000018f(399)	3fb95000(1069109248)	3fb9518f(1069109647)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000000001100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	0000018f	3fb95000	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000000c

is_lui x21, 0x98765000

instr: 10011000011101100101101010110111

instr	func7	rs2	rs1	func3	rd	opcode
98765ab7	1001100	00111(7)	00000(0)	101	10101(21)	0110111
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	98765000(2557890560)	98765000(2557890560)	00000000(0)	00000000(0)	98765000(2557890560)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
98765000(2557890560)	00000000000000000000000000010000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	3fb95000	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000010

is_alui x21, x21, 0x00000345

instr: 00110100010110101000101010010011

instr	func7	rs2	rs1	func3	rd	opcode
345a8a93	0011010	00101(5)	10101(21)	000	10101(21)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765000(2557890560)	00000345(837)	98765345(2557891397)	98765000(2557890560)	00000000(0)	98765345(2557891397)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000345(837)	00000000000000000000000000010100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765000	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000014

is_alui x22, x20, 0xfffffc00

instr: 11000000000001010000101100010011

instr	func7	rs2	rs1	func3	rd	opcode
c00a0b13	1100000	00000(0)	10100(20)	000	10110(22)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	fffffc00(4294966272)	3fb9558f(1069110671)	3fb9518f(1069109647)	00000000(0)	3fb9558f(1069110671)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
fffffc00(4294966272)	00000000000000000000000000011000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000000	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000018

is_alui x23, x20, 0x000007bc

instr: 01111011110010100100101110010011

instr	func7	rs2	rs1	func3	rd	opcode
7bca4b93	0111101	11100(28)	10100(20)	100	10111(23)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	000007bc(1980)	3fb95633(1069110835)	3fb9518f(1069109647)	00000000(0)	3fb95633(1069110835)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
000007bc(1980)	00000000000000000000000000011100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9558f	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000001c

is_alui x22, x20, 0x00000034

instr: 00000011010010100011101100010011

instr	func7	rs2	rs1	func3	rd	opcode
034a3b13	0000001	10100(20)	10100(20)	011	10110(22)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	00000034(52)	00000000(0)	3fb9518f(1069109647)	3fb9518f(1069109647)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000034(52)	00000000000000000000000000100000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9558f	3fb95633
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000020

is_alui x23, x20, 0xffffffff

instr: 11111111111110100011101110010011

instr	func7	rs2	rs1	func3	rd	opcode
fffa3b93	1111111	11111(31)	10100(20)	011	10111(23)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	ffffffff(4294967295)	00000001(1)	3fb9518f(1069109647)	00000000(0)	00000001(1)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
ffffffff(4294967295)	00000000000000000000000000100100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000000	3fb95633
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000024

is_alui x22, x20, 0x00000765

instr: 01110110010110100111101100010011

instr	func7	rs2	rs1	func3	rd	opcode
765a7b13	0111011	00101(5)	10100(20)	111	10110(22)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	00000765(1893)	00000105(261)	3fb9518f(1069109647)	00000000(0)	00000105(261)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
00000765(1893)	00000000000000000000000000101000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000000	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000028

is_alui x23, x20, 0xffffffff

instr: 11111111111110100010101110010011

instr	func7	rs2	rs1	func3	rd	opcode
fffa2b93	1111111	11111(31)	10100(20)	010	10111(23)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	ffffffff(4294967295)	00000000(0)	3fb9518f(1069109647)	00000000(0)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
ffffffff(4294967295)	00000000000000000000000000101100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000105	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000002c

is_alu x22, x21, x20

instr: 01000001010010101000101100110011

instr	func7	rs2	rs1	func3	rd	opcode
414a8b33	0100000	10100(20)	10101(21)	000	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	3fb9518f(1069109647)	58bd01b6(1488781750)	98765345(2557891397)	3fb9518f(1069109647)	58bd01b6(1488781750)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	1	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000000110000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000105	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000030

is_alu x23, x20, x22

instr: 00000001011010100100101110110011

instr	func7	rs2	rs1	func3	rd	opcode
016a4bb3	0000000	10110(22)	10100(20)	100	10111(23)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	58bd01b6(1488781750)	67045039(1728335929)	3fb9518f(1069109647)	58bd01b6(1488781750)	67045039(1728335929)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000000110100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	58bd01b6	00000000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000034

is_alu x22, x21, x20

instr: 00000001010010101000101100110011

instr	func7	rs2	rs1	func3	rd	opcode
014a8b33	0000000	10100(20)	10101(21)	000	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	3fb9518f(1069109647)	d82fa4d4(3627001044)	98765345(2557891397)	3fb9518f(1069109647)	d82fa4d4(3627001044)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000000111000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	58bd01b6	67045039
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000038

is_alu x22, x22, x20

instr: 01000001010010110000101100110011

instr	func7	rs2	rs1	func3	rd	opcode
414b0b33	0100000	10100(20)	10110(22)	000	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
d82fa4d4(3627001044)	3fb9518f(1069109647)	98765345(2557891397)	d82fa4d4(3627001044)	3fb9518f(1069109647)	98765345(2557891397)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	1	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000000111100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	d82fa4d4	67045039
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000003c

is_alu x23, x23, x22

instr: 00000001011010111110101110110011

instr	func7	rs2	rs1	func3	rd	opcode
016bebb3	0000000	10110(22)	10111(23)	110	10111(23)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
67045039(1728335929)	98765345(2557891397)	ff76537d(4285944701)	67045039(1728335929)	98765345(2557891397)	ff76537d(4285944701)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001000000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	98765345	67045039
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000040

is_alu x23, x23, x22

instr: 00000001011010111111101110110011

instr	func7	rs2	rs1	func3	rd	opcode
016bfbb3	0000000	10110(22)	10111(23)	111	10111(23)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
ff76537d(4285944701)	98765345(2557891397)	98765345(2557891397)	ff76537d(4285944701)	98765345(2557891397)	98765345(2557891397)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001000100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	98765345	ff76537d
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000044

is_alu x22, x20, x21

instr: 00000001010110100010101100110011

instr	func7	rs2	rs1	func3	rd	opcode
015a2b33	0000000	10101(21)	10100(20)	010	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001001000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	98765345	98765345
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000048

is_alu x23, x20, x21

instr: 00000001010110100011101110110011

instr	func7	rs2	rs1	func3	rd	opcode
015a3bb3	0000000	10101(21)	10100(20)	011	10111(23)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000001(1)	3fb9518f(1069109647)	98765345(2557891397)	00000001(1)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001001100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000000	98765345
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000004c

is_alui x 3, x 3, 0x00000004

instr: 00000000010000011000000110010011

instr	func7	rs2	rs1	func3	rd	opcode
00418193	0000000	00100(4)	00011(3)	000	00011(3)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	00000000(0)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000001010000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000000	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000050

is_alu x22, x20, x 3

instr: 00000000001110100001101100110011

instr	func7	rs2	rs1	func3	rd	opcode
003a1b33	0000000	00011(3)	10100(20)	001	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	00000004(4)	fb9518f0(4220852464)	3fb9518f(1069109647)	00000004(4)	fb9518f0(4220852464)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001010100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	00000000	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000054

is_alu x22, x21, x 3

instr: 00000000001110101101101100110011

instr	func7	rs2	rs1	func3	rd	opcode
003adb33	0000000	00011(3)	10101(21)	101	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	00000004(4)	09876534(159868212)	98765345(2557891397)	00000004(4)	09876534(159868212)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001011000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fb9518f0	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000058

is_alu x22, x21, x 3

instr: 01000000001110101101101100110011

instr	func7	rs2	rs1	func3	rd	opcode
403adb33	0100000	00011(3)	10101(21)	101	10110(22)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	00000004(4)	f9876534(4186400052)	98765345(2557891397)	00000004(4)	f9876534(4186400052)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	1	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001011100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	09876534	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000005c

is_alui x23, x21, 0x00000010

instr: 00000001000010101001101110010011

instr	func7	rs2	rs1	func3	rd	opcode
010a9b93	0000000	10000(16)	10101(21)	001	10111(23)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	00000010(16)	53450000(1397030912)	98765345(2557891397)	00000000(0)	53450000(1397030912)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000010(16)	00000000000000000000000001100000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	00000001
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000060

is_alui x23, x21, 0x00000008

instr: 00000000100010101101101110010011

instr	func7	rs2	rs1	func3	rd	opcode
008adb93	0000000	01000(8)	10101(21)	101	10111(23)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	00000008(8)	00987653(9991763)	98765345(2557891397)	00000000(0)	00987653(9991763)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000001100100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	53450000
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000064

is_alui x23, x21, 0x00000408

instr: 01000000100010101101101110010011

instr	func7	rs2	rs1	func3	rd	opcode
408adb93	0100000	01000(8)	10101(21)	101	10111(23)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	00000408(1032)	ff987653(4288181843)	98765345(2557891397)	00000000(0)	ff987653(4288181843)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
00000408(1032)	00000000000000000000000001101000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	00987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000068

is_alui x 3, x 0, 0x00000000

instr: 00000000000000000000000110010011

instr	func7	rs2	rs1	func3	rd	opcode
00000193	0000000	00000(0)	00000(0)	000	00011(3)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001101100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000004
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000006c

is_alui x 5, x 0, 0x000000f5

instr: 00001111010100000000001010010011

instr	func7	rs2	rs1	func3	rd	opcode
0f500293	0000111	10101(21)	00000(0)	000	00101(5)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	000000f5(245)	000000f5(245)	00000000(0)	98765345(2557891397)	000000f5(245)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
000000f5(245)	00000000000000000000000001110000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	00000000	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 00000000 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000070

is_store x20 0x00000000(x 3)

instr: 00000001010000011010000000100011

instr	func7	rs2	rs1	func3	rd	opcode
0141a023	0000000	10100(20)	00011(3)	010	00000(0)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000000(0)	00000000(0)	00000000(0)	3fb9518f(1069109647)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000001110100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000074

is_store x21 0x00000004(x 3)

instr: 00000001010100011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
0151a223	0000000	10101(21)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	98765345(2557891397)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000001111000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 98765345 00000000 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000078

is_store x23 0x00000008(x 3)

instr: 00000001011100011010010000100011

instr	func7	rs2	rs1	func3	rd	opcode
0171a423	0000000	10111(23)	00011(3)	010	01000(8)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000008(8)	00000008(8)	00000000(0)	ff987653(4288181843)	00000008(8)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000001111100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 98765345 ff987653 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000007c

is_store x22 0x00000004(x 3)

instr: 00000001011000011001001000100011

instr	func7	rs2	rs1	func3	rd	opcode
01619223	0000000	10110(22)	00011(3)	001	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	f9876534(4186400052)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000010000000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 98766534 ff987653 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000080

is_store x20 0x0000000a(x 3)

instr: 00000001010000011001010100100011

instr	func7	rs2	rs1	func3	rd	opcode
01419523	0000000	10100(20)	00011(3)	001	01010(10)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	0000000a(10)	0000000a(10)	00000000(0)	3fb9518f(1069109647)	0000000a(10)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
0000000a(10)	00000000000000000000000010000100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 98766534 518f7653 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000084

is_store x 5 0x00000007(x 3)

instr: 00000000010100011000001110100011

instr	func7	rs2	rs1	func3	rd	opcode
005183a3	0000000	00101(5)	00011(3)	000	00111(7)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000007(7)	00000007(7)	00000000(0)	000000f5(245)	00000007(7)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000007(7)	00000000000000000000000010001000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518f7653 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000088

is_store x 5 0x00000009(x 3)

instr: 00000000010100011000010010100011

instr	func7	rs2	rs1	func3	rd	opcode
005184a3	0000000	00101(5)	00011(3)	000	01001(9)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000009(9)	00000009(9)	00000000(0)	000000f5(245)	00000009(9)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000009(9)	00000000000000000000000010001100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff553 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000008c

is_store x 5 0x00000008(x 3)

instr: 00000000010100011000010000100011

instr	func7	rs2	rs1	func3	rd	opcode
00518423	0000000	00101(5)	00011(3)	000	01000(8)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000008(8)	00000008(8)	00000000(0)	000000f5(245)	00000008(8)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000010010000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000090

is_load x22, 0x00000000(x 3)

instr: 00000000000000011010101100000011

instr	func7	rs2	rs1	func3	rd	opcode
0001ab03	0000000	00000(0)	00011(3)	010	10110(22)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)	3fb9518f(1069109647)	3fb9518f(1069109647)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000010010100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	f9876534	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 00000000
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000094

is_store x22 0x0000000c(x 3)

instr: 00000001011000011010011000100011

instr	func7	rs2	rs1	func3	rd	opcode
0161a623	0000000	10110(22)	00011(3)	010	01100(12)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	0000000c(12)	0000000c(12)	00000000(0)	3fb9518f(1069109647)	0000000c(12)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
0000000c(12)	00000000000000000000000010011000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9518f	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000098

is_load x23, 0x00000008(x 3)

instr: 00000000100000011001101110000011

instr	func7	rs2	rs1	func3	rd	opcode
00819b83	0000000	01000(8)	00011(3)	001	10111(23)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000008(8)	00000008(8)	00000000(0)	00000000(0)	fffff5f5(4294964725)	fffff5f5(4294964725)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000010011100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9518f	ff987653
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: 00000000 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000009c

is_store x23 0x00000010(x 3)

instr: 00000001011100011010100000100011

instr	func7	rs2	rs1	func3	rd	opcode
0171a823	0000000	10111(23)	00011(3)	010	10000(16)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000010(16)	00000010(16)	00000000(0)	fffff5f5(4294964725)	00000010(16)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000010(16)	00000000000000000000000010100000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9518f	fffff5f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000a0

is_load x23, 0x00000008(x 3)

instr: 00000000100000011101101110000011

instr	func7	rs2	rs1	func3	rd	opcode
0081db83	0000000	01000(8)	00011(3)	101	10111(23)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000008(8)	00000008(8)	00000000(0)	00000000(0)	0000f5f5(62965)	0000f5f5(62965)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000010100100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9518f	fffff5f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 00000000 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000a4

is_store x20 0x00000014(x 3)

instr: 00000001010000011010101000100011

instr	func7	rs2	rs1	func3	rd	opcode
0141aa23	0000000	10100(20)	00011(3)	010	10100(20)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000014(20)	00000014(20)	00000000(0)	3fb9518f(1069109647)	00000014(20)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000014(20)	00000000000000000000000010101000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9518f	0000f5f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000a8

is_load x22, 0x00000007(x 3)

instr: 00000000011100011000101100000011

instr	func7	rs2	rs1	func3	rd	opcode
00718b03	0000000	00111(7)	00011(3)	000	10110(22)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000007(7)	00000007(7)	00000000(0)	00000000(0)	ffffffff5(4294967285)	ffffffff5(4294967285)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000007(7)	00000000000000000000000010101100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	3fb9518f	0000f5f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 00000000 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000ac

is_store x21 0x00000018(x 3)

instr: 00000001010100011010110000100011

instr	func7	rs2	rs1	func3	rd	opcode
0151ac23	0000000	10101(21)	00011(3)	010	11000(24)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000018(24)	00000018(24)	00000000(0)	98765345(2557891397)	00000018(24)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000018(24)	00000000000000000000000010110000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	ffffffff5	0000f5f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000b0

is_load x23, 0x00000007(x 3)

instr: 00000000011100011100101110000011

instr	func7	rs2	rs1	func3	rd	opcode
0071cb83	0000000	00111(7)	00011(3)	100	10111(23)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000007(7)	00000007(7)	00000000(0)	00000000(0)	000000f5(245)	000000f5(245)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000007(7)	00000000000000000000000010110100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	0000f5f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 00000000
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000b4

is_store x23 0x0000001c(x 3)

instr: 00000001011100011010111000100011

instr	func7	rs2	rs1	func3	rd	opcode
0171ae23	0000000	10111(23)	00011(3)	010	11100(28)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	0000001c(28)	0000001c(28)	00000000(0)	000000f5(245)	0000001c(28)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
0000001c(28)	00000000000000000000000010111000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	000000f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000b8

is_load x23, 0x00000018(x 3)

instr: 00000001100000011100101110000011

instr	func7	rs2	rs1	func3	rd	opcode
0181cb83	0000000	11000(24)	00011(3)	100	10111(23)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000018(24)	00000018(24)	00000000(0)	00000000(0)	00000045(69)	00000045(69)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000018(24)	00000000000000000000000010111100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	000000f5
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000000 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000bc

is_store x23 0x00000020(x 3)

instr: 00000011011100011010000000100011

instr	func7	rs2	rs1	func3	rd	opcode
0371a023	0000001	10111(23)	00011(3)	010	00000(0)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000020(32)	00000020(32)	00000000(0)	00000045(69)	00000020(32)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000020(32)	00000000000000000000000011000000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f f5766534 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000c0

is_store x 0 0x00000004(x 3)

instr: 00000000000000011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
0001a223	0000000	00000(0)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	00000000(0)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000011000100	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000c4

is_alu x 9, x 0, x 9

instr: 00000000100100000111010010110011

instr	func7	rs2	rs1	func3	rd	opcode
009074b3	0000000	01001(9)	00000(0)	111	01001(9)	0110011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000011001000	x				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	ffffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000c8

is_bxx

instr: 00000001010110100001010001100011

instr	func7	rs2	rs1	func3	rd	opcode
015a1463	0000000	10101(21)	10100(20)	001	01000(8)	1100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	0	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000011010000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	ffffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000d0

is_bxx

instr: 00000001010110100101010001100011

instr	func7	rs2	rs1	func3	rd	opcode
015a5463	0000000	10101(21)	10100(20)	101	01000(8)	1100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	0	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000011011000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000d8

is_bxx

instr: 00000001010110100111010001100011

instr	func7	rs2	rs1	func3	rd	opcode
015a7463	0000000	10101(21)	10100(20)	111	01000(8)	1100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	3fb9518f(1069109647)	98765345(2557891397)	00000000(0)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	0	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000011011100	0				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000dc

is_alui x 9, x 9, 0x00000002

instr: 00000000001001001000010010010011

instr	func7	rs2	rs1	func3	rd	opcode
00248493	0000000	00010(2)	01001(9)	000	01001(9)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000002(2)	00000002(2)	00000000(0)	00000000(0)	00000002(2)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000002(2)	00000000000000000000000011100000	0				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000000	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000e0

is_bxx

instr: 00000001010110100100010001100011

instr	func7	rs2	rs1	func3	rd	opcode
015a4463	0000000	10101(21)	10100(20)	100	01000(8)	1100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000002(2)	3fb9518f(1069109647)	98765345(2557891397)	00000002(2)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	0	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000011100100	0				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000002	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000e4

is_alui x 9, x 9, 0x00000003

instr: 00000000001101001000010010010011

instr	func7	rs2	rs1	func3	rd	opcode
00348493	0000000	00011(3)	01001(9)	000	01001(9)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000002(2)	00000003(3)	00000005(5)	00000002(2)	00000000(0)	00000005(5)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000003(3)	00000000000000000000000011101000	0				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000002	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000e8

is_bxx

instr: 00000001010110100110010001100011

instr	func7	rs2	rs1	func3	rd	opcode
015a6463	0000000	10101(21)	10100(20)	110	01000(8)	1100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
3fb9518f(1069109647)	98765345(2557891397)	00000005(5)	3fb9518f(1069109647)	98765345(2557891397)	00000005(5)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	0	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000011110000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000f0

is_load x25, 0x00000018(x 3)

instr: 00000001100000011010110010000011

instr	func7	rs2	rs1	func3	rd	opcode
0181ac83	0000000	11000(24)	00011(3)	010	11001(25)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000018(24)	00000018(24)	00000000(0)	00000000(0)	98765345(2557891397)	98765345(2557891397)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000018(24)	00000000000000000000000011110100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	ffffffff5	00000045
24	00000000	00000000	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000f4

is_bxx

instr: 00000001100110101000010001100011

instr	func7	rs2	rs1	func3	rd	opcode
019a8463	0000000	11001(25)	10101(21)	000	01000(8)	1100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
98765345(2557891397)	98765345(2557891397)	00000018(24)	98765345(2557891397)	98765345(2557891397)	00000018(24)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	0	0	0	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000011111100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000000 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 000000fc

is_store x 9 0x00000004(x 3)

instr: 00000000100100011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
0091a223	0000000	01001(9)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	00000005(5)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100000000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000005 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000100

is_load x10, 0x00000004(x 3)

instr: 00000000010000011010010100000011

instr	func7	rs2	rs1	func3	rd	opcode
0041a503	0000000	00100(4)	00011(3)	010	01010(10)	0000011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	00000000(0)	00000005(5)	00000005(5)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	1	1	0
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100000100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000000	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000005 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000104

is_jal

instr: 00000000110000000000000011101111

instr	func7	rs2	rs1	func3	rd	opcode
00c000ef	0000000	01100(12)	00000(0)	000	00001(1)	1101111
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000104(260)	00000004(4)	00000108(264)	00000000(0)	00000000(0)	00000108(264)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
1	0	0	1	0	0	0
imm	**pc_next**	**test**				
0000000c(12)	00000000000000000000000100010000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000000	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000005	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000005 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000110

is_alui x10, x10, 0x0000045c

instr: 01000101110001010110010100010011

instr	func7	rs2	rs1	func3	rd	opcode
45c56513	0100010	11100(28)	01010(10)	110	01010(10)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000005(5)	0000045c(1116)	0000045d(1117)	00000005(5)	00000000(0)	0000045d(1117)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
0000045c(1116)	00000000000000000000000100010100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000005	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000005 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000114

is_store x10 0x00000004(x 3)

instr: 00000000101000011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
00a1a223	0000000	01010(10)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	0000045d(1117)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100011000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	0000045d	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 0000045d 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000118

is_jalr

instr: 00000000000000001000000001100111

instr	func7	rs2	rs1	func3	rd	opcode
00008067	0000000	00000(0)	00001(1)	000	00000(0)	1100111
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000118(280)	00000004(4)	0000011c(284)	00000108(264)	00000000(0)	0000011c(284)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
1	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000100001000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	0000045d	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 0000045d 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000108

is_alui x10, x10, 0x00000008

instr: 00000000100001010000010100010011

instr	func7	rs2	rs1	func3	rd	opcode
00850513	0000000	01000(8)	01010(10)	000	01010(10)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
0000045d(1117)	00000008(8)	00000465(1125)	0000045d(1117)	00000000(0)	00000465(1125)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000100001100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	0000045d	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 0000045d 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000010c

is_store x10 0x00000004(x 3)

instr: 00000000101000011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
00a1a223	0000000	01010(10)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	00000465(1125)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100010000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000465	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000465 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000110

is_alui x10, x10, 0x0000045c

instr: 01000101110001010110010100010011

instr	func7	rs2	rs1	func3	rd	opcode
45c56513	0100010	11100(28)	01010(10)	110	01010(10)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000465(1125)	0000045c(1116)	0000047d(1149)	00000465(1125)	00000000(0)	0000047d(1149)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
0000045c(1116)	00000000000000000000000100010100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000465	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	ffffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000465 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000114

is_store x10 0x00000004(x 3)

instr: 00000000101000011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
00a1a223	0000000	01010(10)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	0000047d(1149)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100011000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	0000047d	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 0000047d 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000118

is_jalr

instr: 00000000000000001000000001100111

instr	func7	rs2	rs1	func3	rd	opcode
00008067	0000000	00000(0)	00001(1)	000	00000(0)	1100111
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000118(280)	00000004(4)	0000011c(284)	00000108(264)	00000000(0)	0000011c(284)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
1	0	0	1	0	0	0
imm	**pc_next**	**test**				
00000000(0)	00000000000000000000000100001000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	0000047d	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 0000047d 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000108

is_alui x10, x10, 0x00000008

instr: 00000000100001010000010100010011

instr	func7	rs2	rs1	func3	rd	opcode
00850513	0000000	01000(8)	01010(10)	000	01010(10)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
0000047d(1149)	00000008(8)	00000485(1157)	0000047d(1149)	00000000(0)	00000485(1157)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	1	0	0	0
imm	**pc_next**	**test**				
00000008(8)	00000000000000000000000100001100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	0000047d	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 0000047d 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 0000010c

is_store x10 0x00000004(x 3)

instr: 00000000101000011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
00a1a223	0000000	01010(10)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	00000485(1157)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100010000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000485	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000485 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000110

is_alui x10, x10, 0x0000045c

instr: 01000101110001010110010100010011

instr	func7	rs2	rs1	func3	rd	opcode
45c56513	0100010	11100(28)	01010(10)	110	01010(10)	0010011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000485(1157)	0000045c(1116)	000004dd(1245)	00000485(1157)	00000000(0)	000004dd(1245)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	1	1	0	0	0
imm	**pc_next**	**test**				
0000045c(1116)	00000000000000000000000100010100	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	00000485	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	ffffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 00000485 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000

pc 00000114

is_store x10 0x00000004(x 3)

instr: 00000000101000011010001000100011

instr	func7	rs2	rs1	func3	rd	opcode
00a1a223	0000000	01010(10)	00011(3)	010	00100(4)	0100011
alu_in1	**alu_in2**	**alu_out**	**reg_read_data1**	**reg_read_data2**	**reg_write_data**	**mem_read_data**
00000000(0)	00000004(4)	00000004(4)	00000000(0)	000004dd(1245)	00000004(4)	00000000(0)
alu_op1_reg_pc	**alu_op2_reg_imm**	**alu_arith**	**reg_write**	**writeback_alu_mem**	**mem_read**	**mem_write**
0	1	0	0	0	0	1
imm	**pc_next**	**test**				
00000004(4)	00000000000000000000000100011000	1				

reg_file(i)	x(i)	x(i+1)	x(i+2)	x(i+3)
0	00000000	00000108	00000000	00000000
4	00000000	000000f5	00000000	00000000
8	00000000	00000005	000004dd	00000000
12	00000000	00000000	00000000	00000000
16	00000000	00000000	00000000	00000000
20	3fb9518f	98765345	fffffff5	00000045
24	00000000	98765345	00000000	00000000
28	00000000	00000000	00000000	00000000
-	-	-	-	-
data_memory(i)	**+0**	**+4**	**+8**	**+c**

00000000: 3fb9518f 000004dd 518ff5f5 3fb9518f
00000010: fffff5f5 3fb9518f 98765345 000000f5
00000020: 00000045 00000000 00000000 00000000
00000030: 00000000 00000000 00000000 00000000
00000040: 00000000 00000000 00000000 00000000
00000050: 00000000 00000000 00000000 00000000
00000060: 00000000 00000000 00000000 00000000
00000070: 00000000 00000000 00000000 00000000