CS315-01 Instruction Decoding and Control

Lab05
Tests

Instruction Decoding

IW ⟶ control signals

Decoders
Reg Decoder - rs1, rs2, rd
Imm Decoder - all immediates

Inst Decoder

To add instructions
1) Add any components needed
2) Add datapath lines/wires
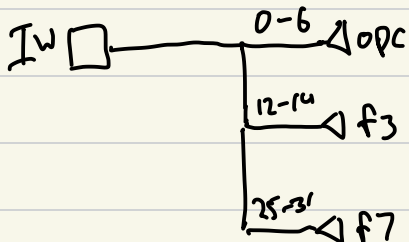3) Often this will require new MUXes
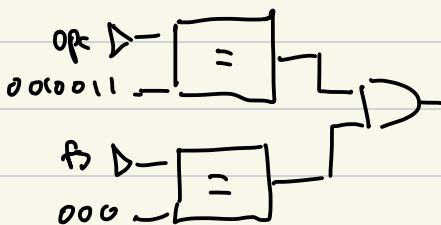4) Update Inst Decoder

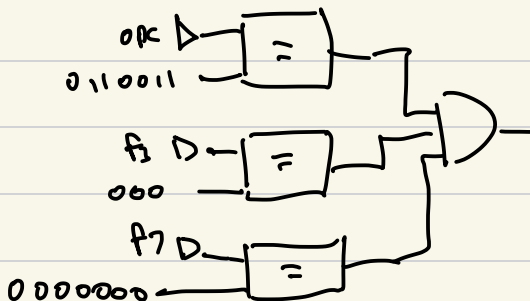# Dashboard

x0 ▷───◎ zero
x1 ▷─◎ ra
x2 ▷─◎ sp

.
.
!

Inst Decoder

ADDI

IW □────── 0-6 ◁ opc

12-14 ◁ f3

25-31 ◁ f7

opc ▷─ | = |
0010011 ──

f3 ▷─ | = |
000 ──

ADD

opc ▷─ | = |
0110011 ──

f3 ▷─ | = |
000 ──

f7 ▷─ | = |
0000000 ──

ADDI

PRI
Encoder 3

Op =
0010011

B =
000

inum

...

ADD

Op =
0110011

B =
000

A7 =
0000000
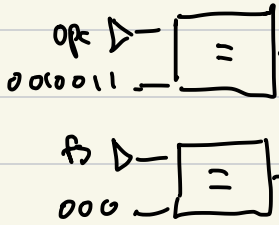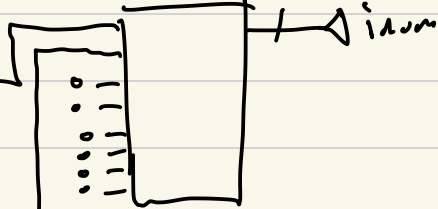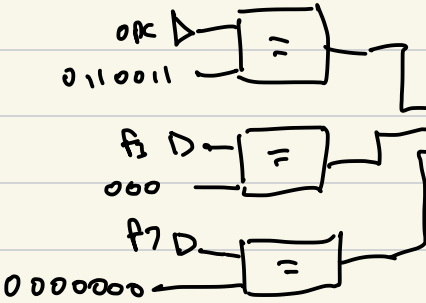
RFW ALUop ALUsrcB

inum

	RFW	ALUop	ALUsrcB
add:	1	000	1
add	0	000	1

5

1-3
4

ALUsrc D —(0) ALUsrcB

ACUOD —(0) ALUop

RFW —(•) RFF