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1 <func>:
2 101f4: 00052503 lw a0,0(a0)
3 101f8: 0005a7f3 lw a5,0(a1)
4 101fc: ----- |bltu a0,a5,10208
5 10200: ----- sub a0,a0,a5
6 10204: ----- |bgeu a0,a5,10200
7 10208: ----- jalr zero,0(ra)

```

$$3 \cdot 4 = 12$$

$$12_{10} = 1100_2$$

R	31 30	25 24	21 20 19	15 14	12 11	8 7 6	0
funct7	rs2			rs1	funct3	rd	opcode
I	imm[11:0]			rs1	funct3	rd	opcode
S	imm[11:5]			rs2	rs1	funct3	imm[4:0]
B	imm[12]	imm[10:5]			rs2	rs1	funct3

$$a_5 = x15$$

$$15_{10} = 01111_2$$

$$a_0 = x10$$

$$10_{10} = 01010_2$$

12 11 10 9 8 7 6 5 4 3 2 1 0
 0 0 0 0 0 0 0 0 1 1 0 0
 imm[12] imm[10:5] rs2 rs1 funct3 imm[4:1] imm[11] opcode
 0000 0000 1111 0101 0110 0110 0110 0011
 0 0 F 5 6 6 6 3

$$-4_{10} = 0100_2$$

$$1011 + 1111 = 10110$$

R	31 30	25 24	21 20 19	15 14	12 11	8 7 6	0
funct7	rs2			rs1	funct3	rd	opcode
I	imm[11:0]			rs1	funct3	rd	opcode

0000011 000 - I LB rd,rs1,imm rd=(int8_t) DMEM[rs1+imm±]
 0000011 001 - I LH rd,rs1,imm rd=(int16_t) DMEM[rs1+imm±]
 0000011 010 - I LW rd,rs1,imm rd=(int32_t) DMEM[rs1+imm±]
 0000011 100 - I LBU rd,rs1,imm rd=(uint8_t) DMEM[rs1+imm±]
 0000011 101 - I LHU rd,rs1,imm rd=(uint16_t) DMEM[rs1+imm±]

$$rs1 = 11_{10} = 01011$$

$$rd = 15_{10} = 01111$$

imm rs1 funct3 rd opcode
 0000 0000 0000 0101 1010 0111 1000 0011
 0 0 0 5 A 7 8 3

```

1 <func>:
2 101f4: 00052503 lw a0,0(a0)
3 101f8: 0005a783 -----
4 101fc: 00f57463 -----
5 10200: 00008067 -----
6 10204: 40f50533 -----
7 10208: ff5ff06f -----

```

$$lw\ a5,0(a_1)$$

0 0 0 5 A 7 8 3
 0000 0000 0000 0101 1010 0111 1000 0011
 imm rs1 funct3 rd opcode
 = 0
 $01011_2 = 11_{10} = x11 = a_1$
 $01111_2 = 15_{10} = x15 = a_5$

```

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2 101f4: 00052503 lw a0,0(a0)
3 101f8: 0005a783 -----
4 101fc: 00f57463 -----
5 10200: 00008067 -----
6 10204: 40f50533 -----
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```

	31	30	25	24	21	20	19	15	14	12	11	8	7	6	0
R	funct7				rs2		rs1		funct3		rd		opcode		
I	imm[11:0]														
S	imm[11:5]				rs2		rs1		funct3		imm[4:0]		opcode		
B	imm[10:5]				rs2		rs1		funct3		imm[4:1]		opcode		
U	imm[31:12]														
J	imm[10:1]				imm[11]		imm[19:12]		rd		opcode				

Opcode	Funct3	Funct7	Fmt	Syntax	Semantics
0110111	-	-	U	LUI rd, imm	$rd = imm \ll 12$
0010111	-	-	U	AUIPC rd, imm	$rd = pc + (imm \ll 12)$
1101111	-	-	J	JAL rd, imm	$rd = pc + 4; pc = pc + (imm \ll 1)$
1100111	000	-	I	JALR rd, rs1, imm	$rd = pc + 4; pc = imm + rs1; pc[0] = '0'$

F F 5 F F 0 6 F
 1111 1111 0101 1111 1111 0000 0110 1111
 imm[20] imm[10:1] imm[11] imm[19:12] rd opcode

jal zero 101fc

Reihenfolge: 1111 1111 1111 1111 010
 flip 0000 0000 0000 0000 101
 + 1

001100 $\rightarrow 1100_2 = -12_{10} \Rightarrow$ 3 Pos. nach hinten