

Lab10 Observations

- 1) Digital Register Usage
- 2) Spreadsheets

Project06 structure

```
project06 - <github_userid> / part1 / *.dig  
                                     / part2  
                                     / part3  
                                     / final  
                                     / inst-decode.pdf
```

```
cd part1
```

```
grade test -p project06
```

Preparing RISC-V functions to run on the processor

Create a new .s file

No ".global"

Use jal instead of call

Need a main

Main:

```
# initialize sp  
li sp, 1024
```

└─

```
jal swap-s  $2^7 = 128$ 
```

└─

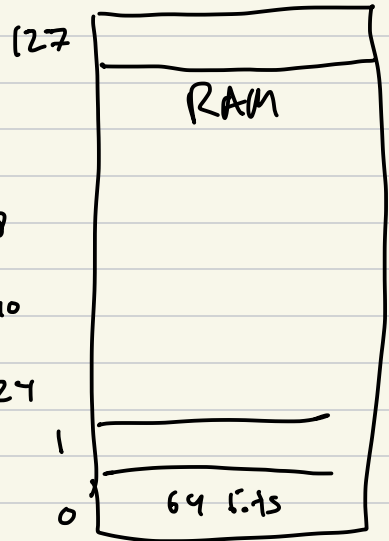
```
unimp
```

$$2^7 \cdot 2^3 = 2^{10} \\ 1024$$

Swap-s:

....
....

dw addr $128 \times 8 = 1024$ byte addr



data bits: 64
addr bits: 7

Review of adding instructions

- 1) Pick an instruction or group of instructions
- 2) Modify or add components
- 3) Modify or add to the datapath

Usually you will need to extend or add muxes.

New Mux: put existing line into input 0

Extend Mux: put new line in new inputs

- 4) Extend the instruction decoder control lines

update spreadsheet

update instruction decoder

- 5) test

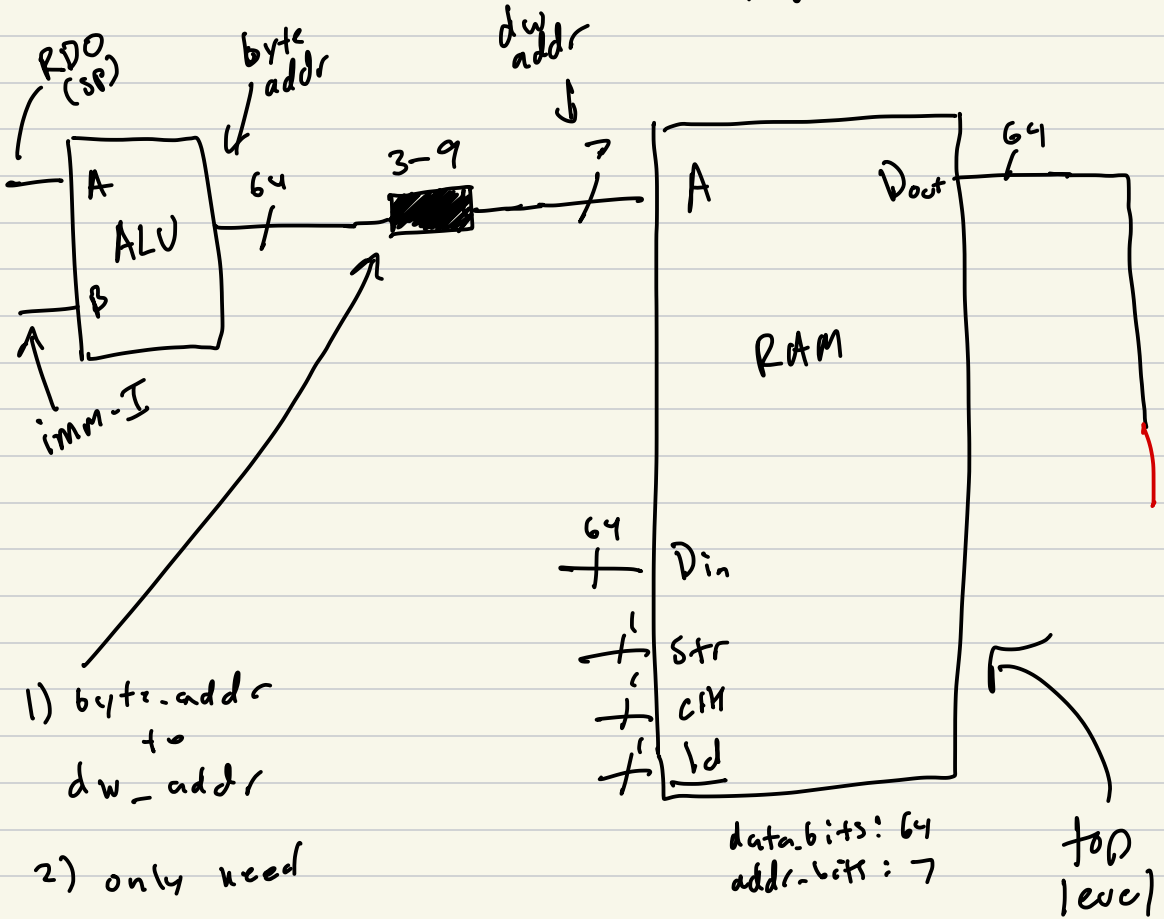
Data Memory

ld / sd

rd (wp) offset base addr

→ ld to, 8(sp)

target addr = base + offset



1) byte addr
to
dw addr

2) only need
7 bits

data bits: 64
addr bits: 7

top level

inst	ld	str	WPSecl
ld	1	0	10
sd	0	1	00

lw/sw (16/56)

