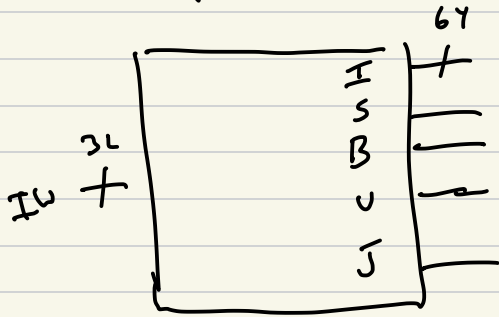


CS315-02 Processor Instruction Decoding 2025-11-04

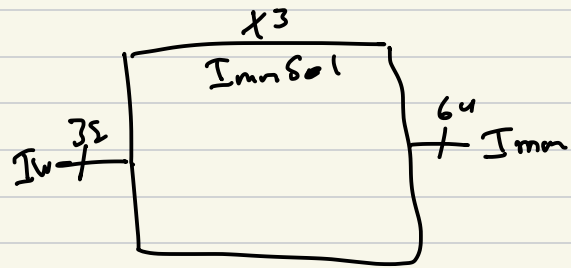
Reg Decoder - $IW \rightarrow rs1, rs2, rd$

Imm Decoder - $IW \rightarrow$ all immediate types

option #1



option #2



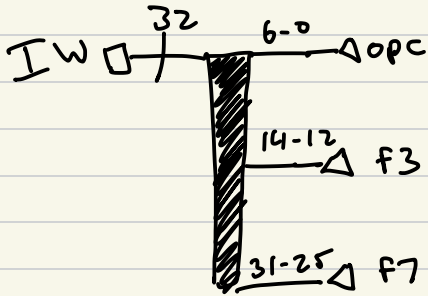
Instruction Decoding

$IW \rightarrow$ Control Signals

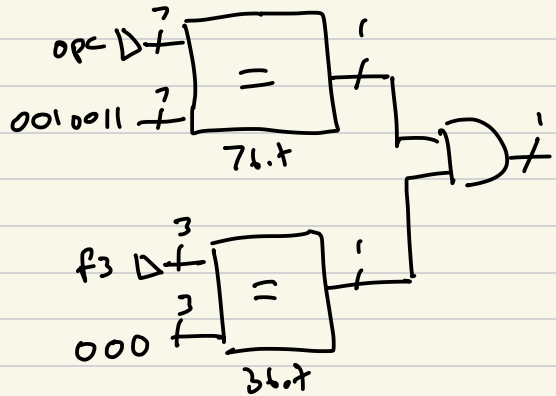
To add new instructions:

- 1) Add new components if needed
- 2) Add or modify the datapath using wires/buses
- 3) Often this will require new or modified Muxes
- 4) Update InstDecoder possibly with new control outputs

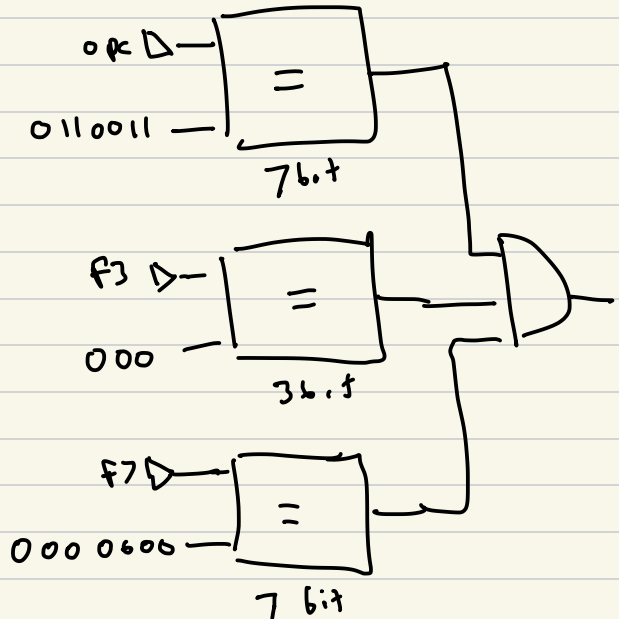
Inst Decoder

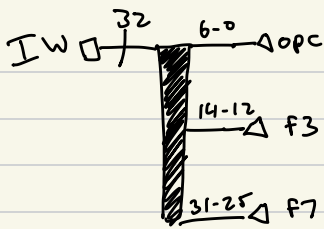


ADDI (i-type)

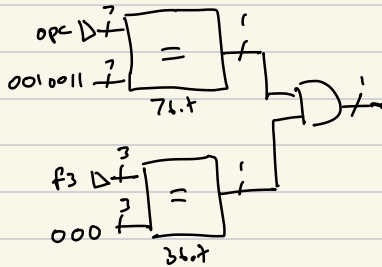


ADD (r-type)

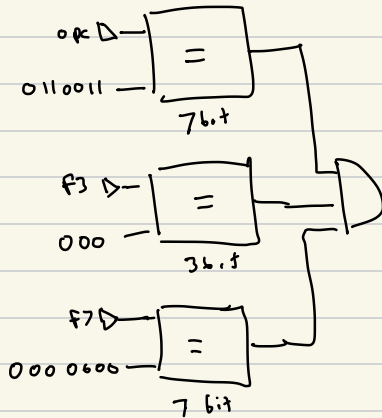




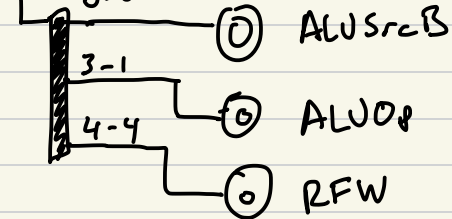
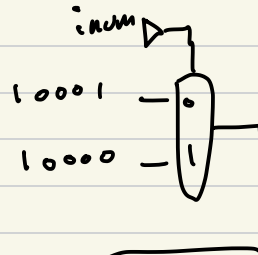
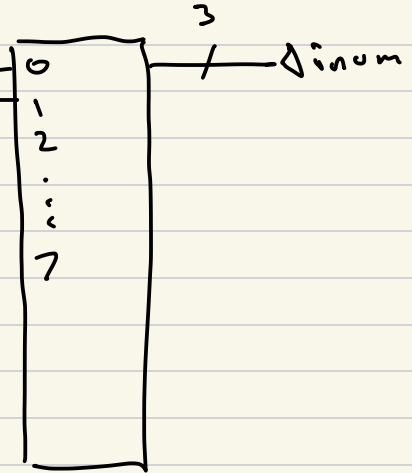
ADDI (i-type)



ADD (r-type)

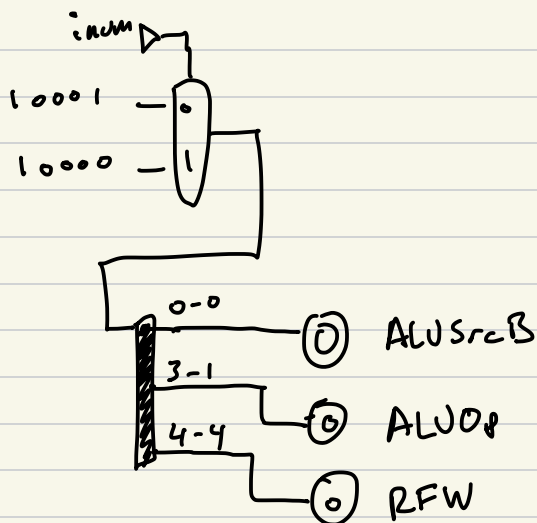


Priority Encoder



inst	inum	RFW	ALUOp	ALUSrcB
J addi	0	1	000	1
J add	1	1	000	0

addi t0, a0, 99



$\Rightarrow$

