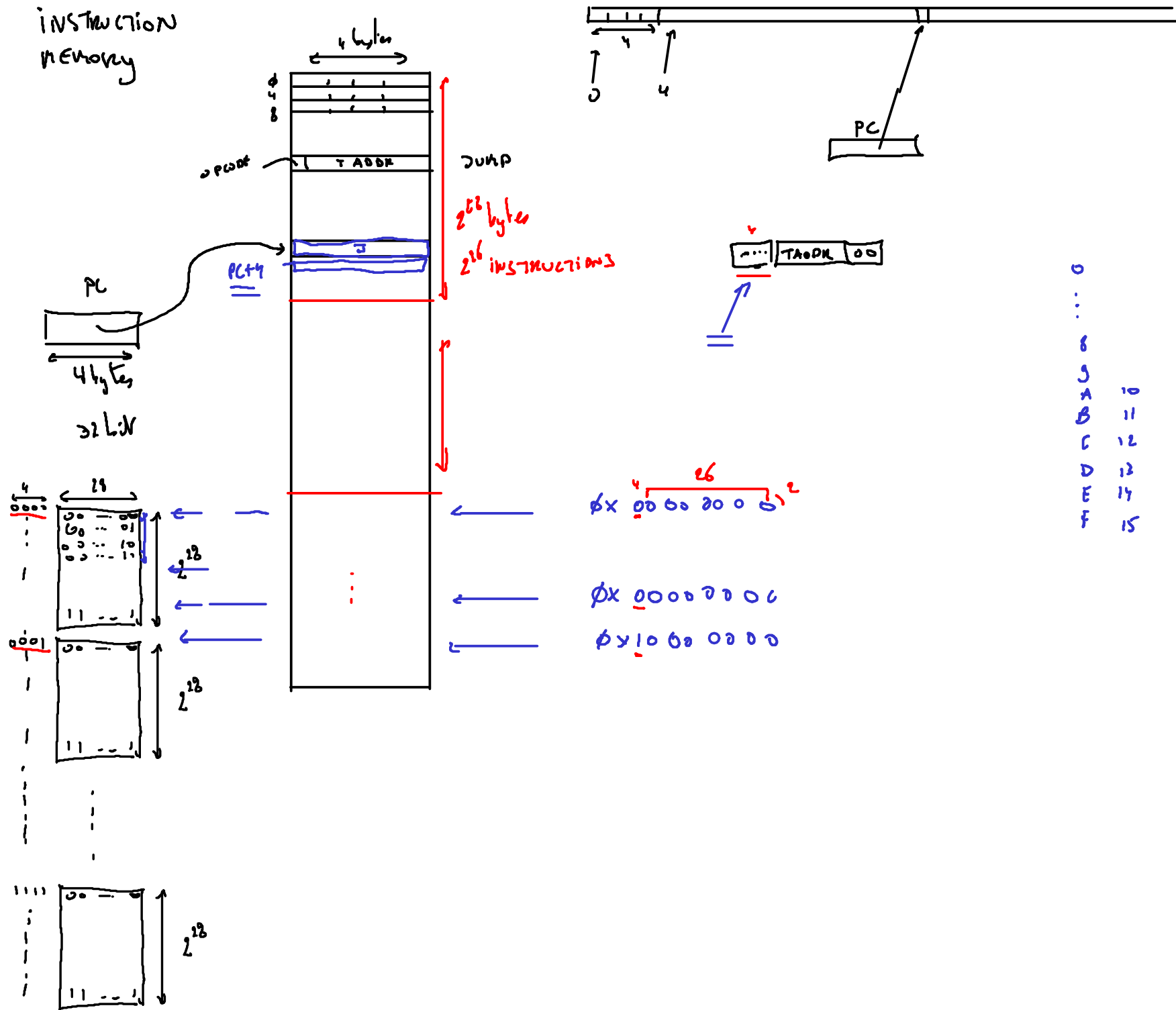


INSTRUCTION MEMORY



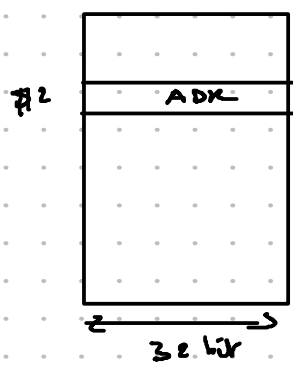
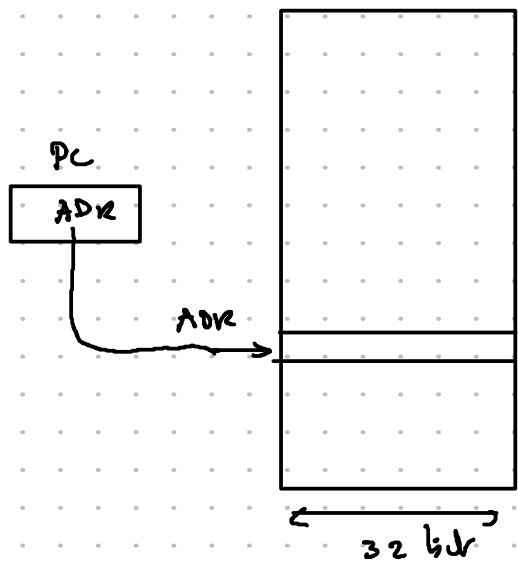
ABSOLUTE, INDIRECT

Jump

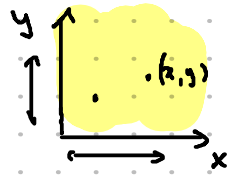
IM

REG

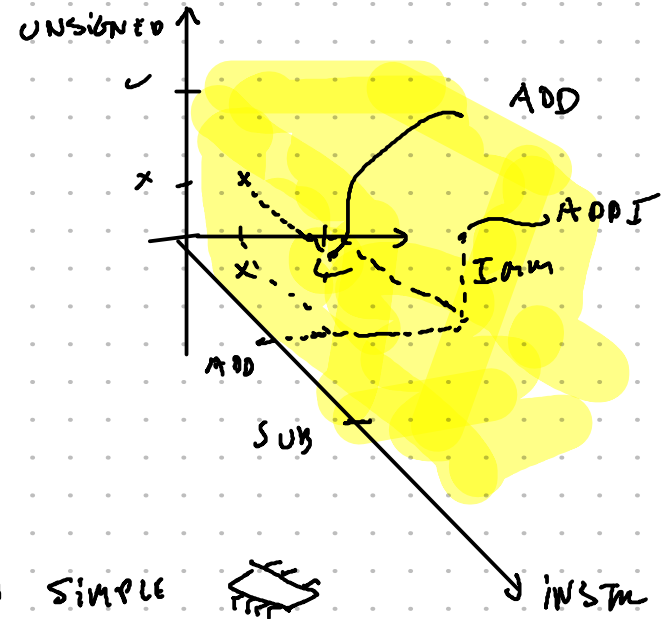
LA \$2, ADR
JR \$2



ORTHOgonALITY ↓



INSTN		I	U	UI
ADDITION	ADD	ADDI	ADDU	ADDUI
SUBTRACTION	SUB	SUBI	SUBU	SUBUI
LOAD	LD	LDS		

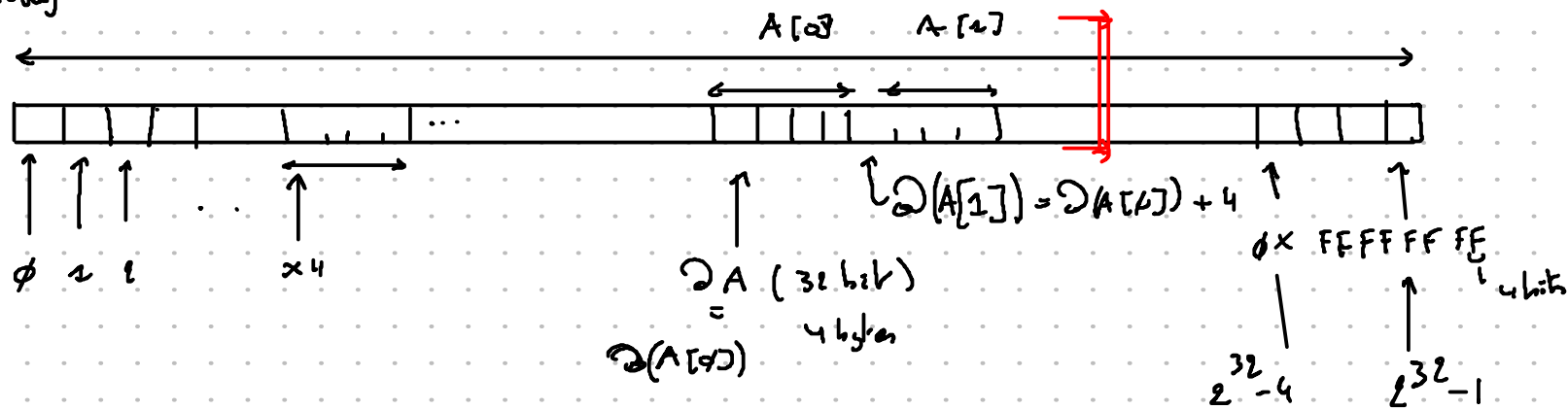


x IMPLEMENTATION SIMPLE

x COGNITIVE EASE



DATA MEMORY



`int A[10];`

`A[0] = 10;`

`A[1] = 5;`

`A[9] = 9;`

size of $(A) = 40 = 4 \times 10$

size of $(\text{int}) = 4$

size of $(\text{int}) = 4$

A : VECTOR OF LENGTH SIZE OF ELEMENTS OF TYPE T

DECLARATION
`T A[SIZE];`

size of $(A) = \text{size of } (T) \times \text{SIZE}$

USE
`A[i] = 5;`

`A[SIZE+1] = 16;`

OUT OF BOUNDS

$\text{address}(A[i]) = \text{address}(A[0]) + i \times \text{size of } (T)$

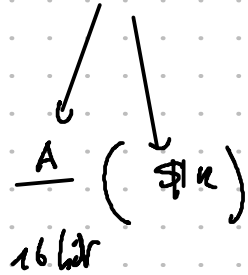
$0 \leq i \leq \text{SIZE} - 1$

> SIZE OUT OF BOUNDS

"ADDRESS OF" $\text{address}(A)$

for i in range 1 .. SIZE-1:

A[i] = i;



SIGNED INT



Overflow

$$[-2^{B-1}, 2^{B-1}-1]$$

$$2 \in \mathbb{Z}$$

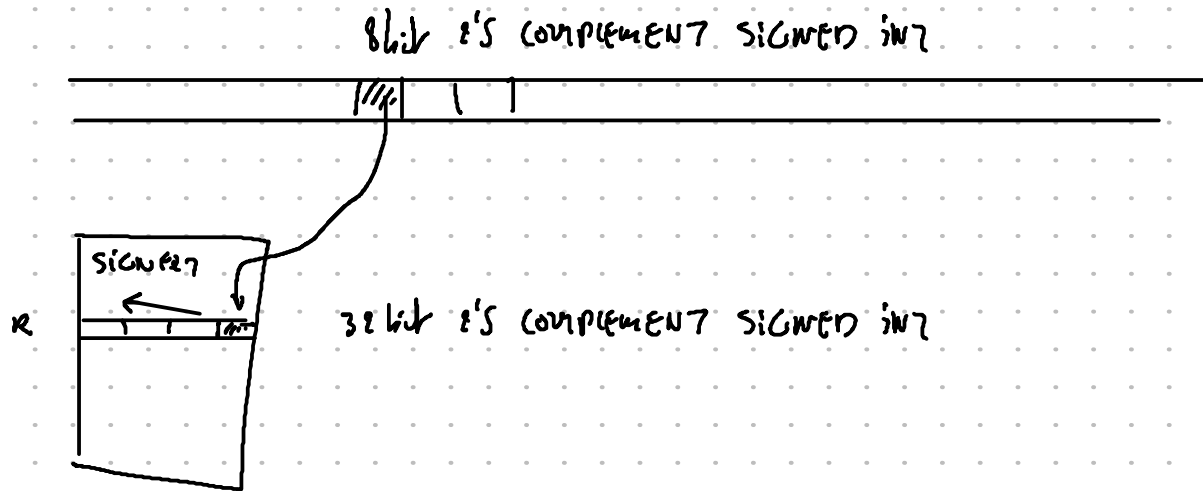
$$2+1 \in \mathbb{Z}$$

ADDI \$S3, \$S2, 4 1 C'

LI \$S1, 4 2 C'
ADD \$S3, \$S1, \$S1

5%

ISA = { INSTRUCTIONS HW }

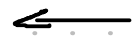


5 bit

UNSIGNED

$[0, 2^5 - 1]$

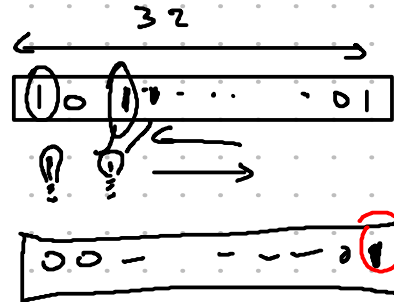
$[0, 31]$



SIGNED

$[-2^4, 2^4 - 1]$

$[-16, +15]$



0xF

LDI \$t2, 15

SLL \$t2, \$t2, 10

AND \$t0, \$t1, \$t2

LDI \$t2, 0x34000000 (II)

TODO: MAXS

LDI \$t2, 0x03000000

\$t2: 00000000 0000 1111

\$t1: 0000 0011 1100 0000 0000 0000



001111