

CS315-02 Processor Design Data Memory

Project 06

Tests \rightarrow program (prog)

No ".global"

Use `jal` instead call

Need main

init stack (SP)
and arguments



`jal func`

`Unimp`

`func:`

Possible packing
into
`0xjal, 73, 23`

Data Memory

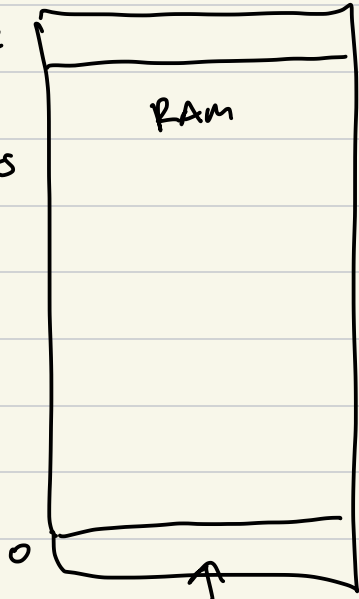
127

7 address bits

$$2^7 = 128$$

$$2^7 \cdot 2^3 = 2^{10}$$

1024



64 bit (8 bytes)

2^3

Adding Instructions

- 1) Modify or add component
- 2) May need to add or modify the data path. Usually you will need to extend or add MUXes
- 3) Extend or add control lines
Do this in your spreadsheet
Then build Inst Decoder
ROM
- 4) Test

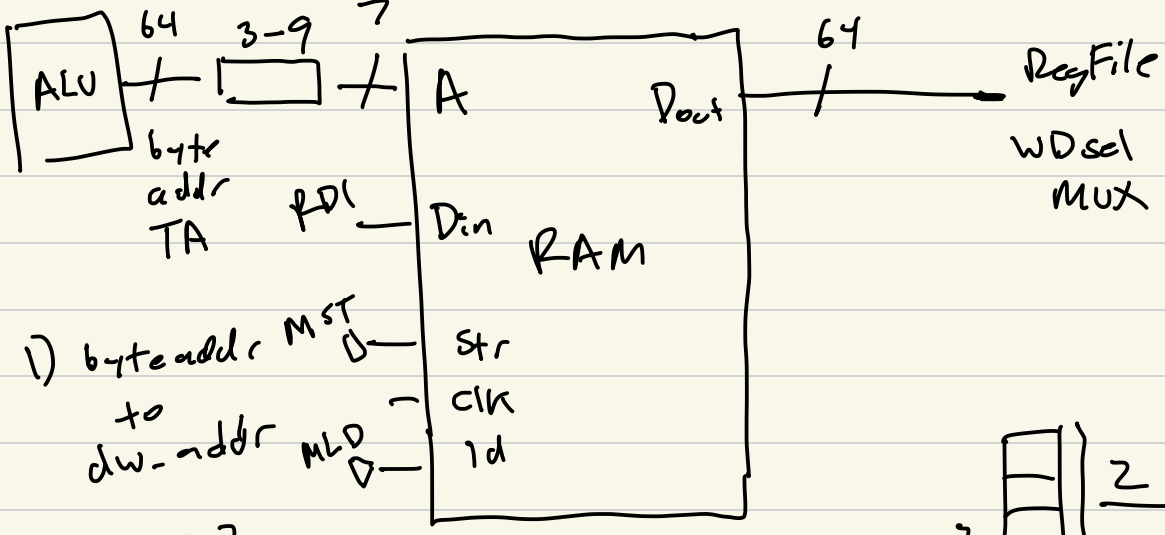
Data Memory

offset, base addr

ld to, 8(sp)

sd to, (r1) target_addr = off + base
 ↑ = 8 + SP

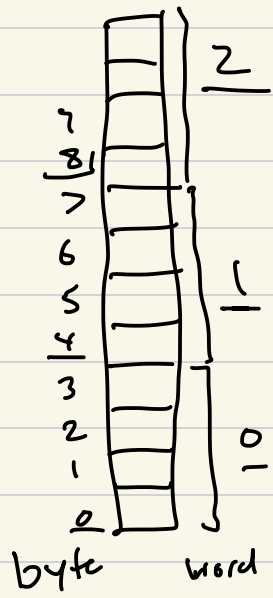
ld / sd



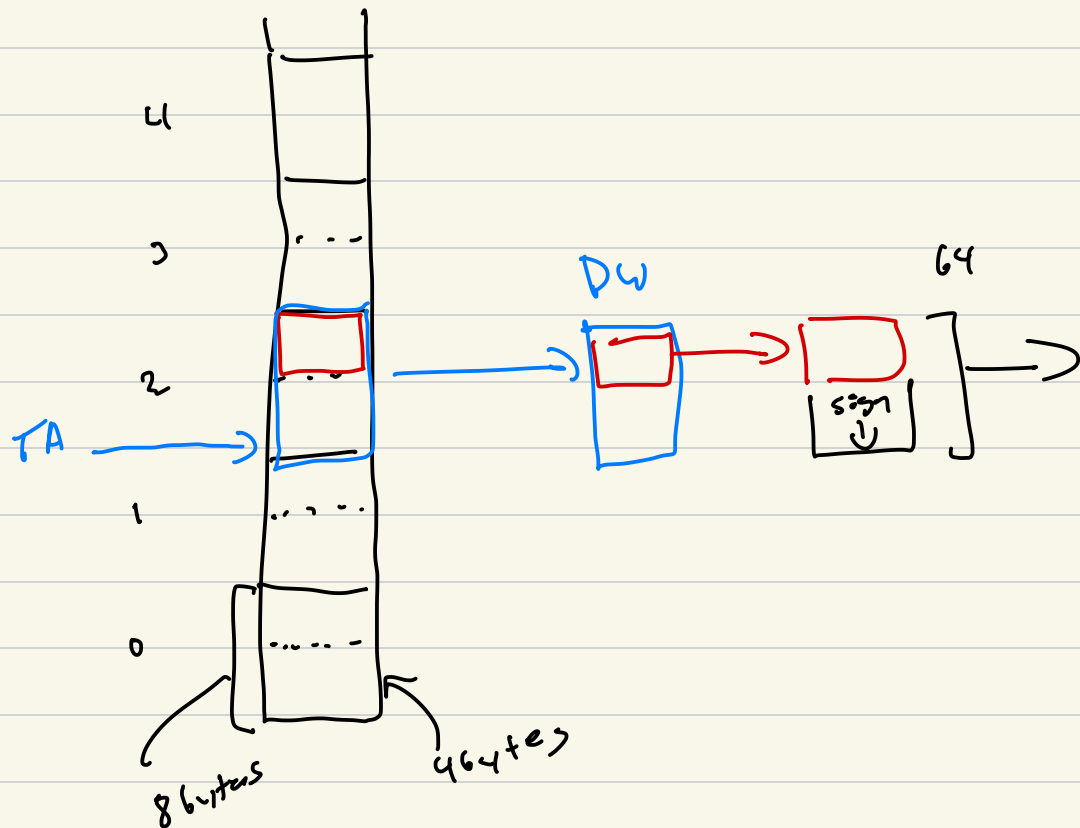
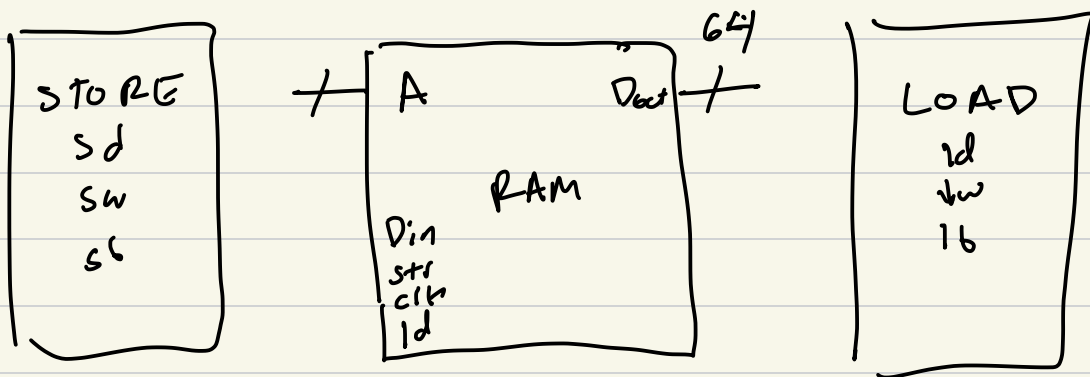
1) byte addr to dw-addr

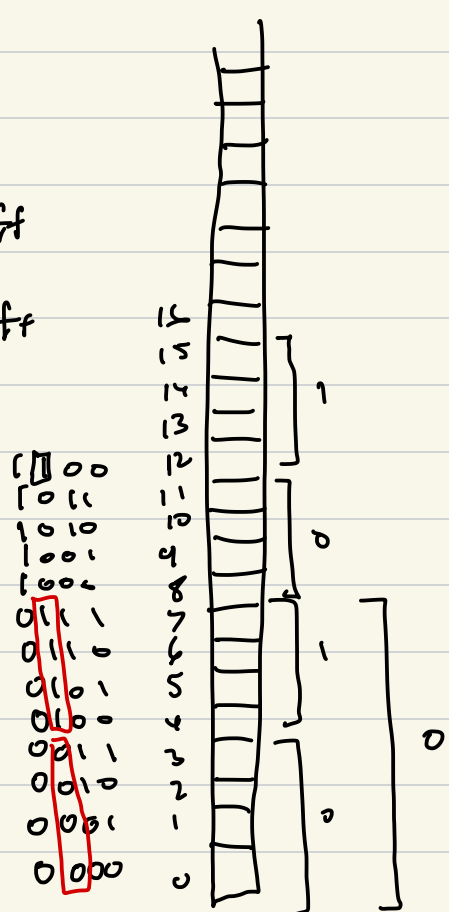
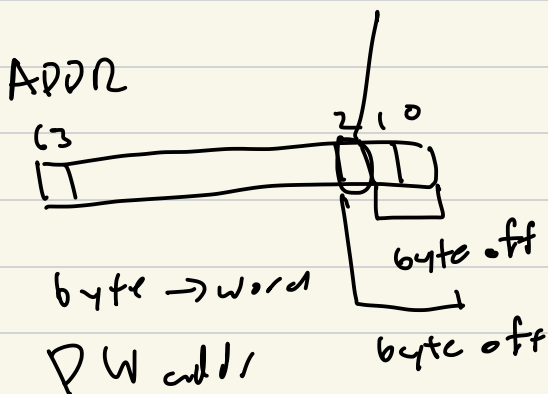
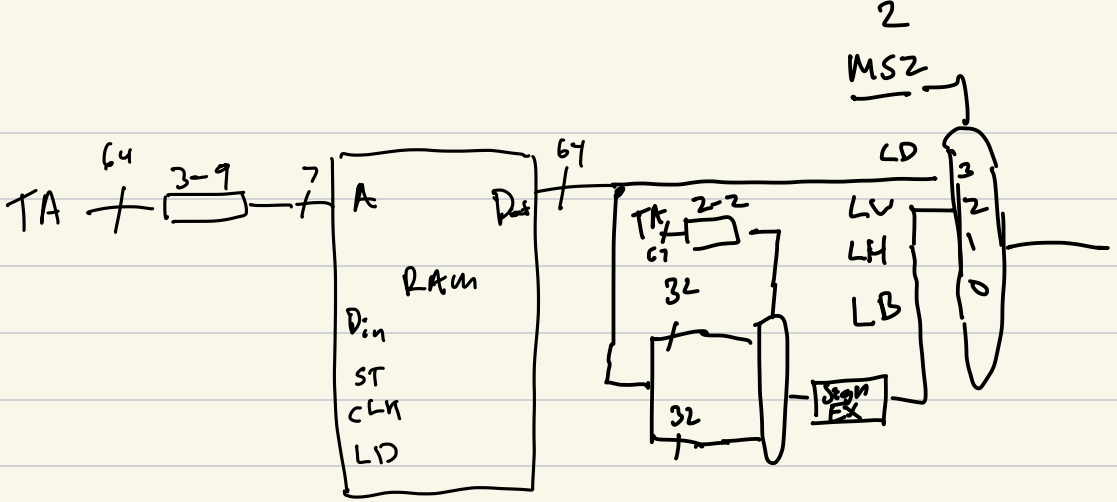
2) need 7 bits

data bits: 64
 addr bits: 7



lw / sw . (16 / sb)





15	0000
14	1000
13	1001
12	1010
11	1011
10	1100
9	1101
8	1110
7	0111
6	0110
5	0101
4	0100
3	0011
2	0010
1	0001
0	0000