

CS315-01 Progs Data Memory 2025-11-11

Lab10 Observations

- 1) Digital Register - use
- 2) Spreadsheets

Project06 structure

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

```
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 the sp $sp \Rightarrow$

[li sp, 1024

jal swap-s

[
unimp

$$2^7 = 128$$

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

$$1024$$

swap-s:



$$\text{data bits} = 64$$

$$\text{addr bits} = \underline{7}$$

Review 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 → always add new datapath wires to new inputs

4) Extend instruction decoder control lines

Update spreadsheet

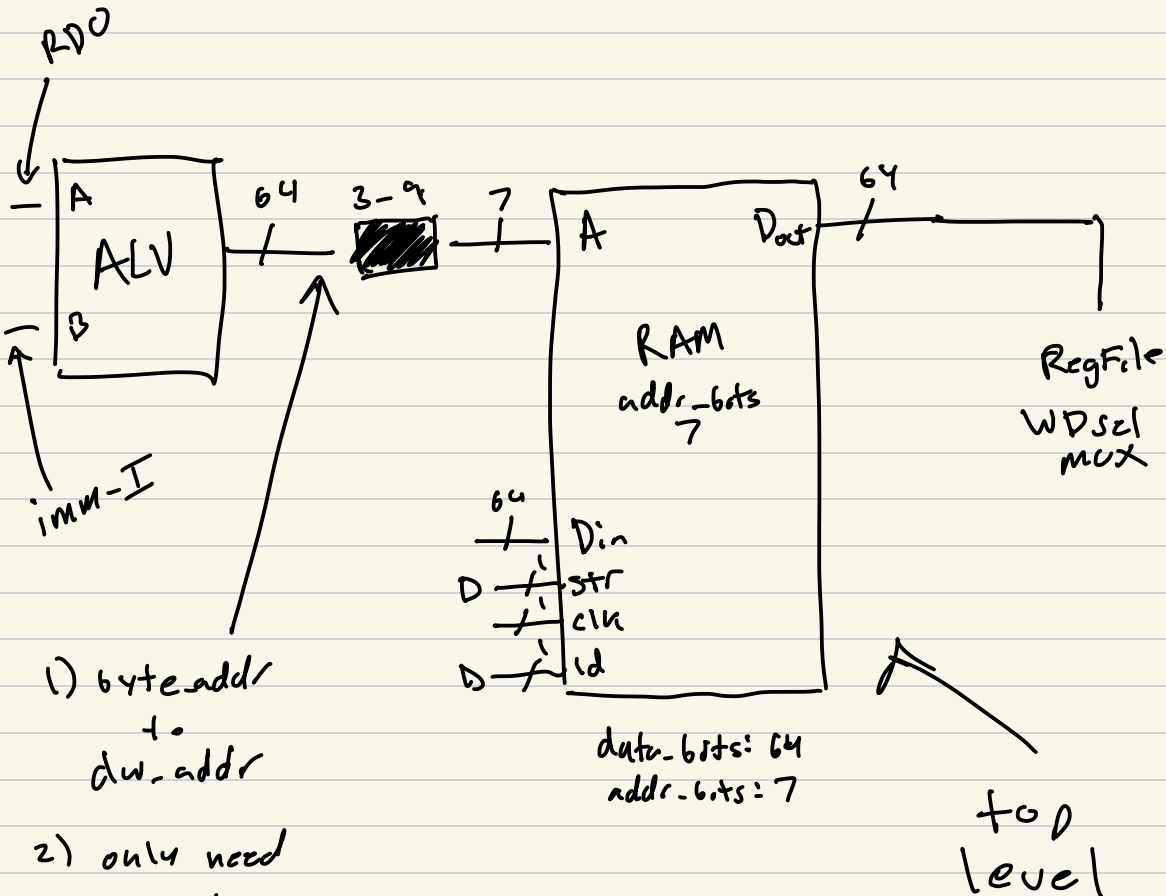
update instruction decoder

5) Test

Data Memory

ld / sd

rd/wr offset base addr
 ↓ ↓ ↓
 ld to 0, 8(sp)
 target-addr = base + offset



Control lines

inst	WdSel(2) or Mem2Reg(1)	ld	str
ld		1	0
sd		0	1

lw/sw (16/64)

